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# Independent Competent Persons Report on Coal of Africa Limited's Greater Soutpansberg Projects

## Prepared for Coal of Africa Limited and Peel Hunt LLP


**COMPETENT PERSON:**

**E. DE KLERK**
B. Sc. (Geol.), M.Sc. (Exploration Geol.)
**Pr.Sci.Nat., FGSSA**
**Manager, Venmyn Deloitte**

**J. SPARROW**
B.Sc. Hons (Geol.), COMcert. Rock Mechanics,
Pr.Sci.Nat.,
**Group Geologist, CoAL**

**COMPILED BY:**

**T. C. ORFORD**
B.Sc. Hons (Geol.), GDE (Min. Eng.),
Pr.Sci.Nat., MGSSA, MSAIMM, MSPE.
**Senior Geologist, Venmyn Deloitte**

**N. MOEKETSI**
BTech. (Env. Sci.)
IAIASA
**Environmental Industry Analyst, Venmyn Deloitte**

**C. JACOBS**
B.Com (Hons). (Investment Management).
SAIMM
**Mineral Project Analyst**

**REVIEWED BY:**

**F.J. HARPER**
B.Sc. Hons (Geol.),
Pr.Sci.Nat., MGSSA.
**Associate Director, Venmyn Deloitte**

**N. McKENNA**
M.Sc. (Geol), B.Sc. Hons. (Geol), Pr.Sci.Nat.
MAusIMM, MSAIMM, MGSSA,MIASSA, M.Inst.D.
**Associate Director, Venmyn Deloitte**



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## Synopsis

Coal of Africa Limited (CoAL or the Company) is a coal mining and exploration company with thermal and coking coal assets located across South Africa in four different coalfields. These assets include mining and prospecting licences for a number of operating mines and exploration projects at various stages of development from early reconnaissance to feasibility stage.

The directors of CoAL requested that Venmyn Deloitte (Pty) Ltd (Venmyn Deloitte) compile an Independent Technical Report, in the form of a Competent Persons' Report (CPR) on certain of their coal assets within the Soutpansberg Coalfield of South Africa. These coal assets are those belonging to CoAL's so called "Greater Soutpansberg Project" (GSP) and comprise all coal assets within the Soutpansberg Coalfield, excluding the Makhado Project (which was reported on in detail in a CPR in 2011 compiled by Venmyn Deloitte, reference number D1010R).

This CPR is addressed to CoAL and to Peel Hunt LLP in its capacity as nominated advisor.

Venmyn Deloitte understands that the update 2015 CPR will form part of the documentation in support of readmission of CoAL to the AIM Market of the London Stock Exchange (LSE). The readmission of CoAL to AIM is in connection with a proposed acquisition with Universal Coal Plc (Universal Coal).

Two CPR's have previously been published by CoAL on the GSP assets. In October 2011, CoAL published a CPR, titled "Independent Competent Persons' Report on the Principal Coal Assets of Coal of Africa Limited (CoAL)". This 2011 CPR included the technical details of all CoAL's principle coal assets at that time. Since then, CoAL acquired a number of additional coal assets from Rio Tinto Minerals Development Ltd (Rio Tinto) and Kwezi Mining Exploration (Pty) Ltd (KME) within the Soutpansberg Coalfield of South Africa. In 2012, CoAL published a follow-up CPR, title "Independent Competent Persons' Report on Certain Coal Assets within the Soutpansberg Coalfield of Coal of Africa Limited (CoAL)", reference number D1121R. The 2012 CPR documents the technical details of the newly acquired coal assets and certain contiguous assets reported on in the 2011 CPR and includes a detailed technical review of all the coal assets of CoAL within the GSP. No changes have been made to the Coal Resource statements for the GSP assets from the 2012 CPR to this 2015 update.

The GSP assets include the following grouping of projects:-

- the Mopane Project, comprising the Voorburg and Jutland sections;
- the Generaal Project, comprising the Mount Stuart and Generaal sections;
- the Makhado Extension, comprising the Telema and Gray section; and
- the Chapudi Project, comprising the Chapudi, Chapudi West and Wildebeesthoek sections.

The GSP assets specifically excludes CoAL's Makhado and Vele Projects also located in the Limpopo Province.

The CoAL corporate structure is currently made up of 18 subsidiary companies as illustrated in the organogram below. CoAL's GSP assets are held by four of the subsidiary companies, namely:-

- Regulus Investment Holdings (Pty) Ltd - Mopane Project;
- Kwezi Mining & Exploration (Pty) Ltd – Generaal Project;
- Chapudi Coal (Pty) Ltd – Chapudi Project; and
- Limpopo Coal Company (Pty) Ltd – Telema & Grey Project.

This updated 2015 CPR serves the purpose of documenting the technical aspects of CoAL's GSP assets and describes each of these mineral assets in terms of its historical and recent exploration and mining data, which would have a bearing on the techno-economic value of the assets.

The coal assets discussed in this CPR are graphically portrayed in a mineral-asset portfolio triangle in order for the reader to obtain an understanding of the relative development of the various projects and their location with respect to the coalfields.

The table below summarises CoAL's GSP assets discussed in the 2015 CPR.

**Summary of CoAL's GSP Assets**

| ASSET[1] | HOLDER | INTEREST (%) | STATUS | LICENCE EXPIRY DATE[2] | LICENCE AREA (ha) | COMMENTS |
|---|---|---|---|---|---|---|
| 1. Voorburg | Regulus Investment Holdings (Pty) Ltd (a 100% owned subsidiary of CoAL) | *74-100% | Advanced Exploration | May-13 | 11,325 | Acceptance letter for NOMR issued in May 2013 |
| 2. Jutland | Regulus Investment Holdings (Pty) Ltd (a 100% owned subsidiary of CoAL) | *74-100% | Early Exploration | Apr-13 | 14,491 | Acceptance letter for NOMR issued in May 2013 |
| 3. Telema and Gray | Limpopo Coal Company (Pty) Ltd (a 100% owned subsidiary of CoAL) | 100% | Exploration | Apr-13 | 2,131 | Acceptance letter for NOPR issued in August 2013 |
| 4. Mount Stuart | Kwezi Mining & Exploration (Pty) Ltd (a 100% owned subsidiary of CoAL) | 100% | Exploration | Apr-13 | 9,125 | Acceptance letter for NOMR issued in July 2013 |
| 5. Generaal | Kwezi Mining & Exploration (Pty) Ltd (a 100% owned subsidiary of CoAL) | 100% | Early Exploration | May-13 | 13,470 | Acceptance letter for NOMR issued in July 2013 |
| 6. Chapudi | Chapudi Coal (Pty) Ltd (a 74% owned subsidiary of CoAL) | 74% | Pre-Feasibility | May-13 | 17,948 | Acceptance letter for NOMR issued in July 2013 |
| 7. Chapudi West | Chapudi Coal (Pty) Ltd (a 74% owned subsidiary of CoAL) | 74% | Early Exploration | May-13 | 8,992 | Acceptance letter for NOMR issued in July 2013 |
| 8. Wildebeesthoek | Chapudi Coal (Pty) Ltd (a 74% owned subsidiary of CoAL) | 74% | Early Exploration | May-13 | 10,641 | Acceptance letter for NOMR issued in July 2013 |

[1] All assets are located in Limpopo Province, Republic of South Africa
[2] Although certain prospecting rights have expired, CoAL has applied for renewal of the relevant rights. Under the MPRDA a prospecting right in respect of which an application for renewal has been lodged shall, despite its stated expiry date, remain in force until such time as the renewal application has been granted or refused.
* CoAL has a 100% interest in all right holder(s) except those acquired as part of the Chapudi Acquisition Transaction. In these right holder(s) CoAL has a 74% interest.

This 2015 CPR has been compiled, to the extent required and in accordance with:-

- the Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves (JORC Code) 2012 edition;
- the Australian Guidelines for the Estimation and classification of Coal Resources, 2014 edition;
- the AIM Note for Mining and Oil & Gas Companies- June 2009;
- the Prospectus Rules published by the Financial Services Authority (FSA) and governed by the United Kingdom Listing Authority (UKLA) (Prospectus Rules);
- the Prospectus Directive (2003/71/EC) and the Prospectus Regulation (809/2004); and
- Sections 131 to 133 and Appendices I to III of the document titled 'ESMA update of the CESR recommendations: The consistent implementation of Commission Regulation (EC) No. 809/2004 implementing the Prospectus Directive' and dated the 23 March 2011.

The Coal Resources for the GSP assets were originally estimated and signed off by CoAL's Competent Person, Mr J Sparrow (Pr.Sci.Nat.) (CoAL's Group Geologist), Venmyn Rand (Pty) Ltd and independent contractor Liz de Klerk (Pr.Sci.Nat) (Glanvill Geoconsulting) in 29 February 2012. At that time Venmyn Deloitte reviewed CoAL's estimation procedures and considered the Coal Resource estimates and classification as prepared and declared by CoAL to be reasonable and compliant with the reporting standard of JORC.

There has been no material change in the Coal Resource statement since 29 February 2012 and it has accordingly been re-presented without change in this 2015 CPR. The following two tables illustrate the 29 February 2012 and 31 December 2015 Coal Resource statement. The Coal Resource statement cannot be presented in the standard AIM tabular format as the suggested columns are not applicable to coal. No Coal Reserves have been declared for any of the GSP assets.

**Previous Coal Resources of CoAL's Greater Soutpansberg Project (excluding Makhado Project) (29 February 2012) (Inclusive of Reserves)**

| PROJECT | SECTION | RESOURCE CATEGORY | GROSS TONNES IN SITU (GTIS) | TOTAL TONNES IN SITU (TTIS) | MINEABLE TONNES IN SITU (MTIS) | COAL ATTRIBUTABLE % | COAL ATTRIBUTABLE (GTIS) |
|---|---|---|---|---|---|---|---|
| Mopane | Voorburg | Measured | 109,435,158 | 98,491,000 | 94,915,200 | *74-100% | 105,669,749.86 |
| Makhado Ext. | Telema and Gray | | 42,244,854 | 38,020,200 | 36,240,800 | 100% | 42,244,854.00 |
| **TOTAL/WT. AVE MEASURED** | | | **151,680,012** | **136,511,200** | **131,156,000** | ***74-100%** | **147,914,603.86** |
| Mopane | Voorburg | Indicated | 125,033,852 | 106,271,000 | 100,500,000 | 74-100% | 119,624,989.06 |
| Makhado Ext. | Telema and Gray | | 29,581,152 | 25,141,000 | 23,225,000 | 100% | 29,581,152.00 |
| **TOTAL/WT. AVE INDICATED** | | | **154,615,004** | **131,412,000** | **123,725,000** | ***74-100%** | **149,206,141.06** |
| Mopane | Voorburg | Inferred | 36,238,997 | 28,920,000 | 23,940,000 | *74-100% | 31,651,715.60 |
| Generaal | Mount Stuart | | 407,162,828 | 325,690,000 | 55,460,000 | 100% | 407,162,828.00 |
| Makhado Ext. | Telema and Gray | | 12,301,228 | 9,820,000 | 7,320,000 | 100% | 12,301,228.00 |
| Chapudi | Chapudi | | 6,399,023,436 | 5,119,130,000 | 1,318,420,000 | 74% | 4,735,277,342.64 |
| **TOTAL/WT. AVE INFERRED** | | | **6,854,726,489** | **5,483,560,000** | **1,405,140,000** | ***74-100%** | **5,186,393,114** |
| **GRAND TOTAL RESOURCES** | | | **7,161,021,505** | **5,751,483,200** | **1,660,021,000** | ***74-100%** | **5,483,513,859** |

Source: CoAL 2012

**Current CoAL Coal Resources of CoAL's Greater Soutpansberg Project (excluding Makhado Project) (31 December 2015) (Inclusive of Reserves)**

| PROJECT | SECTION | RESOURCE CATEGORY | GROSS TONNES IN SITU (GTIS) | TOTAL TONNES IN SITU (TTIS) | MINEABLE TONNES IN SITU (MTIS) | COAL ATTRIBUTABLE % | COAL ATTRIBUTABLE (GTIS) |
|---|---|---|---|---|---|---|---|
| Mopane | Voorburg | Measured | 109,435,158 | 98,491,000 | 94,915,200 | *74-100% | 105,669,749.86 |
| Makhado Ext. | Telema and Gray | | 42,244,854 | 38,020,200 | 36,240,800 | 100% | 42,244,854.00 |
| **TOTAL/WT. AVE MEASURED** | | | **151,680,012** | **136,511,200** | **131,156,000** | ***74-100%** | **147,914,603.86** |
| Mopane | Voorburg | Indicated | 125,033,852 | 106,271,000 | 100,500,000 | 74-100% | 119,624,989.06 |
| Makhado Ext. | Telema and Gray | | 29,581,152 | 25,141,000 | 23,225,000 | 100% | 29,581,152.00 |
| **TOTAL/WT. AVE INDICATED** | | | **154,615,004** | **131,412,000** | **123,725,000** | ***74-100%** | **149,206,141.06** |
| Mopane | Voorburg | Inferred | 36,238,997 | 28,920,000 | 23,940,000 | *74-100% | 31,651,715.60 |
| Generaal | Mount Stuart | | 407,162,828 | 325,690,000 | 55,460,000 | 100% | 407,162,828.00 |
| Makhado Ext. | Telema and Gray | | 12,301,228 | 9,820,000 | 7,320,000 | 100% | 12,301,228.00 |
| Chapudi | Chapudi | | 6,399,023,436 | 5,119,130,000 | 1,318,420,000 | 74% | 4,735,277,342.64 |
| **TOTAL/WT. AVE INFERRED** | | | **6,854,726,489** | **5,483,560,000** | **1,405,140,000** | ***74-100%** | **5,186,393,114** |
| **GRAND TOTAL RESOURCES** | | | **7,161,021,505** | **5,751,483,200** | **1,660,021,000** | ***74-100%** | **5,483,513,859** |

Source: CoAL 2015
* CoAL has a 100% interest in all right holder(s) except those acquired as part of the Chapudi Acquisition Transaction. In these right holder(s) CoAL has a 74% interest.

Venmyn has independently reviewed the Coal Resource estimates of CoAL's GSP assets discussed in this report, and these are considered to have been defined, by CoAL, in accordance with the JORC Code 2012 Edition Since submission of the 2012 CPR, the 2004 edition of the JORC Code has been updated to a 2012 edition. As such this 2015 CPR has been updated to comply with requirements in the 2012 JORC Code.

The key amendments to the code that are relevant to this 2015 CPR are as follows:-

- the requirement to report against Table 1 on an 'if not, why not' basis;
- Competent Person attributions;
- at least a Pre-Feasibility Study required for an Ore Reserve declaration;
- Technical Studies definitions;
- metal equivalents;
- in situ or in ground values; and
- additional guidance on reporting requirements for Competent Persons.

To comply with the JORC Code 2012 edition a Table 1 checklist has been included as Appendix 1 in this 2015 CPR.

The 2015 CPR has been prepared based on exploration, feasibility study, legal tenure and environmental status information available up to and including 31 December 2015 and Coal Resource information as at 29 February 2012.

**VOORBURG SECTION (MOPANE PROJECT)**

The Voorburg Section comprises eight contiguous farms within the Sand River Coalfield subdivision of the greater Soutpansberg Coalfield. The project is at an advanced exploration stage, with quantified Coal Resources over the CoAL properties. It represents the most advanced section of the Mopane Project.

The Voorburg Section is situated in the magisterial district of Vhembe, in the Limpopo Province of South Africa. The nearest town is Musina, situated approximately 30km to the northeast of the Voorburg Section area.

Through its wholly owned subsidiary company Regulus Investment Holdings (Pty) Ltd (subsequent to Section 11 transfer and Section 102 approval), CoAL holds an accepted application for a New Order Mining Right (NOMR) on the farms Ancaster 501MS, Cavan 508MS, Voorburg 503MS, Banff 502MS, Delft 499MS, Krige 495MS, Scheveningen 690MS and Vera 815MS. CoAL has acquired the Voorburg Section from Rio Tinto pursuant to the Soutpansberg Properties Acquisition Agreement with Rio Tinto.

The Voorburg Section represents an isolated and upfaulted block of Karoo age sediments, which lies approximately 10km to the north of the main Soutpansberg Coalfield. The coal bearing sediments occur as alternating mudstone laminae and coal bands within the Middle Ecca or Madzaringwe Formation, although there is coal in the Mikabeni formation. According to CoAL, the coal horizons are divided into six potentially economic seams, namely the Upper, Middle Upper, Middle Lower, Bottom Upper Bottom Middle and Bottom Lower seams.

The earliest known exploration on the Voorburg Section was undertaken on Cavan 508MS by Rapbern Exploration (Pty) Ltd in the early 1970s. A total of seven boreholes were drilled, six of which were sampled and sent for analysis. During 1976, Iscor (now Exxaro) drilled 43 diamond boreholes on the farms Banff 502MS and Voorburg 503MS.

Rio Tinto drilled four diamond boreholes into the properties associated with its NOPRs (held in the name of Chapudi), namely Banff 502MS, Delft 499MS, Vera 815MS and Krige 495MS. One borehole was drilled in each of the farms as part of its regional exploration programme.

Historical underground mining from the Lilliput Colliery was carried out on the farm Cavan 508MS between 1911 and 1918. The coal was supplied to the smelter at Messina Copper Mine. According to historical records, a total of 14,488 tonnes (t) of coal were mined from an inclined shaft sunk into the small flat topped hill situated a few hundred metres west of the Lilliput Siding.

CoAL obtained NOPRs over certain of the Voorburg Section farms in 2006 and proceeded to drill twelve diamond boreholes between 2009 and 2010 on the farm Voorburg 503MS. In 2012, CoAL drilled 15 large diameter drilling (LDD) boreholes in three localities on the farm Voorburg 503MS for bulk sampling purposes.

The historical Iscor and recent (excluding the 2012 drilling) CoAL exploration data has been used in the estimation of the resources for the Voorburg Section. The 2015 Coal Resource table summarises the CoAL's declared resource estimates for the Voorburg Section.

Due to the stage of development of the Voorburg Section, no investigations have been carried out on the potential mining methodology of the deposit. However, upon considering the depth from surface of the coal zones, any future mining is expected to be via opencast methods. The coking potential of Voorburg is good and the project has the potential to produce a semi-hard coking coal.

The Voorburg Section represents a prospective coking coal project, with the potential to contribute significant additional coking coal production from the region.

**JUTLAND SECTION (MOPANE PROJECT)**

The Jutland Section, located within the Soutpansberg Coalfield, forms part of the Mopane Project and is an early stage exploration project comprised of 13 farms.

The Jutland Section is situated in the magisterial district of Vhembe, in the Limpopo Province of South Africa. The nearest town is Musina, situated approximately 35km to the northeast of the Jutland Section area.

Through its wholly owned subsidiary company Regulus Investment Holdings (Pty) Ltd (subsequent to Section 11 transfer and Section 102 approval), CoAL holds an accepted application for a NOMR on the farms Cohen 591MS, Jutland 536MS, Mons 557MS, Stubbs 558MS, Faure 562MS, Hermanus 533MS, Pretorius 531MS, Bierman 599MS, Ursa Minor 551MS, 542MS, Maseri Pan 520MS and the remaining extent of the farms Du Toit 563MS and Verdun 535MS. CoAL has acquired the Jutland Section from Rio Tinto pursuant to the Soutpansberg Properties Acquisition Agreement with Rio Tinto.
The Jutland Section is situated within the Mopane Coalfield subdivision of the Soutpansberg Coalfield. The Karoo sediments of the Jutland Section are preserved as a half graben with an unconformable southern contact. While the lower Karoo sediments are not developed, the coal bearing Madzaringwe Formation is present throughout. The Jutland Section area contains sub-cropping coal seams that dip towards the north at between approximately 10º - 12º.

The coal bearing sediments occur as alternating mudstone laminae and coal bands within the Middle Ecca or Madzaringwe Formation. According to CoAL, the coal horizons are divided into five potentially economic seams, namely the Upper, Middle Upper, Middle Lower and Bottom Upper and Bottom Lower seams.

The earliest known exploration on the Jutland Section was undertaken by Trans Natal Coal Mining Corporation (Trans Natal), between 1968 and 1975. During this time 53 boreholes were drilled within the Jutland Section area. Iscor carried out extensive exploration within the Jutland Section area between 1975 and 1982 totalling 106 boreholes plus bulk sampling on the farms Jutland 536MS, Stubbs 558MS, Mons 557MS and Cohen 591MS. The target was believed to have been coking coal.

In 1982, Iscor conducted a Pre-Feasibility Study (PFS) for a proposed mining operation over the farms Mons 557MS, Stubbs 558MS, Jutland 536MS, and Cohen 591MS. This study concluded that approximately 40.7 million tonnes (Mt) of run-of-mine (RoM) material (including 25.13Mt of coal) could be economically extracted by underground mining of the No.5 Coal Zone (Middle Lower Seam), using bord and pillar methods. Annual production of 2.16Mt of RoM was suggested, for a 20 year life of mine (LoM) (however, this could be extended in consideration of the possible exploitation of the No.9 Coal Zone or Bottom Upper Seam). The proposed underground access was via an inclined shaft.

Recent exploration conducted within the Jutland Section area includes three boreholes drilled by Rio Tinto between 2006 and 2007. The Rio Tinto boreholes were vertical reverse circulation (RC) boreholes over the farms Hermanus 533MS, Verdun 535MS and Ursa Minor 551MS.

In 2012 CoAL drilled 15 RC boreholes for use in structural modelling. These boreholes have not been used in the current Coal Resource statement as they do not contain quality data.

There are currently no Coal Resources associated with the project, but the presence of coal is known.

Due to the stage of development of the Jutland Section, no recent investigations have been carried out on the mining of the deposit. However, upon considering the depth from surface of the coal zones, any future mining is expected to be a combination of opencast and underground methods. Details on mining methods and recoveries will be investigated during a new or updated PFS on the project.

The Jutland Section represents a prospective coking coal project, with the potential to contribute significant additional coking coal production from the region.

**TELEMA & GRAY SECTION (MAKHADO EXTENSION PROJECT)**

The farms Telema 190MS and Gray 189MT, were previously combined as the Makhado Extension Project, and were reported together with the Makhado Project in the 2011 CPR. Under the new project groupings these farms form all of the Makhado Extension Project. The farms comprise an advanced exploration project containing potential coking Coal Resources.

The farms Telema 190MS and Gray 189MT are situated in the magisterial district of Vhembe, in the Limpopo Province of South Africa. The nearest town is Louis Trichardt, situated approximately 35km to the south of the farms Telema 190MS and Gray 189MT. The town of Musina is located approximately 50km north of the farms Telema 1901MS and Gray 189MT.

Coal's wholly owned subsidiary, Limpopo Coal Company (Pty) Ltd, CoAL holds an accepted application for a New Order Prospecting Right (NOPR) on the farms Telema 190MS and Gray 189MT, that was applied for on 8 April 2013. CoAL has acquired the Telema & Gray Section from Rio Tinto pursuant to the Soutpansberg Properties Acquisition Agreement with Rio Tinto.

The farms Telema 1901MS and Gray 189MT are located in the Tshipise South sector of the Soutpansberg Coalfield. All seams comprise interbanded carbonaceous mudstones and coal. Within the Telema and Gray Section area, a number of seams occur within a 30m to 40m thick carbonaceous zone of the Madzaringwe Formation. Six potential mining horizons (seams) have been identified by CoAL and named the Upper, Middle Upper, Middle Lower, Bottom Upper, Bottom Middle and Bottom Lower seams. The Bottom Middle Seam usually comprises predominantly mudstone and for this reason it has not been included in the resource base; however, in certain areas it has sufficient coal to be considered a potential mining target.

The coal component is usually bright and brittle and contains a high proportion of vitrinite. The seams dip northwards at approximately 12°. The frequency of small scale faulting is not well understood.

The frequency of dolerite dykes is unknown; however, examination of aeromagnetic data suggests there are relatively few magnetic dykes within the area. GAP Geophysics (Pty) Limited has interpreted that identified dykes are about 2m to 5m in thickness and steeply dipping.

The Soutpansberg Coalfield was extensively explored by Iscor in the 1970s and 1980s. During this time Iscor drilled a total of 42 diamond core boreholes on the farm Telema 190MS and four boreholes on Gray 189MT. Rio Tinto drilled two diamond core boreholes on Gray 189MT, during their reconnaissance drilling of the Soutpansberg between 2006 and 2007. No historical mining has taken place within the Telema and Gray Section area.

No recent exploration has been conducted by CoAL on the two farms in question. However, CoAL has drilled 172 diamond core, 24 LDD, 13 percussion and five geotechnical boreholes along strike of the Telema & Gray Section, within the Makhado Project.

All previous exploration data on Telema 190MS and Gray 189MT, and the previous and recent exploration data pertaining to the Makhado Project, has been combined into a single geological model. This model has been used in the estimation of the resources for the Telema & Gray Section. It must be noted that although the geological model extends across both farms, no resources can be declared on the farm Gray 189MT as the boreholes situated on this farm do not have coal quality data results.

The JORC compliant Coal Resource for the Telema and Gray Project, as at 31 December 2015, was estimated and signed off by CoAL's Competent Person, Mr J Sparrow (Pr.Sci.Nat.), CoAL's Group Geologist. Venmyn Deloitte reviewed the estimation procedures and considers the Coal Resource estimates and classification as prepared and declared by CoAL as reasonable and compliant with JORC. Only opencast resources have been considered in the reporting of MTIS.

No reserves have been declared for the Telema & Gray Section.

Due to the stage of development of the Telema & Gray Section, no detailed investigations have been carried out on the potential mining of the deposit. However, upon considering the depth from surface of the coal zones, any future mining is expected to be mostly opencast, with limited additional underground potential based on current geological data and plant assumptions.

The Telema & Gray Section coal is most likely to yield coking coal product.

The Telema & Gray Section represents a prospective coking coal project, with the potential to contribute significant additional coking coal production to the region.

**MOUNT STUART SECTION (GENERAAL PROJECT)**

The Mount Stuart Section is an advanced exploration project containing potential coking Coal Resources located in the magisterial district of Vhembe, in the Limpopo Province of South Africa. The nearest town is Musina, situated approximately 35km to the north of the Mount Stuart Section area.

Through its wholly owned subsidiary, Kwezi Mining & Exploration (Pty) Ltd (subsequent to Section 11 transfer and Section 102 approval), CoAL holds an accepted application for a NOMR for the Mount Stuart Section comprised of seven farms, namely Stayt 183MT, Nakab 184MT, Riet 182MT, Schuitdrift 179MT, Mount Stuart 153MT, Ter Blanche 155MT and Septimus 156MT. CoAL has acquired the Mount Stuart Section from Rio Tinto pursuant to the Soutpansberg Properties Acquisition Agreement with Rio Tinto.

The Mount Stuart Section is situated within the Tshipise North Coalfield subdivision of the greater Soutpansberg Coalfield, and represents an isolated and upfaulted block of Karoo age sediments, which lies approximately 6km to the north of the Tshipise South Basin in which the Makhado Project occurs.

The Soutpansberg Coalfield was extensively explored by Iscor in the 1970s and 1980s and a total 435 boreholes exist for the Mount Stuart Section. Iscor drilled a total of 417 boreholes, excluding a number of borehole deflections over the Mount Stuart Section area. No historical mining has taken place within the Mount Stuart Section area. Limited recent exploration has been conducted within the Mount Stuart Section area by both Rio Tinto and CoAL. Data from nine boreholes drilled over the Mount Stuart Section area, by Rio Tinto, were acquired by CoAL. Seven of these boreholes (over Nakab 184MT, Schuitdrift 179MT, Mount Stuart 153MT and Ter Blanche 155MT) were diamond core boreholes, while two (over Nakab 184MT) were percussion boreholes. Limited exploration drilling by CoAL commenced in 2009 on the farm Riet 182MT. Only nine boreholes have been drilled by CoAL to-date. No LDD or bulk sampling has been conducted by either Rio Tinto or CoAL over the Mount Stuart Section area.

All historical and recent exploration data has been used in the estimation of the resources of the Mount Stuart Section, by CoAL. The JORC compliant Coal Resource for the Mount Stuart Project, as at 31 December 2015, was estimated and signed off by CoAL's Competent Person, Mr J Sparrow (Pr.Sci.Nat.), CoAL's Group Geologist. Venmyn Deloitte reviewed CoAL's estimation procedures and considers the Coal Resource estimates and classification as prepared and declared by CoAL as reasonable and compliant with JORC. Only opencast resources have been considered in the reporting of MTIS.

While cognisance has been taken of the resource categories defined by the JORC Code, all resources have been classified, by CoAL in the Inferred Category as a consequence of the resource area being defined on the basis of historical data, with no recent verification drilling or sampling by CoAL on farms within the resource area.

No reserves have been declared for the Mount Stuart Section.

Due to the stage of development of the Mount Stuart Section, no detailed investigations have been carried out on the potential mining of the deposit. However, upon considering the depth from surface of the coal zones, any future mining is expected to be mostly underground, with limited additional opencast potential based on current geological data and plant assumptions.

The Mount Stuart coal is most likely to yield coking coal product. Indications are that the Mount Stuart product will be a hard coking coal, with RoVmax of 1.2.

The Mount Stuart Section represents a prospective coking coal project, with the potential to contribute significant additional coking coal production from the region.

**GENERAAL SECTION (GENERAALPROJECT)**

The Generaal Section, located within the Soutpansberg Coalfield, is an early-stage exploration project. The Generaal Section is situated in the magisterial district of Vhembe, in the Limpopo Province of South Africa. The nearest town is Louis Trichardt, situated approximately 30km to the south of the Generaal Section area. Musina is located approximately 40km to the north of the section area.

Through its wholly owned subsidiary, Kwezi Mining & Exploration (Pty) Ltd (subsequent to Section 11 transfer and Section 102 approval), CoAL holds an accepted application for a NOMR for the Generaal Section comprised of 16 farms, namely Boas 642MS, Generaal 587MS, Phantom 640MS, Van Deventer 641MS, Coen Britz 646MS, Juliana 647MS, Fanie 578MS, Joffre 584MS, Rissik 637MS, Bekaf 650MS, Chase 576MS, Kleinenberg 636MS and Wild Goose 577MS. CoAL has acquired the Generaal Section from Rio Tinto pursuant to the Soutpansberg Properties Acquisition Agreement with Rio Tinto.

The Generaal Section represents a 20km long, east-west striking, up-faulted block within the northern part of the Waterpoort Basin, immediately north of the Makhado Project.

The coal bearing Mikabeni Formation is present within the northern parts of the project area and contains a thick (20m – 30m) package of heavily stone banded coal units. Within this package, three 'cleaner' coal seams have been identified with average thicknesses of 2.9m – 3.9m. Dips in the area are generally 4º-5º, although the central portion of the block is associated with steeper dips.

102 boreholes have been drilled on the Generaal Section. Between 1975 and 1978, Iscor drilled a total of 64 boreholes over the Generaal Section area. There is evidence that Iscor also drilled LDD holes; however, no specific locality or sampling information is available. The Iscor borehole database was acquired in 2007 by CoAL. Downhole logging and partial coal quality data is available for 13 of these boreholes.

Rio Tinto drilled 11 boreholes within the Generaal Section area on three farms. Drilling has intercepted two distinct, thick, interbanded coal seams separated by approximately 15m waste. These seams can be roughly correlated to Seam 6 and Seam 7, observed in the Chapudi Project area.

In 2013 CoAL drilled 27 percussion boreholes that were used to update the geological model. The boreholes do not contain any quality information and the historical quality data is unreliable for a JORC compliant estimation, therefore no Coal Resources have been declared on the Generaal Section.

**CHAPUDI SECTION (CHAPUDI PROJECT)**

The Chapudi Section is situated within the Chapudi Project and is at an advanced stage of exploration. This Section was acquired through the recently completed acquisition of Chapudi Coal and Kwezi. Chapudi Section has potential for coking coal and possibly a middlings fraction for use in power generation.

The Chapudi Section is situated in the magisterial district of Vhembe, in the Limpopo Province of South Africa and extends over a total strike length of approximately 35km. The Chapudi Section lies along strike and to the west of the Makhado Project and is directly adjacent, to the south, of the Wildebeesthoek Section. The nearest town is Louis Trichardt, situated approximately 35km to the south of the easternmost extent of the Chapudi Section. The town of Musina is located approximately 50km north of the Chapudi Section. The village of Waterpoort is located within this section.

The Chapudi Section comprises 21 farms, or portions thereof, held by an accepted application for a NOMR by CoAL's wholly owned subsidiary company, Chapudi Coal (Pty) Ltd (subsequent to Section 11 transfer and Section 102 approval).

The Chapudi Section is situated within an extension of the Tshipise Coalfield, a subdivision of the Soutpansberg Coalfield, also known as the Waterpoort Coalfield.

All seams comprise interbanded carbonaceous mudstones and coal. The coal component is usually bright and brittle and contains a high proportion of vitrinite. The seams dip northwards at approximately 12°.

Within the Chapudi Section, seven coal zones (or seams) are recognised, three of which occur in the Lower Ecca Group with the remaining four occurring in the Upper Ecca Group. Although coal zones are referred to as seams they are effectively selected, potential mining horizons within the coal-bearing package. In the literature, these seams are numbered from Seam 1 at the base to Seam 7 at the top. Rio Tinto focussed its exploration efforts on best developed seams, namely Seams 6 and 7. Seam 6 is typically 30m - 41m in thickness, while Seam 7 attains an average thickness of 12m -15m. Seam 6 is the only seam to contain bright coal, while all the others are classified as dull coal.

As a result of CoAL's extensive experience in the Soutpansberg Coalfield, the company has recognised that Seam 6 has economic potential. CoAL has divided Rio Tinto's Seam 6 into six potential mining horizons or coal dominated seams. These have been named as the Upper, Middle Upper, Middle Lower, Bottom Upper, Bottom Middle and Bottom Lower. The Bottom Middle Seam usually comprises predominantly mudstone and for this reason it has not been included in the resource base; however, in certain areas it is sufficiently coal-bearing to be considered a potential mining target.

Little is known about historical drilling on Chapudi. CoAL obtained the historical database from the Council for Geological Sciences in 2013 that included 162 boreholes drilled by Iscor on Chapudi. It is assumed that the drilling, logging and sampling methods applied during this drilling were the same as other Iscor drilling programmes at the time.

Recent and comprehensive exploration has been conducted on this project by Rio Tinto. The exploration has included a number of phases of drilling and sampling, as well as remote forms of exploration. This exploration focussed on obtaining results for a primary thermal power station coal product and/or a coking coal export fraction.

CoAL has acquired the Chapudi Section primarily as a source of coking coal, with the possibility of producing a middlings fraction for use in power generation. As a result of this change in focus, CoAL have reassessed all previous results in light of this and plan future work streams to meet this goal.

Exploration drilling by Rio Tinto commenced in 2003. To date, a total of 127 boreholes were drilled along the strike length of the project three of which were drilled by CoAL in 2013 to assist with structural interpretation and were not sampled. The primary focus of the historical drilling was on the areas close to sub-outcrop and at short distances down dip. A number of deep boreholes were drilled to verify down dip continuity. These boreholes comprised diamond and open hole drilling. The drilling was undertaken in four stages, namely Reconnaissance Stage, Order of Magnitude (OMS) Domestic Thermal Stage, Down Depth and PFS Stage.

All Rio Tinto exploration data has been used in the estimation of the resources for the Chapudi Section, none of the CoAL boreholes were used in the resource estimation as they did not contain quality data.

No commercial mining has taken place at the Chapudi Section. An Options Study was conducted by Snowden in 2009, which investigated both opencast and underground methods. Various opencast methods were considered including truck and shovel methods and dragline methods of overburden removal for a single seam (Seam 6 only) and a two seam (Seam 6 and Seam 7) operation. A truck and shovel operation was considered for coal extraction. The company concluded that along strike, opencast mining using truck and shovels for both overburden removal and coal extraction was most cost effective. Snowden did not recommend underground mining.

Extensive and highly detailed testwork has been carried out on the samples derived from the various exploration campaigns carried out at Chapudi. The initial reconnaissance campaign focused on a low ash coking product with a middlings fraction for domestic power generation. This was followed by the OMS phase which primarily investigated the potential to produce a domestic power station product only. Later, the low ash primary product, with a middlings fraction of power station coal, was also reconsidered as part of a PFS.

A number of coal processing studies were undertaken by Rio Tinto, the latest of which was a report prepared in 2009 as part of the PFS options phase. The report investigated the coal handling and processing for the Chapudi Section. The report concluded that the use of conventional gravity processes would produce a saleable product.

It must be noted that all studies assumed that the entire Seam 6 would be mined and delivered to the plant for processing. CoAL, however, will consider the selective mining and then processing of five individual seams comprising Seam 6 rather than the entire package. This change in strategy would be expected to increase the potential yields in comparison to the Rio Tinto figures, although the overall tonnage of material available for mining would decrease.

During the OMS, Rio Tinto sampled the entire Seam 6 in one metre intervals, including coal and waste. CoAL was able to re-correlate these samples into their classification, i.e. into the Upper, Middle Upper, Middle Lower, Bottom Upper, Bottom Middle and Bottom Lower seams, for 48 of the 125 boreholes drilled on the Chapudi Section. As a result of not being able to re-correlate all the boreholes, CoAL was forced to adopt Rio Tinto's approach at this time and has modelled the coal horizons within Seam 6.

It must be noted that due to Rio Tinto's method of sample analysis, i.e. drop shatter testing on all samples, compositing of all samples into three horizons within Seam 6, scalping off of the +63mm fraction and removal of fines of -0.075mm and then full washability testwork, CoAL could not reconstitute the quality results according to their classification of the coal seams either. Therefore all quality modelling results are for the +0.075mm-63mm fraction of the coal within Rio Tinto's Seam 6.

An orebody model was prepared by Rio Tinto, which was used to generate the resource statement issued in 2008. This resource statement was prepared at the conclusion of the OMS study and included the reconnaissance and OMS drilling. The resource was estimated for the coal horizons within Seam 6 and extended to a maximum depth of 200m.

The JORC compliant Coal Resource for the Chapudi Project, as at 31 December 2015, was estimated and signed off by CoAL's Competent Person, Mr J Sparrow (Pr.Sci.Nat.), CoAL's Group Geologist. Venmyn Deloitte reviewed CoAL's estimation procedures and considers the coal resource estimates and classification as prepared and declared by CoAL as reasonable and compliant with JORC.

CoAL plans to further drill the Chapudi Section and log and sample the boreholes according to their methods and protocols in order to carefully evaluate the deposit in line with their corporate strategy for the Soutpansberg Coalfield. Therefore future Coal Resource Statements may be significantly different to the current estimates. It is for this reason, and the others noted above, that all resources have been classified as Inferred, even though these points of information may meet the JORC halo requirements of a higher classification category.

Both CoAL and Venmyn Deloitte have a reasonable level of confidence with respect to the current orebody model and the associated resource estimates based upon the currently available information.

No reserves have been declared for the Chapudi Section.

CoAL will initiate its own PFS for the project in order to consider the optimal product stream. This will be done in light of CoAL's strategy for the Soutpansberg and its experience gained at Makhado.

**CHAPUDI WEST SECTION (CHAPUDI PROJECT)**

The Chapudi West Section is situated within the Chapudi Project and is at an early stage of exploration. This Section was acquired through the recently completed acquisition of Chapudi Coal and Kwezi. Chapudi West Section has potential for coking coal and possibly a middlings fraction for power generation.

The Chapudi West Section is situated in the magisterial district of Vhembe, in the Limpopo Province of South Africa and extends over a total strike length of approximately 10km. The Chapudi West Section lies along strike and to the west of the Chapudi Section. The nearest town is Louis Trichardt, situated approximately 70km to the east-southeast of the Chapudi West Section. The town of Musina is located approximately 85km northeast of the Chapudi West Section.

The Chapudi West Section comprises nine farms, or portions thereof, held an accepted application for a NOMR by CoAL's wholly owned subsidiary Chapudi Coal (Pty) Ltd (subsequent to Section 11 transfer and Section 102 approval).

As with the Chapudi Section, the Chapudi West Section is situated within an extension of the Tshipise Coalfield, a subdivision of the Soutpansberg Coalfield, also known as the Waterpoort Coalfield. Although coal zones are referred to as seams they are effectively selected, potential mining horizons within the coal-bearing package. All seams comprise interbanded carbonaceous mudstones and coal. The coal component is usually bright and brittle and contains a high proportion of vitrinite. The seams dip northwards at approximately 12°.

Within the Chapudi West Section, seven coal zones (or seams) are recognised, three of which occur in the Lower Ecca Group with the remaining four occurring in the Upper Ecca Group. These seams were numbered from Seam 1 at the base to Seam 7 at the top by Rio Tinto. CoAL has recognised that Seam 6 has economic potential and has divided it into six potential mining horizons or coal dominated seams. These have been named as the Upper, Middle Upper, Middle Lower, Bottom Upper, Bottom Middle and Bottom Lower. The Bottom Middle Seam usually comprises predominantly mudstone and for this reason it has not been included in the resource base; however, in certain areas it is sufficiently coal-bearing to be considered a potential mining target.

19 historical boreholes have been drilled on the Chapudi West Section by 3 Rio Tinto and 16 by Iscor from 1973 to 1974. The boreholes were included in the geological model of the Chapudi Section. However, due to the paucity of points of information, no resources have been declared for the Chapudi West Section, although the presence of coal is known.

No recent exploration has been conducted by CoAL on Chapudi West Section.

**WILDEBEESTHOEK SECTION (CHAPUDI PROJECT)**

The Wildebeesthoek Section, located within the Soutpansberg Coalfield, is an early-stage exploration project. It represents the least advanced section of the Chapudi Project. CoAL acquired the Wildebeesthoek Section from Rio Tinto as part of the Soutpansberg Properties Acquisition Agreement.

The Wildebeesthoek Section is situated in the magisterial district of Vhembe, in the Limpopo Province of South Africa. The nearest town is Louis Trichardt, situated approximately 25km to the southeast of the Wildebeesthoek Section area. Musina is located approximately 50km to the northeast of the project area.

The 11 farms that constitute the Wildebeesthoek Section are held by an accepted application for a NOMR under CoAL's wholly owned subsidiary Chapudi Coal (Pty) Ltd (subsequent to Section 11 transfer and Section 102 approval).

The Wildebeesthoek Section represents an isolated and upfaulted block of Karoo age sediments, which lies adjacent to the Chapudi Section. The area is interpreted as representing an up-faulted extension of the coal seams from down dip of the main Chapudi Section. The project area comprises the typical local Karoo strata as elsewhere within the basin, and is most similar to that of the Chapudi Section. The coal bearing strata sub-crops and is again, very similar to that of the adjacent Chapudi Section.

Airborne geophysics and limited exploration drilling, within the project area, suggest the presence of numerous dolerite dykes. These dykes, together with the up-faulted nature of the coal, while disrupting the coal sequence, have contributed to the increase in rank observed within the coal locally. This introduces the possibility that, at least locally, the coal from this project could have better coal qualities than that encountered at the Chapudi Section, especially down dip, due to the increase in rank observed with depth.

A total of 118 boreholes have been drilled over the Wildebeesthoek Section .Between 1975 and 1978, Iscor drilled a total of 94 boreholes over the Wildebeesthoek Section area and in 2004 Rio Tinto drilled four boreholes on the farms Wildebeesthoek 661MS and Mapani Ridge 660MS. In 2013 CoAL drilled ten diamond core and ten RC boreholes over the Wildebeesthoek Section to assist with structural interpretation. The new boreholes were used to update the geological model but not the Coal Resource estimation as no sampling was conducted.

CoAL has not yet conducted any exploration resulting in quality data on the Wildebeesthoek Section to date. Therefore no Coal Resources have been declared on the Wildebeesthoek Section, although the presence of coal has been confirmed.

# Disclaimer and Risks

Venmyn Deloitte has compiled this Competent Persons Report and, in so doing, has utilised information provided by CoAL as to its geological models, resource estimates, operational methods and forecasts. Venmyn Deloitte does not accept responsibility for the information prepared and provided by CoAL. Where possible, this information has been verified independently with due enquiry in terms of all material issues that are a prerequisite to comply with the Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves (the JORC Code, 2012 edition). Venmyn Deloitte and its directors accept no liability for any losses arising from reliance upon the information presented in this report.

The authors of this Competent Persons Report are not qualified to provide extensive commentary on legal issues associated with CoAL's right to the mineral properties. CoAL and its attorneys have provided certain information, reports and data to Venmyn Deloitte in compiling this Competent Persons Report which, to the best of CoAL's knowledge and understanding, is complete, accurate and true and CoAL acknowledges that Venmyn Deloitte has relied on such information, reports and data in preparing this Competent Persons Report. No warranty or guarantee, be it express or implied, is made by the authors with respect to the completeness or accuracy of the legal aspects of this document.

# Operational Risks

The businesses of mining and mineral exploration, development and production by their natures contain significant operational risks. The businesses depend upon, amongst other things, successful prospecting programmes and competent management. Profitability and asset values can be affected by unforeseen changes in operating circumstances and technical issues.

# Political and Economic Risks

Factors such as political and industrial disruption, currency fluctuation, increased competition from other prospecting and mining rights holders and interest rates could have an impact on CoAL's future operations, and potential revenue streams can also be affected by these factors. The majority of these factors are, and will be, beyond the control of CoAL or any other operating entity.

# Forward Looking Statements

This report contains forward-looking statements. These forward-looking statements are based on the opinions and estimates of Venmyn Deloitte and CoAL at the date the statements were made. The statements are subject to a number of known and unknown risks, uncertainties and other factors that may cause actual results to differ materially from those forward-looking statements anticipated by Venmyn Deloitte and CoAL. Factors that could cause such differences include changes in world coal markets, equity markets, costs and supply of materials, and regulatory changes. Although Venmyn Deloitte believes the expectations reflected in the forward-looking statements to be reasonable, Venmyn Deloitte does not guarantee future results, levels of activity, performance or achievements.

# Independent Competent Persons Report on Coal of Africa Limited's Greater Soutpansberg Projects

## Prepared for Coal of Africa Limited and Peel Hunt LLC

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# 1. Introduction

The directors of CoAL requested that Venmyn Deloitte (Pty) Ltd (Venmyn Deloitte) compile an independent Technical Report, in the form of a Competent Persons' Report (CPR) on certain of their coal assets within the Soutpansberg Coalfield of South Africa. These coal assets are those belonging to CoAL's so called "Greater Soutpansberg Project" (GSP) and comprise all coal assets within the Soutpansberg Coalfield, excluding the Makhado Project (which was reported on in detail in a CPR in 2011 compiled by Venmyn Deloitte, reference number D1010R).

This CPR is addressed to CoAL and Peel Hunt LLP in its capacity as nominated advisor.

Venmyn Deloitte understands that the update 2015 CPR will form part of the documentation in support of readmission of CoAL to the AIM Market of the London Stock Exchange (LSE). The readmission of CoAL to AIM is in connection with a proposed acquisition with Universal Coal Plc (Universal Coal).

CoAL is a coal mining and exploration company with its principle thermal and coking coal assets located across South Africa in four different coalfields. These assets include mining and prospecting licences for a number of operating mines and exploration projects at various stages of development from early reconnaissance to feasibility stage. This CPR documents the technical details of the coal assets of CoAL within the GSP. The GSP includes the following groups of projects all of which are located in the Limpopo province, South Africa:-

- the Mopane Project, comprising the Voorburg and Jutland sections;
- the Generaal Project, comprising the Generaal and Mount Stuart sections;
- the Chapudi Project, comprising the Chapudi, Chapudi West and Wildebeesthoek sections; and
- the Telema and Gray project, comprising Telema and Gray (formerly Makhado Extension).

The GSP specifically excludes CoAL's Makhado and Vele Projects also located in the Limpopo Province.

This 2015 CPR has been compiled, to the extent required and in accordance with:-

- the Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves (JORC Code) 2012 edition;
- the Australian Guidelines for the Estimation and classification of Coal Resources, 2014 edition;
- the AIM Note for Mining and Oil & Gas Companies- June 2009;
- the Prospectus Rules published by the Financial Services Authority (FSA) and governed by the United Kingdom Listing Authority (UKLA) (Prospectus Rules), so far as incorporated by the AIM Rules for companies (January 2016) (AIM Rules);
- the Prospectus Directive (2003/71/EC) and the Prospectus Regulation (809/2004), so far as incorporated by the AIM Rules for companies (January 2016) (AIM Rules); and
- Sections 131 to 133 and Appendices I to III of the document titled 'ESMA update of the CESR recommendations: The consistent implementation of Commission Regulation (EC) No. 809/2004 implementing the Prospectus Directive' and dated the 23 March 2011.

## 1.1. Coal Assets

CoAL has extensive thermal and coking coal assets located across South Africa in four different Coalfields. The GSP assets include projects at various stages of development from early reconnaissance exploration to Pre-Feasibility Study (PFS) (Table 1).

The locality of the GSP assets which are the subject of this 2015 CPR are presented in Figure 1. CoAL's GSP assets comprise all coal projects within the Soutpansberg Coalfield, excluding the Makhado Project (reported on in detail in the 2011 CPR). The location of CoAL's GSP assets in relation to the Soutpansberg Coalfield and the Makhado Project (not reported on herein) are illustrated in Figure 2 and Figure 3.

The assets are also graphically portrayed in a mineral-asset diamgram (Figure 4) in order for the reader to obtain an understanding of the relative development of the various projects.

**Table 1: Summary of CoAL's GSP Assets**

| COMPANY | PROJECT | SECTION | NO. OF FARMS HELD | DEVELOPMENT STATUS | NEW ORDER LICENCE TYPE | TOTAL LICENCE AREA (Ha) | COAL'S ATTRIBUTABLE INTEREST (%) | TOTAL NO. OF RECENT B/H DRILLED | **TOTAL TONNES IN SITU |
|---|---|---|---|---|---|---|---|---|---|
| Regulus Investment Holdings (Pty) Ltd | Mopane | Voorburg | 8 | Advanced Exploration | Mining | 11,325 | *74-100% | 29 | 223,902,587 |
| | | Jutland | 14 | Early Exploration | | 14,491 | *74-100% | 8 | - |
| Limpopo Coal Company (Pty) Ltd | Makhado Extension | Telema & Gray | 2 | Exploration | Prospecting | 2,131 | 100% | 2 | 68,177,055 |
| Kwezi Mining & Exploration (Pty) Ltd | Generaal Project | Mount Stuart | 7 | Exploration | Mining | 9,125 | 100% | 16 | 56,643,406 |
| | | Generaal | 13 | Early Exploration | | 13,470 | 100% | 5 | - |
| Chapudi Coal (Pty) Ltd | Chapudi | Chapudi | 21 | Pre-Feasibility | | 17,948 | 74% | 125 | 1,345,388,786 |
| | | Chapudi West | 9 | Early Exploration | | 8,992 | 74% | 3 | - |
| | | Wildebeesthoek | 11 | Early Exploration | | 10,641 | 74% | 4 | - |

**Notes:** * CoAL has a 100% interest in all right holder(s) except those acquired as part of the Chapudi Acquisition Transaction. In these right holder(s) CoAL has a 74% interest.

**Resource calculated for maximum seam of 200m for opencast mining. No underground mining considered.

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## LOCATION OF CoAL'S GSP ASSETS IN RELATION TO THE SOUTH AFRICAN COALFIELDS AND MAJOR INFRASTRUCTURE


City / Town
Arterial road
Railway
Coalfields
CoAL principal assets
Not subject to this CPR
Included in the CPR
Not included in the CPR

GREATER SOUTPANSBERG PROJECTS
MAKHADO PROJECT

Musina
Louis Trichardt
Lephalale
Polokwane
Phalaborwa
Bela-Bela
Groblersdal
Skukuza
Rustenburg
Pretoria
Middelburg
Witbank
Barberton
Carolina
Johannesburg
Maputo
Ermelo
Newcastle
Vryheid
Dundee
Richards Bay
Pietermaritzburg
Durban
Port Shepstone
Port Edward
Molteno

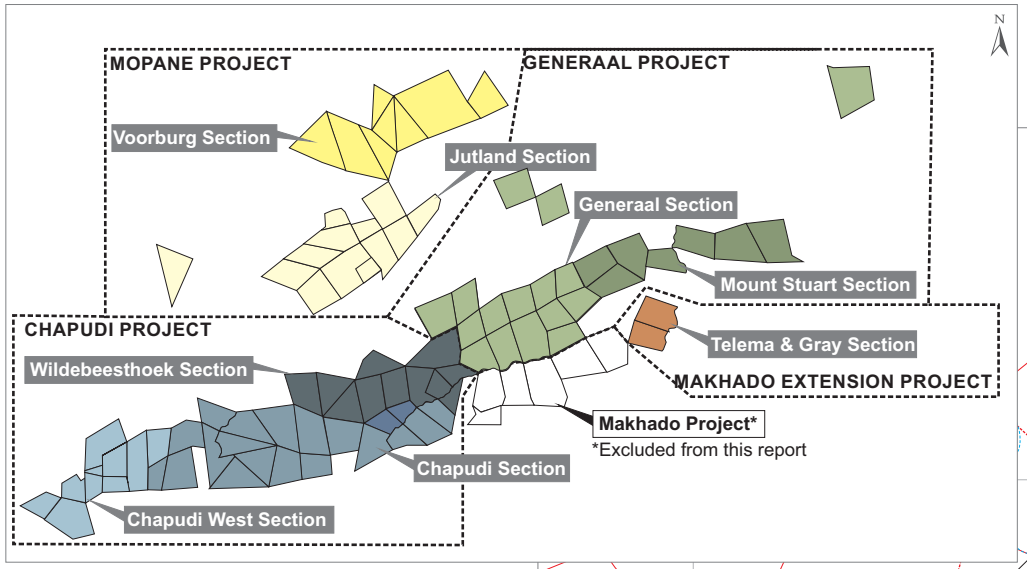
-23°S
-24°S
-25°S
-26°S
-27°S
-28°S
-29°S
-30°S
-31°S
26°E
27°E
28°E
29°E
30°E
31°E
32°E
33°E
N
0
100km
Scale

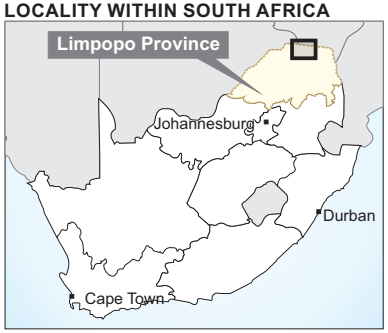
**South African Coalfields**

1 Limpopo
2 Soutpansberg
3 Waterberg
4 Springbok Flats
5 Springs - Witbank
6 Ermelo
7 Highveld
8 South Rand
9 Sasolburg-Vereeniging
10 Free State
11 Kliprivier
12 Utrecht
13 Vryheid
14 Nongoma
15 Somkele
16 Kangwane
17 Molteno

VMD1971_CoAL GSP CPR_2015

# LOCATION OF CoAL'S SOUTPANSBERG COALFIELD EXPLORATION PROJECTS IN RELATION TO THE SOUTPANSBERG COALFIELD AND THE MAKHADO PROJECT





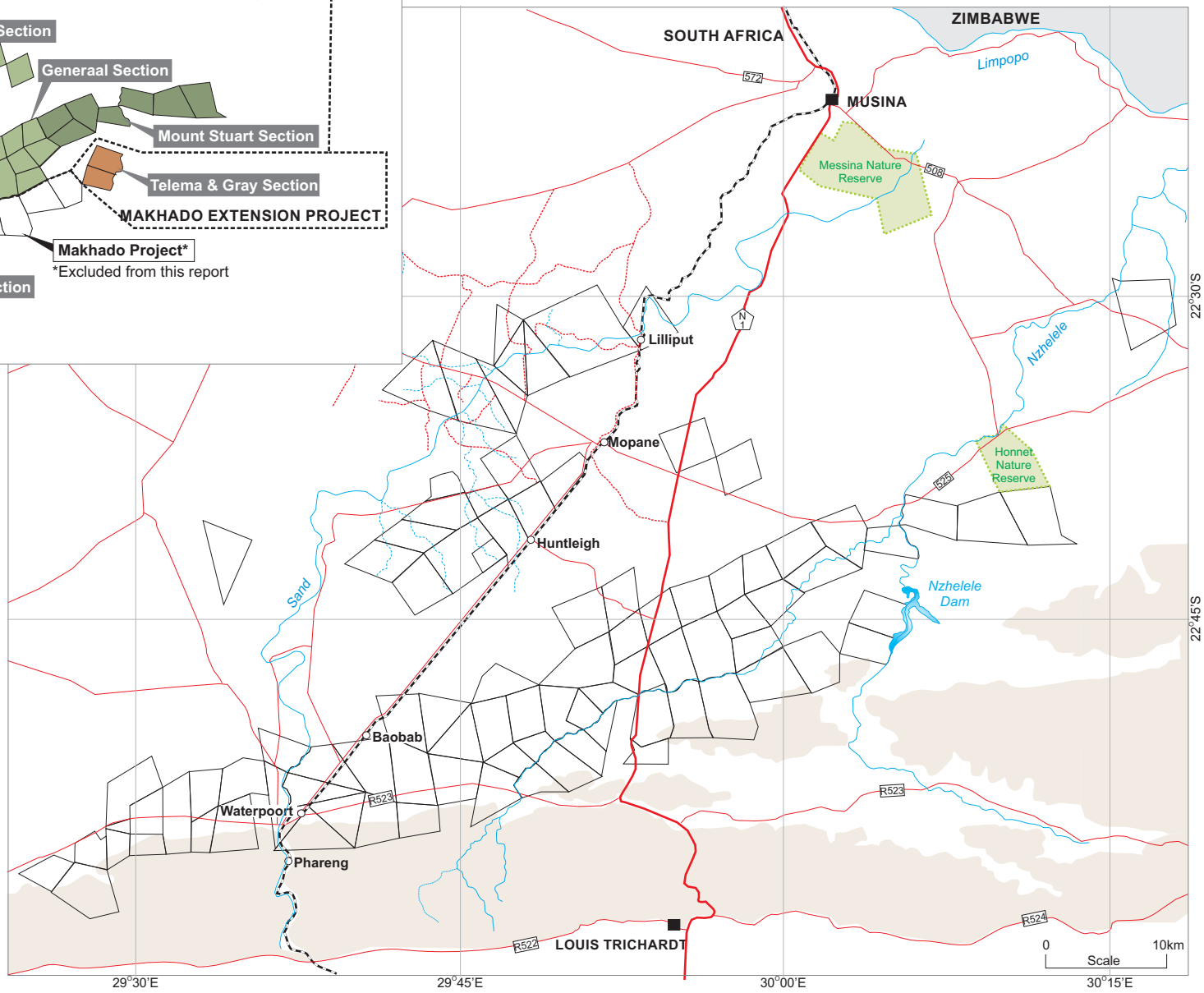



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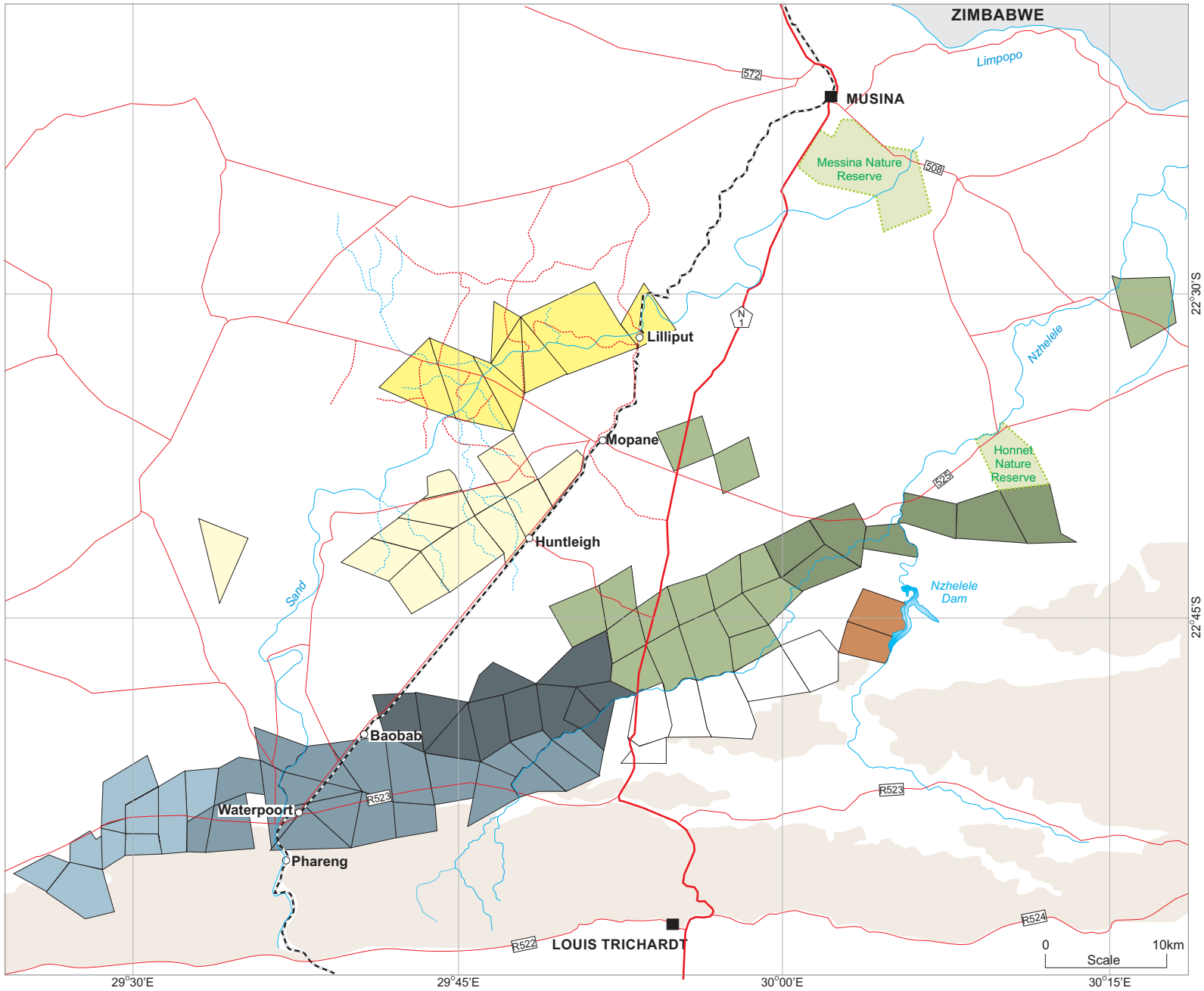
Figure 02

## DIAGRAMMATIC REPRESENTATION OF THE RELATIVE DEVELOPMENTAL STAGES OF ALL COAL ASSETS, INCLUDING THE GSP ASSETS

| PROJECTS | Early Exploration | Exploration | Advanced Exploration | PFS |
|---|---|---|---|---|
| **Mopane:** | | | | |
| Voorburg | | | X | |
| Jutland | X | | | |
| **Chapudi:** | | | | |
| Chapudi West | X | | | |
| Chapudi | | | | X |
| Wildebeesthoek | X | | | |
| **Generaal:** | | | | |
| Generaal | X | | | |
| Mount Stuart | | X | | |
| **Telema and Gray:** | | | | |
| Telema & Gray | | X | | |
| **Makhado:** | | | | |
| Makhado | | | | |




- River
- Main Road
- Secondary Road
- Other Road
- Railway
- Town
- Nature Reserve
- Soutpansberg Mountain Range

VMD1971_CoAL GSP CPR_2015

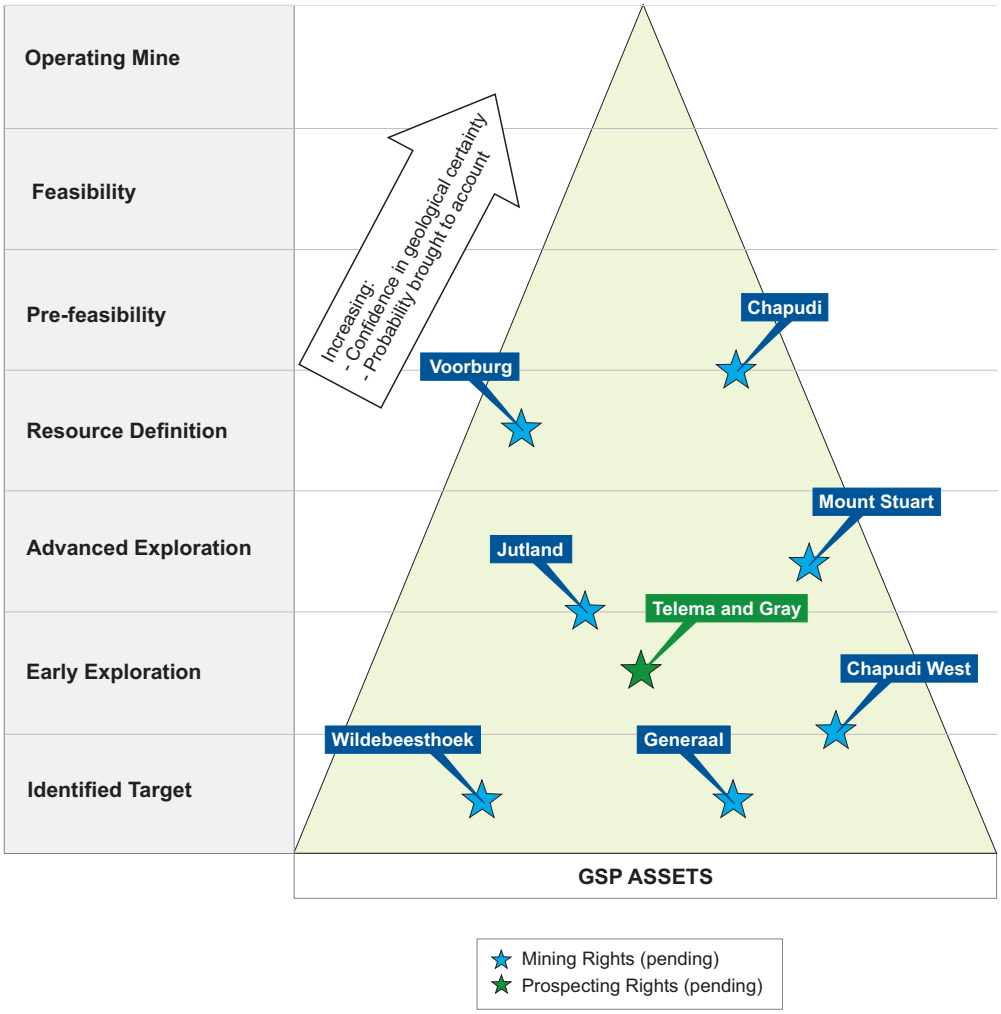
Venmyn Deloitte.

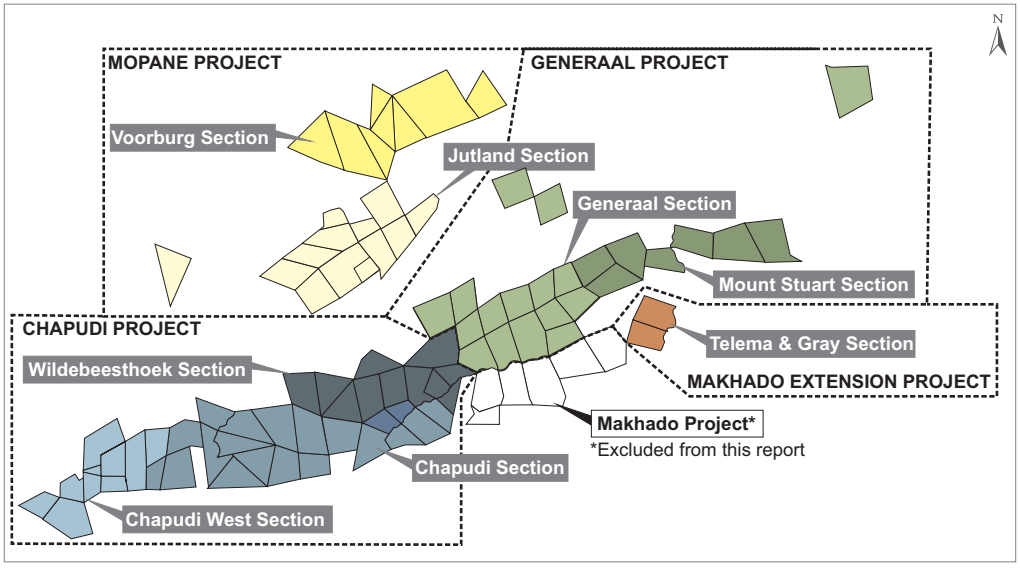
Coal of Africa

Figure 03

VenmynDeloitte. Coal of Africa

## DIAGRAMMATIC REPRESENTATION OF THE RELATIVE STATUS OF CoAL'S GSP ASSETS




Source: Coal of Africa

## 1.2. Scope of the Opinion

This updated 2015 CPR has been compiled in order to incorporate all currently available and material information that will enable potential investors to make a reasoned and balanced judgement regarding the technical merits of the GSP coal assets. As part of the preparation of this CPR, Venmyn Deloitte has reviewed CoAL's declared Coal Resources for each of the assets under consideration, as at 31 December 2015. None of the GSP assets have associated Coal Reserves.

This CPR provides a detailed description of each GSP asset as highlighted in Figure 2, which includes reference to its tenure, status of development, recent exploration and production, CoAL's resource estimates and other relevant information for CoAL's GSP assets. Venmyn Deloitte has also included a review of the South African coal industry.

The independent technical review by Venmyn Deloitte has been based upon technical information which has been supplied by CoAL and its subsidiary companies, and which has been independently due diligenced by Venmyn Deloitte, where possible. CoAL has warranted in writing that it has openly provided all material information to Venmyn Deloitte which, to the best of its knowledge, understanding, and belief is complete, accurate and true, having made all reasonable enquiries and has not omitted anything likely to affect its import. CoAL has also confirmed that disclosure of the information presented herein, with respect to the properties subject to the Soutpansberg Properties Acquisition Agreement, has been authorised by the sellers.

Venmyn Deloitte confirms in compliance with the JORC requirements that, to the best of its knowledge and having taken all reasonable care to ensure that such is the case, declares, that the information contained in the 2015 CPR is, in accordance with the facts, has been obtained in a manner consistent with the requirements of JORC 2012, contains no omission likely to affect its import and is not misleading. No material change has occurred from 31 December 2015 to the date hereof that would require any amendment to the CPR. Venmyn Deloitte reserves the right to, but will not be obliged to, revise this report or sections therein, and conclusions thereto, if additional information becomes known to Venmyn Deloitte subsequent to the date of this report.

## 1.3. Competent Persons Declaration

Venmyn Deloitte's professional advisors are Competent Persons as defined by the JORC Code. They are also members of the Australasian Institute of Mining and Metallurgy (AusIMM), the South African Institute for Mining and Metallurgy (SAIMM) and the Geological Society of South Africa (GSSA), which are Recognised Professional Organisations as defined by the JORC Code. The Competent Persons involved in the compilation of this report are members in good standing with their respective professional institutions, and have the required qualifications and experience as defined in the JORC Code.

None of the Venmyn Deloitte employees, have or have had, any interest in any of CoAL projects capable of affecting their ability to give an unbiased opinion, and have not and will not, receive any pecuniary or other benefits in connection with this assignment, other than normal consulting fees.

Venmyn Deloitte is an independent advisory company. Its consultants have extensive experience in preparing competent persons', technical advisers' and valuation reports for mining and exploration companies. Venmyn Deloitte's advisors have, collectively, more than 30 years of experience in the assessment and evaluation of mining and mineral projects. The signatories to this report are qualified to express their professional opinions on the technical aspects of the coal assets described. To this end, Competent Persons' Certificates are presented in Appendix 5.

## 1.4. Statement of Independence

### 1.4.1. JORC Compliance and Independent Review

This report has been compiled by Venmyn Deloitte, a subsidiary of Deloitte Consulting South Africa (Proprietary) Limited. Venmyn Deloitte has compiled this CPR in accordance with and to the extent required by the Regulatory Guide 111 – Content of expert reports (RG111) and the Regulatory Guide 112 – Independence of experts (RG112), prepared by the Australian Securities and Investment Commission (ASIC) and the JORC Code (Section 5).

Prior to 1 November 2012, Venmyn Deloitte was an independent consultancy called Venmyn Rand (Pty) Ltd and consequently had no audit independence requirements in relation to CoAL or its auditors Deloitte Touche Tohmatsu Services, Inc. The Coal Resources for the GSP project were originally estimated and signed off by CoAL's Competent Person, Mr J Sparrow (Pr.Sci.Nat.) (CoAL's Group Geologist), Venmyn Rand (Pty) Ltd and independent contractor Liz de Klerk (Pr.Sci.Nat) (Glanvill Geoconsulting (Pty) Ltd) in 29 February 2012. For the 29 February 2012 Coal Resource statement, Venmyn Rand (Pty) Ltd reviewed CoAL's estimation procedures and considered the Coal Resource estimates and classification as prepared and declared by CoAL to be reasonable and compliant with the reporting standards of JORC. There has been no material change in the Coal Resource statements since 29 February 2012 and Venmyn Deloitte has accordingly re-presented them without change in this 2015 CPR.

Venmyn Deloitte has acted as independent reviewer of the information provided by CoAL management and declares in compliance with the JORC requirements, that it has taken all reasonable care to ensure that the information contained in the 2015 CPR is, to the best of its knowledge, in accordance with the facts, has been obtained in a manner consistent with the requirements of JORC 2012, contains no omission likely to affect its import and is not misleading.

No Coal Reserves have been declared for the GSP assets.

### 1.4.2. Venmyn Deloitte Independence

Neither Venmyn Deloitte nor its staff have, or have had, any interest in these projects capable of affecting their ability to give an unbiased opinion and, have not received, and will not receive, any pecuniary or other benefits in connection with this assignment, other than normal consulting fees. Neither Venmyn Deloitte nor any of its personnel involved in the preparation of this CPR have any material interest in CoAL in any of the properties described herein.

Venmyn Deloitte was remunerated a fixed fee amount for the preparation of this report, with no part of the fee contingent on the conclusions reached, or the content or future use of this report. Except for these fees, Venmyn Deloitte has not received and will not receive any pecuniary or other benefit whether direct or indirect for or in connection with the preparation of this report.

Since 2010, Venmyn Deloitte (previously Venmyn Rand) has compiled a number of CPRs and technical reports on CoAL's mineral projects for both internal and external purposes. These included an Independent Competent Persons Report on the Principal Coal Assets of CoAL (October 2012), an Independent Technical Statement as at 18 September 2011, an Independent Technical Statement for the Greater Soutpansberg as at 31 May 2012 and a Best Practise Guideline for Exploration (June 2012), the 2011 CPR and the 2012 CPR.

As of 1 November 2012, Venmyn Deloitte became a subsidiary of Deloitte Consulting South Africa (Proprietary) Limited, a South African member firm of Deloitte Touche Tohmatsu Limited (Deloitte). The reader is advised that Deloitte is currently CoAL's external auditor. Auditor independence requirements are set out in section 290 of The Code of Ethics for Professional Accountants issued by the Accounting Professional & Ethical Standards Board (APES110). APES 110 defines three potential threats to auditor independence with respect to the current scope of work. In particular, these were considered in relation to the technical review of the GSP assets and included:-

- a self-review threat; which would be created if the Coal Resources were subject to audit procedures by Deloitte;
- the potential implication of the performance of management functions by Venmyn Deloitte; and
- a self-interest threat; which would be created if Venmyn Deloitte were to be remunerated on a contingent basis.

In considering the above, Venmyn Deloitte and Deloitte Touche Tohmatsu Services, Inc. have taken into account the following:-

- the 29 February 2012 Coal Resources were independently signed off by Glanvill GeoConsulting (Pty) Ltd, Competent Person, John Sparrow, Group Geologist of CoAL and Venmyn Rand (Pty) Ltd;
- no material changes have taken place on the GSP projects since that date; and
- the original 29 February 2012 Coal Resources can be re-presented in the 31 December 2015 Coal Resource statements as they were been independently signed off, remain unchanged and have been independently reviewed for compliance with the JORC 2012 edition reporting standards.

Deloitte has determined that there is no significant threat to its independence of CoAL because of the following:-

- Coal Resources have been signed off by Competent Person, John Sparrow, Group Geologist of CoAL and Glanvill Geoconsulting (Pty) Ltd with no change to date;
- Venmyn Deloitte is not performing any advisor role in the CoAL / Universal Coal transaction;
- the Coal Resources have not changed materially since last reported in the public domain on 29 February 2012, and as such, Deloitte can rely upon the 29 February 2012 Coal Resource statements in future audits;
- the 2015 CPR will not be used for financial reporting purposes and will not be incorporated into CoAL's financial statements, and therefore not subject to audit procedures; and
- the Venmyn Deloitte team working on the 2015 COR has not and will not be involved in the audit of CoAL; and
- Venmyn Deloitte has been and will be remunerated on a fixed fee basis only and according to a signed agreement with CoAL.

Deloitte has declared it is comfortable that this scope of work would not impair its independence of CoAL in respect of its external audit. The audit committee for CoAL has also approved this assignment. Venmyn Deloitte has acted as independent reviewer of the information provided by CoAL management and declares in compliance with the JORC requirements, that it has taken all reasonable care to ensure that the information contained in the 2015 CPR is, to the best of its knowledge, in accordance with the facts, has been obtained in a manner consistent with the requirements of JORC 2012, contains no omission likely to affect its import and is not misleading.

### 1.4.3. Statements on AIM Rules

Venmyn Deloitte has given and has not withdrawn its consent to the inclusion of its updated 2015 CPR contained in Part IX (Mineral Expert's Report) of the Admission Document in the form and context in which it appears, and has authorised the contents of that part of the Admission Document which comprises its report for the purposes of Prospectus Rule 5.5.3R(2)(f) and for the purposes of paragraph 23.1 of Annex I of the Prospectus Rule 5.5.3R(2)(f), Venmyn Deloitte ".…….has authorised the contents' of the 2015 CPR in the Admission Document as provided for by Prospectus Rule 5.5.8.

Venmyn Deloitte has not prepared the Coal Resource estimate provided in the 2015 CPR which remains identical to the 29 February 2012 estimate, the latter of which was prepared and independently signed-off on 29 February 2012 signed off by Glanvill GeoConsulting and Competent Person J Sparrow, and in accordance with the JORC requirements, is the responsibility of CoAL management.

Venmyn Deloitte has acted as independent reviewer of the information provided by CoAL management and declares in compliance with the JORC requirements and Item 1.2 of Annex 1 of the Prospectus Rules, that it has taken all reasonable care to ensure that the information contained in the 2015 CPR is, to the best of its knowledge, in accordance with the facts, has been obtained in a manner consistent with the requirements of JORC 2012, contains no omission likely to affect its import and is not misleading.

## 1.5. Sources of Information and Reliance on Other Experts

Venmyn Deloitte has based its review of CoAL's Soutpansberg coal assets, reported herein, on information provided by CoAL and its subsidiary companies, along with technical reports by its contractors and associates and other relevant published data. A full list of all sources of information is provided in Appendix 1. Drafts of this CPR have been provided to CoAL and its relevant subsidiary companies, in order to identify and address any factual errors or omissions prior to finalisation.

In addition to relying on general information contained within the reports and articles detailed in Appendix 2 Venmyn Deloitte has relied specifically on the opinions of the following experts, detailed in Table 2, which have had a material impact on the conclusions drawn in this report.

**Table 2: List of Other Experts**

| COMPANY | EXPERT | ASPECTS OF RELIANCE | PROJECTS |
|---|---|---|---|
| CoAL | John Sparrow | Coal Resources 2012 and 2015 | All projects for which Coal Resources are declared |
| Glanvill GeoConsulting | Liz de Klerk | Verification of databases, methods and results with particular reference to the Coal Resources 2012 | All projects for which Coal Resources are declared |

The CPR has been compiled based on exploration and feasibility study information available up to and including the 31 December 2015 and Coal Resource information as at the 31 December 2015.

The authors of this report are not qualified to provide extensive commentary on the legal issues associated with CoAL's and/or its subsidiaries' right to the mineral properties. Venmyn Deloitte has reviewed and is satisfied with the the NOPR and NOMR documentation and acceptance letters from the DMR at the CoAL offices in Johannesburg. No warranty or guarantee, be it express or implied, is made by the authors with respect to the completeness or accuracy of the legal aspects of this document.

## 1.6. Personal Inspections

The JORC Code requires that site visits be conducted to the asset under consideration. The authors of this report have carried out numerous site visits to CoAL's mineral asset between March 2010 and May 2012 as part of previous work assignments for the company. During these site visits, the authors have inspected the operations including exploration sites, drilling procedures, core logging and data capture and all available infrastructure in the general area and within the properties themselves.

These site visits have substantiated the existence of CoAL's mineral and mining assets which are supported by the exploration results detailed in the relevant sections to follow. Since 2012 there have been no material changes to the procedures in place, Mineral Resources or infrastructure and for this reason, no further site visits were considered necessary.

# 2. Corporate Structure

CoAL's corporate structure, with respect to the assets to be discussed in this report, is presented in Figure 5. A number of other, and unrelated, subsidiary companies have been excluded from the corporate structure diagram for the sake of simplicity.

In terms of the legal tenure sections of this report, specific reference is made to the associated subsidiary companies holding the various rights, as appropriate and their relationship to CoAL as set out in the corporate structure. However, for ease of reference, and throughout the remainder of the CPR references to 'CoAL' should be understood to mean 'CoAL though its relevant subsidiary'.

Similarly, this CPR includes those assets that were acquired from 'Rio Tinto' as part of the Soutpansberg Properties Acquisition Agreement. For the purpose of this CPR, references to 'Rio Tinto' should be understood to mean 'Rio Tinto through its relevant subsidiary/ies'.

# 3. South African Country Profile

## 3.1. Political and Economic Climate

South Africa gained independence from Britain on the 31 May 1910, and was declared a republic in 1961. From 1948 until 1990, the South African political and legal systems were based upon the concept of apartheid, a philosophy of separate racial development, enforced by a white minority government. The first multiracial elections in 1994 brought an end to apartheid and ushered in black majority rule under the African National Congress (ANC), with a number of different political parties participating in the elections. The country continues to hold democratic, peaceful, free and fair elections, the last of which was won by the ANC in 2009, under the leadership of President Jacob Zuma.

South Africa is the most advanced economy in Africa and provides the gateway to Sub-Saharan Africa. It is classified as a middle-income emerging market, with well-developed financial, legal and judicial systems and modern infrastructure.

Between 2004 and 2008 South Africa grew economically as a result of macroeconomic stability and a global commodities boom, but growth slowed in the second half of 2008 and 2009 due to poor global economic conditions, which influenced commodity prices and demand. Gross Domestic Product (GDP) fell almost 2% in 2009, worsening the country's already high unemployment levels. However, in 2010, 2011,2012 and 2013, the country again reflected a positive economic growth rate, with 2.8%, 3.4%, 2.2% and 2.2% real GDP growth rates, respectively (CIA, 2016). The country experienced a drop in GDP in 2014, with real GDP dropping to 1.5% (CIA 2016). Stats SA (2015) reports that the South African economy has been slowing in 2015, with a 1.3% contraction in the second quarter and only marginal growth in the third quarter. Concerns over drought conditions as well as high food prices have resulted in suggestions that South Africa may go into a recession unless the government institutes policies to prevent this.

South African economic policy is fiscally conservative but pragmatic. The country attempts to control inflation by keeping it within an acceptable range (3% - 6%), maintains a budget surplus, uses State-owned enterprises to deliver basic services to low-income areas and provides social grants to a quarter of the population. Currency and inflation volatility, poverty, income disparities, and poor availability of public services continue to characterise the country, however, and it is believed that the country's inflation levels rose to 6.1% in 2014 and that unemployment rose from 24.6% to 25.1% between 2013 and 2014 (CIA, 2016). Consolidated inflation and unemployment figures for 2015 were unavailable at the time of writing this report.

## 3.2. Minerals Industry

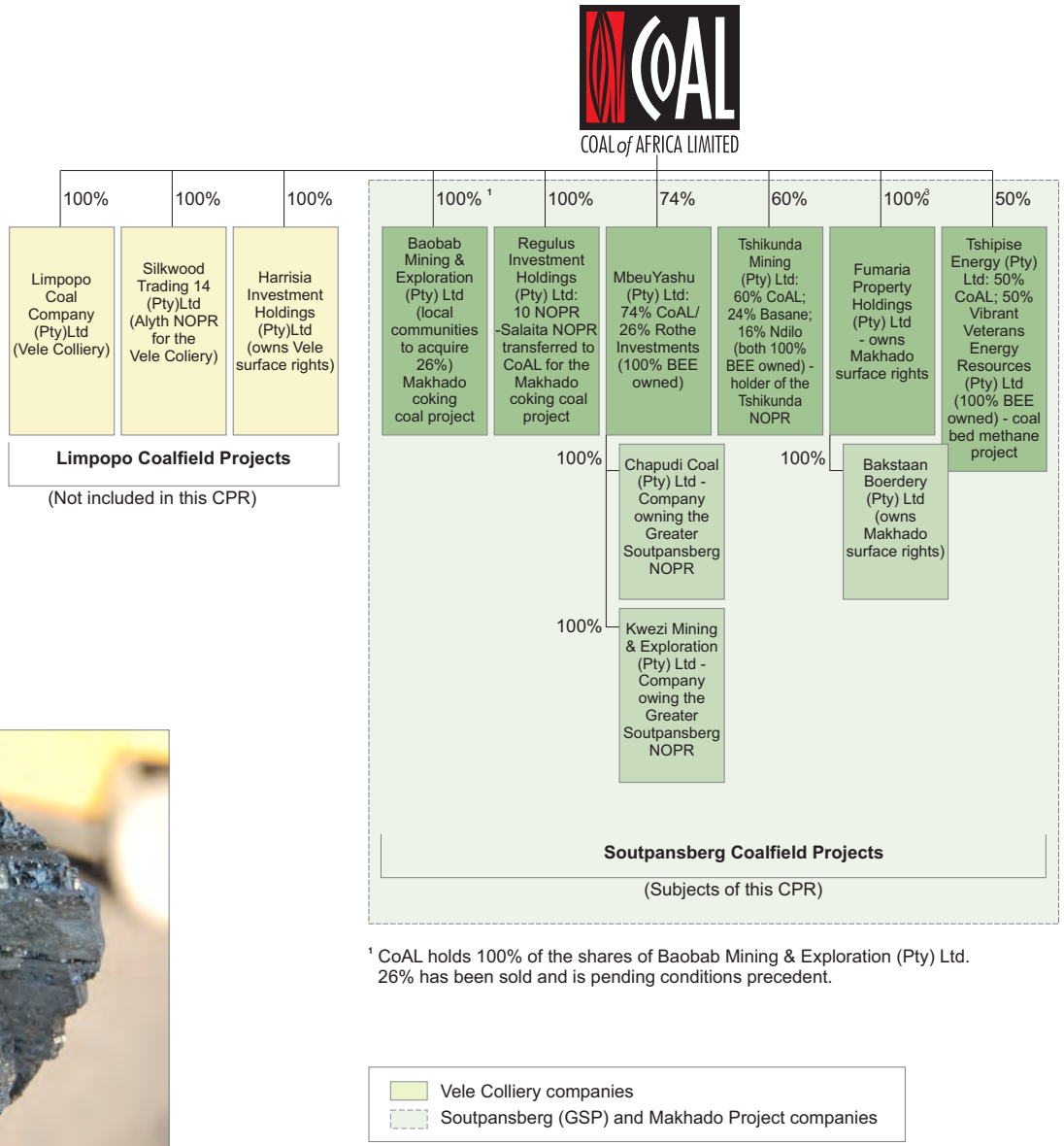
The minerals industry has historically contributed approximately 6% of South Africa's GDP, but this contribution is more significant if multiplier and induced effects of mining are taken into account (Statssa, 2015).

South Africa has a mature minerals industry developed from gold and diamond discoveries in the late 1800s. The country is the world's largest producer of platinum, chrome and vanadium and ranks highly in the production of diamonds, coal, iron ore and base metals. South Africa hosts a number of large orebodies such as the Bushveld Complex (BC) and the Witwatersrand Basin, as well as rich diamond fields and extensive coalfields.

One of the greatest challenges associated with the minerals and mining industry in South Africa is the rising costs of labour, electricity, diesel and steel, among other costs.

Another challenge, which has gained headline attention in recent years, is that of labour and community unrest caused by low wages, particularly among contract workers and under-resourced communities – a phenomenon that has been worsened by municipalities' inability to provide adequate infrastructure to communities and an historical apartheid-era homeland system that had workers from labour-sending areas being impoverished by supporting two households.

## CoAL'S CORPORATE STRUCTURE




**SOUTPANSBERG COAL**

Source: Coal of Africa
VMD1971_CoAL GSP CPR_2015

Other important concerns for the mining industry are the effect of HIV/Aids on the workforce, as well as uncertainty related to resource nationalism, including requirements for beneficiation, limitations on the export of "strategic minerals", the introduction of a State mining company and calls for the nationalisation of mines.

## 3.3. Legislative Framework

The South African Government has an extensive legal framework within which mining, environmental and social aspects are managed. Inclusive within the framework are international treaties and protocols, and national acts, regulations, standards, and guidelines which address international, national, provincial and local management areas.

The government of South Africa is divided into national, provincial and local spheres which address environmental and social regulatory elements within the country. These spheres are distinct, but are closely interdependent and interrelated. The South African Constitution allocates legislative and administrative functions to all three spheres of government, providing for a broad and diverse platform from which government agencies can responsibly manage environmental, social and human rights aspects.

The national elections, held on 7 May 2014 resulted in the allocation of environmental responsibility at national level to the Department of Environmental Affairs (DEA). Within this new ministerial function, there are two autonomous departments, namely, the Department of Water and Sanitation (DWS) and the DEA. The National Environmental Advisory Forum and the Committee for Environmental Coordination are advisory bodies established by the National Environmental Management Act, 107 of 1998 (NEMA). The former has been established to advise the Minister on any matter concerning environmental management and governance, with the latter mandated to promote the integration and coordination of environmental functions by the relevant organs of state. The latter committee has not yet been constituted.

South African statutory legislation and requirements relevant to the projects and considered as part of this assessment included:-

- Mineral and Petroleum Resources Development Act (Act 28 of 2002) (MPRDA);
- Mineral and Petroleum Resources Development Amendment Act 49 of 2008;
- Mineral and Petroleum Resources Development Draft Amendment Bill (2013);
- Broad-Based Socio-Economic Charter (and associated amendments, 2010);
- Promotion of Beneficiation Bill;
- Mineral and Petroleum Resources Royalty Act (Act 28 of 2008) (MPRRA);
- National Environmental Management Act (Act 107 of 1998) (NEMA);
- National Environmental Management: Air Quality Act (Act 39 of 2004) (NEM:AQA); and
- National Environmental Management: Waste Act (Act 59 of 2008) (NEM:WA).

The most important of these, applicable to CoAL's GSP assets, are summarised in the subsections to follow.

### 3.3.1. Mineral and Petroleum Resources Development Act (Act 28 of 2002) (MPRDA)

Types of rights and permits applicable to the mining industry in South Africa, as provided for in the MPRDA and amendments, are detailed in Table 3.

The South African government enacted the MPRDA on 1 May 2004. It defines the State's legislation on mineral rights and mineral transactions in South Africa. The Act emphasises that the government did not accept the existence of the historic dual State and private ownership of mineral rights in South Africa and, as such, the Act legislated that all mineral and petroleum resources in South Africa now vest in the State.

Additional objectives of the Act include the promotion of economic growth, the development of resources to expand opportunities for the historically disadvantaged, and the socio-economic development of the areas in which mining and prospecting companies are operating. It also provides for security of tenure relating to prospecting, exploration, mining and production.

**Table 3: Types of Rights Applicable in South Africa**

| LICENCE TYPE | PURPOSE | DURATION | REQUIREMENTS | CONDITIONS |
|---|---|---|---|---|
| Reconnaissance Permission | Exploration at the reconnaissance stage. | 1 year non renewable | Financial ability; technical ability and work programme. | Holder does not have the exclusive right to apply for a New Order Prospecting Right (NOPR). |
| New Order Prospecting Right (NOPR) | Exploration at target definition stage. | Up to 5 years initially. Renewable once for 3 years. | Financial ability; technical ability; economic programme; work programme and environmental plan. | Payment of Prospecting fees. Holder has the exclusive right to apply for NOMR. |
| Retention Permit | Hold onto legal rights between prospecting and mining stages. | 3 years initially. Renewable once for 2 years. | Prospecting stage complete; feasibility study complete and Environmental Management Plan (EMP) complete. Project not currently feasible. | May not result in exclusion of competition, unfair competition or hoarding of rights. May not be transferred, ceded, leased, sold, mortgaged or encumbered in any way. |
| New Order Mining Right (NOMR) | Development and production stage. | 30 years initially. Renewable for further periods of 30 years. Effective for life of mine (LOM). | Financial ability; technical ability; prospecting complete; economic programme; work programme; social plan; labour plan and completed EMP. | Payment of royalties (from 2010). Compliance with Mining Charter and Codes of Good Practice on broad based BEE. |
| Mining Permit | Small-scale mining. | 2 years initially. Renewable for 3 further periods of 1 year at a time. | Life of project must be <2 years; areas must be <5ha and completed EMP. | Payment of royalties (from 2010). May not be leased or sold. |

A further objective of the Act was to advance Black Economic Empowerment (BEE) within South Africa's minerals industry, by encouraging mineral exploration and mining companies to enter into equity partnerships with BEE companies. The Act also makes provision for the implementation of social responsibility procedures and programmes by coal resource companies.

The Act incorporated a "use-it or lose-it" principle, that has been applied to companies or individuals who owned mineral rights or the rights to prospect and mine prior to 2004 (Old Order Rights). These Old Order Rights were required to be transferred within specified timeframes, under the provisions of the Act, into New Order Rights to prospect and mine.

Once the State has granted the conversion of the Old Order Rights to New Order Rights, or has granted a New Order Right for new applications submitted after the implementation of the MPRDA, a Notarial Agreement between the State and the holder of the New Order Right is entered into. This Agreement sets out all the conditions associated with the New Order Right. New Order Rights can be suspended or cancelled by the Minister if, upon notice of a breach from the Minister of its obligations to comply with the MPRDA, or the conditions prescribed as part of its New Order Right, a breaching entity fails to rectify such a breach.

In addition, in terms of the MPRDA, mining and exploration companies have to comply with additional responsibilities relating to environmental management and to environmental damage, degradation or pollution, resulting from their prospecting or exploration activities.

Prior to 20 November 2015, mining right applications had to be supported by an EIA and rehabilitation liability process governed by the MPRDA Regulations GN R. 527 and the EIA Regulations GN R.982 of 8 December 2014.

General Notice Regulation 527 (GNR 527) of the MPRDA previously provided the technical specifications and methodology to be applied when determining the financial provision for mine rehabilitation and closure. It also required that the quantum of financial provision be approved by the South African Minister of Mining, and that it include the commitments to closure as made in the approved Environmental Management Plan (EMP).

Specific changes made in the MPRDA applicable to the MPRDA sectional requirements are illustrated in Table 4.

**Table 4: Changes made to the MPRDA**

| SECTION | SECTION TEXT |
|---|---|
| Section 38 | Section 38 was repealed – this section previously regulated environmental management and the responsibility to remedy the environmental impacts. It was subsequently replaced with Sections 38A stating that the DMR is the responsible authority for implementing the provisions of NEMA and Section 38B stating that an EMP approved in terms of this Act before, and at the time of the coming into effect of NEMA, is deemed to be an environmental authorisation. |
| Sections 39 to 42 | Sections 39 to 42 which previously regulated the EMP and its development, residue and stockpile management and financial provision have been deleted without any replacement. |
| Section 43 | Section 43 regulating the issuance of closure certificates was amended – this section now provides that the holder of a mining right remains responsible for any environmental liability relating to environmental degradation and compliance to the licence conditions. |
| General | The MPRDA now provides for corporate governance between the DMR and various other authorities. This now means that that no closure certificate may be issued unless a written confirmation from the Chief Inspector of each department, confirming that matters relating to Safety, Health and Environment (SHE) have been addressed. |

Further to the changes above, on the 20 November 2015, Bomo Edith Edna Molewa, Minister of Environmental Affairs for South Africa, promulgated the Regulations for financial provision for prospecting, exploration, mining or production operations (the financial provisioning regulations). These regulations were promulgated under section 44(aE), (aF), (aG), (aH) read with sections 24(5)(b)(ix), 24(5)(d), 24N, 24P and 24R of NEMA.

The transitional arrangements defined within GNR 1147 state that all operations holding any authorisation in terms of the MPRDA must ensure that a review, assessment and adjustment of the financial provision is conducted in accordance with regulation 11 of these Regulations, read with the necessary changes, and submit an updated financial provision, including the plans and report contemplated in regulation 11(1):-

- within three months of its financial year end following the coming into effect of the GNR 1147 and annually thereafter; or
- within 15 months after the coming into effect of GNR 1147 and annually thereafter.

A summary of the amendments applicable to CoAL is provided in Section 16.6. This section has been compiled as a supplement to assist CoAL Management in understanding what effects the amended legislation may have on the process to determine closure and rehabilitation liability

### 3.3.2. Mineral and Petroleum Resources Development Amendment Act 49 of 2008

In 2008, an Amendment Bill proposed to make significant changes to the MPRDA. The Bill was signed by the President in 2009 but did not come into force at that time (Webber Wentzel, 2009). The 31 May 2013 Government Gazette noted the Act would come into force on 7 June 2013, but this announcement was followed by a further announcement in the 6 June 2013 Government Gazette that some of the amendments, including those relating to the transferability of MPRDA rights (which required Ministerial approval) and the prohibition of the amendment of rights to include additional areas or minerals, would not come into effect. Van der Want (2013) suggests that the proclamation of this Act was an error. While not an exhaustive list, the Amendment Act is noteworthy because it addresses the following issues:-

- it requires the prior written consent for disposal in various forms of a prospecting or mining right or an interest in such a right;

- it changes the duration of the reconnaissance permission from two years to one and allows a Regional Manager to reject a defective application with reasons within 14 days of receipt;
- it requires that the Minister refuse a prospecting right if there is a concentration of rights by the applicant and associated companies;
- it allows the Minister to impose further conditions on an applicant for mining rights to include participation by the community;
- it increases the area for which a mining permit can be issued to 5ha, but does not allow an applicant to have more than one mining permit on the same or adjacent land;
- it allows for the cancelation or suspension of mineral rights if there is non-compliance with the MPRDA;
- it discusses transitional arrangements for mineral rights, including documentary proof that holders of Old Order Mining Rights are in compliance with the BEE and socio-economic objectives of the MPRDA;
- it attempts to promote the development of input and downstream industries;
- it encourages the entry of HDSAs, including women and communities with interests or rights to land, into the industry; and
- it has various forward-looking environmental provisions that were to come into effect 18 months after the promulgation of the Act. These include:-
    - making the Minister of Mineral Resources responsible for environmental matters that relate to mining;
    - requiring the simultaneous application for environmental authorisation with mineral tenure applications;
    - requiring a report on compliance with environmental authorisation with renewal applications (Legalbrief Today, 2013; Webber Wentzel, 2013).

### 3.3.3. Mineral and Petroleum Resources Development Draft Amendment Bill (2012)

An explanatory summary of the 2013 Amendment Bill was published in the same Government Gazette that announced that the 2008 Amendment Act was to come into force. The 2013 Amendment Bill proposes amendments to the 2008 Amendment Act and the MPRDA and is seen as an important indicator of likely future mineral policy in South Africa (Legalbrief Today, 2013).

While not an exhaustive list, some of the key changes that are proposed in the Bill are the following:-

- the Minister is given the right to initiate beneficiation, including setting the level required for beneficiation, the price required for beneficiation, and the percentage of raw material inputs that are set aside for local beneficiators;
- persons who intend to export “designated minerals” are required to obtain written approval for this from the Minister. The term is not defined, but is thought to refer to what was known as “strategic minerals”, or minerals defined periodically by the State to be of strategic importance to the country;
- historic tailings, the ownership of which was contested by a high-profile De Beers court case, are now held in custody by the State rather than the historic producer of those tailings;

- associated minerals, discovered in mining, can be mined by the primary mineral rights holder. Third parties are also permitted to apply for rights over associated minerals, but will have to notify the primary rights holder of the application;
- the right to a mineral deposit is sub-divisible, but consent as to the transfer of any interest is required from the Minister;
- environmental requirements will be implemented under NEMA, and rights holders will be responsible for environmental liabilities even after a closure certificate has been issued by the Minister;
- penalties for non-compliance with various mining-related legislation and requirements are set as a percentage of annual turnover and exports;
- the Minister is prohibited from granting a right where this would result in anti-competitive conduct and dominance by the applicant in a particular sector of the mining industry;
- the State has a right to a share in the annual profits derived from exploration or production from all new petroleum exploration and production rights;
- BEE objectives are required to be complied with in prospecting rights, where they were required to be complied with in only mining rights in the past;
- in the case of liquidation, mineral rights held fall within the insolvent estate but ministerial approval is required when they are transferred to a new owner; and
- historically disadvantaged persons are redefined to exclude white women (Tucker and Sibisi, 2013; Leon, 2013).

The MPRDA Amendment Bill was approved by parliament in 2014 but its status in unclear. This is because it was referred back to the National Assembly in January 2015 with little progress since then (Leon, 2015).

It is believed that the new bill will reinforce that the oil and gas industry still falls under the MPRDA. The State's mooted free-carried interest in oil and gas projects will also become "more subdued" and it will only be able to take its 20% share in profits after exploration and production costs have been deducted (Peyper, 2016).

### 3.3.4. Broad-Based Socio-Economic Charter

Promulgation of the Broad-based Socio-Economic Charter for the South African Mining Industry (also known as the Mining Charter) marked the end of protracted debates and varying interpretations of the legislation's requirements, paving the way for the full implementation of the MPRDA.

All mining and prospecting companies are required to comply with the provisions of the Mining Charter. The objectives of the Mining Charter are to:-

- promote equitable access to the State's resources by all the people of South Africa. It required that every mining company achieved a 15% level of ownership of its mining assets by historically disadvantaged South Africans (HDSAs) by 1 May 2009, and a level of 26% ownership by 1 May 2014;
- substantially and meaningfully expand opportunities for HDSAs, including women, to enter the mining and minerals industry and to benefit from the exploitation of the nation's resources. In terms of this requirement, 40% of management roles were to be held by HDSAs by 2010;
- expand the skills base of HDSAs to serve the community;

- promote employment and advance the social and economic welfare of mining communities, and the major areas from which labour is drawn to carry out exploration or mining; and
- promote the beneficiation of South Africa's mineral commodities, whereby the companies which have facilitated downstream, value-adding activities for products they mine, could achieve an "offset" against the HDSA equity participation requirement.

Most mining companies are already implementing their own empowerment strategies. These strategies demonstrate their best endeavours to consider the issues and a willingness to accommodate the requirements when they are finally defined. Compliance with the Mining Charter is measured using a designated scorecard, which provides a practical framework against which the Minister can assess whether a company actually measures up to what was intended in the MPRDA and the Mining Charter.

### 3.3.5. Amendment of the Broad-Based Socio-Economic Empowerment Charter (2010)

New amendments to the Mining Charter are likely to be ready by 31 March 2016 (Peyper, 2015a). These amendments are thought to be necessary because of a lack of compliance by many companies with the existing Charter and Scorecard. The DMR has stated that provisions of the current Charter will remain intact until the amended Charter is completed and approved. The amended Charter is likely to align sanctions for non-compliance with those stipulated by the Competition Commission, and could result in mines being fined 10% of their income for non-compliance.

### 3.3.6. Promotion of Beneficiation Bill

This is still being prepared, and is expected to provide incentives for upstream companies that facilitate downstream investments, in order to reduce the exporting of unprocessed mineral products and to promote local value addition.

### 3.3.7. Mineral and Petroleum Resources Royalty Act (Act 28 of 2008) (MPRRA)

This legislation incorporates the government's intention to impose royalties on revenues derived from mineral production in South Africa. Enacted in 2008, the MPRRA was initially set to be implemented in May 2009. However, in an effort to mitigate job losses in the mining sector during the global financial crisis, the government decided to postpone the implementation of the new mineral and mining royalty regime until the 31 March 2010.

The main purpose of the Act was to provide legislation for the collection of royalties from mines, developed and operated in terms of the New Order Mining Right (NOMR), granted through the MPRDA process.

The Act distinguishes between refined and unrefined resources, where refined minerals have been refined beyond a condition specified by the Act, and unrefined minerals have undergone limited beneficiation as specified by the Act.

The royalty is determined by multiplying the gross sales value of the extractor, in respect of that mineral resource, in a specified year, by the percentage determined by the royalty formula. Both direct operating expenditure (Opex) and capital expenditure (Capex) incurred is deductible for the determination of earnings before interest and tax (EBIT). The quantum of the revenue royalty on all minerals is dependent on the profitability of the company based on the following formula. For refined mineral resources the formula is:-

$$\text{Royalty Rate} = 0.5 + \frac{\text{EBIT}}{\text{Gross Sales (refined)} \times 12.5} \times 100$$

The maximum percentage for refined mineral resources is 5%.
For unrefined mineral resources the formula is:-

$$Royalty\ Rate = 0.5 + \frac{EBIT}{Gross\ Sales\ (unrefined) \times 9} \times 100$$

The maximum percentage for unrefined mineral resources is 7%.

Beneficiation had been included in amendments to the MPRDA, as a way of aligning the different mineral legislation that applies to South Africa. However, it is believed that the constitutionality of beneficiation provisions in proposed amendments has been questioned and this has resulted in delays in the final promulgation of the MPRDA Amendment Bill (Peyper, 2015b).

### 3.3.8. Institutional and Administrative Environmental and Social Regulatory Structures

The government of South Africa is divided into national, provincial and local spheres which address environmental and social regulatory elements within the country. These spheres are distinct, but are closely interdependent and interrelated. The South African Constitution allocates legislative and administrative functions to all three spheres of government, providing for a broad and diverse platform from which government agencies can responsibility manage environmental and social aspects.

The national elections, held in 2009, resulted in the allocation of environmental responsibility at national level to the Department of Water and Environmental Affairs (DWEA). Within this new ministerial function, there are two autonomous departments, namely, the Department of Water Affairs (DWA) and the Department of Environmental Affairs (DEA) (Patel, 2011). The National Environmental Advisory Forum and the Committee for Environmental Coordination are advisory bodies established by NEMA.
The former has been established to advise the Minister on any matter concerning environmental management and governance, with the latter mandated to promote the integration and coordination of environmental functions by the relevant organs of state (Patel, 2011).

### 3.3.9. National Environmental Management Act (Act No. 107 of 1998) (NEMA)

NEMA was promulgated in 1998 to replace the Environmental Conservation Act 1989 (Act No. 73 of 1989) (ECA) as the overarching national environmental legislative framework. NEMA was promulgated to give effect to the Environmental Management Policy (published in 2007), and has been subsequently amended, including the National Environmental Management Amendment Act of 2003, and the National Environmental Management Second Amendment Act, No. 8 of 2004.

The EIA Regulations, an application for environmental authorisation for certain listed activities must be submitted to the provincial environmental authority, the national authority, depending on the types of activities being applied for or, when mining and mineral processing activities are involved, the Department of Mineral Resources (DMR).

The current EIA regulations, GN R.982, GN R.983, GN R.984 and GN R.985, promulgated in terms of Sections 24(5), 24M and 44 of the NEMA and subsequent amendments, commenced on 8 December 2014.

In summary, the amendments have the following repercussions:-

- NEMA will regulate all environmental related aspects;
- all environmental aspects have been repealed from the MPRDA;
- the Mineral Resources Minister will be responsible for the issuance of Environmental Authorisation (EA) in terms of NEMA;

- the Mineral Resources Minister will implement the provisions of NEMA and the subordinate legislation; and
- the three Ministers (Mineral Resources, Environmental, Water and Environmental Affairs) will adhere to a fixed time frame (300 days) for the consideration and issuing of licences or permits.

GN R.983 lists those activities for which a Basic Assessment is required, GN R.984 lists the activities requiring a full EIA (Scoping and Impact Assessment phases) and GN R.985 lists certain activities and competent authorities in specific identified geographical areas. GN R.982 defines the EIA processes that must be undertaken to apply for Environmental Authorisation. Specific sectional requirements to KEHL are illustrated in Table 4.

Section 44 of NEMA has been amended to empower the Minister of Environmental Affairs to promulgate regulations with respect to:-

- the assessment and determination of environmental liability;
- auditing and reporting of environmental liability; and
- any other matter necessary to facilitate the implementation of the financial provision.

As a result, new closure and rehabilitation financial regulations have been promulgated in accordance with the mandate of NEMA Section 44.

The purpose of GNR 1147 is to regulate the determine and making of financial provision as contemplated in the Act for the costs associated with the undertaking of management, rehabilitation and remediation of environmental impacts from prospecting, exploration, mining or production operations through the lifespan of such operations and latent or residual environmental impacts that may become known in the future.

GNR 1147 requires that all applicants or holders of a right or permit must determine and make financial provision to guarantee the availability of sufficient funds to undertake rehabilitation and remediation of the adverse environmental impacts of prospecting, exploration, mining or production operations, as contemplated in the NEMA and to the satisfaction of the Minister responsible for mineral resources.

The Financial Provisioning Regulations regulate the following aspects of rehabilitation, decommissioning and closure:-

- financial guarantee;
- deed of trust;
- minimum content of an annual rehabilitation plan;
- minimum content of a final rehabilitation, decommissioning and mine closure plan;
- minimum content of an environmental risk assessment report; and
- care and maintenance plan.

**Table 4: NEMA Requirements**

| SECTION | SECTION TEXT |
|---|---|
| Section 2 | Some of the most important principles contained in NEMA are that:-<br>• environmental management must put people and their needs first;<br>• development must be socially, environmentally and economically sustainable;<br>• there should be equal access to environmental resources, benefits and services to meet basic human needs;<br>• government should promote public participation when making decisions about the environment;<br>• communities must be given environmental education;<br>• workers have the right to refuse to do work that is harmful to their health or to the environment;<br>• decisions must be taken in an open and transparent manner and there must be access to information;<br>• the role of youth and women in environmental management must be recognised;<br>• the person or company who pollutes the environment must pay to clean it up;<br>• the environment is held in trust by the state for the benefit of all South Africans; and<br>• the utmost caution should be used when permission for new developments is granted. |
| Section 24N | The provisions in section 24N of NEMA have been made applicable to all activities and not just mining activities.<br>NEMA now contains a detailed definition for "financial provision" and has been enhanced.<br>NEMA has been amended to allow for the Integrated Environmental Management (IEM) including:-<br>• enabling the Mineral Resources Minister to be the competent authority for all environmental matters relating to mineral resources; and<br>• the requirement that financial provision be made available in the form of trusts, insurance companies or banking institutions for environmental rehabilitation. |
| Section 21 (5) (b) | Section 24 (5) (b) – the Minister of Environmental Affairs may now enact regulations in respect of all mine residue stockpiles and deposits:-<br>• the Director – General of the DMR may now issue Section 289 directives;<br>• the Minister of Mineral Resources may now designate environmental mineral resources inspectors; and<br>• the Minister of Environmental Affairs has the power to direct Environmental Management Inspectors (EMIs) to perform compliance and monitoring enforcement duties. |

### 3.3.10. National Environmental Management: Waste Act (Act 59 of 2008) (NEM:WA)

The National Environmental Management: Waste Amendment Act 26 of 2014 (Waste Amendment Act) came into operation on 2 June 2014. “Waste” now means:-

- (a) any substance, material or object, that is unwanted, rejected, abandoned, discarded or disposed of, or that is intended or required to be discarded or disposed of, by the holder of that substance, material or object, whether or not such substance, material or object can be re-used, recycled or recovered and includes all wastes as defined in Schedule 3 to this Act; or
- (b) any other substance, material or object that is not included in Schedule 3 that may be defined as a waste by the Minister by notice in the Gazette, but any waste or portion of waste, referred to in paragraphs (a) and (b), ceases to be a waste-
    - (i) once an application for its re-use, recycling or recovery has been approved or, after such approval, once it is, or has been re-used, recycled or recovered;
    - (ii) where approval is not required, once a waste is, or has been re-used, recycled or recovered; or
    - (iii) where the Minister has, in terms of section 74, exempted any waste or a portion of waste generated by a particular process from the definition of waste.

The regulations of residue deposits and residue stockpiles have also been included within the scope of the new Act (this was previously regulated in terms of the Mineral and Petroleum Resources Development Act 28 of 2002).

According to the new amended Act of 2014, "residue deposits" means any residue stockpile remaining at the termination, cancellation or expiry of a prospecting right, mining right, mining permit, exploration right or production right, and "residue stockpile" means any debris, discard, tailings, slimes, screening, slurry, waste rock, foundry sand, mineral processing plant waste, ash or any other product derived from or incidental to a mining operation and which is stockpiled, stored or accumulated within the mining area for potential re-use, or which is disposed of, by the holder of a mining right, mining permit or, production right or an old order right, including historic mines and dumps created before the implementation of this Act.

Residue deposits and residue stockpiles include:-

- wastes resulting from exploration, mining, quarrying, and physical and chemical treatment of minerals;
- wastes from mineral excavation;
- wastes from physical and chemical processing of metalliferous minerals;
- wastes from physical and chemical processing of non-metalliferous minerals; and
- wastes from drilling muds and other drilling operations.

Hazardous waste’’ is now classified to mean any waste that contains organic or inorganic elements or compounds that may, owing to the inherent physical, chemical or toxicological characteristics of that waste, have a detrimental impact on health and the environment and includes hazardous substances, materials or objects within business waste, residue deposits and residue stockpiles.

### 3.3.11. National Water Act (Act 36 of 1998) (NWA)

The NWA stipulates that a Water Use Licence (WUL) is required for the abstraction, storage, use, diversion, flow reduction and disposal of water and effluent in terms of Section 21 of the Act.

Use of water for mining and related activities is also regulated through regulations that were updated after the promulgation of the NWA in 1999 - Government Notice (GN) 704. GN 704 addresses the regulations on use of water for mining and related activities aimed at the protection of water resources (DWAF, 2007). Inclusive within GN 704 are the control measures for activities and its regulation of the sizing, control and monitoring of water management measures.

### 3.3.12. National Environmental Management: Air Quality Act (Act 39 of 2004) (NEM:AQA)

The National Environmental Management: Air Quality Act (NEM:AQA, Act 39 of 2004) results from the promulgation of the NEMA. The Act serves as the dominant legislative tool for the management of air pollution and related activities, and defines listed emission activities which require licensing. The overall objectives of the Act are to protect the environment by providing reasonable measures for:-

- protection and enhancement of the quality of air in the Republic;
- prevention of air pollution and ecological degradation;
- securing ecologically sustainable development while promoting justifiable economic and social development; and
- giving effect to Section 24(b) of the constitution to enhance the quality of ambient air for the sake of securing an environment that is not harmful to the health and wellbeing of people.

The South African government has established National Ambient Air Quality Standards in Government Notice 1210. The standard provides for various emission limits, inclusive of particulate matter ($PM_{10}$), ozone ($O_3$), carbon monoxide (CO), sulphur dioxide ($SO_2$), and nitrogen dioxide ($NO_2$).

# 4. Global Coal Market Review

Coal is mined commercially in over 50 countries and used in more than 70 countries worldwide. Coal is readily available from a wide variety of sources in a well-supplied worldwide market and it can be transported to demand centres quickly, safely and easily by ship and rail. A large number of suppliers are active in the international coal market, ensuring competitive behaviour and efficient functioning.

## 4.1. Resources

Venmyn Deloitte is not aware of any calculation of global coal resources. British Petroleum (BP) provides a list of coal reserves globally (Table 5), although whether these reserves are defined in terms of the Committee for Mineral Reserves International Reporting Standards (CRIRSCO) Codes is uncertain.

At the outset, it is important to note that in order to estimate the global coal resources, professional experts are faced with a significant problem and that is that the CRIRSCO Codes insists that a resource can only be quantified and classified if there are “reasonable prospects for eventual economic extraction”. In many cases, the sheer size and potential technical constraints associated with a coalfield mean that it may not be able to satisfy that condition for public reporting.

However, the United Nations Framework Classification (UNFC) System does allow the classification of coal reserves as a strategic imperative. Unfortunately, many of the so-called coal studies do not necessarily address this problem. In this section of the report, Coal Resources are strategic numbers that are not necessarily compliant with CRIRSCO, but are important to gauge coal resources available for the future of humankind.

**Table 5: Global Coal Reserves (end 2014)**

| COUNTRY / REGION | ANTHRACITE AND BITUMINUS (Mt) | SUB-BITUMINOUS AND LIGNITE (Mt) | TOTAL (Mt) | SHARE OF TOTAL | R/P RATIO |
|---|---|---|---|---|---|
| US | 108,501 | 128,794 | **237,295** | 26.6% | 262 |
| Canada | 3,474 | 3,108 | **6,582** | 0.7% | 96 |
| Mexico | 860 | 351 | **1,211** | 0.1% | 87 |
| **NORTH AMERICA** | **112,835** | **132,253** | **245,088** | **27.5%** | **248** |
| Brazil | - | 6,630 | **6,630** | 0.7% | * |
| Colombia | 6,746 | - | **6,746** | 0.8% | 76 |
| Venezuela | 479 | - | **479** | 0.1% | 189 |
| Other S. & Cent. America | 57 | 729 | **786** | 0.1% | 234 |
| **SOUTH & CENTRAL AMERICA** | **7,282** | **7,359** | **14,641** | **1.6%** | **142** |
| Bulgaria | 2 | 2,364 | **2,366** | 0.3% | 76 |
| Czech Republic | 181 | 871 | **1,052** | 0.1% | 22 |
| Germany | 48 | 40,500 | **40,548** | 4.5% | 218 |
| Greece | - | 3,020 | **3,020** | 0.3% | 61 |
| Hungary | 13 | 1,647 | **1,660** | 0.2% | 174 |
| Kazakhstan | 21,500 | 12,100 | **33,600** | 3.8% | 309 |
| Poland | 4,178 | 1,287 | **5,465** | 0.6% | 40 |
| Romania | 10 | 281 | **291** | w | 12 |
| Russian Federation | 49,088 | 107,922 | **157,010** | 17.6% | 441 |
| Spain | 200 | 330 | **530** | 0.1% | 136 |
| Turkey | 322 | 8,380 | **8,702** | 1.0% | 125 |
| Ukraine | 15,351 | 18,522 | **33,873** | 3.8% | w |
| United Kingdom | 228 | - | **228** | w | 20 |
| Uzbekistan | 47 | 1,853 | **1,900** | 0.2% | 432 |
| Other Europe & Eurasia | 1,389 | 18,904 | **20,293** | 2.3% | 337 |
| **EUROPE & EURASIA** | **92,557** | **217,981** | **310,538** | **34.8%** | **268** |
| South Africa** | 30,156 | - | **30,156** | 3.4% | 116 |
| Zimbabwe | 502 | - | **502** | 0.1% | 120 |
| Other Africa | 942 | 214 | **1,156** | 0.1% | 379 |
| Middle East | 1,122 | - | **1,122** | 0.1% | * |
| **MIDDLE EAST AND AFRICA** | **32,722** | **214** | **32,936** | **3.7%** | **122** |
| Australia | 37,100 | 39,300 | **76,400** | 8.6% | 155 |
| China | 62,200 | 52,300 | **114,500** | 12.8% | 30 |
| India | 56,100 | 4,500 | **60,600** | 6.8% | 94 |
| Indonesia | - | 28,017 | **28,017** | 3.1% | 61 |
| Japan | 337 | 10 | **347** | w | 265 |
| New Zealand | 33 | 538 | **571** | 0.1% | 143 |
| North Korea | 300 | 300 | **600** | 0.1% | 19 |
| Pakistan | - | 2,070 | **2,070** | 0.2% | * |
| South Korea | - | 126 | **126** | w | 72 |
| Thailand | - | 1,239 | **1,239** | 0.1% | 6 |
| Vietnam | 150 | - | **150** | w | 4 |
| Other Asia Pacific | 1,583 | 2,125 | **3,708** | 0.4% | 97 |
| **ASIA PACIFIC** | **157,803** | **130,525** | **288,328** | **32.3%** | **51** |
| **TOTAL** | **403,199** | **488,332** | **891,531** | | |

* More than 500 years.
Less than 0.05%.

**Notes: Proved Reserves of coal** - Generally taken to be those quantities that geological and engineering information indicates with reasonable certainty can be recovered in the future from known deposits under existing economic and operating conditions.

**Reserves-to-production (R/P) ratio** - If the reserves remaining at the end of the year are divided by the production in that year, the result is the length of time that those remaining reserves would last if production were to continue at that rate.

** Section 5 states that South Africa has 66.7Bt of reserves. This information was sourced from the Department of Mineral Resources (DMR), which may be using a different reserve classification methodology to that employed by BP or have additional information not available to BP.

## 4.2. Reserves

Total global coal reserves are estimated at 891Bt, according to BP (BP, 2015). Historically, estimates of world recoverable coal reserves have reduced from 1,174Bt in 1990, to 1,083Bt in 2000 and 891Bt in 2014 (Table 5).

Although coal deposits are widely distributed, almost three quarters of the world's recoverable coal reserves were located in five countries at the end of 2014: the United States (26.6%), Russia (17.6%), China (12.8%), Australia (8.6%) and India (6.8%).

Anthracite and bituminous coal accounted for ~45% of the world's estimated recoverable coal reserves (on a tonnage basis) in 2014, while sub-bituminous and lignite accounted for ~55% in 2014.

Regionally, Europe and Eurasia, with 34.8% of recoverable coal reserves, accounted for the largest quantity of proved coal. The Middle East, with the world's largest oil deposits, contained the least coal reserves in the world (0.1%). Africa accounted for 3.6% of recoverable coal reserves in 2014 (Table 5).

South Africa's coal reserves were estimated at ~30Bt in 2014 according to the BP, but at 66.7Bt according to the DMR.

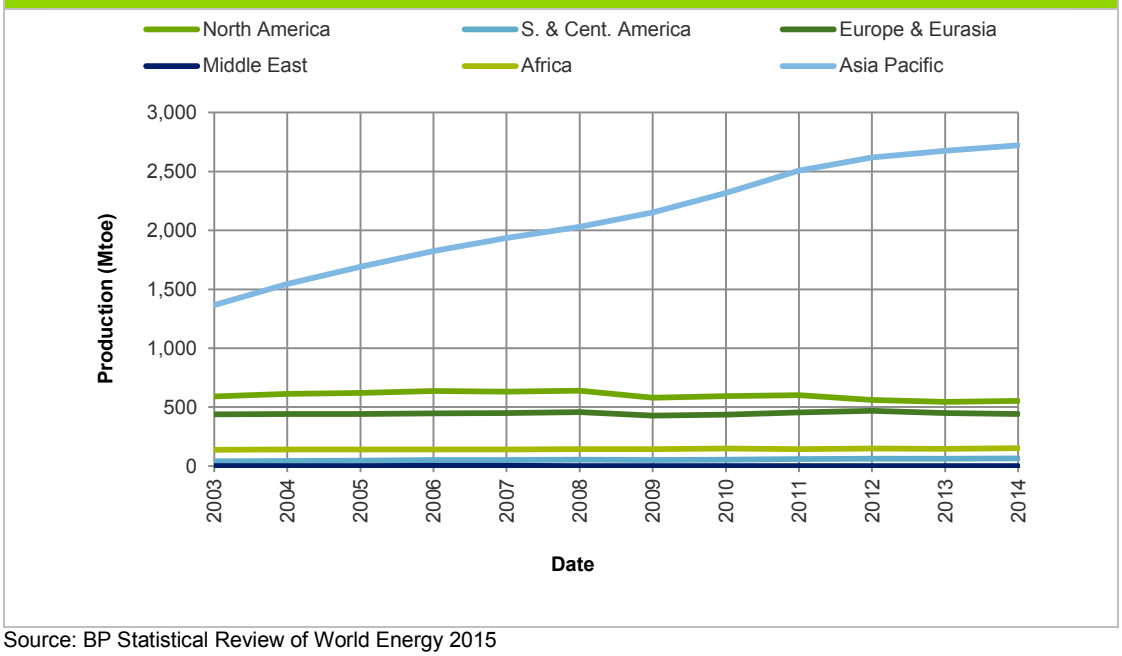
## 4.3. Current Supply

The Asia Pacific region was the largest coal producing region in 2012 (Figure 6).

The Asia Pacific region accounted for 2,722.5Mtoe of coal produced, or ~69% of coal produced, in 2014 (Figure 6). China, Australia, Indonesia and India were the dominant producers, but China was the most significant producer, producing ~68% of Asia Pacific coal in energy terms in 2014.

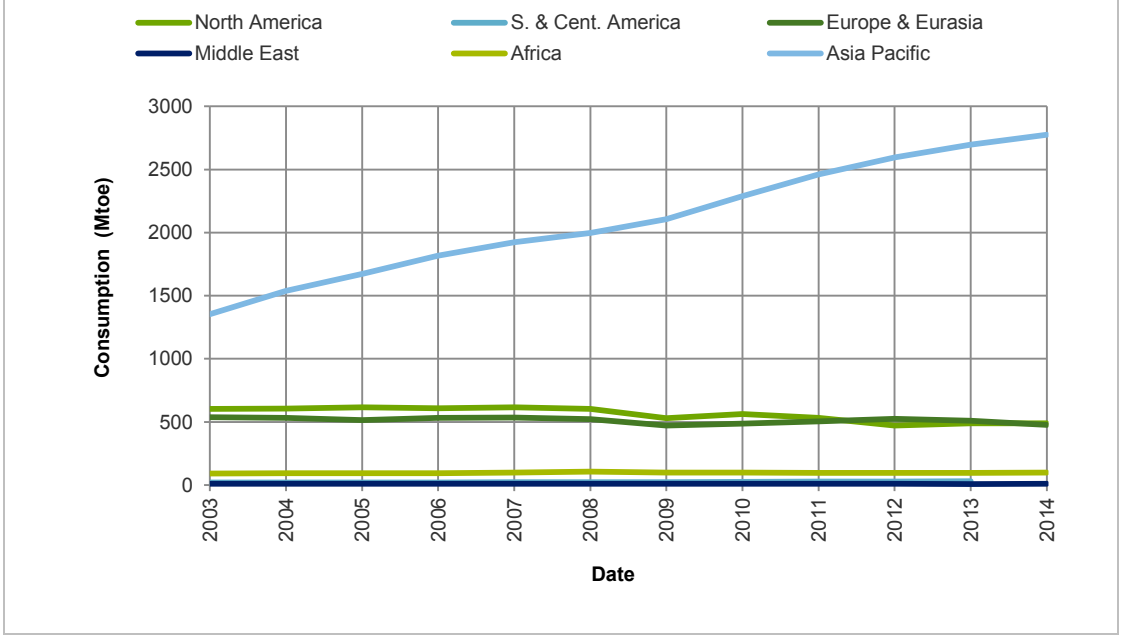
After the Asia Pacific region, North America produces the next highest amount of coal by energy value, although it has traditionally produced less coal in volume terms than Europe and Eurasia. Africa, South and Central America and the Middle East are the next largest coal producers by volume and energy values. This pattern is observed in consolidated global figures for 2014 (Figure 6 and Figure 7).

**Figure 6: Global Coal Production (2002 – 2014)**




Source: BP Statistical Review of World Energy 2015

**Figure 7: Coal Consumption (2003 – 2014)**




Source: BP Statistical Review of World Energy 2015

## 4.4. Current Demand

There was a global increase in demand for coal in 2014, with consumption, in energy terms, increasing by 0.9% in general. The increase is a notably decelerated in comparison to the year 2013 (2% increase) and is well below the 10 year average increase of 2.1% (BP, 2015). Among the most significant users of coal was China, which increased its year-on-year consumption (in energy terms) by a mere 0.1%; the US, which experienced a 0.3% slowdown in consumption; and India, which increased its consumption by 11.1% in 2014 (BP, 2015). Various countries, including Belarus, Belgium, Turkey, Egypt, Pakistan, Thailand and Vietnam increased their consumption (in energy terms) by double digit percentage figures; however, these countries' consumption levels were still significantly lower than the largest coal consuming nations globally (BP, 2015).

Africa experienced the highest increase in demand for coal by the end of 2014 as a result of Egypt's staggering 295.8% increase in coal demand (BP, 2015). Asia Pacific's increase ranked second in the global coal demand, this is in line with this increased demand from China and India as well as other emerging Asian nations. Growth in coal demand from other regions, and particularly from Europe and Eurasia and the Middle East is negative. This could be attributed to environmental concerns, poor economic growth and a switch to cheaper energy alternatives.

The Asia Pacific region accounted for the bulk of coal demand by energy value in 2014, with 71.5%, or 2,776.6Mtoe, of global consumption stemming from this region in 2014 (Figure 7).

North America, at 12.6%, or 488.9Mtoe, of global demand continues to have greater coal consumption (in energy terms) than, Europe and Eurasia at 12.3% of global demand, or 476.5Mtoe, in 2014 (Figure 6).

## 4.5. Future Demand

### 4.5.1. Thermal Coal

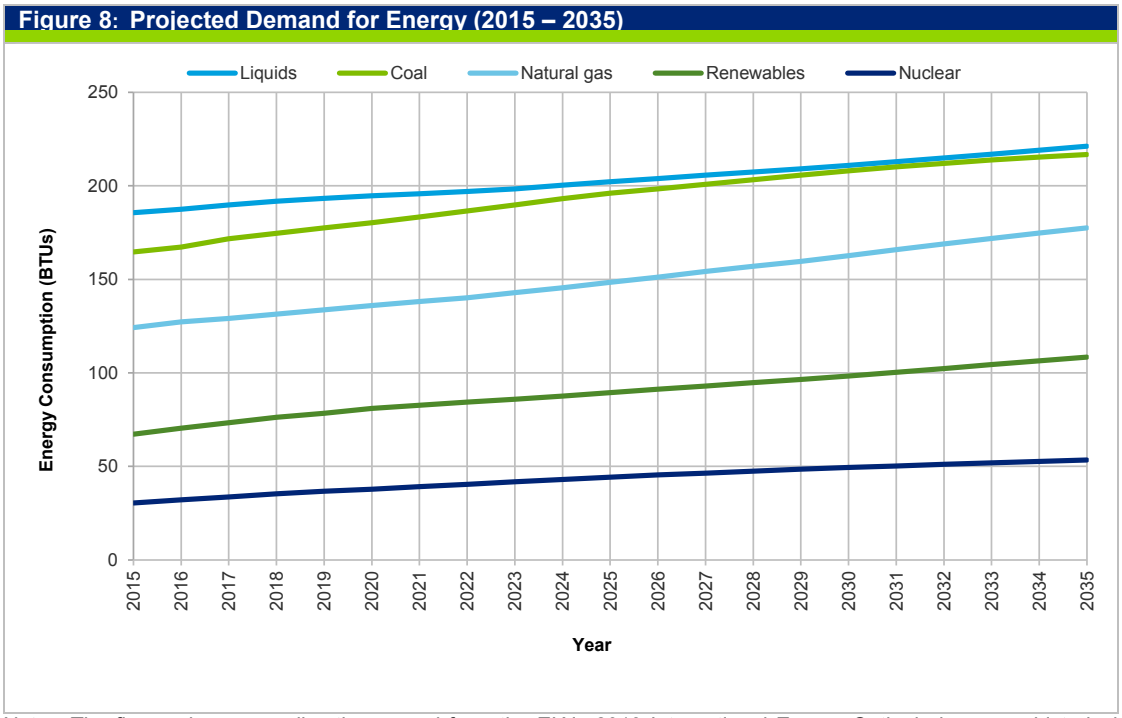
The US Energy Information Administration in its International Energy Outlook (EIA, 2013) indicates that energy consumption from most fuel types is likely to rise. This includes coal. The demand for thermal coal in the future will largely depend on the extent of global reliance on coal for electricity production. Thermal coal demand is expected to increase significantly, especially on the back of increases in power and industrial production, and particularly demand from the power and industrial sectors in emerging Asian nations (Table 8).

Global coal consumption is forecast to increase by 2.1% per year until 2019; this translates to approximately 772 million tonnes coal equivalent units (Mtce) per year (IEA, 2014).

Most of the incremental growth is expected to come from China even though it is anticipated that the country will take strong action to diversify primary energy sources and increase energy efficiency. India is forecast to attribute 177Mtce per year to the global demand, solidifying its role and Asia's status as the 'coal continent' (IEA, 2014)

A decrease is forecasted in both US and European coal consumption. US coal demand is anticipated to decrease by 1.7% over the outlook period to the year 2019, reaching its lowest level since 1983 with a 561Mtce coal demand (IEA, 2014). The increase in shale gas production and environmental regulation on emissions will attribute to the drop in coal demand. Increasing renewable generation and energy efficiency will contribute to the deterioration in European thermal coal and lignite demand. A decrease of up to 16Mtce can be expected over the outlook period (IEA, 2014).

**Figure 8: Projected Demand for Energy (2015 – 2035)**




Note: The figure above was directly sourced from the EIA's 2013 International Energy Outlook; however, historical observations were removed.

### 4.5.2. Coking Coal

Demand for coking coal will be linked to industrial growth and particularly growth in the steel and cement sectors, with growth in the steel sector playing the more important role in influencing the demand for coking coal.

Fenton (2014) notes that a contraction or expansion of global GDP is the most significant predictor of the growth of steel manufacturing and the derived demand for coking coal. This is largely because steel use tends to be strongly linked to economic growth. Steel use is also linked to GDP/capita levels, with high intensity use among higher income countries.

Other factors that will influence steel demand, and hence coking coal demand, in the future is the extent of urbanisation and industrialisation in emerging nations in particular. These are key factors in promoting steel use, which tends to increase in intensity with urbanisation and industrialisation.

Assuming that GDP growth globally continues at a steady pace, one would expect steel and coking coal demand to also continue to grow. Continued industrialisation and urbanisation would also promote the use of steel and iron ore, as would GDP/capita growth among emerging nations in particular.
However, it is important to note that, as with thermal coal, the economic slowdown in China has not supported high growth rates, and this will negatively influence demand for coking coal.

## 4.6. Future Supply

### 4.6.1. Thermal Coal

At present, coal supply appears to be exceeded by demand in line with:-

- a reduction in GDP growth and growth expectations in China and India;
- the debt crisis in the Eurozone; and
- changes to substitute fuels in the power generation market.

The lack of GDP growth in China and India has had the most significant impact on the global coal market.

The Eurozone debt crisis also continues to affect global demand for coal, since growth from this region has become sluggish. The reduced demand for coal from the Eurozone was not considered significant when China and India's growth was at a high; however, the Eurozone crisis is exasperating the situation of reduced growth from India and China and contributing to depressed coal prices.

Other regions that are contributing to a surplus coal supply are those in which coal is being replaced by substitute energy fuels in power stations. Such is the case in the US, where natural gas power plants are being built and coal-fired power plants are being converted to gas. US coal producers have responded by redirecting their coal to other regions of the world, contributing to the oversupply and the lower coal prices, or by closing their operations.

A significant growth in thermal seaborne supply over the next two decades is forecasted by Wood Mackenzie based on the power demand by China and India. This is fuelled by power hungry China and India. Chinese demand is still relevant, even with its significant move to alternative energy but the seaborne coal markets are now switching their focus to India, which will be the dominant demand market for coal going forward. The growth in seaborne supply is expected to come from existing and emerging resources such as Australia's Surat and Galilee basins, Indonesia's Kalimantan and Sumatra basins as well as basins in Mozambique, Mongolia, Russia's Far East and the west coast of the US.

### 4.6.2. Coking Coal

The coking coal market is believed to be in a state of severe over supply, and this state has led some analysts to call for rationalisation and further shutdowns. This seems unlikely in the case of the US, where several companies have filed for Chapter 11 bankruptcy protection and are continuing to produce coal during their financial restructuring. Chinese coking coal producers are also unlikely to cut production soon, since it is believed that the Chinese government is intent on protecting this industry (Hume, 2015).

## 4.7. Pricing Trends

### 4.7.1. Thermal Coal

Thermal coal prices are based on the energy content and quality of the coal. In the South African market, low-grade coal is predominantly used in Eskom-operated power stations. Low grade coal prices are based on contracts and are rarely reported in the public domain. The pricing mechanism is usually based on a cost plus basis where the price of the coal covers cost plus a margin. At present CoAL does not have an off take agreement with Eskom.

INet Bridge reports on the 6,000kCal price and Figure 9 illustrates the historic price trends of this grade of coal. This is the free-on-board (FoB) Nett as Received (NaR) price for 6,000kCal thermal coal and is an average of the prices being shipped from Colombia, Russia, South Africa, Poland and Australia. The thermal coal price has fluctuated significantly over the last five years, but is exhibiting an overall negative trend, as illustrated in Figure 9. Coal has been trading over a relatively narrow range in 2014 and 2015.
The 6,000kCal NAR prices opened in 2014 at USD84/t, dipping to below USD74/t in June 2014 and rising in price to more than USD79/t in August 2014. These prices stayed in a narrow range in 2015, with the price for this coal in January quoted as USD58.95/t and as USD59.85/t in July.

The prices dipped lower towards the end of the year with the November 2015 price quoted at USD55.24/t.

**Figure 9: Coal (6,00kCal) Price History from January 2010 to November 2015**


Source: INet Bridge

### 4.7.2. Coking Coal

From the South Africa's Directorate Mineral Economics (2015), it is known that bituminous coal sold in South Africa at between ZAR284/t and ZAR323/t between September 2014 and August 2015, and was exported from South Africa at export prices ranging from ZAR599/t and R659/t. The Directorate does not specifically state what the domestic or export price for coking coal was over this period.

At present coking coal is trading at its lowest price in more than ten years (Matich, 2015). This is owing to an oversupply in the commodity that is unlikely to be reversed any time in the near future.

## 4.8. Supply

The South African coal-mining industry is highly concentrated, with three companies, namely South 32, Anglo Coal and Exxaro, dominating production.

South Africa produced ~258Mt of coal for the period between September 2014 and August 2015 (Table 6). The country's bituminous coal RoM production (minus discards) totalled ~255Mt (Table 7). Its anthracite coal RoM production (minus discards) totalled ~3.4Mt (Table 7).

There are numerous South African coalfields, with the Witbank and Highveld Coalfields being the most economically important, as they produce the highest percentage of South Africa's saleable coal. However, given that these have been mined for many decades, the industry is looking to the Limpopo Province for South Africa's future production.

**Table 6: South African Coal Production, Sales and Exports (September 2014 – August 2015)**

| PERIOD | PRODUCTION QUANTITY (Mt) | LOCAL SALES QUANTITY (Mt) | LOCAL SALES VALUE (ZARm) | LOCAL SALES UNIT VALUE (ZAR/t) | EXPORT SALES QUANTITY (Mt) | EXPORT SALES VALUE (ZARm) | EXPORT SALES UNIT VALUE (ZAR/t) | TOTAL SALES QUANTITY (Mt) | TOTAL SALES VALUE (ZARm) |
|---|---|---|---|---|---|---|---|---|---|
| Sep-14 | 23.00 | 15.45 | 4,890 | 317 | 6.96 | 4,548 | 654 | 22.41 | 9,438 |
| Oct-14 | 23.75 | 16.17 | 4,850 | 300 | 6.73 | 4,182 | 621 | 22.90 | 9,032 |
| Nov-14 | 21.25 | 15.19 | 4,612 | 304 | 6.59 | 4,183 | 635 | 21.79 | 8,795 |
| Dec-14 | 19.47 | 14.73 | 4,864 | 330 | 6.77 | 4,458 | 658 | 21.50 | 9,322 |
| Jan-15 | 20.62 | 14.78 | 4,308 | 291 | 6.72 | 4,044 | 602 | 21.50 | 8,352 |
| Feb-15 | 20.78 | 14.47 | 4,404 | 304 | 6.72 | 4,137 | 616 | 21.19 | 8,541 |
| Mar-15 | 22.75 | 15.56 | 4,628 | 297 | 6.33 | 4,120 | 651 | 21.89 | 8,748 |
| Apr-15 | 21.11 | 14.85 | 4,528 | 305 | 6.42 | 3,986 | 621 | 21.27 | 8,514 |
| May-15 | 21.10 | 14.67 | 4,518 | 308 | 5.70 | 3,521 | 618 | 20.37 | 8,039 |
| Jun-15 | 20.95 | 15.17 | 4,729 | 312 | 6.32 | 4,120 | 652 | 21.49 | 8,850 |
| Jul-15 | 22.44 | 15.40 | 4,758 | 309 | 6.52 | 4,024 | 617 | 21.92 | 8,783 |
| Aug-15 | 21.57 | 14.83 | 4,691 | 316 | 6.76 | 4,221 | 624 | 21.59 | 8,911 |
| **TOTAL** | **258.79** | **181.29** | **55,781** | | **78.53** | **49,544** | | **259.82** | **105,325** |

Source: Directorate Mineral Economics (2015).

**Table 7: South African Bituminous and Anthracite RoM Minus Discard (September 2014 – August 2015)**

| PERIOD | PRODUCTION QUANTITY (Mt) | |
|---|---|---|
| | BITUMINOUS | ANTHRACITE |
| Sep-14 | 22.70 | 0.30 |
| Oct-14 | 23.42 | 0.33 |
| Nov-14 | 20.98 | 0.27 |
| Dec-14 | 19.25 | 0.22 |
| Jan-15 | 20.36 | 0.27 |
| Feb-15 | 20.53 | 0.25 |
| Mar-15 | 22.41 | 0.33 |
| Apr-15 | 20.85 | 0.27 |
| May-15 | 20.83 | 0.27 |
| Jun-15 | 20.66 | 0.29 |
| Jul-15 | 22.12 | 0.32 |
| Aug-15 | 21.26 | 0.30 |
| **TOTAL** | **255.37** | **3.42** |

Source: Directorate Mineral Economics (2015).

## 4.9. Demand

South African coal demand (including bituminous coal demand) for the period between September 2014 and August 2015 totalled 181.3Mt. Local bituminous coal sales for the same period totalled 179.4Mt, while local anthracite coal sales totalled 1.85Mt (Table 8 and Table 9).

According to the Department of Energy (2016), the main markets for South African coal are:-

- the export market, which took up ~21% of total production; and
- the domestic market, which consists of:-
  - electricity generation, which consumes 62% of coal in the domestic market;
  - petrochemical companies, primarily Sasol, which consume 23% of coal in the domestic market;
  - general industry, which consumes 8% of coal in the domestic market;
  - metallurgical industry, primarily ArcelorMittal, Highveld Steel and Columbus Steel, which consumes 4% of coal in the domestic market; and
  - about 4% of coal for the domestic market which is purchased by merchants, and sold locally for the household market or exported, among other users.

### 4.9.1. The Export Market

South Africa has the capacity to export 91Mt of coal from the Richards Bay Coal Terminal (RBCT), with its actual exports increasing steadily, with reported exports of 70.2Mt in 2013 and 71.2Mt in 2014 from RBCT (RBCT, 2015).

An alternative option for exporting South African coal is to export via the Matola Coal Terminal, in Maputo, Mozambique.

Another alternative is the Durban Bulk Connection (DBC), which currently has a capacity of 2Mtpa for sized coal exports.

A planned expansion of the Richards Bay Coal Terminal (RBCT) – a joint venture between Grindrod and RBT Resources – will also increase throughput capacity from 3.2Mtpa to 4.5Mtpa by the first quarter of 2016 at a fully-mechanised coal terminal at Richards Bay. This will provide additional export tonnages to primarily broad-based black economic empowerment (BBBEE) companies, but the success of the venture, which is intended to eventually have throughput capacity of 20Mtpa, will require the harmonisation of port and rail infrastructure (Ryan, 2015).

In other infrastructure-expanding initiatives intended to boost coal exports, South African rail utility Transnet is considering large infrastructure projects in the Limpopo Province to increase rail capacity for coal produced in the Waterberg and Limpopo regions. It was undertaking a pre-feasibility study for the upgrade of the ZAR8bn line between Groenbult (60km north-east of Polokwane) and the Mozambican port of Maputo and considering a new line between Groenbult and the Waterberg. From Lephalale via Groenbult, the rail distance to Maputo is approximately 148km less than to RBCT. These projects, if they are completed, bode well for the exporting of coal from the Waterberg.

**Table 8: South African Bituminous Coal Sales and Exports (September 2014 – August 2015)**

| PERIOD | PRODUCTION QUANTITY (t) | LOCAL SALES QUANTITY (Mt) | LOCAL SALES VALUE (ZARm) | LOCAL SALES UNIT VALUE (ZAR/t) | EXPORT SALES QUANTITY (Mt) | EXPORT SALES VALUE (ZARm) | EXPORT SALES UNIT VALUE (ZAR/t) | TOTAL SALES QUANTITY (Mt) | TOTAL SALES VALUE (ZARm) |
|---|---|---|---|---|---|---|---|---|---|
| Sep-14 | n | 15.28 | 4,723 | 309 | 6.64 | 4,369 | 658 | 21.92 | 9,092 |
| Oct-14 | n | 15.99 | 4,677 | 293 | 6.55 | 4,051 | 619 | 22.54 | 8,728 |
| Nov-14 | n | 15.06 | 4,467 | 297 | 6.29 | 3,984 | 633 | 21.35 | 8,451 |
| Dec-14 | n | 14.58 | 4,709 | 323 | 6.64 | 4,377 | 659 | 21.22 | 9,086 |
| Jan-15 | n | 14.64 | 4,154 | 284 | 6.62 | 3,968 | 599 | 21.26 | 8,121 |
| Feb-15 | n | 14.30 | 4,223 | 295 | 6.63 | 4,067 | 614 | 20.93 | 8,290 |
| Mar-15 | n | 15.40 | 4,459 | 290 | 6.19 | 4,006 | 647 | 21.59 | 8,466 |
| Apr-15 | n | 14.70 | 4,377 | 298 | 6.30 | 3,914 | 621 | 21.01 | 8,291 |
| May-15 | n | 14.52 | 4,356 | 300 | 5.60 | 3,447 | 615 | 20.12 | 7,803 |
| Jun-15 | n | 15.03 | 4,590 | 305 | 6.25 | 4,060 | 650 | 21.27 | 8,650 |
| Jul-15 | n | 15.25 | 4,602 | 302 | 6.25 | 3,825 | 612 | 21.50 | 8,427 |
| Aug-15 | n | 14.69 | 4,548 | 310 | 6.64 | 4,128 | 621 | 21.33 | 8,676 |
| **TOTAL** | | **179.44** | **53,886** | | **76.61** | **48,196** | | **256.05** | **102,082** |

Source: Directorate Mineral Economics (2015)
"n" means data not collected

**Table 9: South African Anthracite Coal Sales and Exports (September 2014 – August 2015)**

| PERIOD | PRODUCTION QUANTITY (t) | LOCAL SALES QUANTITY (t) | LOCAL SALES VALUE (ZARm) | LOCAL SALES UNIT VALUE (ZAR/t) | EXPORT SALES QUANTITY (Mt) | EXPORT SALES VALUE (ZARm) | EXPORT SALES UNIT VALUE (ZAR/t) | TOTAL SALES QUANTITY (Mt) | TOTAL SALES VALUE (ZARm) |
|---|---|---|---|---|---|---|---|---|---|
| Sep-14 | n | 0.17 | 167.32 | 973 | 0.31 | 178.65 | 574 | 0.48 | 345.98 |
| Oct-14 | n | 0.18 | 173.35 | 949 | 0.18 | 130.65 | 727 | 0.36 | 304.00 |
| Nov-14 | n | 0.13 | 144.26 | 1,072 | 0.30 | 199.19 | 668 | 0.43 | 343.45 |
| Dec-14 | n | 0.15 | 154.73 | 1,063 | 0.14 | 81.75 | 603 | 0.28 | 236.48 |
| Jan-15 | n | 0.14 | 154.41 | 1,081 | 0.10 | 76.05 | 786 | 0.24 | 230.46 |
| Feb-15 | n | 0.17 | 180.61 | 1,049 | 0.09 | 70.16 | 766 | 0.26 | 250.78 |
| Mar-15 | n | 0.16 | 169.04 | 1,055 | 0.14 | 113.54 | 820 | 0.30 | 282.58 |
| Apr-15 | n | 0.15 | 150.77 | 1,028 | 0.11 | 72.00 | 638 | 0.26 | 222.78 |
| May-15 | n | 0.16 | 162.49 | 1,031 | 0.10 | 74.44 | 783 | 0.25 | 236.93 |
| Jun-15 | n | 0.15 | 139.20 | 933 | 0.07 | 60.15 | 853 | 0.22 | 199.36 |
| Jul-15 | n | 0.15 | 156.68 | 1,054 | 0.27 | 198.54 | 729 | 0.42 | 355.21 |
| Aug-15 | n | 0.14 | 142.30 | 1,006 | 0.12 | 92.92 | 775 | 0.26 | 235.23 |
| **TOTAL** | | **1.85** | **1,895** | | **1.92** | **1,348** | | **3.78** | **3,243** |

Source: Directorate Mineral Economics (2015)
"n" means data not collected

## 4.9.2. The Domestic Market

**Electricity Generation**

CoAL currently does not have an offtake agreement with South African State electricity utility Eskom or with any other electricity utility in the region. However, since Eskom is currently a large consumer of South African coal, it is worthwhile to discuss the utility as well as the electricity supply situation in the region in general.

The type of electricity generation in selected Southern African countries as well as their total capacities are described in Table 10.

**Table 10 : Electricity Generation Mix in Selected Southern African Countries (MWh)**

| COUNTRY | COAL | OIL | GAS | HYDRO | NUCLEAR | GEO-THERMAL | BIOMASS & WASTE | OTHERS | TOTAL CAPACITY |
|---|---|---|---|---|---|---|---|---|---|
| Botswana | 340,000 | | | | | | | | 340,000 |
| Mozambique | | | 30,000 | 16,280,001 | | | | | 16,310,001 |
| South Africa | 225,149,994 | 2,180,000 | | 1,100,000 | 14,740,000 | | 280,000 | 50,000 | 243,499,994 |
| Swaziland | 90,000 | 270,000 | | 130,000 | | | | | 490,000 |
| Zimbabwe | 2,090,000 | 20,000 | | 5,790,000 | | 30,000,000 | 90,000 | | 37,990,000 |

Source: The Shift Project (2016)

South Africa Dominates the subregion in its maximum electricity demand, its total electricity capacity and its proportional dependency on coal as part of the possible electricity generation mix that is available to it (Table 10) – and this has significant implication for its current and future use of coal, which finds its dominant domestic use in electricity production.

This is for a number of reasons, including that:-

- South Africa is the regional economic superpower, and its electricity consumption per capita reflects this dominance;
- South Africa's power stations have been built on the back of the country's abundant coal resources; and
- South Africa's power stations were built in the country's apartheid era, which required the country to attract investors into its mining, chemical and agricultural sectors using low-cost power which was created through significant investment into coal-fired power stations capacity (Malzbender, 2005).

Because of its heavy dependence on coal-fired electricity, every year South African State electricity parastatal Eskom consumes more than 60% of domestically-sold coal from which it provides more than 90% of the country's electricity capacity (The Shift Project, 2016).

Eskom's power stations have been specifically designed to burn low-grade coals which are abundant in South Africa (Table 11).

**Table 11 : Weighted Coal Qualities by Sector**

| SECTOR | COAL TYPE | CV (MJ/kg) | Ash (%) | VOLATILE MATTER (%) |
|---|---|---|---|---|
| Electricity generation | Bituminous | 21 | 25-33 | 20 |
| Synfuels | Bituminous | 20-22.64 | 20-29.7 | 21-26.9 |

Source:- Steyn, M, et al (2010)

Various other State energy utilities exist in the region and these have their own quality specifications.

**Coal Used for Purposes other than Electricity Generation**

For CoAL, one of the most currently important markets is the metallurgical sector. The metallurgical sector, as mentioned previously, consumes about 4% of the local coal production, with the major players in the industry including ArcelorMittal, Columbus Stainless and Highveld Steel.

There are, however, other uses of coal domestically, as already indicated.

For instance, Sasol consumes approximately 23% of South Africa's annual domestically-consumed coal and operates coal mines to provide feedstock for synthetic fuels and chemical plants (Department of Energy, 2016). The company primarily uses the coal mined by Sasol Mining to produce petrol, diesel and petrochemicals and power generation at the chemical plants.

In addition, approximately 4% of local consumption also goes to the household market, with the suppliers largely being coal traders in formal and informal residential areas, and general industry, which consumes 8% of domestically-produced coal (Department of Energy, 2016).

## 4.10. Outlook

Thermal coal export sales and sales to Eskom are the most important sources of demand for South Africa's coal sector, and the outlook for these sales avenues are the most important to consider for any participant in the coal sector.

The outlook for the global thermal coal market has been discussed in Section 4.5.1. The regional outlook for thermal coal, particularly in South Africa, is likely to show a similar increasing demand trend in the next two decades owing to the relative lack of suitable alternatives to coal as an energy source. Southern Africa also presents a considerable opportunity for coal supply as it institutes various generation projects, including coal generation projects, to ensure that the region has a sustainable energy supply.

Coking coal export sales and sales primarily to metallurgical companies are the most important sources of demand for coking coal. The global outlook for the coking coal industry has been discussed in Section 4.5.2. Domestic sales of coking coal to primarily steel producers are likely to be affected by similar factors as export sales of coking coal, since many of the South African steel producers are companies producing steel for the international market.

# 5. Reporting and Classification of Exploration Results and Coal Resources

All Exploration Results and Coal Resources, quoted in this CPR are based upon information prepared by Competent Persons who are Members or Fellows of The Australasian Institute of Mining and Metallurgy and/ or a Recognised Overseas Professional Organisation (ROPO). The Competent Persons each have a minimum of five years of experience which is relevant to the style of mineralisation and type of deposit under consideration. The Venmyn Deloitte Competent Person undertaking the review of the CoAL resource estimate for this CPR is Mrs. E. de Klerk, a geologist and manager at Venmyn Deloitte. The Competent Person who prepared the Exploration Results and Coal Resources for the GSP assets is Mr J. Sparrow, the Group Geologist at CoAL. Both Mrse. E. de Klerk and Mr. J. Sparrow are registered with the South African Council for Natural Scientific Professions (SACNASP).

All Coal Resources in this CPR are classified according to the JORC Code 2012 edition. In conjunction the guidelines outlines in the Australian Guideline for Estimating and Reporting of Coal Resources (2014 edition) were also followed.

More specifically, the resources are classified according to the distances between points of information as defined in the latter. According to section 4.3 of this guideline, *"...Coal Resources should be estimated and reported for individual seams or seam groupings within a deposit. They should also be subdivided and reported on the basis of key variables, such as thickness, depth range, strip ratio, coal quality parameters, geographic constraints and geological or technical considerations. The key variables and assumptions for each deposit should be clearly stated in order to ensure clarity and transparency of the report."*

Neither the guidelines nor the Code prescribes how this should be undertaken, merely that resources should be quoted as Measured, Indicated and Inferred and that reserves should be quoted as Proved and Probable.

Taking this requirement into account, the Coal Resources have been reported in a stepwise process demonstrating the application of each of the technical parameters listed in section 4.3 of the guideline. The South African Code for the Reporting of Exploration Results, Mineral Resources and Mineral Reserves (the SAMREC Code) which embodies the South African National Standard to the systematic evaluation of Coal Resources and Coal Reserves (SANS10320:2004) outlines a standard method of reporting of Coal Resources and Coal Reserves through the application of the various technical parameters described above in the Australian Guideline. This standard is typically applied to South African coal deposits in order to demonstrate the effect of applying each of these parameters to the resources and reserves. The datapoint spacing defined in the Australian Guidelines is summarised in Table 12. Coal Resource and Coal Reserves are reported in this way to fully demonstrate clarity and transparency and enable comparisons to be made between projects. Venmyn Deloitte believes that this method provides the reader with a full understanding of the resources and reserves quoted.

The resources are presented in the following standard manner for all projects:-

- Gross Tonnes In Situ (GTIS), application of mineral tenure boundaries and a 0.5m seam thickness cutoff. This is the simplest form of resource declaration;
- Total Tonnes In Situ (TTIS), application of geological losses to GTIS; and
- Mineable Tonnes In Situ (MTIS), application of basic mining parameters to TTIS. An example of this would be the application of a minimum seam thickness cutoff for underground mining.

**Table 12 : The Australian Guideline Distances for JORC Resource Classification**

| JORC RESOURCE CATEGORY | MAX DISTANCE BETWEEN POINTS OF OBSERVATION (m) | MAX. HALO RADIUS (m) |
|---|---|---|
| Measured | 500 | 250 |
| Indicated | 1,000 | 500 |
| Inferred | 4,000 | 2,000 |

Table 12refers to all types of coal located in any coal basin. Thin discrete seam deposits are treated in the same manner as large interlaminated coal packages.

In order to classify the coal resources, a halo diagram is prepared by CoAL using only the boreholes with quality and quantity results, for example as presented in Figure 27.

# 6. Property Description, Location, Access and Climate

CoAL is a coal mining and exploration company whose GSP projects are located in the Soutpansberg Coalfield of South Africa. The GSP projects are all located within the magisterial district of Vhembe in the Limpopo Province, approximately 500km northeast of Johannesburg. The projects occur near the towns of Musina and Louis Trichard. Musina is a regional centre and provides modern conveniences, including accommodation and services. The town is also a source of fuel and labour, includes a police station, a number of schools and a hospital. The town of Musina has a long history of mining, and experienced staff and labour are expected to be sourced from this centre.

The GSP projects are located in four regions covering a total of 88,123ha (Figure 2). The three regions are split into eight projects. CoAL also holds the right to three further projects, namely Mooiplaats, located in Mpumalanga Province, and Vele and Makhado, located in the Limpopo Province, which are not included in the 2015 CPR and are reported in detail in the 2011 CPR (Figure 1).

The various properties can be accessed by a network of gravel roads that branch off the N1 and R525. The gravel roads are in a good condition, whilst the N1 road is in an excellent condition.

The GSP projects typically experience a warm, semi-arid climate. Temperatures average 15°C during the winter months (April to September) and may be in excess of 37°C during the summer. Rainfall is highly variable and usually falls during the summer months (October – March).

Mean annual rainfall is approximately 490mm. Operations can occur all year around and the climatic conditions generally do not prevent exploration or mining. However, during times of heavy downpours, temporary delays may be experienced.

The topography of the GSP project areas is generally relatively flat and is traversed by non-perennial and perennial rivers. Vegetation is North Eastern Mountain Sour Veld and the Soutpansberg Arid Mountain Bushveld biomes, characterised predominantly by a grassy ground layer and an upper layer of woody plants, dominated by sweet thorn and mopane. The land is mainly used for cattle grazing and game ranching with localised arable farming.

More detailed project descriptions are provided in the various project sections that follow.

## 6.1. Material Agreements

On 26 November 2010, CoAL, RTMD, Kwezi, Keynote Trading, Chapudi Coal and KME, entered into a sale of shares and claims agreement in terms of which 100% of the shares and claims held by RTMD and Kwezi in Chapudi Coal and KME were acquired by Keynote Trading (a wholly owned subsidiary of CoAL) for a total consideration of USD75m. This transaction has been called the Soutpansberg Acquisition Transaction.

All the conditions precedent for the Soutpansberg Aqusition Transaction with Rio Tinto and Kwezi have been fulfilled. CoAL has negotiated a settlement agreement with RTMD with the balance at 31 December 2015 currently at USD19.2million.

The shareholdings before and after the Soutpansberg Acquisition Transaction is illustrated in Figure 10.

## 6.2. Soutpansberg BEE Transaction

As part of the BEE requirements for the Section 11 transfer discussed in Section 6 CoAL has concluded a transaction with Rothe Investment (Pty) Limited (Rothe), to acquire a 26% shareholding in Keynote Trading and Investment 108 (Pty) Limited (Keynote Trading),. Rothe is 100% owned by BEE companies, one of which represents local communities.

As part of this transaction, CoAL bears the funding risk for the Soutpansberg Properties Transaction and the initial costs up to definitive feasibility study (DFS) level. Upon successful completion of the DFS, Rothe will undertake to fund its pro-rata portion of the funding costs and acquisition costs. Should Rothe be unable to raise the necessary financing, the Shareholders Agreement will facilitate the introduction of a new BEE shareholder/s in Keynote Trading.

## 6.3. Soutpansberg Properties Acquisition Transaction

The Soutpansberg Properties Acquisition Transaction details the terms by which CoAL, through its wholly owned subsidiary Keynote Trading, have acquired 100% of various NOPRs in various properties from Rio Tinto, within the Soutpansberg Coalfield. This results in extensions to CoAL's pre-existing projects (e.g. Voorburg Section and Jutland Section) and new project areas (e.g. Wildebeesthoek Section and Generaal Section). The shareholding structure before and after the Soutpansberg properties acquisition transaction is illustrated in Figure 10.

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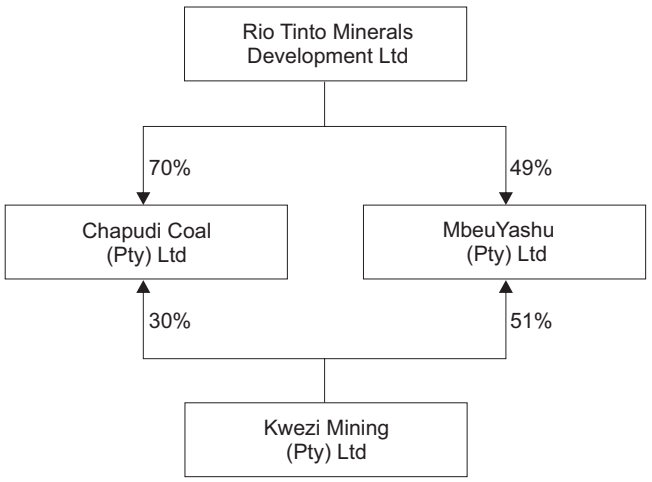
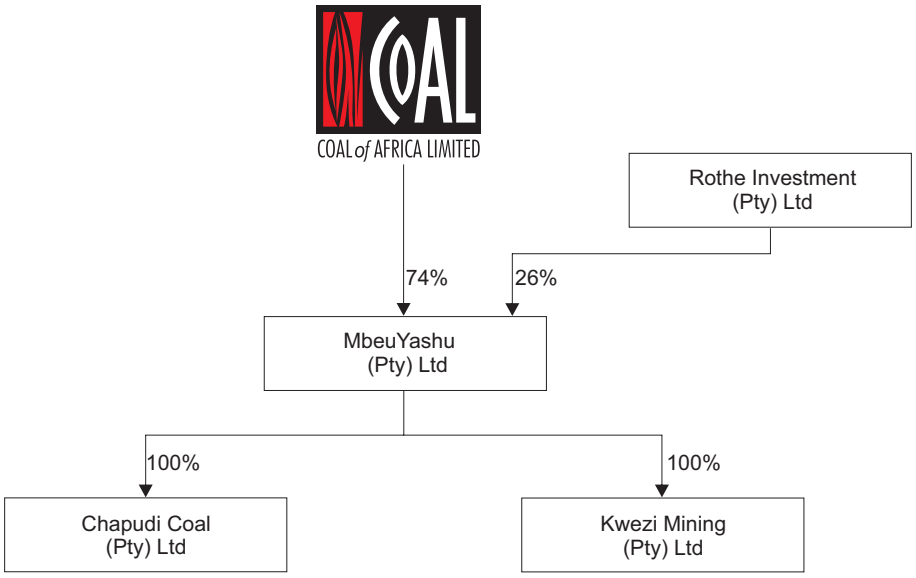
## SHAREHOLDINGS BEFORE AND AFTER THE SOUTHPANSBERG PROPERTIES ACQUISITION TRANSACTION

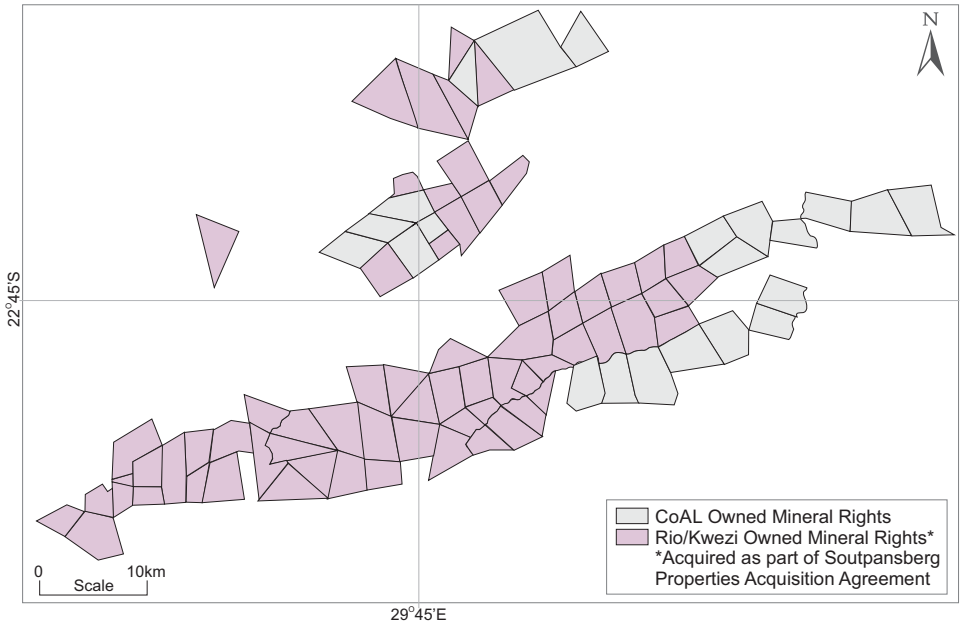
### SHAREHOLDING BEFORE SOUTPANSBERG PROPERTIES AQUISITION TRANSACTION




### SHAREHOLDING AFTER SOUTPANSBERG PROPERTIES AQUISITION TRANSACTION




### RELATIVE LOCATION OF PROSPECTING RIGHTS



# 7. Regional Geology

The Soutpansberg Coalfield is situated north of the Soutpansberg Mountain Range in the Limpopo Province of South Africa and stretches for ± 190km from Waterpoort in the west to the Kruger National Park in the east (Figure 1**)**. The greater Soutpansberg Coalfield has been divided into three subdivisions:-

- the Mopane Coalfield, between the towns of Mopane and Waterpoort in the west (Figure 11);
- the Tshipise Coalfield, stretching east of Mopane in the area of the town of Tshipise (Figure 11); and
- the Pafuri Coalfield, terminating at the northern limit of the Kruger National Park in the east (Figure 11).

The generalised stratigraphic sequence across the Coalfield is illustrated in Figure 12.

The Soutpansberg Coalfield is preserved within a down-faulted, graben structure, at the north-eastern edge of the Kaapvaal Craton. The Karoo Sequence rocks, containing the Soutpansberg Coalfield, overly the Soutpansberg rocks and dip between 3° and 20° northwards, terminating against east-west trending strike faults on the northern margin.

The region is faulted, becoming more severe in the far east, and has throws of between 60m and 200m, leading to the formation of horst and graben structures. A further subordinate set of faults, orientated at right angles to that mentioned above, subdivides the eastern portion of the Soutpansberg Coalfield region into a set of irregular blocks (Figure 13).

The nature of the coal deposits gradually changes from a multi-seam coal-mudstone association, approximately 40m thick in the west and comprising up to seven discrete coal seams (Mopane Coalfield in the Waterpoort area), to two individual seams in the east (Pafuri Coalfield in the Tshikondeni area) (Figure 11), with a 3m thick Upper Seam and a 2m thick Lower Seam approximately 100m deeper.

Where developed, the coal is generally bright and high in vitrinite and the coal rank (carbon/energy content) increases towards the east. Dull coal occurs locally at the base of the multi-seam coal-mudstone association in the Waterpoort area as well as in the upper part of the lower seam at Tshikondeni. The volatile content in the west (Waterpoort) is approximately 35% which decreases to 25% in the east (Tshikondeni).

## 7.1. Pafuri Coalfield

In the Pafuri Coalfield, composite seams consisting of thin bands, generally less than 0.5m, of alternating coal and mudstone occur in the Mikambeni Formation. The Main Seam, of approximately 3.5m in thickness, occurs in the Madzaringwe Formation and consists of up to nine coal bands separated by carbonaceous mudstone. The 2.5m thick Lower Seam forms the lowermost part of the composite unit directly above the diamictite of the Tshidzi Formation.

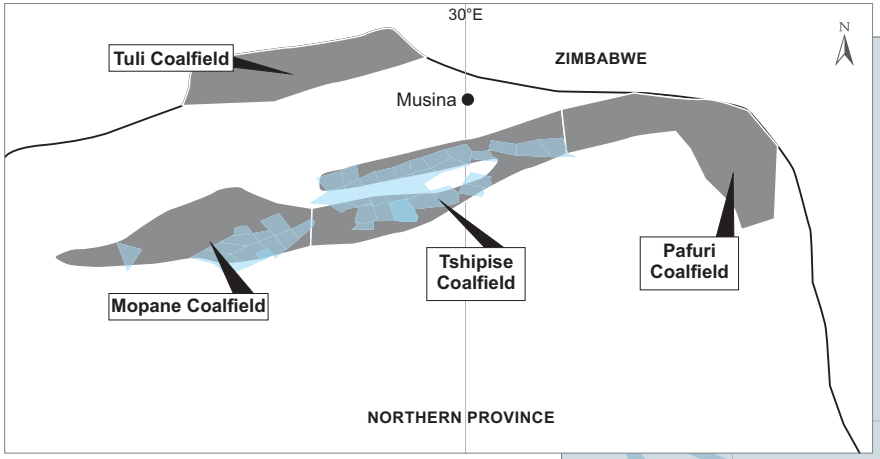
In general, the vitrinite content tends to decrease with increasing depth, whereas the rank tends to increase.

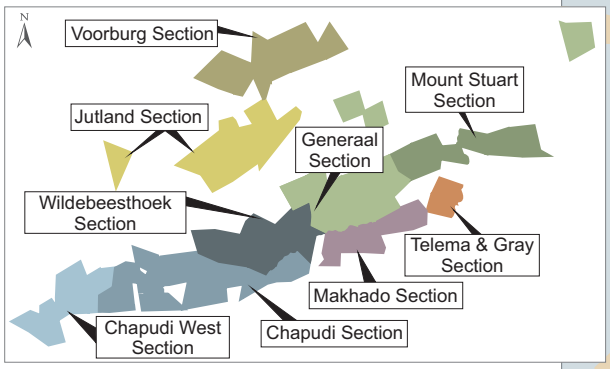
These trends are related to a higher geothermal gradient associated with the tectonic instability which led to pronounced block faulting and the northward tilting of the strata. These tectonic activities have been compounded by the presence of numerous dolerite intrusions.

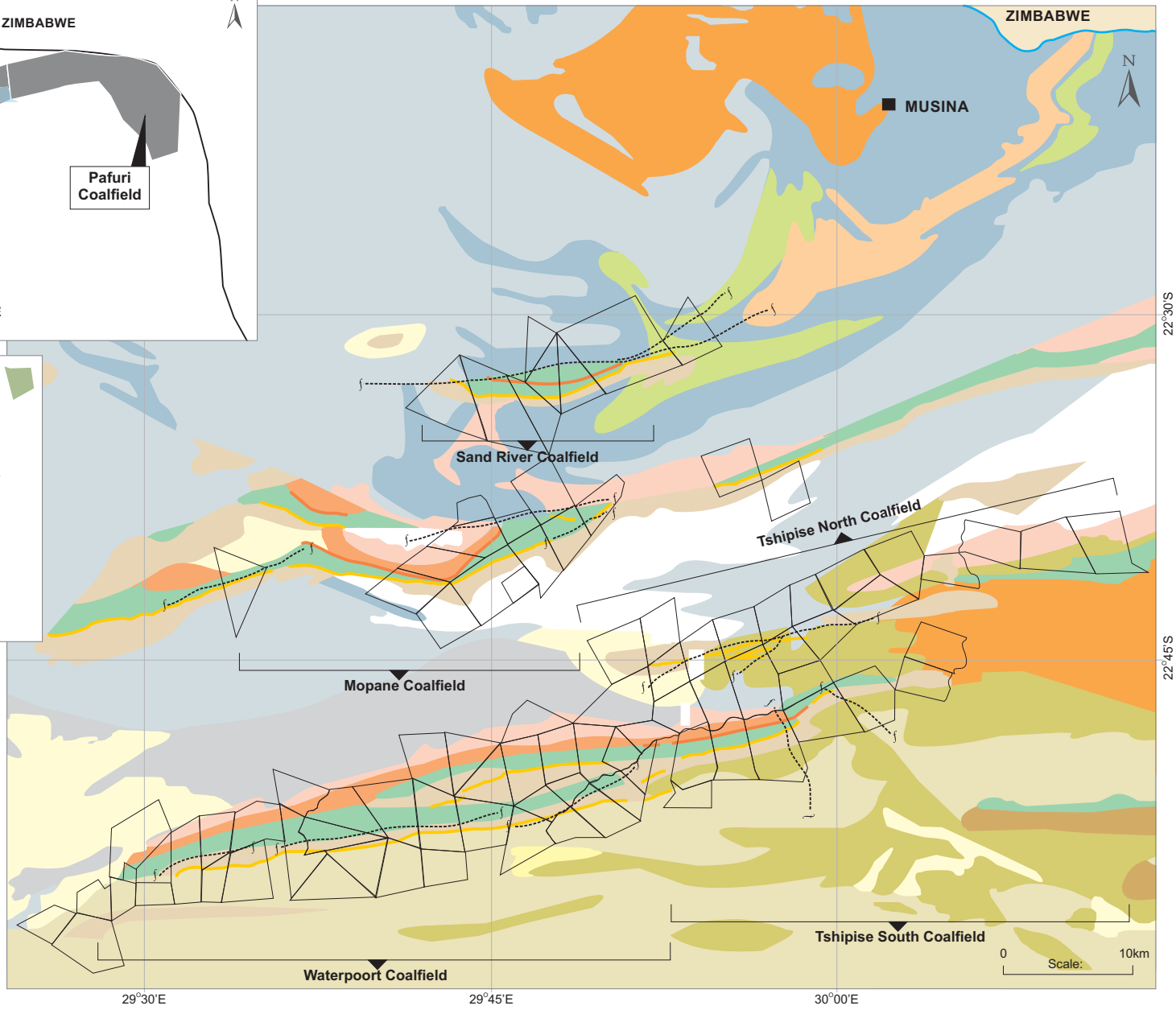
The Main Seam has been the only seam exploited in the Pafuri Coalfield due to its coking properties and medium phosphorous content. The Lower Seam also has coking properties but the high phosphorus content is not acceptable to steel manufacturers.

# REGIONAL GEOLOGICAL MAP OF THE GREATER SOUTPANSBERG COALFIELD

## DISTRIBUTION OF COALFIELDS




**Quartenary Group:**
- Quartenary

**Karoo Group:**
- Letaba
- Clarens
- Elliot
- Molteno
- Beaufort
- Fripp Formation
- Ecca

**Waterberg Group:**
- Soutpansberg
- Waterberg

**Beit Bridge Complex:**
- Bulai Gneiss
- Malala Drift
- Sand River
- Messina Suite
- Gumbu

**Moodies Group:**
- Mount Dowe

- CoAL Projects (not subject to this CPR)
- Fault

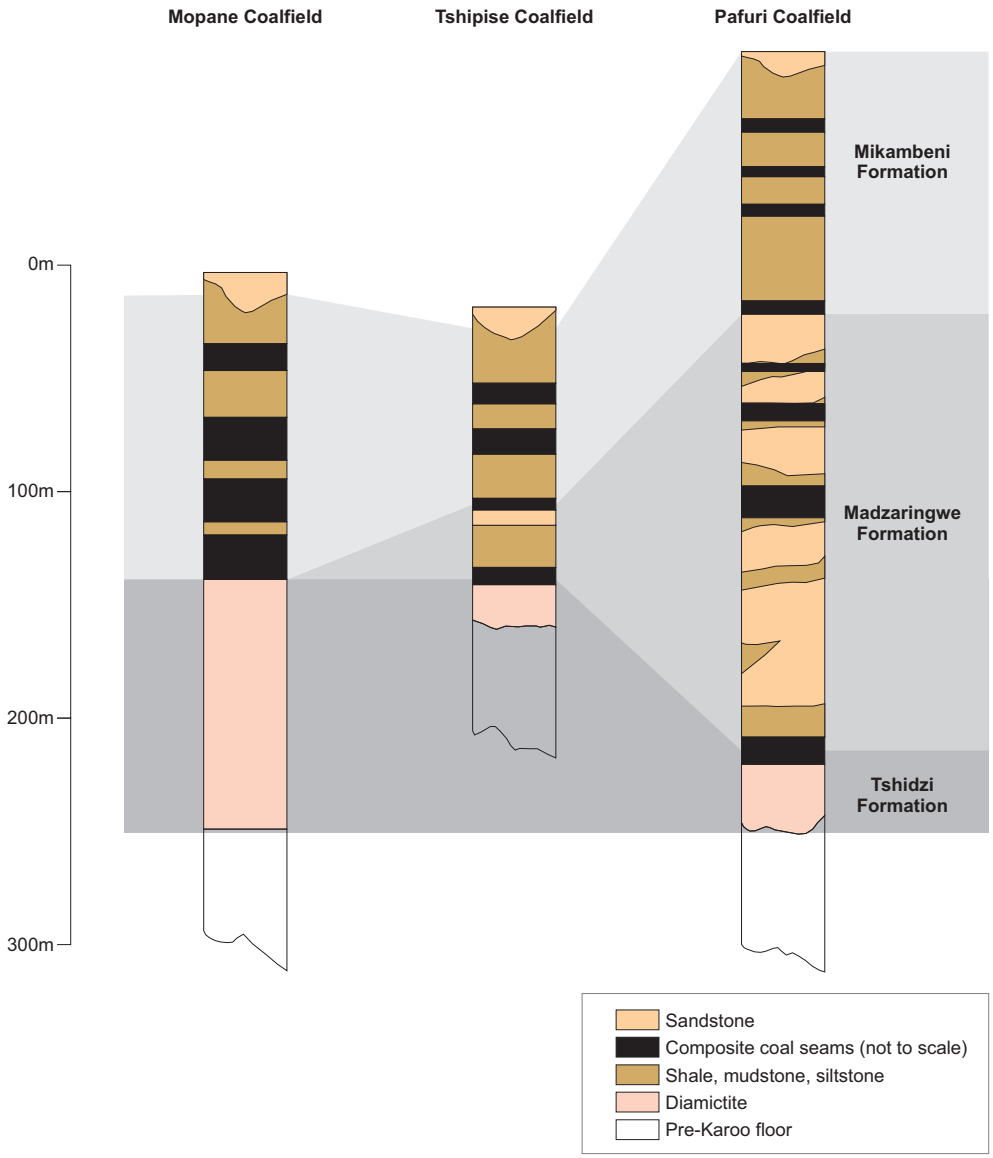
VMD1971_CoAL GSP CPR_2015

Venmyn Deloitte.

Coal of Africa

Figure 11

## GENERALISED STRATIGRAPHY OF THE GREATER SOUTPANSBERG COALFIELD




| MOPANE COALFIELD | TSHIPISE COALFIELD | PAFURI COALFIELD |
|---|---|---|
| Letaba Formation | Letaba Formation | Letaba Formation |
| Clarens Sandstone | Clarens Sandstone | Clarens Sandstone |
| Elliot Formation | Bosbokpoort, Klopperfontein and Solitude Members | Bosbokpoort Formation |
| Molteno Formation | Fripp Formation | Klopperfontein Formation |
| | DISCONFORMITY | |
| Beaufort Group (lower) | Mikambeni Formation | Solitude Formation |
| | Madzaringwe Formation | Fripp Formation |
| | | Mikambeni Formation (Volksrust Fm) |
| Dwyka Group or pre-Karoo surface scree | Tshidzi Formation (Dwyka Group) | Madzaringwe Formation (Vryheid Fm) |
| | | Tshidzi Formation (Dwyka Group) |

VMD1971_CoAL GSP CPR_2015

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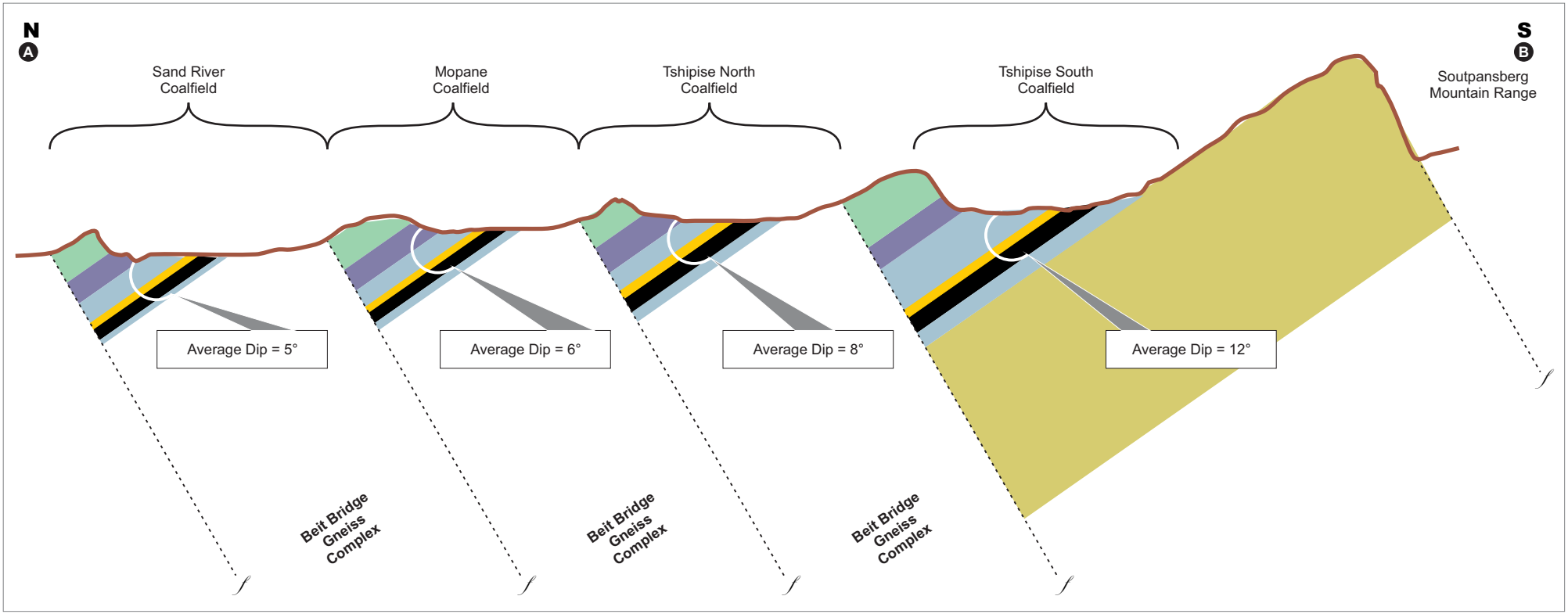
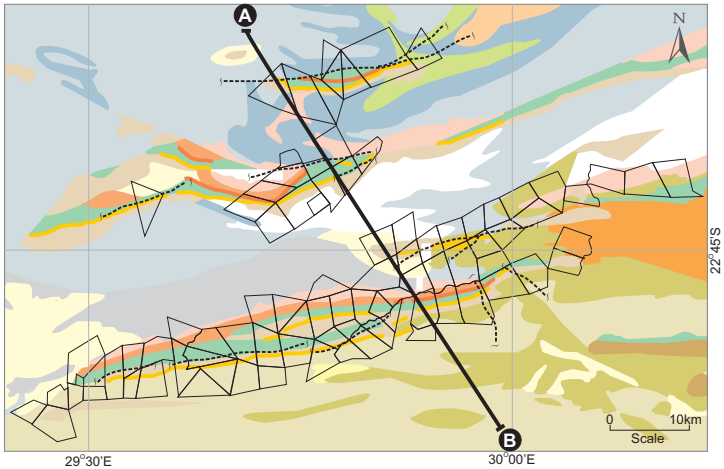
Figure 12

## SCHEMATIC CROSS-SECTION THROUGH THE GREATER SOUTPANSBERG COALFIELD

### SOUTPANSBERG - SCHEMATIC NORTH-SOUTH SECTION




- Beaufort shale / mudstones "Red beds"
- Mudstone / siltstones
- Fripp formation sandstone
- Coal seams (Upper, Middle, Lower)
- Soutpansberg quartzites
- Fault

Karoo Sequence

VMD1971_CoAL GSP CPR_2015

Figure 13

## 7.2. Tshipise Coalfield

The stratigraphic column in the Tshipise Coalfield is very similar to that of the Pafuri Coalfield, except that the coal-bearing interval is dominated by shale, mudstone and siltstone.

The Madzaringwe Formation, therefore, thins markedly towards the east. The coal seams are also composite, consisting of alternating bands of coal and mudstone, and the coal bands exhibit the same trend of decreasing vitrinite content (from 90% to 80%) with increasing depth. The raw coal has an ash content of approximately 25%.

In 1911, Messina Transvaal Development Company Limited (MTDC) sunk a decline shaft on the farm Cavan 508MS (now part of CoAL's Voorburg Section). Between 1911 and 1918, MTDC mined coal from its Lilliput Colliery, to supply the company's furnace in Messina (now Musina).

In 1918, the Colliery ceased production, and there has not been any mining within the Sandriver Sub-basin of the Tshipise Coalfield since that time.

## 7.3. Mopane Coalfield

The Mopane Coalfield comprises a number of east-west trending half-graben structures in which upper Ecca units are preserved. The geology is generally broken up into fault blocks by a number of parallel strike faults.

There has never been any commercial mining within the Mopane Coalfield. CoAL's Makhado Project, on commissioning, would therefore represent the first such mining operation in the Mopane Coalfield and only the second active coal mine within the greater Soutpansberg Coalfield.

# 8. Voorburg Section

The Voorburg Section, located within the Soutpansberg Coalfield, is an advanced exploration project which contains coking coal resources.

## 8.1. Location

The Voorburg Section is situated in the magisterial district of Vhembe, in the Limpopo Province of South Africa (Figure 2), and represents the Mopane Project's most advanced exploration section. The location of the Voorburg Section area in relation to regional infrastructure and the mineral tenure of CoAL in the greater Soutpansberg Project area is illustrated in Figure 14.

The nearest town is Musina, situated approximately 30km to the north of the Voorburg Section area.

## 8.2. Access

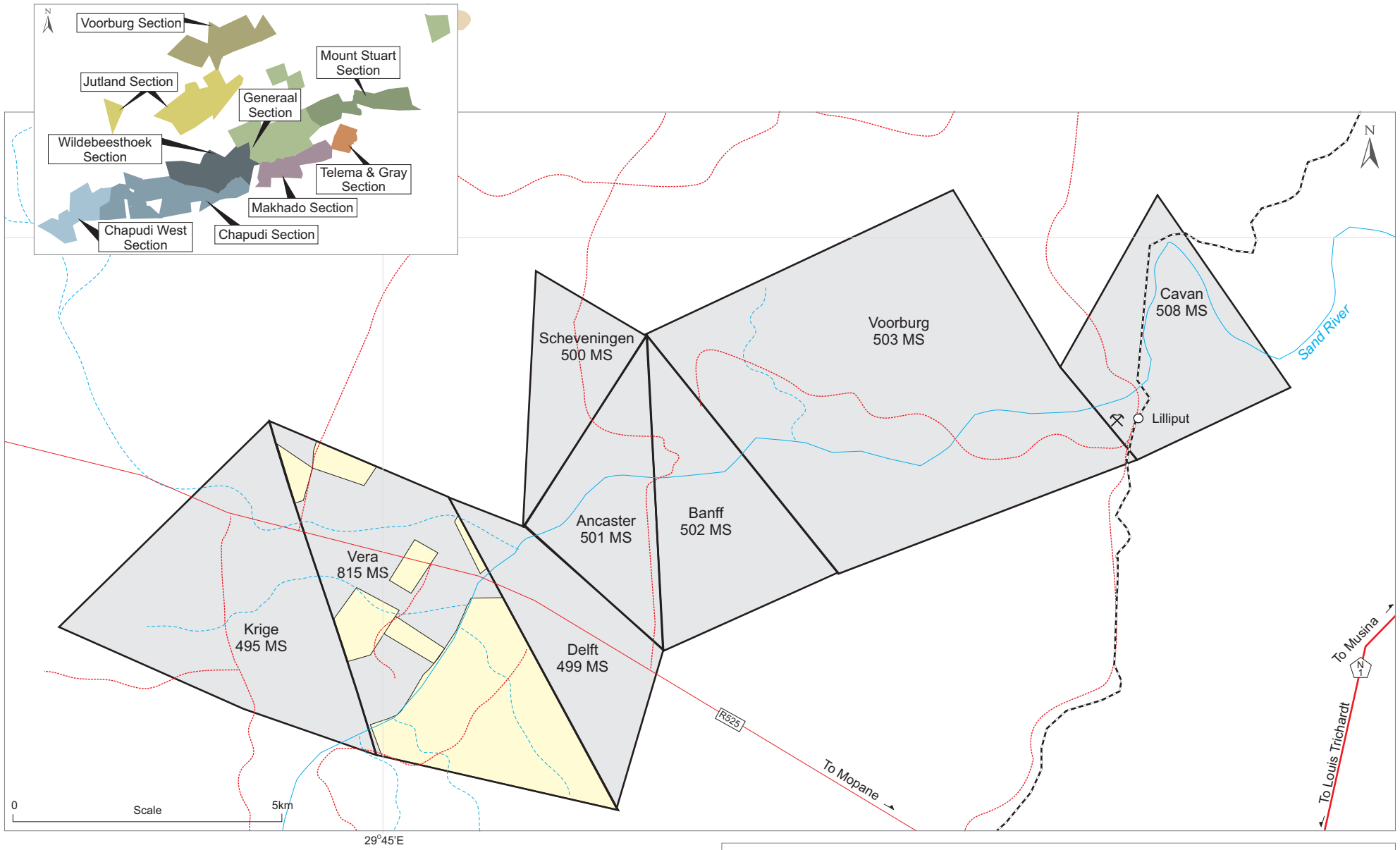
Access to the Voorburg Section area is via the tarred national N1 road from Louis Trichardt to Musina. Approximately 58km north of Louis Trichardt the R525 westward dirt road is taken for 15km (Figure 14) until the farm Ancaster 501MS is reached. The gravel road is in a good condition, whilst the tarred N1 road is in excellent condition. The section area is approximately 380km, by road, from the capital, Pretoria. The various properties within the section area are accessed by a network of gravel farm roads that branch off the R525.

## 8.3. Climate and Topography

The Voorburg Section experiences a warm, semi-arid climate as described in Section 10.3. Mining and exploration operations can occur all year round and the climatic conditions generally do not prevent exploration operations. However, during times of heavy downpours, temporary delays may be experienced.

The topography of the Voorburg Section area is relatively flat and lies at an average elevation of 600 metres above mean sea level (mamsl). The area is drained by the non-perennial Sand River, which flows in an easterly direction across the central area of the project.

## LOCATION OF CoAL'S VOORBURG SECTION IN RELATION TO LOCAL INFRASTRUCTURE AND MINERAL TENURE




Source: Coal of Africa
VMD1971_CoAL GSP CPR_2015

Venmyn Deloitte

Coal of Africa

Figure 14

## 8.4. Fauna & Flora

The Voorburg Section area falls within the North Eastern Mountain Sour Veld and the Soutpansberg Arid Mountain Bushveld biomes, characterised predominantly by a grassy ground layer and an upper layer of woody plants, dominated by sweet thorn and mopane.

The land is mainly given over to cattle and game ranching with localised arable farming.

## 8.5. Legal Aspects

### 8.5.1. Ownership by CoAL

Through its wholly owned subsidiary company Regulus Investment Holdings (Pty) Ltd (subsequent to Section 11 transfer and Secton 102 approval), CoAL holds an accepted application for a New Order Mining Right (NOMR) on the farms Ancaster 501MS, Cavan 508MS, Voorburg 503MS, Banff 502MS, Delft 499MS, Krige 495MS, Scheveningen 690MS and Vera 815MS. CoAL has acquired the Voorburg Section from Rio Tinto pursuant to the Soutpansberg Properties Acquisition Agreement with Rio Tinto.

The ownership of the Voorburg Section is illustrated in Figure 15.

### 8.5.2. Mineral Tenure

All of the five NOPRs held by CoAL for the farms that make up the Voorburg Section expired in June 2013. In May 2013, prior to expiry, CoAL applied for a NOMR under its wholly owned subsidiary Regulus Investment Holdings (Pty) Ltd for all of the Voorburg Section. The DMR issued an acceptance letter for the NOMR application in May 2013. Venmyn Deloitte has viewed the acceptance letters and confirms the security of the mineral tenure.

The rights relating to the Voorburg Section are summarised in Table 13 and their locations are graphically presented in Figure 14.

### 8.5.3. Surface Rights

Currently, CoAL has agreements with the various surface rights owners to access properties for exploration purposes and access is sufficient for its prospecting requirements.

### 8.5.4. Royalties

There are no private royalties payable for the Voorburg Section. State royalties, as per the MPRRA will be payable, however, on any future production.

### 8.5.5. Material Contracts

Currently there are no offtake agreements, operational contracts or contract mining agreements that are relevant to the Voorburg Section, as it is still in the early stages of development.

### 8.5.6. Other Legal Issues

CoAL has informed Venmyn Deloitte of land claims on the farms Cavan 505MS and Vera 815MS. A summary of the land claims on the Voorburg Section are listed in Table 14

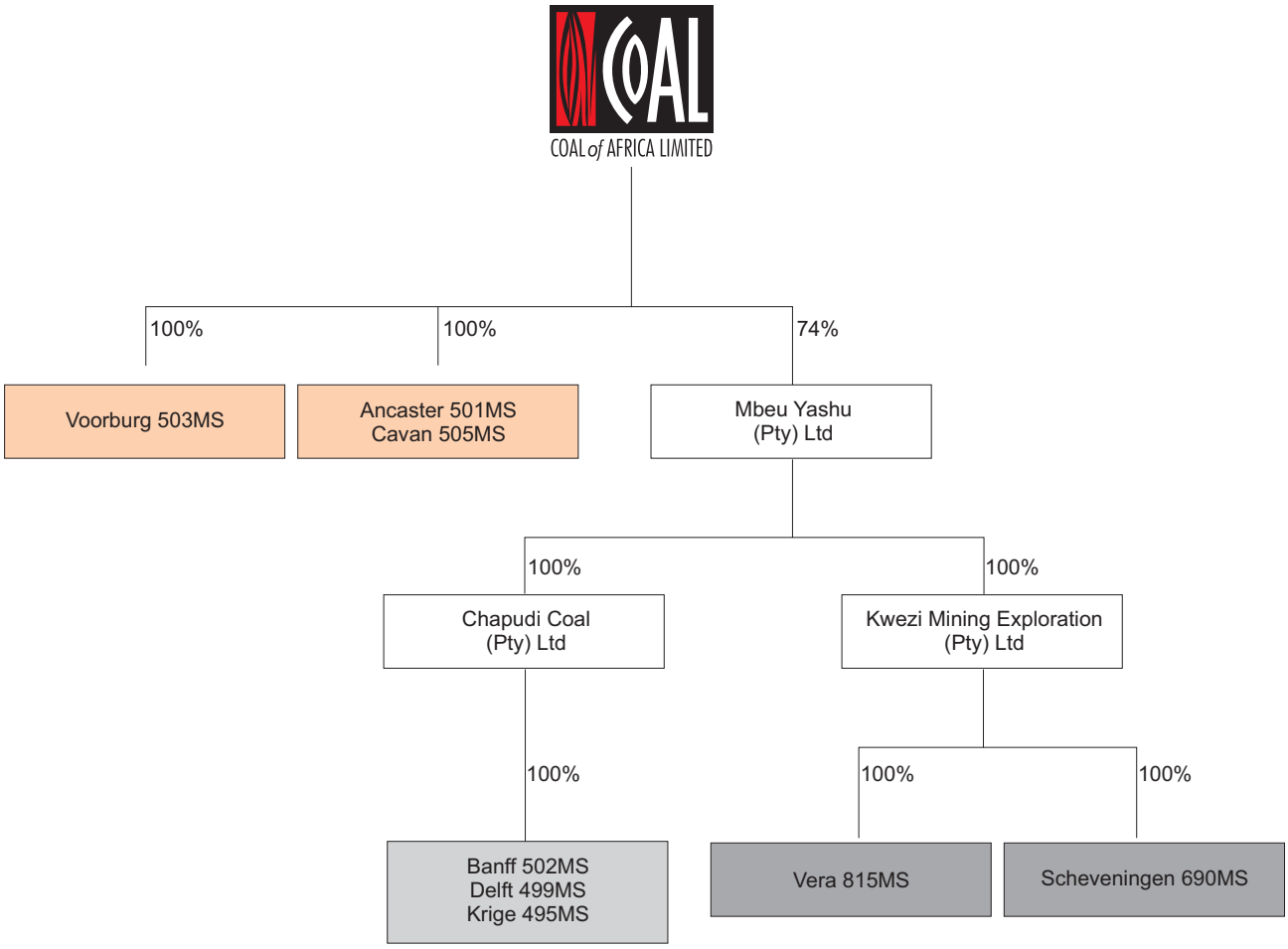
The land claims on the various properties have been gazetted by the Department of Rural Development and Land Reform (DRDLR). CoAL recognises land claimants as key stakeholders, and the company's engagement is governed by the company's stakeholder engagegemt strategy that ensures regular, meaningful and transparent engagement.

CoAL recognises the legislative framework of the land claims process and will work within that framework.

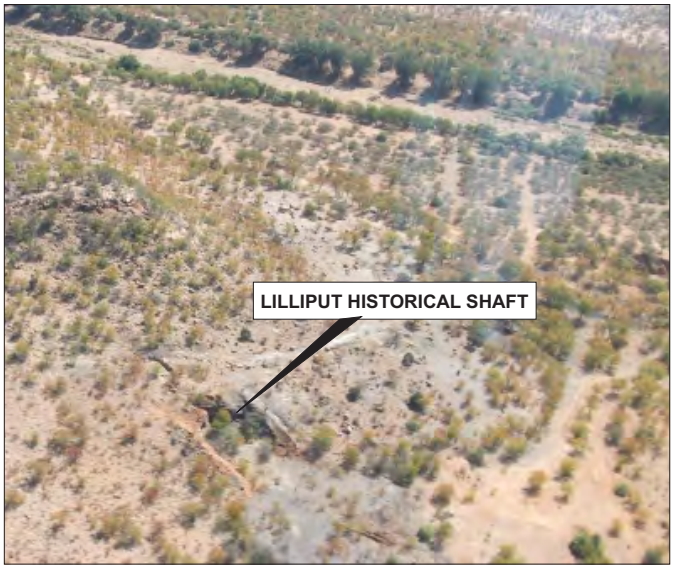
Venmyn Deloitte is not aware of any litigation or competing rights associated with the Voorburg Section area.

VenmynDeloitte. Coal of Africa

## OWNERSHIP OF THE VOORBURG SECTION




**LILLIPUT HISTORICAL SHAFT AND WORKINGS**




**LILLIPUT SIDING**

**Table 13 : Summary of the Voorburg Section Mineral Tenure**

| SECTION | FARM NAME & NO. | PORTION NO. | AREA (ha) | APPLYING ENTITY | NEW ORDER LICENCE TYPE | LICENCE NO. | SUBMISSION DATE OF MINING RIGHT APPLICATION | DATE OF ACCEPTANCE | SURFACE RIGHTS |
|---|---|---|---|---|---|---|---|---|---|
| Voorburg | Banff 502MS | Whole farm | 1,133.33 | Regulus Investment Holdings (Pty) Ltd | Mining | LP 30/5/1/2/2/10032 MR | 13/04/2013 | 17/05/2013 | No |
| | Delft 499MS | Portions 1, 2 & RE | 880.47 | | | | | | No |
| | Krige 495MS | Whole farm | 1,855.18 | | | | | | No |
| | Ancaster 501MS | Portions 1, 2, 3 & RE | 833.54 | | Mining | LP 30/5/1/2/2/10034 MR | 13/04/2013 | 17/05/2013 | No |
| | Cavan 505MS | Portions 1, 2 & RE | 1,224.57 | | | | | | No |
| | Scheveningen 500MS | Whole farm | 575.43 | | Mining | LP 30/5/1/2/2/10031 MR | | 17/05/2013 | No |
| | Vera 815MS | Portions 1, 3-9, 13-24, 26-27, 29-30, 35-41, 44-46,48-52 & 54, RE of portion 10 | 998 | | Mining | LP 30/5/1/2/2/10030 MR | 13/04/2013 | 17/05/2013 | No |
| | Voorburg 503MS | Whole farm | 3,978.05 | | Mining | LP 30/5/1/2/2/10033 MR | 13/04/2013 | 20/05/2013 | No |
| | | **TOTAL VOORBURG** | **11,478.57** | | | | | | |

## 8.6. Infrastructure

The Voorburg Section is well situated with respect to major infrastructure, including rail, road and power.

The railway linking Gauteng (in South Africa) and Zimbabwe traverses the farm Cavan 508MS in the east of the section area with the nearest rail siding, Lilliput, being located on this farm (Figure 14). Although this siding is located on CoAL's property, the company has negotiated the rights to the Huntleigh Siding, located approximately 20km to the south of Lilliput.

Eskom grid power lines are located parallel to the N1 and are situated 6km east of the farm Cavan 508MS at their closest point (Figure 14).

Water for drilling and potable requirements is currently available from the local landowners' dams and boreholes.

Due to the fact that the Voorburg Section is still at an exploration stage, details on the availability and requirements of power, water, tailings disposal and other infrastructural items have not been investigated in detail and are therefore not reported upon in this document. These will be addressed once the Section reaches the PFS stage.

### 8.6.1. Local Resources

The nearest towns of Louis Trichardt and Musina are regional centres and provide modern conveniences, including accommodation and services. The towns are also sources of fuel and labour.

## 8.7. Regional Geological Setting

The Voorburg Section is situated within the Sand River Coalfield a subdivision of the Mopane Coalfield located in the Greater Soutpansberg Coalfield (Figure 11). The Sand River Coalfield represents and isolated and upfaulted block of Karoo age sediments, which lies approximately 10km to the north of the remainder of the Soutpansberg Coalfield. The reader is referred to Section 7 on the regional geology of the Soutpansberg Coalfield and Section 7.3 on the regional geology of the Mopane Coalfield.

## 8.8. Local Geological Setting

The Voorburg Section represents an isolated and upfaulted block of Karoo age sediments, which lies approximately 10km to the north of the remainder of the Coalfield (Figure 16). The basin represents a half graben with an unconformable southern contact and a fault bounded northern contact.

The Karoo age sediments were deposited onto basement granite gneisses. The lowermost sediments include Dwyka tillites, which were followed by the deposition of the coal bearing strata (Figure 16) of the Ecca Group. The Ecca Group sediments comprise sandstones and shales. The Lower Ecca Group appears absent in the area. The coal bearing sediments occur as alternating mudstone laminae and coal bands within the Upper Ecca or Mikabeni Formation. According to CoAL, the coal horizons are divided into six potentially-economic seams, namely the Upper, Middle Upper, Middle Lower, Bottom Upper, Bottom Middle and Bottom Lower seams

**Table 14: Summary of Land Claims for the Voorburg Section**

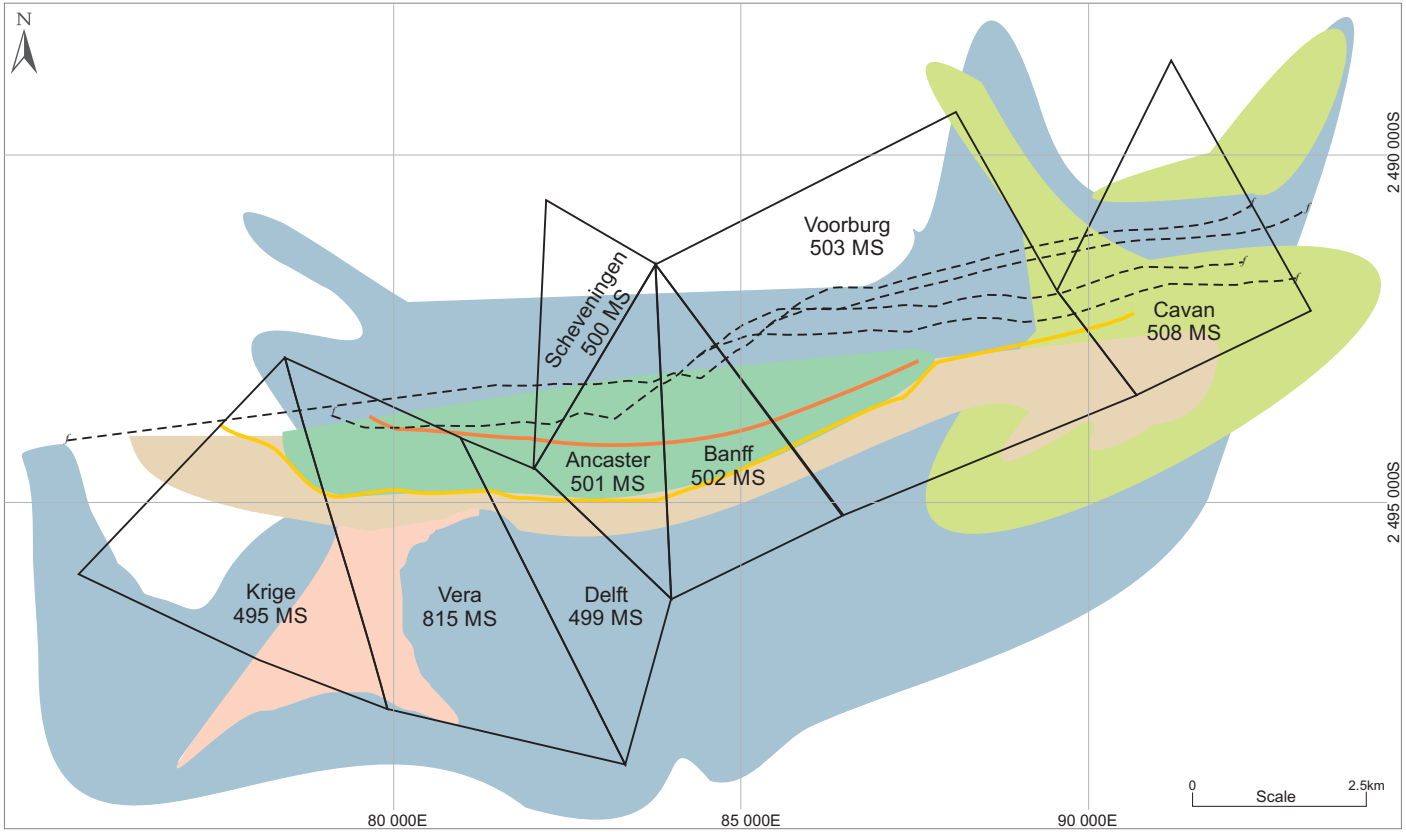
| SECTION | FARM NAME & NO. | PORTION NO. | LAND OWNER | LAND CLAIMANT | OFFICIAL |
|---|---|---|---|---|---|
| Voorburg | Banff 502MS | Whole farm | Mazicom cc | No land claimant | Not stated |
| | Delft 499MS | Portions 1 | Wynand & Christa Marais | | |
| | | Portions 2 | Paul Smit Eindomme | | |
| | | Portions RE | Johnsen Family Trust | | |
| | Krige 495MS | Whole farm | Brodsky Trading 268 (Pty) Ltd | | |
| | Ancaster 501MS | Portions 1, 2, 3 | LTT Algemene Handelaars cc | | |
| | Ancaster 501MS | RE | Scottco (Pty) Ltd | | |
| | Cavan 505MS | RE | Republic of South Africa | Mulambwane | |
| | Cavan 505MS | Portions 1, 2 | Transnet | | |
| | Scheveningen 500MS | Whole farm | Scottco (Pty) Ltd | No land claimant | |
| | Vera 815MS | 1 | Willem Johannes Jacobus Maree | Mulambwane | |
| | | 3 | Pioen 1102 (Pty) Ltd | | |
| | | 4, 5, 7, 8, 16, 35 | Alfred Charles & Rouxnel White Hanekom | | |
| | | 6, 27 | Gerrit & Lettie van Deventer | | |
| | | 9, 26 | Mutshaeni Boerdery cc | | |
| | | RE of Portion 10 | LP Swuhana | | |
| | | 13 | Marthinus Herdrik Erwee | | |
| | | 14 | HJ Steyn | | |
| | | 15, 39 | Sarel George Marais | | |
| | | 17 | Ina du Toit | | |
| | | 18, 19, 20, 21, 24 | Torive Safaris | | |
| | | 29 | Etiene Pieter Cornelius de Jong | | |
| | | 30 | Emmanuel Christian School | | |
| | | 36, 37, 38, 41 | AB Singh Family Trust | | |
| | | 40 | David Gordon Clark | | |
| | | 44, 45, 46 | Pieter Lodewikus & Moira Ina du Toit | | |
| | | 48 | Derick & Aletta Elizabetha Cloete | | |
| | | 49 | Johan Botha Trust | | |
| | | 50 | Willem Hendrik Hogan | | |
| | | 51 | Nthangeni Richard & Dorah Tshiwela Maanda | | |
| | | 52 | Edward George Scott | | |
| | | 54 | Betcor Boerdery cc | | |
| | Voorburg 503MS | Whole farm | Koos Minnaar Tust | No land claimant | |

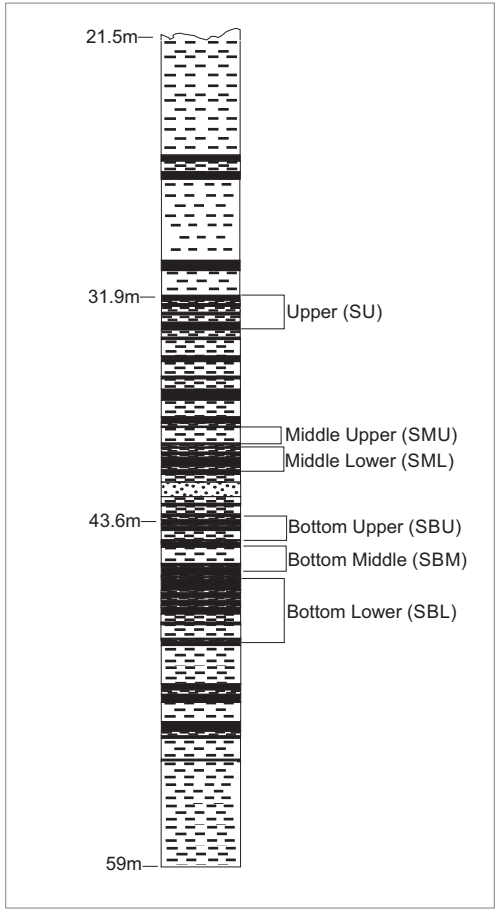
The coal bearing strata are overlain by red shales and mudstones belonging to the Beaufort Group. The coarse sandstone and conglomerate marker bed of the Fripp Formation is present within the Section area and forms the small flat topped hill into which the Lilliput Shaft was excavated (Figure 16).

These sediments are limited in the north by a 25km long west southwesterly / east northeasterly trending fault. This is a normal fault with an upthrow of approximately 1,000m to the south. The Sand River roughly follows this fault plane in an easterly direction by exploiting this zone of weakness. A semi parallel fault occurs as an offshoot to the main fault. This fault has a throw of between 5m and 10m.

According to the Tolmay Report (1975), the formation of this Karoo age basin was closely associated with this fault, which formed its northern limit. This downfaulted block is believed to have created a basin into which the Karoo age sediments were deposited. Karoo age sedimentation into the basin was believed to have caused sagging of the basin floor and further movement along the fault. During times of basin stability, the coal bearing strata were formed. The occurrence of the Karoo sediments is limited in the south by the gentle upsloping edge of the palaeo-basin into which they were deposited. This results in the best development of the coal bearing horizons in the north, with thinning of the seams towards the edge of the basin in the south.

## LOCAL GEOLOGICAL MAP AND TYPICAL STRATIGRAPHIC COLUMN FOR THE VOORBURG SECTION




- Faults
- Clarens
- Molteno
- Fripp Formation
- Ecca
- Beaufort
- Mouny Dowe
- Messina Suite
- Prospecting Boundary

- Coal and Shale
- Shale and Mudstone
- Siltstone/Shale and Siltstone
- Sandstone
- Diamictite Argillaceous
- Diamictite Sandy

VMD1971_CoAL GSP CPR_2015

Figure 16

Coal of Africa

The coal seams exhibit an average dip 5°N. Minor faulting and dolerite intrusions have been noted from historical borehole data and mapping.

One dolerite sill was intersected in the basement of one of the new boreholes. It measured 0.4m in thickness, and is the only dolerite that has been intersected in the current and historical drilling.

## 8.9. Historical Ownership

The historical ownership, and associated activities with respect to the Voorburg Section, are summarised in Table 15.

**Table 15 : Voorburg – Summary of Historical Exploration and Mining**

| DATE | COMPANY | ACTIVITY |
|---|---|---|
| 1911 - 1918 | Messina Transvaal Development Company Ltd | Excavated the inclined Lilliput shaft on the farm Cavan 508MS. Mined coal from the Lilliput Colliery to supply the company's furnace in Messina. |
| 1942 | Fuel Research Institute of South Africa | Prepared "Report on coal samples taken in the vertical shaft of the Lilliput Colliery on the farm Cavan 850 in the Zoutpansberg District of Transvaal". |
| 1974 - 1975 | Rapbern Exploration (Pty) Ltd (Rapbern) | Drilled seven boreholes on Cavan 508MS and produced report entitled "Cavan Coalfield - Preliminary geological report" which included an estimate of reserves for the farm. |
| 1975 - 1978 | Iscor (now Exxaro) | Drilled 39 boreholes on Banff 502MS and Voorburg 503MS. Prepared reports entitled "The Cavan Coalfield, Soutpansberg District", "Cavan Coalfield - Geological Report", " Report on proposed opencast mining project - Cavan Coalfield - Ore reserves" and "Cavan Coalfield - Possibility of underground mining" from the results. |
| 1991 | African Finance Corporation Investments Ltd (AFC) | Held mineral rights on Voorburg 503MS. |
| 1995 - 1999 | Rio Tinto Mining & Exploration Ltd. (Rio Tinto) | Held old order prospecting right over Voorburg 503MS. |
| 2001 | Baobab Coal (Pty) Ltd | Prepared report entitled "Coal Interests in the Tshipise and Mopane Coalfields Soutpansberg District". |
| | AfriOre (Pty) Ltd | Farms under application for old order prospecting rights included Ancaster 501MS, Banff 502MS and Cavan 508MS. |
| | | Under discussion with private mineral rights holder on Voorburg 503MS. |
| 2004 | AFC Property (Pty) Ltd | Held mineral rights over Voorburg 503MS. |
| | Rio Tinto & KME | Applies for NOPRs over Krige 495MS, Vera 815MS, Delft 499MS, Banff 502MS and Scheveningen 500MS. |
| 2005 | Rio Tinto | Drilled 2 RC boreholes. |
| 2006 | Rio Tinto & KME | Award of NOPRs. |
| 2006 | CoAL | Acquired rights to the Baobab Joint Venture through Motjoli. |
| | | Acquired NOPR over Voorburg 503MS. |
| | | Acquired NOPR over Ancaster 501MS and Cavan 508MS. |
| 2007 | Rio Tinto | RC and diamond drilling. |
| 2009 - 2010 | CoAL | Drilled boreholes on Voorburg 503MS. |
| 2011 | | Concluded transaction with Rio Tinto & Kwezi Mining to acquire rights to their farms, and submitted Section 11 transfer application. |
| 2012 | | Drilled 15 LDD holes (5holes each at three separate sites) on the farm Voorburg 503MS. |
| | | Section 11 approval for properties subject to the Soutpansberg Properties Acquisition Agreement. |

## 8.10. Historical Exploration and Mining

The earliest known exploration on the Voorburg Section was undertaken on Cavan 508MS by Rapbern in the early 1970s (Table 16). A total of seven boreholes were drilled, six of which were sampled and sent for analysis. The results are presented in a report by Mr. S. Tolmay (1975). No information is available on the drilling, logging, sampling and surveying methods and standards used, except that the exploration was carried out for reconnaissance purposes. These boreholes are not used in the current resource model.

During 1976, Iscor (now Exxaro) drilled 43 diamond boreholes on the farms Banff 502MS and Voorburg 503MS (Table 16). The location of the holes is indicated on Figure 17. The drilling was widely spaced and carried out for reconnaissance purposes. The Iscor boreholes are believed to have been drilled vertically. The Iscor boreholes are named consecutively from VG503001 upwards for those drilled on the farm Voorburg 503MS and consecutively from B502001 upwards for those drilled on Banff 502MS.

The drilling and sampling protocols used by Iscor are unknown. However, it is assumed that the drilling methods were conventional and pre-date the more efficient triple-tube wireline techniques that are commonly employed today.

It is not known whether the Iscor borehole collars were professionally surveyed.

The Iscor holes were sampled and sent to their in-house laboratory for analysis. Typically 13 samples were taken from the top to the base of the coal bearing strata, and numbered consecutively in this order. Raw analyses were carried out on the coal samples. Washed analyses were only undertaken at an RD=1.40. Proximate, CV, Roga and swell index testwork was carried out.

Iscor produced two reports in the mid 1970s assessing the potential for opencast and underground mining on the properties which it had drilled. It recognised the high coking properties of the coal and also estimated "reserves" on these properties. Iscor concluded that, under the prevalent economic circumstances, opencast mining was not feasible, but that underground mining might be feasible.

The Iscor borehole database was acquired in 2007 by CoAL.

Rio Tinto drilled four diamond boreholes into the properties associated with their NOPRs (held in the name of Chapudi Coal and KME), namely Banff 502MS, Delft 499MS, Vera 815MS and Krige 495MS (Table 16, Figure 17). One borehole was drilled in each of the farms as part of their regional exploration programme.

The diamond hole on Banff 502MS was sampled on a ply-by-ply basis and analysed for washability results. A petrography sample was also collected and subjected to proximate, ultimate, CV and vitrinite reflectance analysis.

The borehole on Delft 499MS was an RC hole with the sample chips being analysed for proximate, CV, total sulphur and vitrinite reflectance result on the RD=1.40 fraction from each subsection. Rio Tinto reported that because the RC drilling method has the potential to partially lose high quality coal in the fine fractions, these results should be regarded as representing a worst case scenario.

The borehole on Krige 495MS was also an RC hole. A petrography sample was collected from this hole and subjected to proximate, ultimate, CV and vitrinite reflectance analyses.

No samples have been collected from the diamond borehole drilled on Vera 815MS.

Although the results of these boreholes have been provided to CoAL by Rio Tinto, these have not yet been included in the modelling and resource estimation as CoAL have their own boreholes adjacent to the hole located on Banff 502MS (Figure 17). The other three boreholes are situated as outliers to the west of the current extent of the drilling and outside of CoAL's immediate area of interest governed by their NOPRs and have therefore not been included in the resource modelling at this stage.

Historical underground mining from the Lilliput Colliery was carried out on the farm Cavan 508MS between 1911 and 1918. The coal was supplied to the smelter at Messina Copper Mine. According the Fuel Research Institute of South Africa (Report No.53 of 1942) a total of 14,488t of coal was mined from an inclined shaft excavated into the small flat topped hill situated a few hundred metres west of the Lilliput Siding (Figure 15). No information was available on the coal qualities produced and the extent of the mined out area. The location of the Lilliput Mine inclined shaft is indicated on Figure 17.

## 8.11. Recent Exploration

CoAL obtained NOPRs over the Voorburg Section farms in 2006 and proceeded to drill twelve diamond boreholes between 2009 and 2010 on the farm Voorburg 503MS (Table 16 and Figure 17). In 2012, CoAL identified three sites for LDD drilling, and drilled five LDD boreholes at each of these three sites. These boreholes have been logged and sampled but the information has not been used to update the Coal resource estimation. For all exploration procedures followed by CoAL for the 2012 drilling programme and all future CoAL drilling programmes the reader is referred to the protocol document prepared by Venmyn Rand (Pty) Ltd for CoAL on 10 April 2012 named "Coal Exploration Best Practise Guideline for the Greater Soutpansberg Projects (GSP) Prepared for Coal of African Limited (COAL)", Venmyn Deloitte reference number D1140. All drilling has been managed by CoAL, with Mr. C. Mafiri (Pr.Sci.Nat.) as the responsible geologist.

**Table 16 : Voorburg Section – Summary of Historical and Recent Drilling**

| DATE | COMPANY | LOCATION | PURPOSE | SURVEYOR | DRILLING COMPANY | TYPE OF DRILLING | SIZE | RESPONSIBLE GEOLOGIST | TOTAL NO. B/H | WIRELINE LOGGING | SEAMS SAMPLED | LABORATORY FOR QUALITY | USED IN MODEL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1974 | Rapburn | Cavan508Ms | Reconnaissance | Unknown | Unknown | Unknown | N/A | Possibly S Tolmay | 7 | | Unknown | 6 holes sampled. Sent to TCOA* & Iscor Laboratories. | No |
| 1976 | Iscor (now Exxaro) | Banff 502MS & Voorburg 503MS | Reconnaissance | In house | In house | Diamond | N/A | In house | 43 | | All | Iscor. Analyses only on 1.4RD fraction. | Yes - 38 holes |
| 2008 - 2009 | Rio Tinto | Banff 502MS, Delft 499MS, Vera 815MS & Krige 495MS | Regional exploration | In house | Earth Resources | 2 Diamond, 2 RC | PQ3 | D Hristov | 4 | Unknown | Seams 6 & 7** | ALS | No |
| 2009 - 2010 | CoAL | Voorburg 503MS | Confirmation of Iscor holes and resource declaration. | P Matibe & Associates | Scott Drilling | Diamond | PQ3 | C Mafiri | 12 | Yes | Upper, Middle, Middle Lower, Bottom Upper and Bottom Lower | Inspectorate | Yes |
| 2012 | | | Quality sampling | | Drillcon | LDD | T6 146 | | 15 | | | CAM | No |
| | | | | | | | | **TOTAL** | **81** | | | | |

## VOORBURG SECTION – LOCATION OF BOREHOLES AND HISTORICAL SHAFT

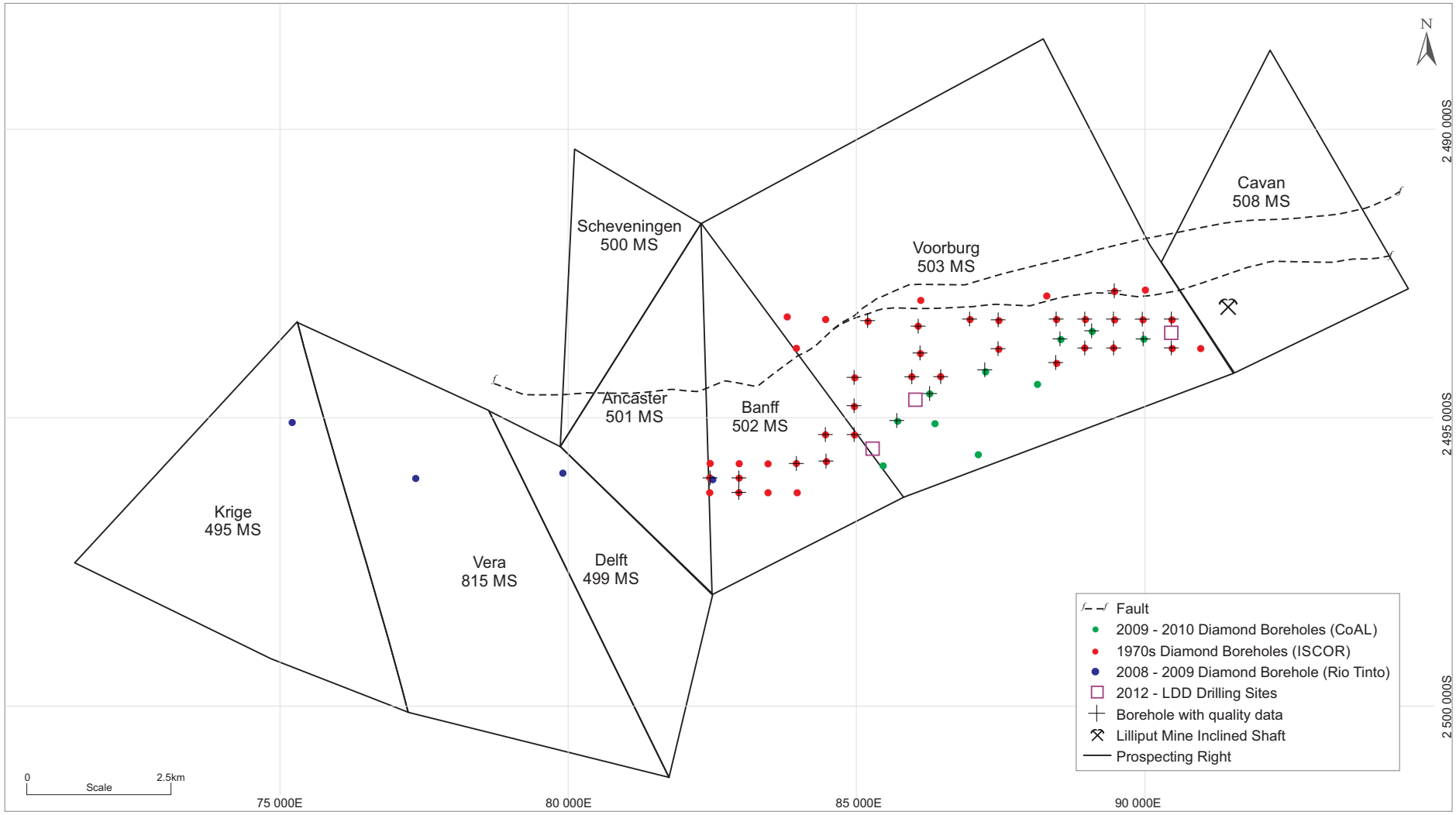



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Figure 17

### 8.11.1. Remote Geophysical Sensing

CoAL commissioned Eugene Pretorius and Associates (Pty) Ltd (EPA) to conduct a photographic/LIDAR survey in 2008 over the properties it held at that time. This survey was flown in a fixed wing aircraft at a height of approximately 1,100m above ground surface. A 70kHz laser provided ground elevation data to a 15cm vertical and 30cm horizontal accuracy. Digital colour images were obtained with a pixel size of 15cm and transformed to orthophotos. The survey was based on WGS84 datum and Lo29E projection. Ellipsoidal heights were transformed to orthometric heights in Xform 4.3 using the Southern Africa Quazi geoidal model. No horizontal transformation was carried out because the final survey was required on the WGS84 datum.

### 8.11.2. Surveying Methods

The CoAL boreholes were sited in the field using a hand-held Garmin™ GPS device. Following completion of the boreholes, the collar positions were accurately surveyed using Leica™ GPS equipment by P Matibe and Associates, which is registered (No. PLS0915) with PLATO.

All CoAL boreholes were drilled vertically. No down-hole directional surveys were undertaken. Given the relatively shallow depths involved, this is not considered a deficiency.

### 8.11.3. Diamond Drilling

Diamond drilling was carried out by Scott Drilling. The geologist responsible for the drilling and sampling was Mr. C. Mafiri (Pr.Sci.Nat.). The purpose of the drilling was to confirm the Iscor borehole results and to drill sufficient boreholes to declare resources.

Venmyn Deloitte has not independently witnessed the drilling and sampling protocols as no exploration drilling is currently taking place. However, Venmyn Deloitte is confident that the drilling was carried out to the required standard as the drilling programmes have been independently supervised or verified by other reputable consulting companies.

#### 8.11.3.1. Drilling

Most boreholes were drilled at a core size of PQ3 (83mm) to obtain sufficient sample material for analysis and to reduce core loss. Drilling was undertaken using triple tube techniques in order to minimise core loss. The boreholes were consecutively named from V503001 to V503010.

Two boreholes, namely V503008 and V503010, had to be redrilled due to excessive core loss in the coal horizons. The re-drills are indicated with a letter “A” suffix.

LDD boreholes were drilled conventionally using a T6 (146mm) drill bit, which produces a core of 122.8mm in diameter. The LDD was conducted for bulk sampling purposes.

The CoAL drilling contracts demanded a minimum recovery of 98% within coal horizons and 95% in non-coal sediments. CoAL reported that, throughout the exploration drilling programmes, every effort was made to achieve maximum core recovery and minimise the loss of fines.

The following general drilling techniques were employed:-

- each drill run was limited to 3m in length, which was reduced if poor recoveries or difficult drilling conditions were experienced;
- the core was placed in steel trays and enclosed in bubble-wrap;
- full core trays were stacked, covered and transported to the core storage facility at the end of each shift.

Core was transported to the core shed by the drilling contractor, received by the geologist and stacked. In the case of coal intersections, the core was stored in a refrigerated container. When both the core and the geophysical logs were received, the borehole was considered to have been completed. Core recovery within individual coal plies was measured with reference to the geophysical logs and, if found to be acceptable, logging commenced. CoAL did not retain records of core recovery.

### 8.11.3.2. Logging

Core was not split prior to logging in order to minimise the effects of oxidation. Lithological depths were finalised only after reconciliation with the geophysical wireline logs. Field logs were generated using printed logging forms and are archived at the CoAL offices in Johannesburg. Data from handwritten logs was transferred into MS Excel™ format and subsequently captured into a Sable™ database.

Borehole core photography using a hand-held digital camera was initiated in January 2009 and was sporadic until November 2009. Since that time all core has been photographed.

Geotechnical logging has not been undertaken.

### 8.11.3.3. Sampling Method

On the basis of the Iscor data, CoAL defined seams or selected mining cuts by firstly selecting intervals comprising predominantly coal and then by identifying the sample names associated with those intervals and automatically allocating them to the seam. This process was recently revised for Iscor boreholes by re-selecting the seam intervals based on a visual assessment of the Iscor hand-written graphic logs. The process was deemed necessary as CoAL geologists were not satisfied that the allocation of sample numbers to seams by Iscor was sufficiently consistent.

For the CoAL boreholes, the field geologists were responsible for the selection of seam intervals under the supervision of the responsible geologist, Mr. C. Mafiri (Pr.Sci.Nat.).

The Iscor and CoAL sampling nomenclatures differ (Table 17). Given that the Iscor sample/seam allocations have recently undergone re-interpretation by CoAL geologists, the allocations presented for Iscor samples in the table can be considered generally valid, but exceptions do occur.

**Table 17 : CoAL and Iscor Sample Nomenclature**

| SEAM | CoAL SAMPLING NOMENCLATURE | ISCOR SAMPLING NOMENCLATURE |
|---|---|---|
| Upper | 14C (14CA, 14CB, 14CC) | 3, 3A, 3B |
| Middle Upper | 14A (14AA, 14AB, 14AC), 14BA | 5, 5A, 5B, 5C, 5D |
| Middle Lower | 12A (12AA, 12AB), 12B, 12C, (12CA, | 7, 7A, 7B, 7C |
| Bottom Upper | 11A (11AA, 11AB, 11AC), 11B, 11BA | 9A, 9B, 9C, 9D, 9E |
| Bottom Middle | 10A (10AA, 10AB) | Not recognised |
| Bottom Lower | 9A (9AA, 9AB, 9AC), 9B | 10, 10A, 10B, 10C, 10D |

CoAL conducted whole core sampling and sample intervals were selected on the basis of the geophysical logs. Samples were numbered from the base upwards and correspond to the same stratigraphic interval in every borehole.

CoAL has identified six potentially mineable seams within the Coal Zone. The nomenclature of samples taken from the various seams is summarised in Figure 16.

Samples were double-bagged with each bag sealed with cable ties and labelled. Manila tags identifying the borehole and sample numbers were placed inside the inner bag (with the sample material) and also attached to the cable tie around the neck of the inner bag. Bagged samples were stored in a locked refrigerated container prior to transportation to the laboratory in a closed truck.

### 8.11.4. Percussion or Open Hole Drilling

Venmyn Deloitte is not aware of any recent percussion or open hole drilling having been conducted by CoAL at the Voorburg Section.

### 8.11.5. Down the Hole Geophysics / Wireline Logging

Downhole geophysical surveys were conducted on all the boreholes by a dedicated Weatherford geophysical logging unit. Heavy dependence is placed on the geophysical log and a borehole is not considered complete until a geophysical log has been generated. The geophysical logs are used as the basis for identifying, correlating and sampling the coal horizons. A basic suite of tools is run for dual density, natural gamma and calliper measurements.

### 8.11.6. Bulk Sampling

No bulk sampling has been carried out on the Voorburg Section, other than that associated with the LDD drilling discussed in Section 8.11.3.1.

### 8.11.7. Laboratory Analyses

All samples were sent to Inspectorate's SANAS accredited laboratory in Polokwane (No T0476).

#### 8.11.7.1. Sample Preparation and Analysis

The laboratories followed the ISO and SANAS standard set of tests and methods that are used for coal analyses by South African laboratories.

The ISO and South African National Standard (SANS) has a standard set of tests and methods that are used for coal analyses by South African laboratories. The standard method of coal sample preparation is summarised as follows:-

- receipt of the sample into the laboratory's electronic information management and sample tracking system;
- all coking coal samples are refrigerated at between 0°C - 6°C upon receipt;
- drying of sample. All drying oven temperatures do not exceed 40°C;
- measuring mass of sample;
- determining the relative density of the sample;
- crushing the sample to -25mm;
- screening out of the -0.5mm fraction for proximate, calorific value (CV) and total sulphur analysis;
- pulverising the -25mm+0.5mm sample;
- pulverised material split using a rotary splitter;
- carrying out the raw proximate, CV and total sulphur analysis;
- washing the -25mm+0.5mm fraction at client specified relative densities, usually at relative density intervals of 0.05 between 1.35 and 1.75, plus the sink fraction;
- drying and weighing each fraction;
- crushing and pulverising each fraction;

- conditioning each sample for one hour;
- carrying out the raw proximate, CV and total sulphur analysis for each fraction;
- automatically generating an electronic laboratory report which is emailed to the client;
- an official signed laboratory certificate reporting on the fractional and cumulative results is delivered to the client; and
- storing all excess sample material under refrigeration as per the client's requests.

The standard tests utilised by South African coal laboratories, in particular those of Inspectorate, are listed in Table 18, with those tests carried out on Voorburg's exploration samples indicated in the relevant column.

No standard or duplicate samples were submitted by CoAL for analysis and no repeat or laboratory cross checks were requested. This is not an uncommon practice in the South African coal industry in which reliance is often placed on the internal quality controls of the laboratories.

The laboratory performed proximate and CV analyses on the raw samples. Full washability testwork was also conducted from an RD = 1.35 to 1.70 in 0.05 intervals and from 1.70 to 2.00 in 0.10 intervals. The closely spaced intervals were utilised to obtain maximum information on the yields (and associated qualities) within the expected RD range for future processing.

In addition to the testwork described above, specific coking coal potential tests were undertaken including the measurement of the FSI.

The LDD samples are yet to be sent to the laboratory.

#### 8.11.7.2. Security

All samples were stored within a locked refrigerated container before despatch to the laboratories. Once at the laboratories, the samples were subject to the standard security measures of the respective laboratories.

#### 8.11.7.3. QA/QC

Laboratories are required to calibrate their coal analytical equipment daily and are also required to partake in round robin proficiency tests to ensure a high standard of results. All result reports are verified by the laboratory manager and any inconsistencies or variations about the laboratory's specifications are reanalysed. CoAL has specifically requested that the laboratories plot ash versus CV curves for all samples. Any samples with a correlation coefficient of less than 0.90 are reanalysed.

CoAL has validated all results in Sable$^{TM}$, by doing basic tests on cumulative results and checking of logs.

### 8.11.8. Database Management

#### 8.11.8.1. Data Acquisition and Validation

CoAL purchased both hard and electronic data copies of the original Iscor database from Exxaro in 2007. The borehole elevation coordinates were verified with the LIDAR results and found to be consistent.

The complete set of CoAL borehole results, i.e. lithology, collar and raw and washed laboratory results, is currently stored in an Access database along with the Iscor data and identified separately based upon borehole nomenclature.

The original borehole paper logs were captured into Sable and verified by the responsible geologist. All boreholes are presented graphically as well as plotted on plans for verification by the responsible geologist. Cross sections are plotted to confirm correlations. These are then imported directly into the Access database.

All laboratory results were received in MS Excel™ format and included into the Sable™ plots for each borehole. The laboratory results were also imported directly into the Access database to eliminate the possibility of typing errors.

**Table 18: Tests and Standards Performed by Laboratories on Coal Samples**

| TEST / REQUIREMENT | DETAIL | STANDARD/TEST METHOD | VOORBURG | JUTLAND | MOUNT STUART | GENERAAL | CHAPUDI | WIDLEBEES-THOEK |
|---|---|---|---|---|---|---|---|---|
| Sample Preparation | | ISO 13909-4 / ISO 18283 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Ash Content | | IAO 1171 | ✓ | ✓ | ✓ | ✓ | | ✓ |
| Volatile Matter | | ISO 562 | | ✓ | | ✓ | | ✓ |
| Mineral Matter | | By Analysis | | | | | ✓ | |
| Total Moisture | | ISO 589 | ✓ | ✓ | | ✓ | | ✓ |
| Calorific Value (Sulphur Correction) | | ISO 1928 | ✓ | ✓ | ✓ | ✓ | | ✓ |
| Ash Fusion Temperature | | ISO 540 | □ | ✓ | ✓ | | ✓ | |
| Total Sulphur | | ASTM D4239 | | | ✓ | ✓ | ✓ | ✓ |
| Ultimate | Carbon | ASTM D5373 ISO 609 | | | ✓ | | ✓ | |
| | Hydrogen | | | | ✓ | | ✓ | |
| | Nitrogen | ASTM 5373 | | | ✓ | | ✓ | |
| | Oxygen | By Difference | | | ✓ | | ✓ | |
| Forms of Sulphur | Pyritic Sulphur | ASTM D2492 | | | ✓ | | ✓ | |
| | Sulphate Sulphur | | | | ✓ | | ✓ | |
| | Organic Sulphur | By Difference | | | ✓ | | ✓ | |
| Chlorine | | ASTM D4208 | | | ✓ | | | |
| Phosphorous (P% in Coal) | | ISO 622 | | | | | ✓ | |
| Hardgrove Grindability Index | | ASTM D409 | | | ✓ | | ✓ | |
| Crucible Swelling Number | | ISO 501 | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Roga Index | | ISO 335 | ✓ | ✓ | ✓ | ✓ | | ✓ |
| Drop Shatter | | AS 4156.8 - 2007 | | | | | ✓ | |
| Wet and Dry Tumble Test | | AS 1456.1 - 1994 | | | | | ✓ | |
| Apparent Relative Density | | Water Displacement / ISO 1014 / AS 1038.23 - 2005 | ✓ | ✓ | ✓ | ✓ | | ✓ |

| TEST / REQUIREMENT | DETAIL | STANDARD/TEST METHOD | VOORBURG | JUTLAND | MOUNT STUART | GENERAAL | CHAPUDI | WIDLEBEES-THOEK |
|---|---|---|---|---|---|---|---|---|
| Float and Sink (Washability) | | ISO 7936 | | ✓ | | ✓ | | ✓ |
| Gray King Test | | ISO 502 | | | ✓ | | ✓ | |
| Relative Density (By Bottle) | | AS 1034.21.1.1 | | | | | ✓ | |
| Preparation of Sample for Petrographic analysis | | ISO 7404-2 | | | ✓ | | | |
| Maceral analysis | | ISO 7404-3 | | | | | ✓ | |
| Random Vitrinite reflectance | | ISO 7404-5 | ✓ | | ✓ | | ✓ | |
| Audibert-Arnu Dilatometer Test | | ISO 349:1975 | | | ✓ | | ✓ | |
| Geisler Fluidity Platometry | | ISO 10329 | | | ✓ | | ✓ | |
| Moisture Holding Capacity | | ISO 1018:1975 | | | | | ✓ | |
| Proximate Analysis | | ISO 17246:2010 | | ✓ | ✓ | ✓ | ✓ | ✓ |

The Access database is imported into Minex™ software for orebody modelling purposes. This software package has a series of automatic verification procedures including checking for physical data including overlapping intervals and missing intervals, etc. It also undertakes automatic quality verifications including increasing cumulative ash values, decreasing cumulative volatile values, totalling proximate analyses to 100%, etc. Any errors identified in Minex™ are investigated by the responsible geologist.

Venmyn Deloitte has randomly selected eight boreholes (four Iscor holes and four CoAL boreholes) from the database and independently cross checked the data with the original paper logs. No errors were identified.

Venmyn Deloitte has also performed independent validations on the input parameters of the modelling database using Geosoft Target. These included checking the “from” and “to” and collar information files. Venmyn Deloitte identified that the lithology intersections in two boreholes (namely, B502008 and VG503010) were greater than the end of hole (EOH) measurements recorded in the collar file. When checked against the original logs it was clear that the incorrect number had been used in the collar file and the lithology file was correct. Since the lithology file was found to be correct the error would not have had a negative effect on the modelling.

### 8.11.8.2. Database Management

The Access database for the Voorburg Section area currently contains data from Iscor and CoAL boreholes. The Access database is managed and maintained by CoAL’s Competent Person, Mr. J. Sparrow (Pr.Sci.Nat.). Backups are stored at CoAL’s head office in Johannesburg.

## 8.12. Orebody Modelling and Results

The orebody model on the Voorburg Section has been prepared by Mr. J. Sparrow (Pr.Sci.Nat.), CoAL's Competent Person. The model was prepared in Minex™ Software. The model takes into account all available historical and recent drilling and other geological information as of the 29th February 2012. It does not include the four Rio Tinto boreholes and therefore has not been extended across all the farms. The model also does not include the 2012 LDD boreholes, as the logging and sampling was not yet complete.

Venmyn Deloitte has reviewed the model and interviewed Mr. J. Sparrow (Pr.Sci.Nat.) concerning his methods of modelling. Venmyn Deloitte has also independently plotted the graphical distribution of the boreholes and morphology of the seams in Geosoft Target and Micromine and found the results to be satisfactory. Venmyn Deloitte is satisfied with the integrity and results of the model.

Both CoAL and Venmyn Deloitte have a high level of confidence with respect to the current model and the associated resource estimates.

The upper surface of the model was sourced from the DTM and is presented in Figure 18. The extent of the available DTM does not extend across all the farms. The low elevation associated with the Sand River is clearly evident in the centre of the modelled area.

The model of the coal is limited in the north by the fault and in the south by the suboutcrop of the coal seams. It must be noted that the model was limited in the east, along the farm boundary of Cavan 508MS, due to the lack of drilling on this farm. Similarly, the model was limited by the extent of the drilling towards the west, along the eastern boundary of the farm Ancaster 501MS. It is expected that additional drilling along strike will identify further coal in both a westerly and easterly direction.

Both the physical and quality parameters of the various seams were modelled. Grids with a 25m mesh were estimated using Minex's™ general purpose gridding function, using a 3km search radius. The model of the physical parameters of the seam was cut along any significant structures, whilst the quality parameters were modelled across it. All physical and quality parameters were plotted and visually inspected to ensure they were acceptable for geological interpretation.

### 8.12.1. Physical Results

The physical parameters of the elevation, in metres above sea level, and the depth from surface of the Upper, Middle Upper, Middle Lower, Bottom Upper, and Bottom Lower seams floor and roof were modelled. The Bottom Seam is predominantly mudstone and therefore has not been included in the modelling or the resource estimation.

The seam thicknesses were modelled, by CoAL, for each and this was used as the basis for the calculation of the resource volumes. Although all these parameters were modelled, only the respective seam floor elevations, depths from surface and the seam thicknesses results are presented below. Due to the availability of boreholes, the model extends from Ancaster 501MS in the west to Voorburg 503MS in the east.

Physical models have been generated for depth, seam thickness, and seam qualities for each of the coal seams modelled. Descriptions and plots of these parameters are detailed in the sections to follow.

#### 8.12.1.1. Seam Floor Elevation

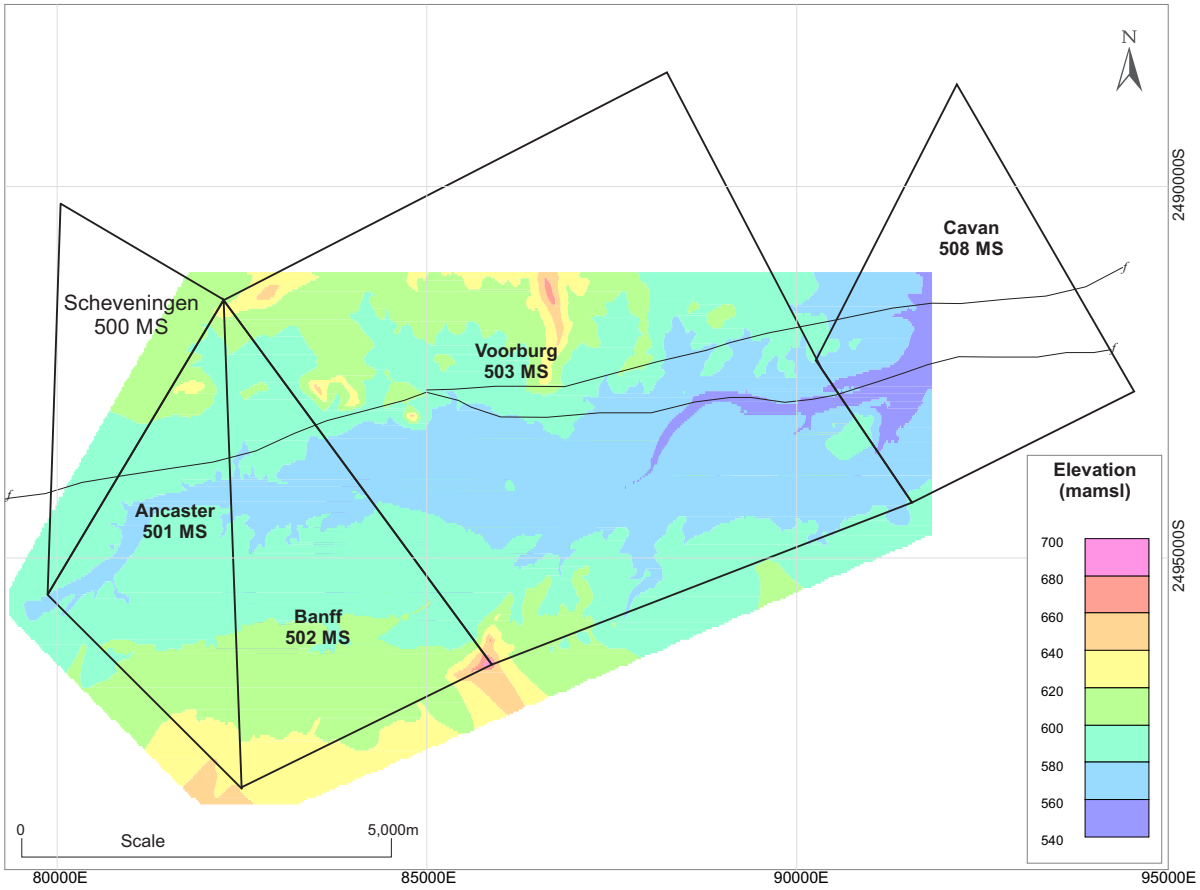
The Bottom Lower Seam floor elevation has been modelled, by CoAL, in order to identify any abrupt elevation changes which would indicate the presence of faulting and also to identify the dip across the project area. The variations in seam floor elevations are presented in Figure 18.

This figure clearly illustrates that the coal seams dip towards the north, with the shallowest part of the basin located in the south. No faults within the modelled areas are evident as changes in elevation are continuous and steady.

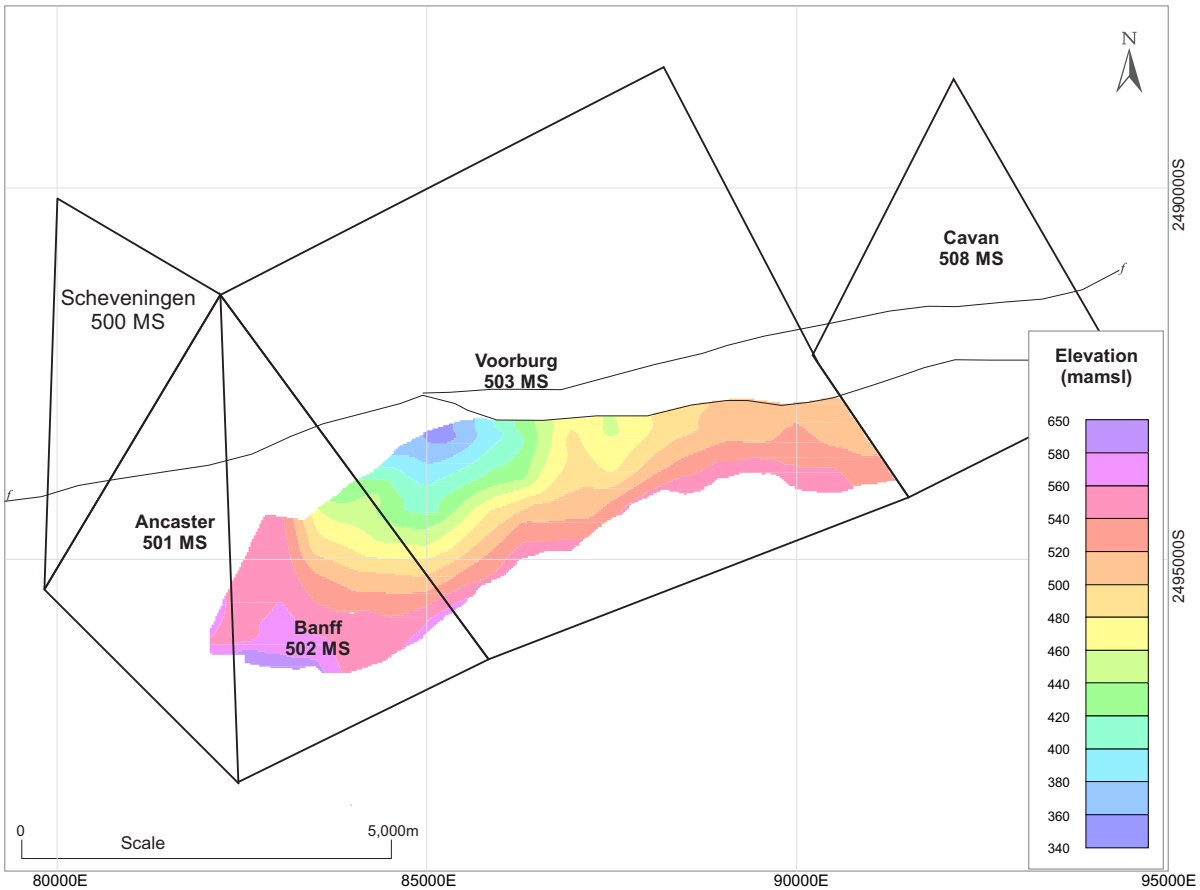
VenmynDeloitte. Coal of Africa

## VOORBURG SECTION – SURFACE CONTOURS AND BOTTOM LOWER SEAM FLOOR ELEVATION

### TOPOGRAPHY




### BOTTOM LOWER SEAM FLOOR ELEVATION




Source: Coal of Africa

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#### 8.12.1.2. Depth from Surface

The depth of the seams from surface will have an impact on the mining method (opencast versus underground) and the extraction safety factors and pillar sizes for an underground operation. The seam floor depth from surface for each of the seams is presented in Figure 19.

The coal seams vary in depth from surface from a minimum of less than 20m in the west to a maximum of almost 240m for the Bottom Lower Seam in the north.

The figure clearly indicates that the coal can be mined using opencast methods from the suboutcrop in the south. The dip of the coal towards the north would necessitate underground mining methods on selected seams toward the northern limit of the project area as the depth from surface increases.

To further illustrate this, Figure 20 presents the calculated strip ratios including all economic seams. The areas with stripping ratios less than 7bcm:t coal have the potential to be mined using opencast method. However, the majority of the project area has a stripping ratio of less than 4bcm:t coal.

#### 8.12.1.3. Seam Thickness

The seam thickness contours or isopachs are presented in Figure 21. The seams vary in thickness from 0.5m to a maximum of 6.0m in the case of the Upper and Middle Upper seams. The Middle Lower and Bottom Upper seams are generally thinner than the other seams.

A circular area in the centre of the project where the Middle Lower Seam is less than 0.5m thick is identified in Figure 21. This figure also identifies an area to the west, on the farm Banff 502MS where all seams are present with widths less than 0.5m.

### 8.12.2. Quality Results

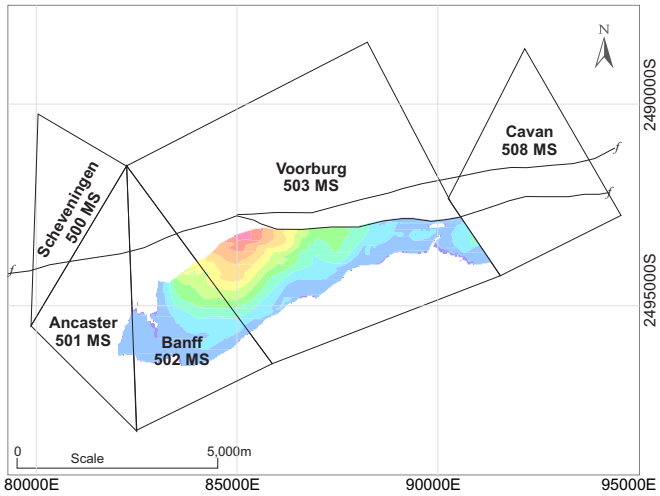
Both raw and washed quality results were available for the CoAL boreholes and included the raw proximate (ash, volatile, fixed carbon, moisture and sulphur) and the raw CV. The historical boreholes, however, were not analysed raw, but were washed and analysed at a density of 1.40 only. Therefore, the most appropriate and common parameter available for both sets of data are the analyses of a washed product at this relative density. This approximately equates to a 12% ash product. Due to this, only the washed proximate and CV product results were modelled for resource purposes and are presented below. The product yield at this RD is also presented.

#### 8.12.2.1. Coking Potential

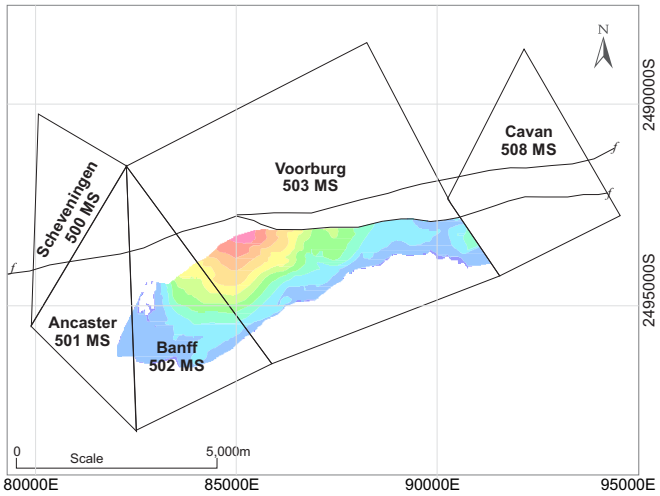
Coke is manufactured from the carbonisation of prime coking coals. Carbonisation is performed to make a smokeless fuel for domestic/industrial applications (domestic coke); to provide a coke for other processes such as in blast furnaces (metallurgical or foundry coke) or to produce a combustible gas. Raising the temperature of coking coals, in the absence of oxygen, results in their devolatolisation and the formation of a solid fuel, coke, which has a porous structure. Two types of coke can be made, hard and soft with the difference being a result of the temperature of carbonisation. Soft coke is carbonised at temperatures of 600°- 700°C to produce a product with a reduced volatile content of the order 9% and hence better combustion characteristics. Hard coke is carbonised at higher temperatures, resulting in devolatolisation and loss of porosity. Combustion characteristics are reduced making these cokes only suitable for more specialist purposes such as manufacture of carbon electrodes or in blast furnaces.

## VOORBURG SECTION – SEAM DEPTHS FROM SURFACE

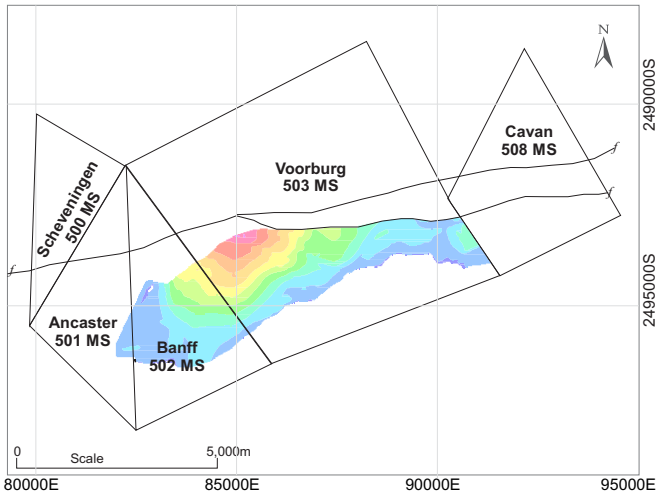
### UPPER SEAM

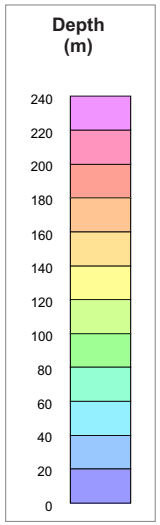



### MIDDLE SEAM

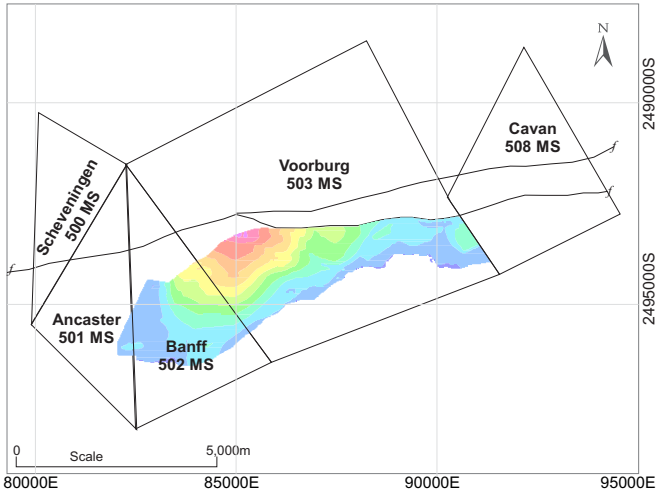



### MIDDLE LOWER SEAM

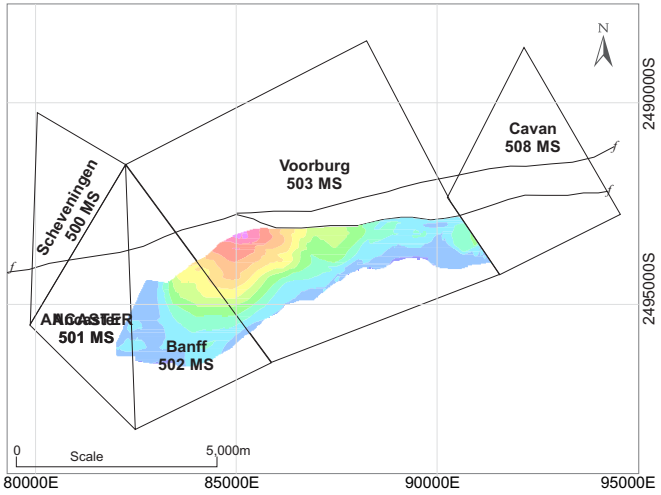



### BOTTOM UPPER SEAM




### BOTTOM LOWER SEAM

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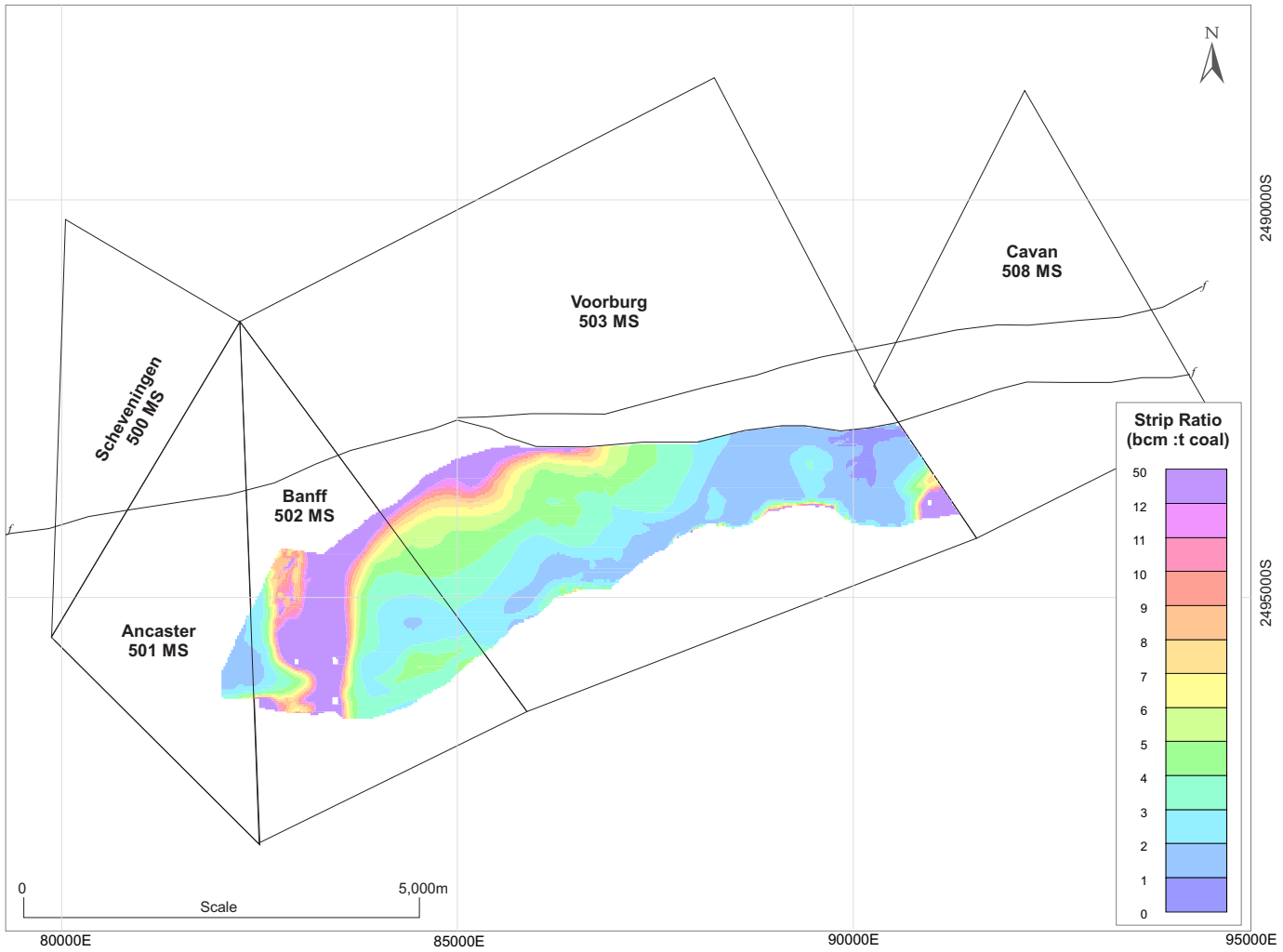
Coal of Africa

Figure 19

## VOORBURG SECTION - STRIP RATIO INCLUDING ALL ECONOMIC SEAMS




Source: Coal of Africa
VMD1971_CoAL GSP CPR_2015

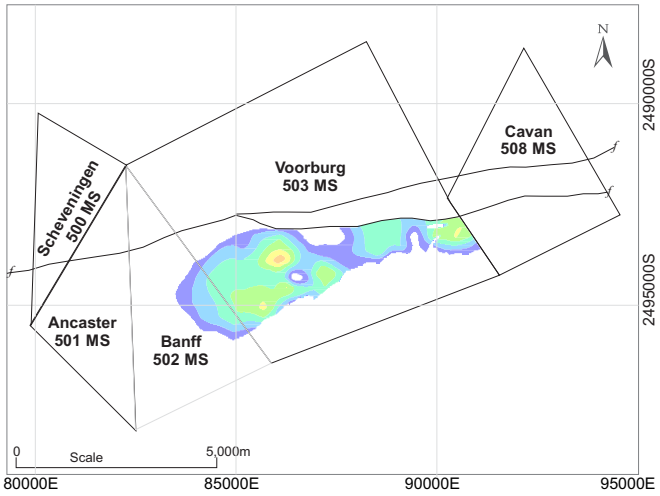
Venmyn Deloitte.

Coal of Africa

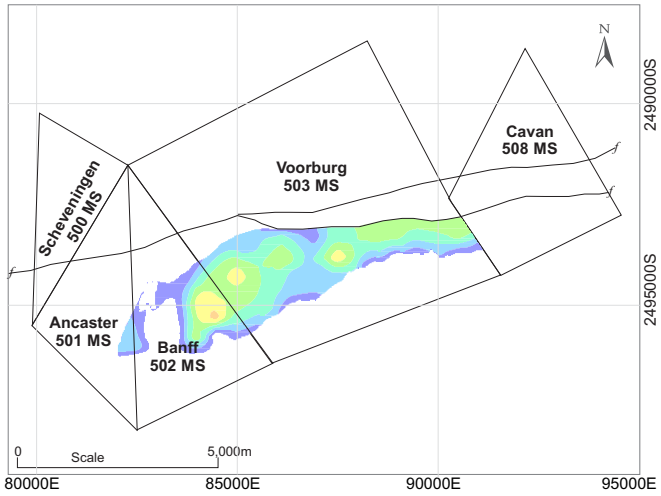
Figure 20

## VOORBURG SECTION – ISOPACH CONTOURS

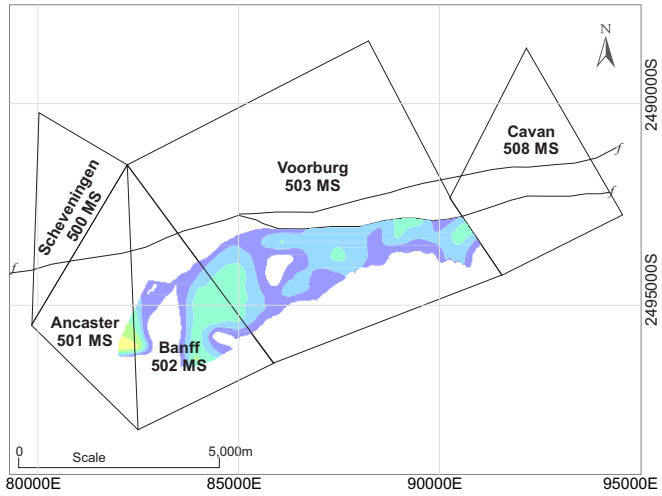
### UPPER SEAM



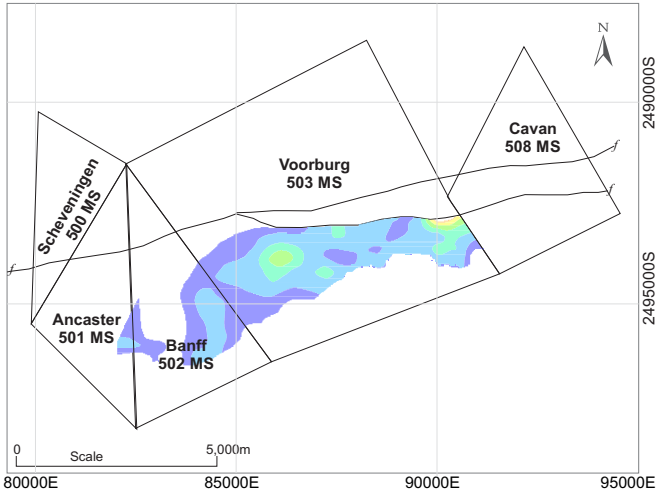

### MIDDLE SEAM



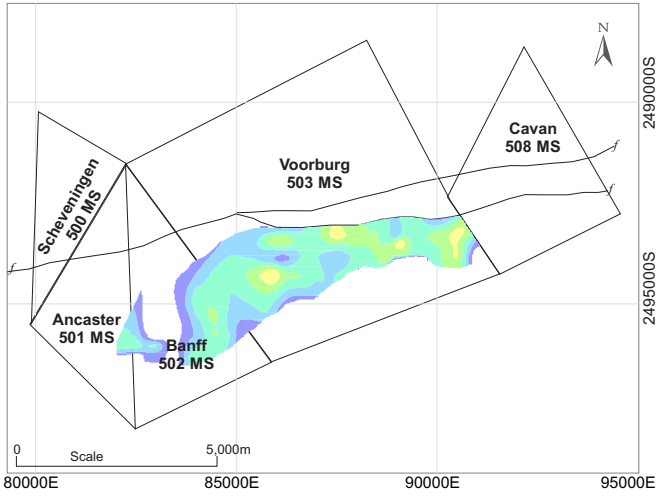

### MIDDLE LOWER SEAM

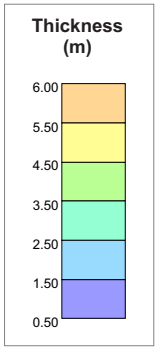



### BOTTOM UPPER SEAM




### BOTTOM LOWER SEAM




Source: Coal of Africa
VMD1971_CoAL GSP CPR_2015

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Coal of Africa

Figure 21

A unique set of properties are required for the production of coking coal. As a coking coal is heated, it passes through a state where it becomes plastic, softening and swelling before it re-solidifies. The residue is a cellular coke mass. Coals which do not cake simply form a non-coherent or weakly coherent char. A number of tests have been devised to classify the caking properties of coals, including the Roga test, Free Swelling Index and Gray - King test. Caking behaviour is critical to coke production as a successful coke must be strong and not powdery. Other tests assess additional parameters important to coke such as the vitrinite content.

In order to identify the coking potential of a coal, a specific suite of tests can be carried out in addition to the regular laboratory tests. These parameters are graphically presented in Figure 22 as ranges with the optimal coking potential for each highlighted in red. The typical results for each of CoAL's projects (for which results are available) with coking potential is also indicated on the diagram.

These tests include the measurement of the following, in order of general importance:-

- Free Swelling Index (FSI). This is used to measure a coal's swelling properties when heated under prescribed conditions without physical restrictions. The FSI is obtained by heating prepared samples of coal over a burner and comparing the resultant coke button to a series of standard profiles. The FSI is useful in determining the plastic properties of coal, and as an indication of the coal's suitability for use as a coking coal. Industry standard FSI figures range from 0 (no increase in size) to 9 (greatest increase in size). FSI can be affected by moisture content, weathering, and the consistency of the pulverized sample (Source: SGS);
- Roga Index (RI). The simplest indicator for the potential of a coal for caking purposes in terms of the mechanical strength of the coke obtained by carbonisation. A coal sample is combined with a standard measure of anthracite and heated to form a button. The resultant button is tested for mechanical strength by being rotated in a drum for a specific time. There is a correlation between RI and FSI. Measured with the index varying from 0 – 100, with figures greater than 45 having maximum strength and being comparative to an FSI of >4;
- Gray – King Test (G index). The Gray - King Test is essentially the same as the FSI except the residue button is compared with a number of previously made standard cakes. The result is assigned a letter ranging from A (no coking properties) to G (where it has maintained its volume and form as a fused product). If it swells beyond its volume it is said to have superior coking qualities and is further tested and designated as coke type G1 – G11;
- vitrinite content (%). Vitrinite is one of the primary organic components of coal and is derived from the cell-wall material or woody tissue of the plants from which coal was formed. It has a shiny or vitreous appearance resembling glass. The vitrinite content provides an indication of the rank of the coal;
- Coke Strength After Reaction (CSR) is used to test the "hot" strength of coke. It is used to obtain an indication of coke performance and is one of the major considerations when blending coking coal for export sale. The test involves heating a 200g sample of –21mm to +19mm particle range coke at 1,100 °C under 1 atmosphere pressure of carbon dioxide for 2 hours.

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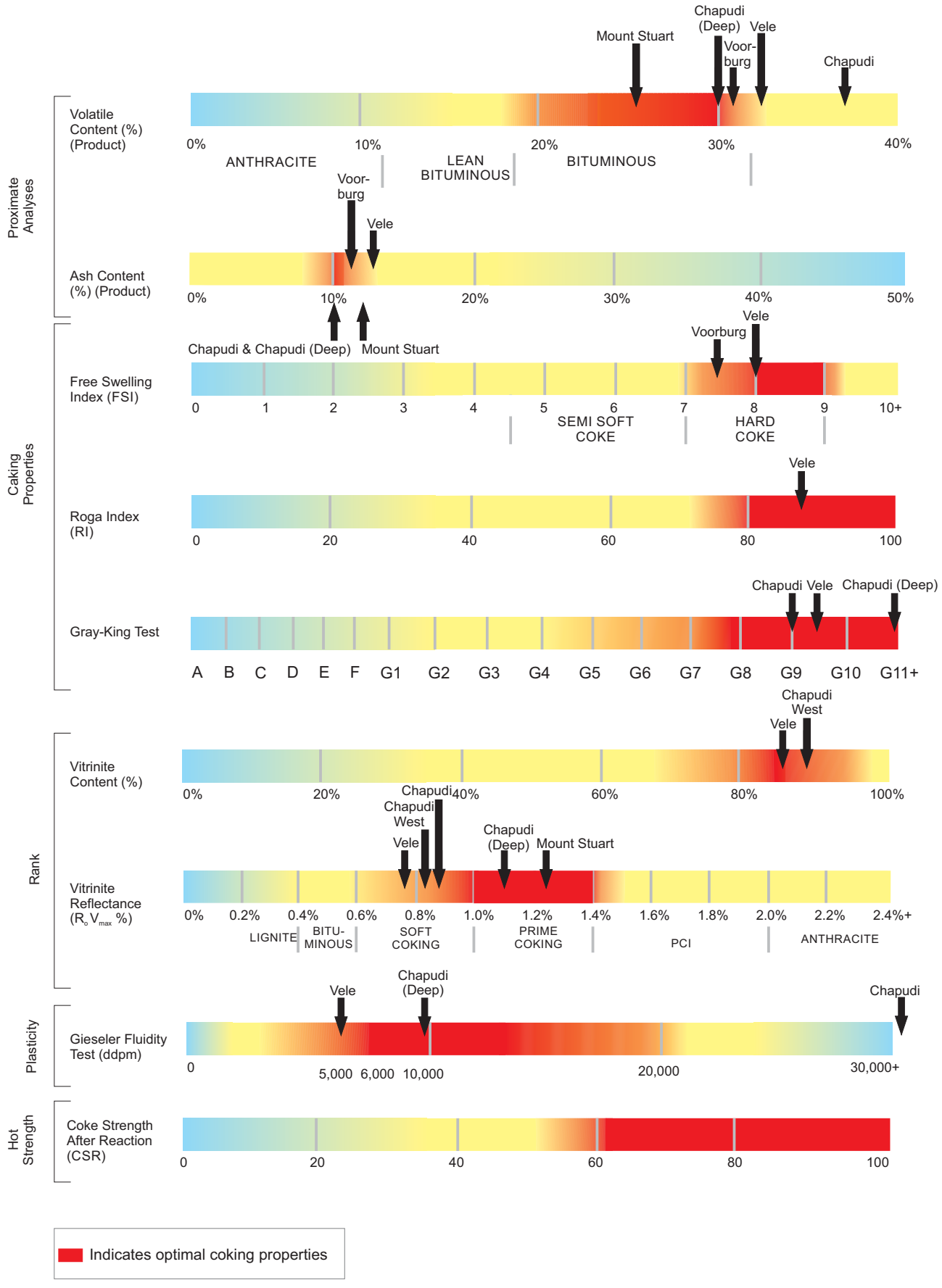
## CoAL'S COKING COAL PROJECTS SHOWN IN RELATION TO SELECTED COKING COAL TEST RESULT OPTIMAL RANGES




Source: Coal of Africa

VMD1971_CoAL GSP CPR_2015

The coke is preheated and cooled under nitrogen and the weight loss during reaction is measured. The percentage weight loss is known as the reactivity (CRI). The reacted coke is then placed in a drum and subjected to 600 revolutions in 30 minutes. The percent of carbon material removed from the drum that is +10mm is known as the CSR;

- vitrinite reflectance (RoVmax). There is a correlation between carbon content and reflectance and this parameter is used to precisely determine the thermal maturity, or rank, of coal. This is measured against the mean maximum reflectance of vitrinite in oil (RoVmax) to determine the rank; and
- Gieseler Plastometer or Fluidity Test. Used to determine the plasticity range of coals including the temperature at which the initial softening, maximum fluidity and resolidification occurs. The maximum fluidity value is measured in dial divisions per minute (ddpm) and are key factors in determining which blends of coals will be optimal for coking. (Source: SGS)

Coking coals can be classified by their volatile content. This will determine whether the coal can be classified as hard or soft coking coal potential. In addition, the coal is required to have a low ash content, i.e. between 8% -10%, although the South African market accepts coals of 12% ash.

The coking potential of the Voorburg Section is good and the project has the potential to produce a semi-hard coking coal (Figure 22).

The FSI varies between 5.0 – 7.0 for the recent CoAL boreholes at RD=1.40. The historical Iscor boreholes exhibit ranges from 6.5 – 9.0, with an average of 8.2 at RD=1.40. One Iscor borehole on Banff 502MS (BF4) does, however, report FSI results in the order of 1.0.

The RI was not measured by CoAL, but the Iscor results reveal RI ranges of 78 – 94, with an average of 89 at RD=1.40. A single sample yielded a result of 66.

No other specific coking coal tests were carried out.

#### 8.12.2.2. Washed Calorific Value

No information is available on CV for the historical boreholes. Therefore this parameter has not been modelled, by CoAL, or plotted. It must be noted that CV is not a critical parameter for coking coal and therefore this omission is not material to the assessment of the coal and declaration of resources.

#### 8.12.2.3. Washed Ash

The modelled product ash content of the various seams at Voorburg Section for a wash at an RD = 1.40 is graphically presented in Figure 23. Due to the fact that a product coal is presented at a fixed RD, the natural variability of the ash content of the raw coal is not clearly portrayed. The coal therefore varies in a small range, in this case between 5% and 15% for the various seams.

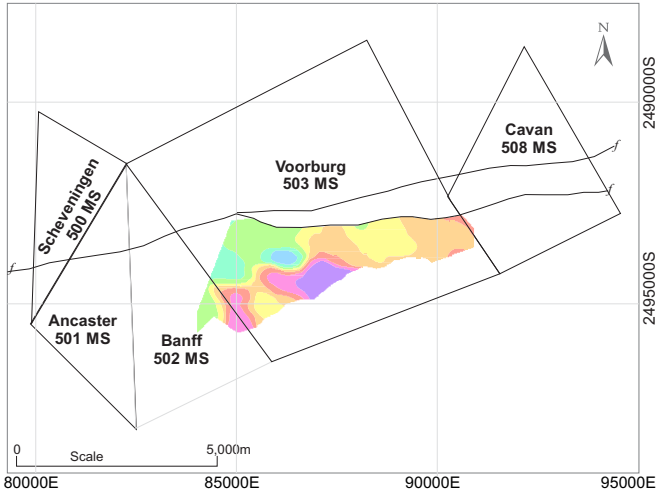
The diagram provides evidence that the coal can produce the required ash content of between 8% - 12%, with the average ash content for the project's MTIS being 11% at an RD=1.40.

#### 8.12.2.4. Washed Volatiles

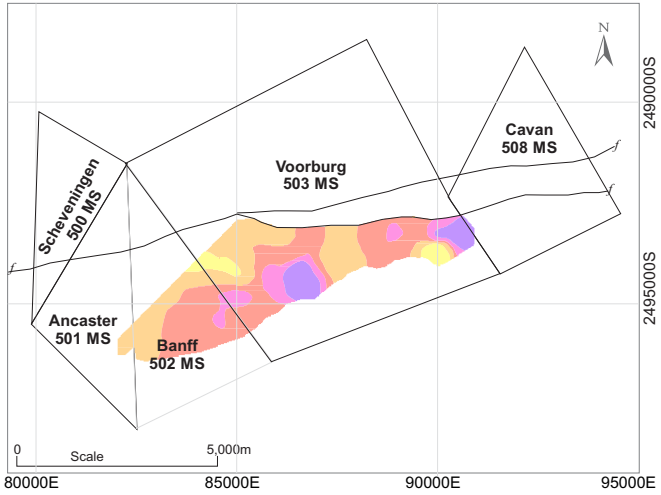
The modelled product volatile content of the various seams at Voorburg for a wash at an RD = 1.40 is graphically presented in Figure 24.

## VOORBURG SECTION – THEORETICAL PRODUCT ASH CONTOURS (@RD=1.40)

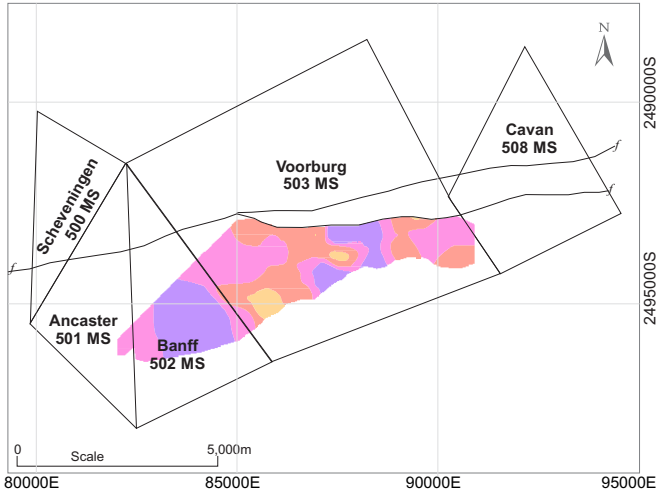
### UPPER SEAM

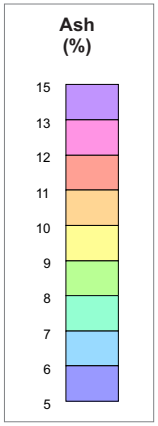



### MIDDLE SEAM

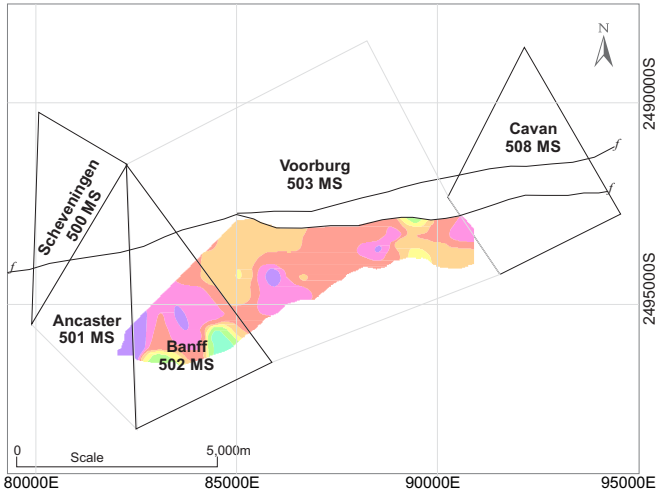



### MIDDLE LOWER SEAM




### BOTTOM UPPER SEAM




### BOTTOM LOWER SEAM

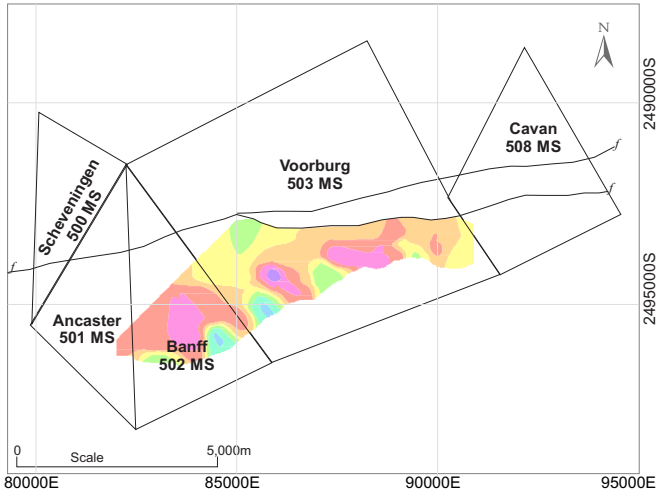



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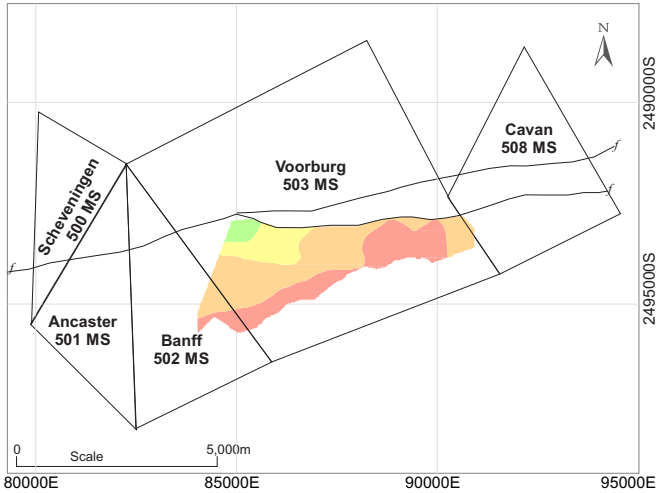
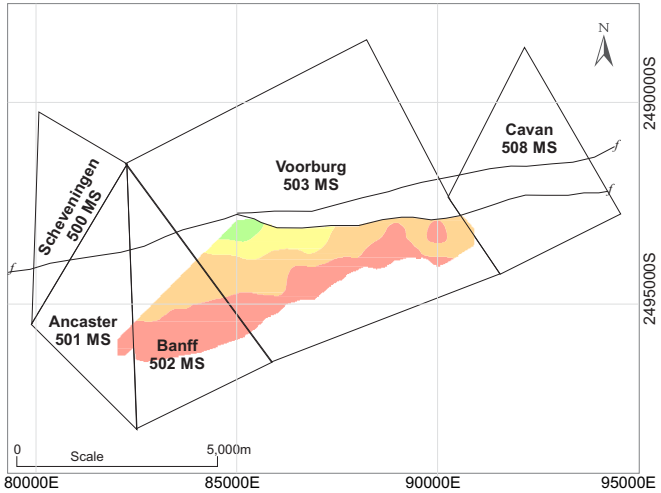
Figure 23

## VOORBURG SECTION – THEORETICAL PRODUCT VOLATILE CONTOURS (@RD=1.40)

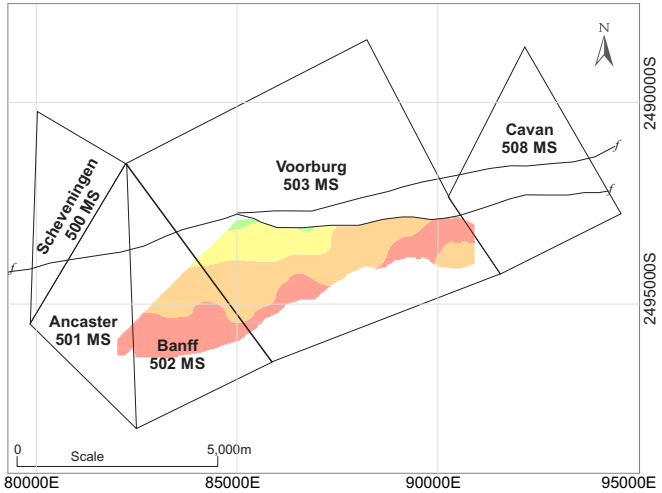
### UPPER SEAM



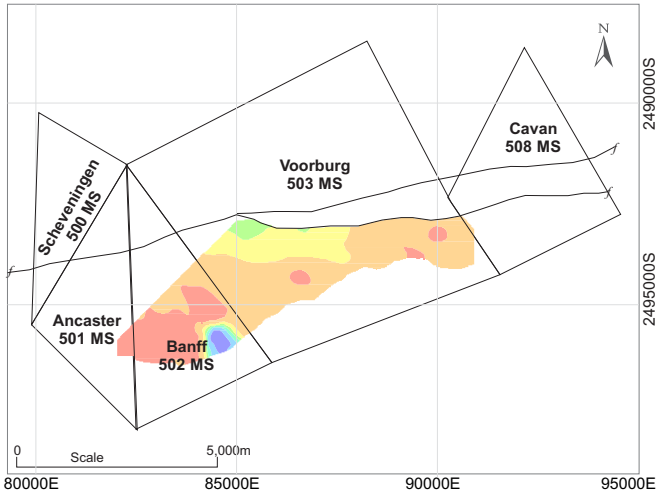

### MIDDLE SEAM



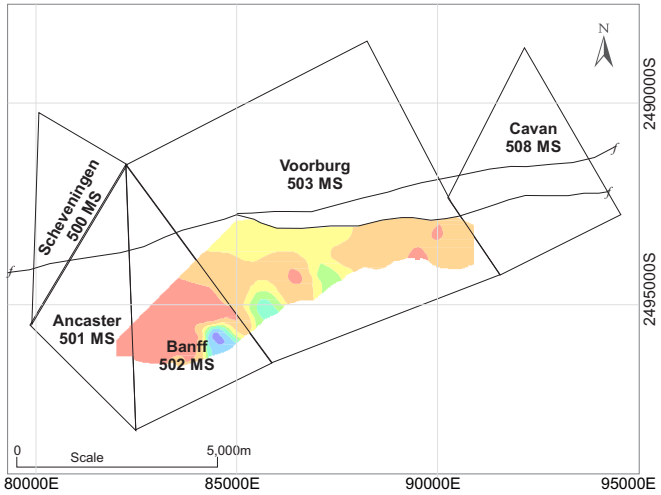

### MIDDLE LOWER SEAM

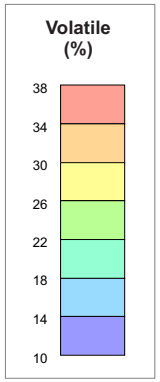



### BOTTOM UPPER SEAM




### BOTTOM LOWER SEAM



Although the plot presents a product volatile content, the trends in the inherent volatile content of the coal are evident. The washed volatile content varies between 10% and 38% for the various seams. A clear trend of increasing volatile content to the south for the Upper, Middle Upper and Middle Lower seams is shown in Figure 24. The Bottom Upper and Bottom Lower seams show an increasing volatile content trend towards the southeast, with low volatile coal being present near the suboutcrop.

The average volatile content for the project's MTIS is 32% at RD=1.40. This means that the Voorburg Section has the potential to produce a semi-hard coking coal.

#### 8.12.2.5. Potential Yields

The washability of the coal was tested at an RD = 1.40 which roughly equates to a 12% Ash product coal, as stated above. The average ash content for the project is 11% at this wash density. The theoretical yields of the various seams are graphically presented in Figure 25.

The yields vary widely, between 0% and 55% as indicated in Figure 25 which is a function of the relative percentage of shale or mudstone within the coal seams. All seams portray these highly variable yields, with the Upper Seam having the lowest average yields.
The average yield on Banff 502MS is significantly higher (37%) than the average for the remainder of the Voorburg Section (27%).

## 8.13. Coal Mining

Due to the stage of development of the Voorburg Section, no investigations have been carried out, by CoAL, on the mining of the deposit. However, upon considering the depth from surface of the coal zones, any future mining is expected to initially be opencast, possibly followed later by underground methods on selected seam horizons only. Opencast mining to a maximum depth of 200m has been utilised for the purposes of the declaration of MTIS resources. This is the economic depth currently being used on CoAL's nearby Makhado Project. The stripping ratios are graphically portrayed in Figure 20.

Details on mining methods and recoveries will be investigated during a PFS on the project.

## 8.14. Coal Processing

The Voorburg Section coal is most likely to yield a coking coal product. This product is briefly discussed in Section 8.12.2.5. No details are currently available on the envisaged processing plant. This study will be undertaken as part of a PFS.

## 8.15. Coal Market

The indications are that the Voorburg Section product will be a semi-hard coking coal, based on current geological data and plant assumptions. There are currently no contracts in place for the sale of this coal.

## 8.16. Previous Resource Statement

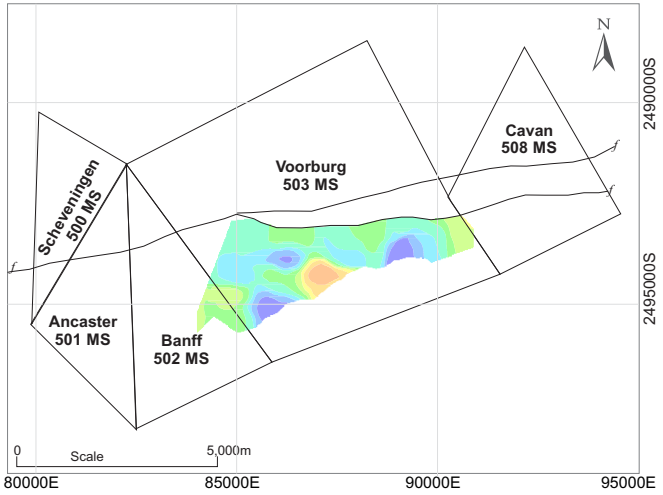
A Coal Resource was declared as at 29 February 2012 in the CPR entitled "Independent Competent Persons' Report on Certain Coal Assets Within the Soutpansberg Coalfield of Coal Of Africa Limited". No additional changes have been made by CoAL to the geological model or resource estimation for the Voorburg Section since the 2012 CPR.

## 8.17. Current Resource Statement

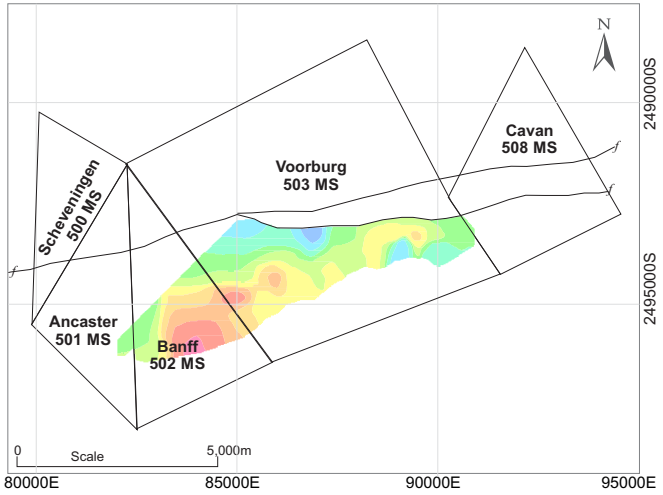
The 2012 updated Coal Resources for the Voorburg Section reflected the 'expanded' Voorburg Section as a consequence of the Soutpansberg Properties Acquisition Transaction (Section 6.3), and the addition of the Coal Resources on the farm Banff 502MS to the previously reported coal resources in the 2011 CPR. No changes have been made to the Coal Resources since 29 February 2012.

## VOORBURG SECTION – THEORETICAL PRODUCT YIELD CONTOURS (@RD=1.40)

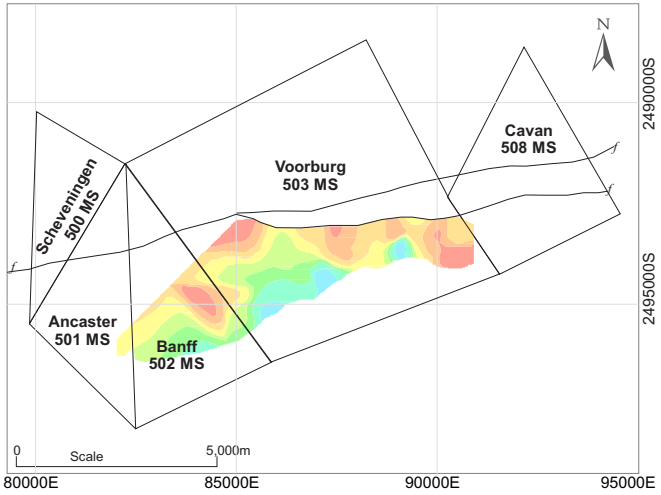
### UPPER SEAM

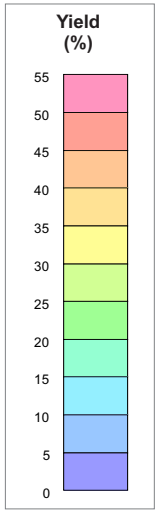



### MIDDLE SEAM

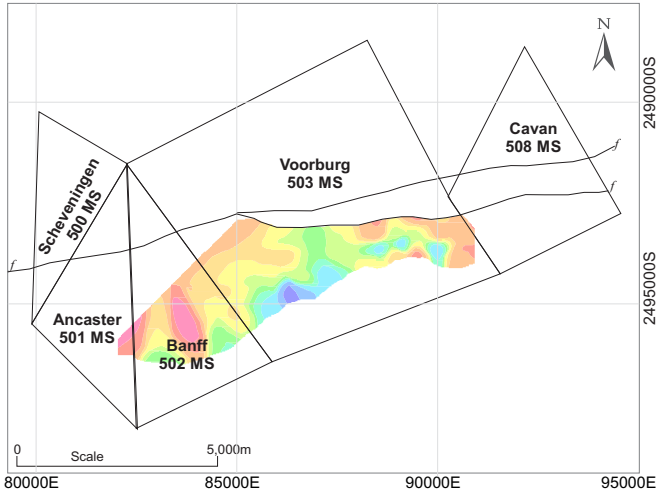



### MIDDLE LOWER SEAM




### BOTTOM UPPER SEAM




### BOTTOM LOWER SEAM

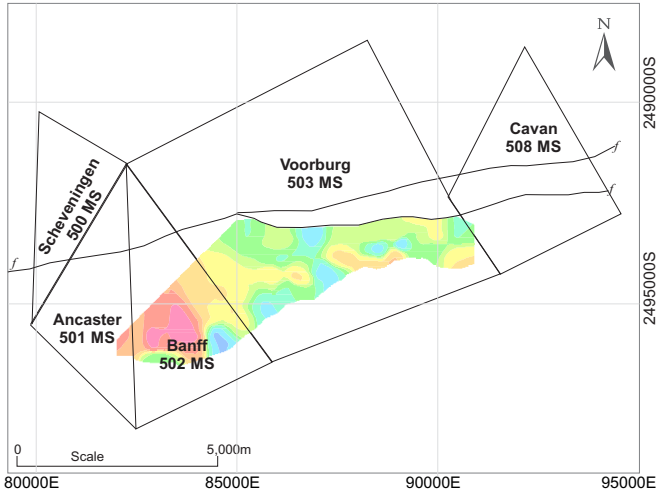



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Figure 25

The Coal Resource for the Voorburg Section reported according to Jorc, as at 31 December 2015, was estimated and signed off by CoAL's Competent Person, Mr J Sparrow (Pr.Sci.Nat.), CoAL's Group Geologist. Venmyn Deloitte reviewed CoAL's procedures and considers the Coal Resource estimates and classification as prepared and declared by CoAL as reasonable and compliant with JORC.

The Coal Resource Statement for the Voorburg Section, is presented in Table 19 and the location of the Coal Resources in relation to the NOMRs boundary is illustrated in Figure 26.

### 8.17.1. Resource Classification

The classification, by CoAL, into the various resource categories is primarily based upon the relative spacing of points of observation with both quantitative and qualitative results. Venmyn Deloitte is confident, having reviewed the data, that the logging, sampling, data density and distribution are suitable for the Coal Resource estimation. The estimation of each of the parameters required for the reporting of coal resources is presented in the section to follow.

Resources have been categorised, by CoAL, as Measured, Indicated or Inferred according to observation point halos in accordance with JORC reporting standards. The resources have not been sub-divided into the proposed underground and opencast sectors. In order to classify the coal resources, a halo diagram is prepared using only the boreholes with quality and quantity results, as presented in Figure 27.

### 8.17.2. Input Parameters and Limits

The detailed Coal Resource Statement, by farm, is presented in Table 19. This table presents CoAL's input parameters, the calculations and limits used in a stepwise process to obtain the resultant resource tonnages and associated qualities.

#### 8.17.2.1. Volume

The volume of the seams were estimated, by CoAL, using the Minex$^{TM}$ model of the seam thickness, divided into the various farms or blocks.

#### 8.17.2.2. Density

The Minex$^{TM}$ modelled average raw density per resource block was used to calculate the tonnage from the volume. The raw density of every sample was either measured in the laboratory or back calculated from the shale density and the percentage of coal in the sample.

#### 8.17.2.3. Tonnage

The tonnage is calculated, by CoAL, on a block by block basis from the volume multiplied by the average raw density.

#### 8.17.2.4. Quality

Each of the quality parameters were modelled, by CoAL, in Minex$^{TM}$ and the average quality per farm is reported in the Coal Resource Statement.

#### 8.17.2.5. Losses and Limits

The following cutoffs or limits were applied, by CoAL, to the coal resources:-

- the limit of the NOPRs boundary;
- the limit of the coal seams in the north along the fault line;
- the limit of the occurrence of the coal seams in the south;
- no resources were classified on Cavan 505MS due to the paucity of drill holes on the farm and the proximity of the historical mining area;
- a minimum seam thickness limit of 0.5m was applied prior to the reporting of GTIS;

- geological losses of between 10 - 20% were applied prior to the reporting of TTIS. These losses take into account any unforeseen geological features, such as dykes and faults, which have not been identified in the drilling and which may have a negative impact on the coal resources;
- all coal with a volatile content of <20% was excluded;
- only opencast mining was considered for the derivation of MTIS. The maximum depth of opencast mining was set at 200m, which is the current depth of potential economic mining at the nearby Makhado Project; and
- mining layout losses of 2% were applied prior to the calculation of MTIS.

### 8.17.3. Differences Between Resource Statements

No additional changes have been made by CoAL since the Coal Resource statement of 29 February 2012 and 31 December 2015 to the geological model or resource estimation for the Voorburg Section.

## 8.18. Ore Reserve Statement

As a result of the current stage of development of the Voorburg Section, no Coal Reserves have yet been declared by CoAL. Coal Reserves can only be declared once a mining plan has been prepared. This will be undertaken, by CoAL, during the next stage of development of the project i.e. at Pre-feasibility Stage.

**Table 19 : Voorburg – Coal Resource Statement (29 February 2012) at Minimum 0.5mm Seam Thickness, CoAL**

**RESOURCE CALCULATED AT 0.5mm MINIMUM SEAM THICKNESS**

| FARM | RESOURCE CATEGORY | SEAM | AVE WIDTH (m) | COAL RAW RD (t/m) | GROSS TONNES IN SITU | GEOL. LOSSES (%) | TOTAL TONNES IN SITU | AIR DRIED WASHED QUALITIES @ RD = 1.4 | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | YIELD (%) | CV (MJ/kg) | ASH (%) | VOL (%) | FIXED CARBON (%) | SULPH. (%) | MOIST. (%) |
| Voorburg | Measured | Upper | 3.21 | 2.02 | 16,321,018 | 10.00 | 14,688,900 | 19.64 | | 10.04 | 32.57 | 56.75 | 1.15 | 0.64 |
| | | Middle Upper | 3.26 | 1.94 | 21,621,666 | 10.00 | 19,459,400 | 28.46 | | 11.57 | 32.81 | 55.05 | 1.24 | 0.57 |
| | | Middle Lower | 2.04 | 1.92 | 12,410,134 | 10.00 | 11,169,100 | 34.65 | | 12.07 | 32.33 | 54.89 | 1.18 | 0.72 |
| | | Bottom Upper | 2.06 | 1.87 | 16,890,762 | 10.00 | 15,201,600 | 30.31 | | 11.33 | 31.86 | 56.07 | 1.09 | 0.73 |
| | | Bottom Lower | 3.27 | 1.85 | 27,120,868 | 10.00 | 24,408,700 | 26.51 | | 10.80 | 31.41 | 56.42 | 0.99 | 0.71 |
| | **TOTAL/AVERAGE MEASURED RESOURCES** | | **2.75** | **1.91** | **94,364,448** | **10.00** | **84,927,700** | **27.52** | | **11.11** | **32.12** | **55.90** | **1.12** | **0.67** |
| | Indicated | Upper | 2.57 | 2.03 | 23,657,570 | 15.00 | 20,108,000 | 16.99 | | 9.98 | 32.44 | 56.81 | 1.13 | 0.80 |
| | | Middle Upper | 2.79 | 1.96 | 25,033,496 | 15.00 | 21,278,000 | 27.36 | | 11.44 | 32.33 | 55.53 | 1.27 | 0.71 |
| | | Middle Lower | 1.62 | 1.91 | 15,624,062 | 15.00 | 13,280,000 | 32.09 | | 12.07 | 31.27 | 55.90 | 1.14 | 0.77 |
| | | Bottom Upper | 1.81 | 1.87 | 15,432,803 | 15.00 | 13,117,000 | 30.40 | | 11.31 | 31.09 | 56.85 | 1.02 | 0.75 |
| | | Bottom Lower | 2.73 | 1.84 | 23,312,932 | 15.00 | 19,815,000 | 25.26 | | 10.11 | 29.39 | 55.77 | 0.86 | 0.70 |
| | **TOTAL/AVERAGE INDICATED RESOURCES** | | **2.29** | **1.92** | **103,060,863** | **15.00** | **87,598,000** | **25.68** | | **10.88** | **31.34** | **56.13** | **1.09** | **0.74** |
| | Inferred | Upper | 1.79 | 1.97 | 4,827,979 | 20.00 | 3,860,000 | 19.31 | | 10.32 | 32.47 | 56.47 | 1.10 | 0.79 |
| | | Middle Upper | 2.15 | 1.95 | 4,715,050 | 20.00 | 3,770,000 | 26.22 | | 11.07 | 32.57 | 55.82 | 1.14 | 0.55 |
| | | Middle Lower | 1.38 | 1.93 | 2,142,872 | 20.00 | 1,710,000 | 32.24 | | 12.30 | 30.50 | 56.66 | 1.10 | 0.57 |
| | | Bottom Upper | 1.33 | 1.86 | 1,495,843 | 20.00 | 1,190,000 | 32.08 | | 11.01 | 30.65 | 57.59 | 0.91 | 0.60 |
| | | Bottom Lower | 2.07 | 1.82 | 2,321,918 | 20.00 | 1,850,000 | 28.53 | | 9.97 | 30.63 | 59.09 | 0.80 | 0.58 |
| | **TOTAL/AVERAGE INFERRED RESOURCES** | | **1.78** | **1.92** | **15,503,662** | **20.00** | **12,380,000** | **25.81** | | **10.84** | **31.78** | **56.80** | **1.05** | **0.64** |
| | **TOTAL/ AVERAGE VOORBURG** | | **2.42** | **1.92** | **212,928,973** | **13.00** | **184,905,700** | **26.53** | | **10.98** | **31.74** | **56.70** | **1.10** | **0.70** |
| Ancaster 501MS | Measured | Bottom Upper | 1.37 | 1.83 | 200,203 | 10.00 | 180,100 | 48.86 | | 14.79 | 35.72 | 48.87 | 0.99 | 0.29 |
| | | Bottom Lower | 2.49 | 1.86 | 388,168 | 10.00 | 349,300 | 44.03 | | 11.28 | 35.50 | 53.67 | 0.98 | 0.39 |
| | **TOTAL/AVERAGE MEASURED RESOURCES** | | **1.95** | **1.85** | **588,371** | **10.00** | **529,400** | **45.67** | | **12.47** | **35.57** | **52.04** | **0.98** | **0.36** |
| | Indicated | Bottom Upper | 1.34 | 1.83 | 397,472 | 15.00 | 337,000 | 50.43 | | 14.94 | 35.49 | 48.87 | 0.98 | 0.27 |
| | | Bottom Lower | 2.45 | 1.87 | 772,198 | 15.00 | 656,000 | 45.14 | | 11.39 | 35.38 | 53.67 | 0.99 | 0.37 |
| | **TOTAL/AVERAGE INDICATED RESOURCES** | | **1.91** | **1.86** | **1,169,670** | **15.00** | **993,000** | **46.94** | | **12.59** | **35.42** | **52.04** | **0.99** | **0.34** |
| | Inferred | Middle Upper | 1.70 | 1.84 | 885,837 | 20.00 | 700,000 | 24.48 | | 10.48 | 35.52 | 53.56 | 1.09 | 0.36 |
| | | Middle Lower | 3.83 | 1.73 | 1,963,917 | 20.00 | 1,570,000 | 32.17 | | 12.90 | 36.49 | 50.44 | 1.62 | 0.23 |
| | | Bottom Upper | 1.10 | 1.85 | 83,804 | 20.00 | 60,000 | 52.12 | | 14.81 | 34.52 | 49.80 | 0.95 | 0.25 |
| | | Bottom Lower | 2.08 | 1.85 | 158,387 | 20.00 | 120,000 | 44.16 | | 11.35 | 34.70 | 54.41 | 0.98 | 0.34 |
| | **TOTAL/AVERAGE INFERRED RESOURCES** | | **2.64** | **1.77** | **3,091,945** | **20.00** | **2,450,000** | **30.76** | | **12.18** | **36.08** | **51.56** | **1.42** | **0.27** |
| | **TOTAL/ AVERAGE ANCASTER** | | **2.33** | **1.80** | **4,849,986** | **18.00** | **3,972,400** | **36.79** | | **12.32** | **35.85** | **51.74** | **1.25** | **0.30** |

**Notes:**

Rounding down of tonnages to 100t; 1,000t and 10,000t for Measured, Indicated and Inferred, respectively.

**RESOURCE CALCULATED AT 0.5mm MINIMUM SEAM THICKNESS**

| FARM | RESOURCE CATEGORY | SEAM | AVE WIDTH (m) | COAL RAW RD (t/m) | GROSS TONNES IN SITU | GEOL. LOSSES (%) | TOTAL TONNES IN SITU | AIR DRIED WASHED QUALITIES @ RD = 1.4 YIELD (%) | CV (MJ/kg) | ASH (%) | VOL (%) | FIXED CARBON (%) | SULPH. (%) | MOIST. (%) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Banff 502MS | Measured | Upper | 2.37 | 2.02 | 1,715,648 | 10.00 | 1,544,000 | 24.05 | | 10.7 | 34.36 | 54.49 | 0.96 | 0.43 |
| | | Middle Upper | 4.19 | 1.91 | 2,901,002 | 10.00 | 2,610,900 | 42.60 | | 11.9 | 34.77 | 52.91 | 1.12 | 0.37 |
| | | Middle Lower | 2.85 | 1.93 | 1,989,230 | 10.00 | 1,790,300 | 38.43 | | 13.3 | 34.57 | 51.71 | 1.27 | 0.37 |
| | | Bottom Upper | 1.29 | 1.86 | 2,675,415 | 10.00 | 2,407,800 | 33.59 | | 11.1 | 29.22 | 59.23 | 0.91 | 0.44 |
| | | Bottom Lower | 2.31 | 1.88 | 5,201,044 | 10.00 | 4,680,900 | 32.36 | | 10.5 | 30.15 | 58.86 | 0.81 | 0.43 |
| | **TOTAL/AVERAGE MEASURED** | | **2.24** | **1.90** | **14,482,339** | **10.00** | **13,033,900** | **34.49** | | **11.3** | **32.01** | **56.24** | **0.97** | **0.41** |
| | Indicated | Upper | 1.71 | 2.02 | 1,952,024 | 15.00 | 1,659,000 | 25.35 | | 10.0 | 33.38 | 56.12 | 0.96 | 0.53 |
| | | Middle Upper | 2.73 | 1.90 | 6,092,697 | 15.00 | 5,178,000 | 44.80 | | 11.7 | 34.94 | 52.86 | 1.10 | 0.45 |
| | | Middle Lower | 2.21 | 1.96 | 5,347,964 | 15.00 | 4,545,000 | 30.66 | | 13.8 | 34.98 | 50.81 | 2.56 | 0.37 |
| | | Bottom Upper | 1.30 | 1.86 | 2,474,691 | 15.00 | 2,103,000 | 35.12 | | 11.0 | 29.04 | 59.43 | 0.87 | 0.46 |
| | | Bottom Lower | 2.19 | 1.89 | 4,935,943 | 15.00 | 4,195,000 | 33.06 | | 10.6 | 29.99 | 58.81 | 0.78 | 0.42 |
| | **TOTAL/AVERAGE INDICATED RESOURCES** | | **2.09** | **1.92** | **20,803,319** | **15.00** | **17,680,000** | **35.40** | | **11.7** | **32.93** | **54.83** | **1.37** | **0.43** |
| | Inferred | Upper | 1.58 | 1.92 | 1,767,701 | 20.00 | 1,410,000 | 23.75 | | 9.02 | 32.04 | 58.55 | 0.92 | 0.50 |
| | | Middle Upper | 2.38 | 1.90 | 4,731,549 | 20.00 | 3,780,000 | 33.45 | | 11.0 | 33.65 | 54.95 | 1.01 | 0.34 |
| | | Middle Lower | 2.03 | 1.86 | 5,570,655 | 20.00 | 4,450,000 | 37.04 | | 13.9 | 33.99 | 52.64 | 1.46 | 0.25 |
| | | Bottom Upper | 1.16 | 1.85 | 1,850,789 | 20.00 | 1,480,000 | 39.33 | | 11.8 | 33.44 | 54.09 | 0.78 | 0.35 |
| | | Bottom Lower | 1.96 | 1.88 | 3,722,696 | 20.00 | 2,970,000 | 38.07 | | 11.1 | 34.06 | 56.05 | 0.78 | 0.37 |
| | **TOTAL/AVERAGE INFERRED RESOURCES** | | **1.89** | **1.88** | **17,643,390** | **20.00** | **14,090,000** | **35.20** | | **11.6** | **33.66** | **54.72** | **1.07** | **0.33** |
| | **TOTAL/ AVERAGE BANFF** | | **2.05** | **1.90** | **52,929,048** | **15.00** | **44,803,900** | **35.07** | | **11.5** | **32.89** | **55.21** | **1.16** | **0.40** |
| | **GRAND TOTAL/ AVERAGE VOORBURG** | | **2.34** | **1.91** | **270,708,007** | **14.00** | **233,682,000** | **28.34** | | **11.1** | **32.03** | **55.83** | **1.11** | **0.64** |

**Notes:**

Rounding down of tonnages to 100t; 1,000t and 10,000t for Measured, Indicated and Inferred, respectively.

**RESOURCE CALCULATED FOR MAXIMUM SEAM DEPTH OF 200m FOR O/C MINING, NO U/G MINING CONSIDERED, COAL WITH VOLATILE CONTENT >20% EXCLUDED**

| FARM | RESOURCE CATEGORY | SEAM | AVE WIDTH (m) | COAL RAW RD (t/m) | GROSS TONNES IN SITU | GEOL. LOSSES (%) | TOTAL TONNES IN SITU | MINING BLOCK LAYOUT LOSSES (%) | MINEABLE TONNES IN SITU | AIR DRIED WASHED QUALITIES @ RD = 1.4 | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | YIELD (%) | CV (MJ/kg) | ASH (%) | VOL (%) | FIXED CARB ON (%) | SULPH. (%) | MOIST. (%) |
| Voorburg | Measured | Upper | 3.21 | 2.02 | 16,321,018 | 10.00 | 14,688,9 | 2.00 | 14,395,100 | 19.64 | | 10.04 | 32.57 | 56.75 | 1.15 | 0.64 |
| | | Middle Upper | 3.26 | 1.94 | 21,621,666 | 10.00 | 19,459,4 | 2.00 | 19,070,300 | 28.46 | | 11.57 | 32.81 | 55.05 | 1.24 | 0.57 |
| | | Middle Lower | 2.04 | 1.92 | 12,410,134 | 10.00 | 11,169,1 | 2.00 | 10,945,700 | 34.65 | | 12.07 | 32.33 | 54.89 | 1.18 | 0.72 |
| | | Bottom Upper | 2.06 | 1.87 | 16,890,762 | 10.00 | 15,201,6 | 2.00 | 14,897,600 | 30.31 | | 11.33 | 31.86 | 56.07 | 1.09 | 0.73 |
| | | Bottom Lower | 3.27 | 1.85 | 27,120,868 | 10.00 | 24,408,7 | 2.00 | 23,920,600 | 26.51 | | 10.80 | 31.41 | 56.42 | 0.99 | 0.71 |
| | **TOTAL/AVERAGE MEASURED** | | **2.75** | **1.91** | **94,364,448** | **10.00** | **84,928,0** | **2.00** | **83,229,300** | **27.52** | | **11.11** | **32.13** | **55.90** | **1.12** | **0.67** |
| | Indicated | Upper | 2.60 | 2.03 | 23,424,614 | 15.00 | 19,910,9 | 2.00 | 19,512,000 | 17.00 | | 9.99 | 32.50 | 56.74 | 1.14 | 0.80 |
| | | Middle Upper | 2.83 | 1.96 | 24,574,338 | 15.00 | 20,888,1 | 2.00 | 20,470,000 | 27.57 | | 11.45 | 32.44 | 55.40 | 1.27 | 0.71 |
| | | Middle Lower | 1.63 | 1.91 | 15,209,852 | 15.00 | 12,928,3 | 2.00 | 12,669,000 | 31.76 | | 12.07 | 31.39 | 55.78 | 1.14 | 0.77 |
| | | Bottom Upper | 1.85 | 1.87 | 15,085,002 | 15.00 | 12,822,2 | 2.00 | 12,565,000 | 30.19 | | 11.33 | 31.20 | 56.71 | 1.02 | 0.76 |
| | | Bottom Lower | 2.77 | 1.84 | 22,575,806 | 15.00 | 19,189,4 | 2.00 | 18,805,000 | 25.40 | | 10.15 | 29.48 | 55.51 | 0.86 | 0.71 |
| | **TOTAL/AVERAGE INDICATED** | | **2.32** | **1.92** | **100,869,61** | **15.00** | **85,739,1** | **2.00** | **84,021,000** | **25.65** | | **10.90** | **31.45** | **55.99** | **1.09** | **0.75** |
| | Inferred | Upper | 1.86 | 1.99 | 4,102,004 | 20.00 | 3,281,60 | 2.00 | 3,210,000 | 19.31 | | 10.32 | 32.47 | 56.47 | 1.10 | 0.79 |
| | | Middle Upper | 2.20 | 1.95 | 4,656,435 | 20.00 | 3,725,14 | 2.00 | 3,650,000 | 26.22 | | 11.07 | 32.57 | 55.82 | 1.14 | 0.55 |
| | | Middle Lower | 1.39 | 1.93 | 2,128,200 | 20.00 | 1,702,56 | 2.00 | 1,660,000 | 32.24 | | 12.30 | 30.50 | 56.66 | 1.10 | 0.57 |
| | | Bottom Upper | 1.35 | 1.86 | 1,456,315 | 20.00 | 1,165,05 | 2.00 | 1,140,000 | 32.08 | | 11.01 | 30.65 | 57.59 | 0.91 | 0.60 |
| | | Bottom Lower | 2.10 | 1.82 | 2,291,481 | 20.00 | 1,833,18 | 2.00 | 1,790,000 | 28.53 | | 9.97 | 30.63 | 59.09 | 0.80 | 0.58 |
| | **TOTAL/AVERAGE INFERRED** | | **1.82** | **1.93** | **14,634,435** | **20.00** | **11,707,5** | **2.00** | **11,450,000** | **26.10** | | **10.86** | **31.75** | **56.81** | **1.05** | **0.63** |
| | **TOTAL/ AVERAGE VOORBURG** | | **2.45** | **1.92** | **209,868,49** | **13.00** | **182,374,** | **2.00** | **178,700,300** | **26.55** | | **10.99** | **31.79** | **56.00** | **1.10** | **0.70** |
| Ancaster 501MS | Measured | Bottom Upper | 1.37 | 1.83 | 200,203 | 10.00 | 180,183 | 2.00 | 176,500 | 48.86 | | 14.79 | 35.72 | 49.05 | 0.99 | 0.29 |
| | | Bottom Lower | 2.49 | 1.86 | 388,168 | 10.00 | 349,351 | 2.00 | 342,300 | 44.03 | | 11.28 | 35.50 | 53.14 | 0.98 | 0.39 |
| | **TOTAL/AVERAGE MEASURED** | | **1.95** | **1.85** | **588,371** | **10.00** | **529,534** | **2.00** | **518,800** | **45.67** | | **12.47** | **35.57** | **51.75** | **0.98** | **0.36** |
| | Indicated | Bottom Upper | 1.33 | 1.83 | 359,672 | 15.00 | 305,721 | 2.00 | 299,000 | 50.43 | | 14.94 | 35.49 | 48.87 | 0.98 | 0.27 |
| | | Bottom Lower | 2.44 | 1.87 | 700,210 | 15.00 | 595,179 | 2.00 | 583,000 | 45.14 | | 11.39 | 35.38 | 53.67 | 0.99 | 0.37 |
| | **TOTAL/AVERAGE INDICATED** | | **1.90** | **1.86** | **1,059,882** | **15.00** | **900,900** | **2.00** | **882,000** | **46.94** | | **12.59** | **35.42** | **52.04** | **0.99** | **0.34** |
| | Inferred | Middle Upper | 1.76 | 1.83 | 683,946 | 20.00 | 547,157 | 2.00 | 530,000 | 23.48 | | 10.48 | 35.52 | 53.56 | 1.09 | 0.36 |
| | | Middle Lower | 4.08 | 1.70 | 1,509,655 | 20.00 | 1,207,72 | 2.00 | 1,180,000 | 32.17 | | 12.90 | 36.49 | 50.44 | 1.62 | 0.23 |
| | | Bottom Upper | 1.13 | 1.83 | 2,318 | 20.00 | 1,854 | 2.00 | 0.00 | 52.12 | | 14.81 | 34.52 | 49.80 | 0.95 | 0.25 |
| | | Bottom Lower | 2.12 | 1.88 | 4,500 | 20.00 | 3,600 | 2.00 | 0.00 | 44.16 | | 11.35 | 34.70 | 55.41 | 0.98 | 0.34 |
| | **TOTAL/AVERAGE INFERRED** | | **2.93** | **1.74** | **2,200,419** | **20.00** | **1,760,33** | **2.00** | **1,710,000** | **29.51** | | **12.15** | **36.18** | **51.42** | **1.45** | **0.27** |
| | **TOTAL/ AVERAGE ANCASTER** | | **2.41** | **1.79** | **3,848,672** | **17.00** | **3,190,76** | **2.00** | **3,110,800** | **37.11** | | **12.33** | **35.87** | **51.65** | **1.24** | **0.30** |

**Notes:**
Minimum seam thickness of 0.5mm applied to GTIS; Maximum seam depth of 200m for opencast mining; No underground mining.
Rounding down of tonnages to 100t; 1,000t and 10,000t for Measured, Indicated and Inferred, respectively.

**RESOURCE CALCULATED FOR MAXIMUM SEAM DEPTH OF 200m FOR O/C MINING, NO U/G MINING CONSIDERED, COAL WITH VOLATILE CONTENT >20% EXCLUDED**

| FARM | RESOURCE CATEGORY | SEAM | AVE WIDTH (m) | COAL RAW RD (t/m) | GROSS TONNES IN SITU | GEOL. LOSSES (%) | TOTAL TONNES IN SITU | MINING BLOCK LAYOUT LOSSES (%) | MINEABLE TONNES IN SITU | AIR DRIED WASHED QUALITIES @ RD = 1.4 | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | YIELD (%) | CV (MJ/kg) | ASH (%) | VOL (%) | FIXED CARBON (%) | SULP H. (%) | MOIST. (%) |
| Banff 502MS | Measured | Upper | 2.51 | 2.03 | 1,547,979 | 10.00 | 1,393,18 | 2.00 | 1,365,300 | 24.05 | | 10.73 | 34.36 | 54.49 | 0.96 | 0.43 |
| | | Middle Upper | 4.19 | 1.91 | 2,901,002 | 10.00 | 2,610,90 | 2.00 | 2,558,600 | 42.60 | | 11.95 | 34.77 | 52.91 | 1.12 | 0.37 |
| | | Middle Lower | 2.85 | 1.93 | 1,989,230 | 10.00 | 1,790,30 | 2.00 | 1,754,500 | 38.43 | | 13.35 | 34.57 | 51.71 | 1.27 | 0.37 |
| | | Bottom Upper | 1.20 | 1.86 | 2,071,499 | 10.00 | 1,864,34 | 2.00 | 1,827,000 | 36.48 | | 11.98 | 33.71 | 53.91 | 0.87 | 0.39 |
| | | Bottom Lower | 2.15 | 1.88 | 4,151,622 | 10.00 | 3,736,46 | 2.00 | 3,661,700 | 37.47 | | 11.30 | 33.89 | 54.42 | 0.83 | 0.41 |
| | **TOTAL/AVERAGE MEASURED** | | **2.61** | **1.91** | **12,661,332** | **10.00** | **11,395,1** | **2.00** | **11,167,100** | **36.99** | | **11.81** | **34.23** | **53.57** | **0.99** | **0.39** |
| | Indicated | Upper | 2.05 | 2.06 | 1,596,215 | 15.00 | 1,356,78 | 2.00 | 1,329,000 | 25.35 | | 10.02 | 33.38 | 56.12 | 0.96 | 0.53 |
| | | Middle Upper | 2.74 | 1.90 | 6,091,440 | 15.00 | 5,177,72 | 2.00 | 5,074,000 | 44.80 | | 11.75 | 34.94 | 52.86 | 1.10 | 0.45 |
| | | Middle Lower | 2.19 | 1.96 | 5,141,010 | 15.00 | 4,369,85 | 2.00 | 4,282,000 | 30.66 | | 13.83 | 34.98 | 50.81 | 2.59 | 0.37 |
| | | Bottom Upper | 1.26 | 1.86 | 1,917,006 | 15.00 | 1,629,45 | 2.00 | 1,596,000 | 38.68 | | 11.87 | 32.95 | 54.73 | 0.82 | 0.38 |
| | | Bottom Lower | 2.09 | 1.89 | 3,981,934 | 15.00 | 3,384,64 | 2.00 | 3,316,000 | 37.86 | | 11.35 | 33.18 | 55.25 | 0.79 | 0.37 |
| | **TOTAL/AVERAGE INDICATED** | | **2.24** | **1.92** | **18,727,605** | **15.00** | **15,918,4** | **2.00** | **15,597,000** | **37.16** | | **12.10** | **34.24** | **53.27** | **1.40** | **0.41** |
| | Inferred | Upper | 2.53 | 2.10 | 461,848 | 20.00 | 369,478 | 2.00 | 360,000 | 23.75 | | 9.02 | 32.04 | 58.55 | 0.92 | 0.50 |
| | | Middle Upper | 2.48 | 1.90 | 4,559,246 | 20.00 | 3,647,39 | 2.00 | 3,570,000 | 33.45 | | 11.00 | 33.65 | 54.95 | 1.01 | 0.34 |
| | | Middle Lower | 1.99 | 1.87 | 4,104,781 | 20.00 | 3,283,82 | 2.00 | 3,210,000 | 37.04 | | 13.19 | 33.99 | 52.64 | 1.46 | 0.25 |
| | | Bottom Upper | 1.16 | 1.85 | 1,535,236 | 20.00 | 1,228,18 | 2.00 | 1,200,000 | 39.56 | | 11.85 | 33.66 | 53.83 | 0.78 | 0.34 |
| | | Bottom Lower | 1.95 | 1.88 | 3,118,181 | 20.00 | 2,494,54 | 2.00 | 2,440,000 | 38.30 | | 11.15 | 34.22 | 55.91 | 0.78 | 0.37 |
| | **TOTAL/AVERAGE INFERRED** | | **2.06** | **1.89** | **13,779,292** | **20.00** | **11,023,4** | **2.00** | **10,780,000** | **35.97** | | **11.71** | **33.83** | **54.47** | **1.06** | **0.33** |
| | **TOTAL/ AVERAGE BANFF** | | **2.29** | **1.91** | **45,168,229** | **15.00** | **38,337,0** | **2.00** | **37,544,100** | **36.77** | | **11.90** | **34.12** | **53.71** | **1.18** | **0.38** |
| **GRAND TOTAL/ AVERAGE VOORBURG** | | | **2.38** | **1.92** | **258,885,39** | **14.00** | **223,902,** | **2.00** | **219,355,200** | **28.45** | | **11.17** | **32.24** | **55.55** | **1.12** | **0.64** |

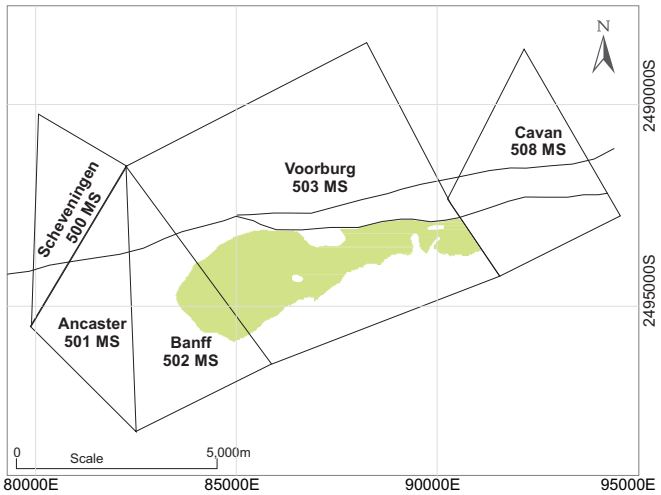
**Notes:**

Minimum seam thickness of 0.5mm applied to GTIS; Maximum seam depth of 200m for opencast mining; No underground mining.

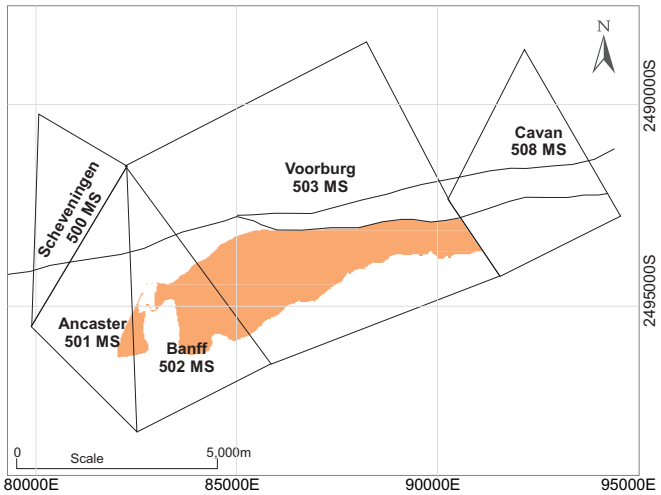
Rounding down of tonnages to 100t; 1,000t and 10,000t for Measured, Indicated and Inferred, respectively.

## VOORBURG SECTION – LOCATION OF RESOURCES

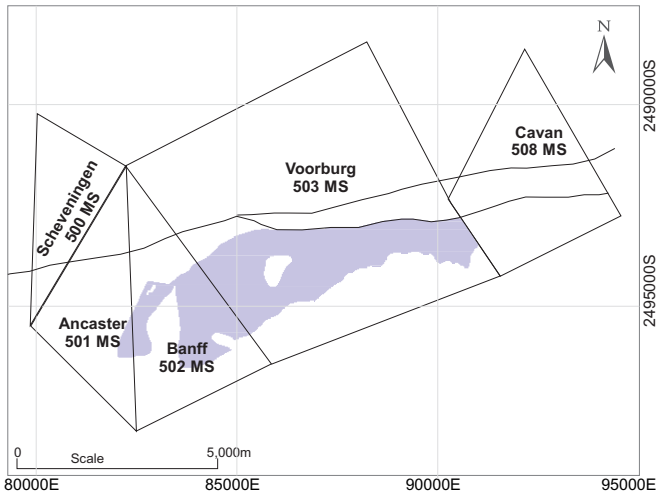
### UPPER SEAM



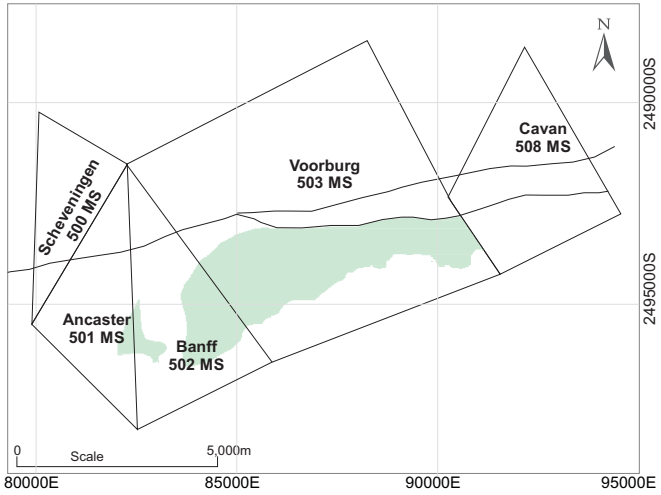

### MIDDLE SEAM



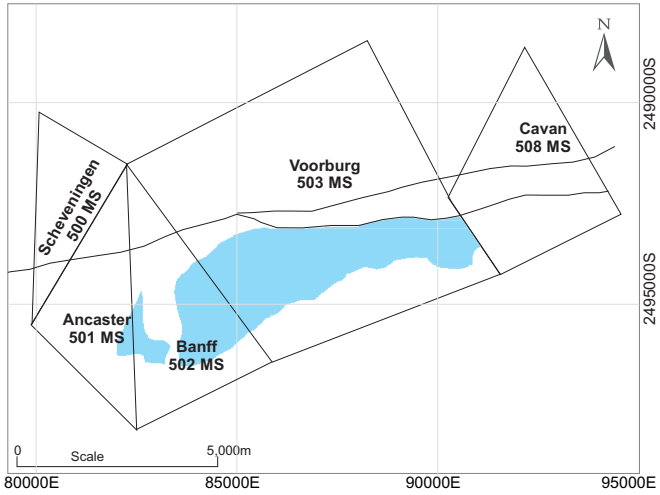

### MIDDLE LOWER SEAM




### BOTTOM UPPER SEAM




### BOTTOM LOWER SEAM



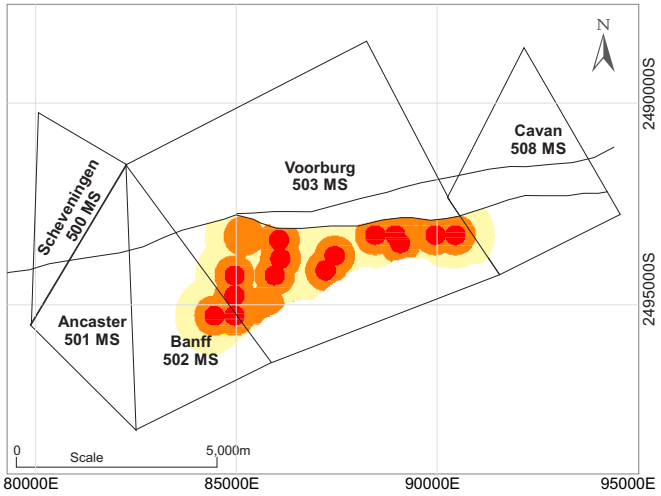

**Mineral Resource**

- Prospecting Rights Boundary
- Upper Seam
- Middle Seam
- Middle Lower Seam
- Bottom Upper Seam
- Bottom Lower Seam

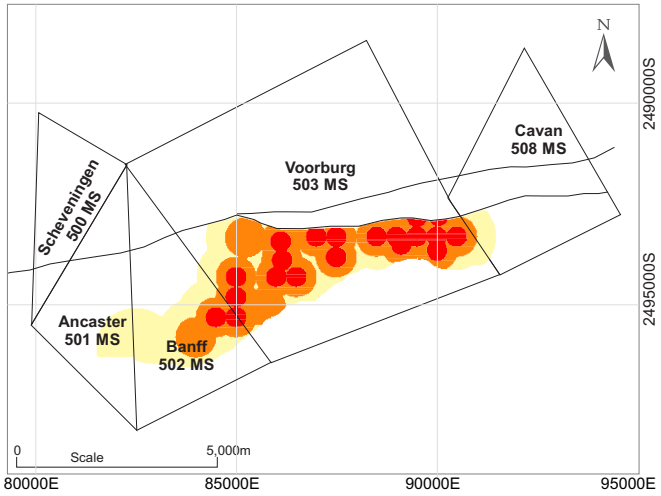
Source: Coal of Africa
VMD1971_CoAL GSP CPR_2015

## VOORBURG SECTION – OBSERVATION POINT HALOS IN ACCORDANCE WITH JORC REPORTING STANDARDS

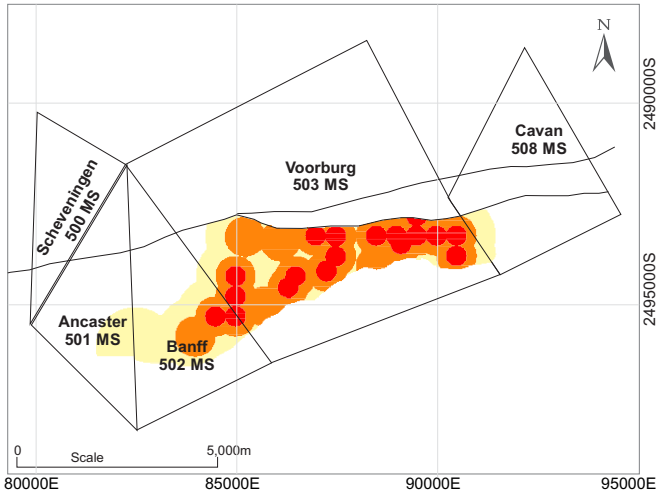
### UPPER SEAM



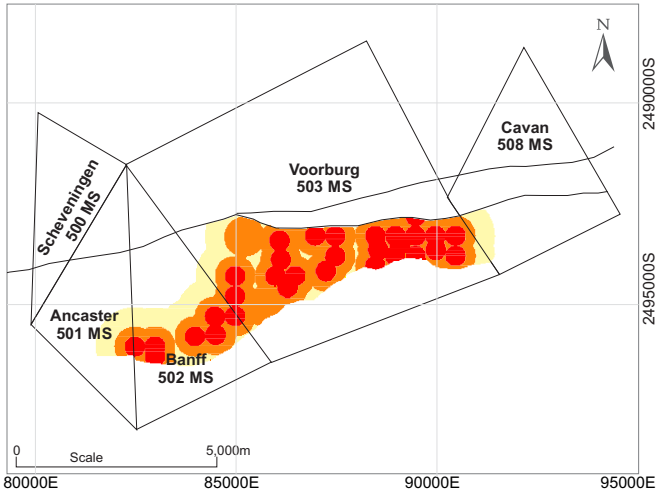

### MIDDLE SEAM



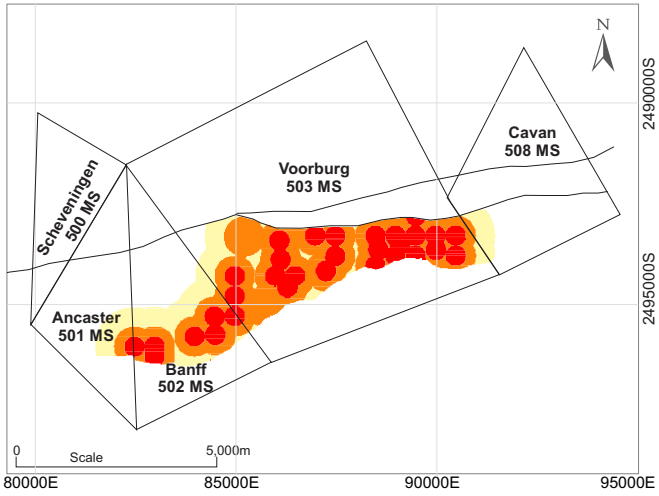

### MIDDLE LOWER SEAM




### BOTTOM UPPER SEAM




### BOTTOM LOWER SEAM




**Mineral Resource**

- Measured (250m radius from borehole with quality data)
- Indicated (500m radius from borehole with quality data)
- Inferred (2000m radius from borehole with quality data)
- Prospecting Rights Boundary

Source: Coal of Africa
VMD1971_CoAL GSP CPR_2015

Figure 27

# 9. Jutland Section

The Jutland Section, located within the Soutpansberg Coalfield, is classified as an early stage exploration project. Currently there are no coal resources associated with the project, but the presence of coal is known. It represents one of the least developed sections of the Mopane Project.

## 9.1. Location

The Jutland Section is situated in the magisterial district of Vhembe, in the Limpopo Province of South Africa (Figure 2). The location of the Jutland Section area in relation to regional infrastructure and the mineral tenure in the greater Soutpansberg Project area is illustrated in Figure 28.

The nearest town is Musina, situated approximately 35km to the northeast of the Jutland Section area.

## 9.2. Access

Access to the Jutland Section area is via the tarred national N1 road from Louis Trichardt to Musina. Approximately 40km north of Louis Trichardt, the R525 dirt road westwards is taken for 7.5km (Figure 28) to the Mopane Siding. Here a gravel road branches to the south. The farm Pretorius 531MS is 2km from the turnoff. The gravel roads are in a good condition, and the tarred N1 is in an excellent condition. The project area is approximately 380km, by road from the capital, Pretoria. The various properties within the project area are accessed by a network of gravel farm roads.

## 9.3. Climate and Topography

Jutland experiences a warm, semi-arid climate as described in Section 10.3. Operations can occur all year round and the climatic conditions generally do not prevent exploration operations. However, during times of heavy downpours, temporary delays may be experienced.

The topography of the Jutland Section area is essentially flat and lies at an average elevation of about 600mamsl. The area is drained by a non-perennial tributary of the Sand River which flows in a northerly across the project area.

## 9.4. Fauna & Flora

The Jutland Section area falls within the North Eastern Mountain Sour Veld and the Soutpansberg Arid Mountain Bushveld biomes, characterised predominantly by a grassy ground layer and an upper layer of woody plants, dominated by sweet thorn and mopane.

The land is mainly given over to cattle and game ranching with localised arable farming.

## 9.5. Legal Aspects

### 9.5.1. Ownership by CoAL

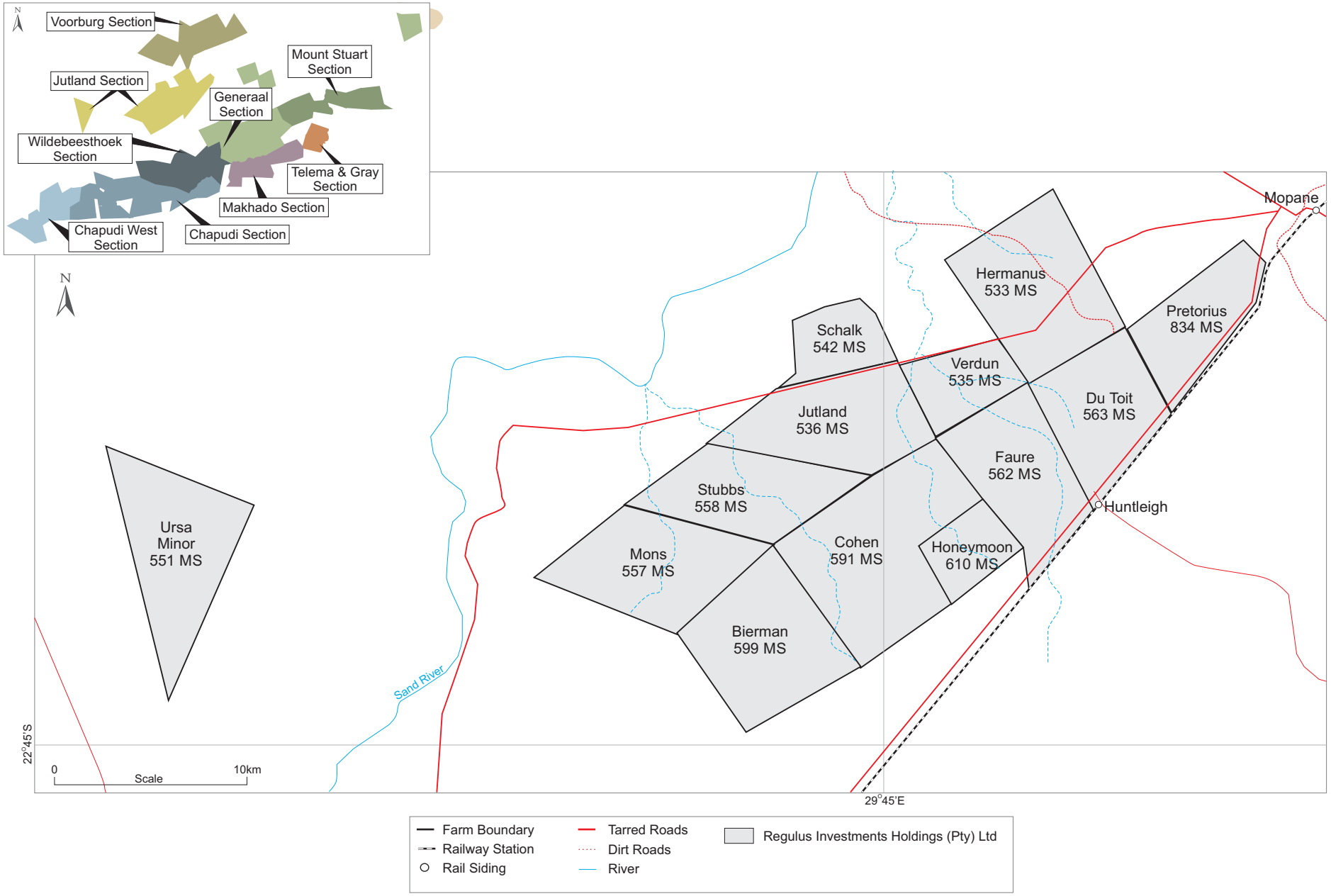
Through its wholly owned subsidiary company Regulus Investment Holdings (Pty) Ltd (subsequent to Section 11 transfer and Secton 102 approval), CoAL holds an accepted application for a NOMR on the farms Cohen 591MS, Jutland 536MS, Mons 557MS, Stubbs 558MS, Faure 562MS, Hermanus 533MS, Pretorius 531MS, Bierman 599MS, Ursa Minor 551MS, 542MS, Maseri Pan 520MS and the remaining extent of the farms Du Toit 563MS and Verdun 535MS. CoAL has acquired the Jutland Section from Rio Tinto pursuant to the Soutpansberg Properties Acquisition Agreement with Rio Tinto.

The ownership of the Jutland Section is illustrated in Figure 29.

### 9.5.2. Mineral Tenure

All of the five NOPRs held by CoAL for the farms that make up the Jutland Section expired by June 2013. In April 2013, prior to expiry, CoAL applied for a NOMR under its wholly owned subsidiary Regulus Investment Holdings (Pty) Ltd for all of the Jutland Section. The DMR issued an acceptance letter for the NOMR application in May 2013. Venmyn Deloitte has viewed the acceptance letters and confirms the security of the mineral tenure. The rights relating to the Jutland Section are summarised in Table 20 and illustrated in Figure 28.

## LOCATION OF CoAL'S JUTLAND SECTION IN RELATION TO LOCAL INFRASTRUCTURE AND MINERAL TENURE

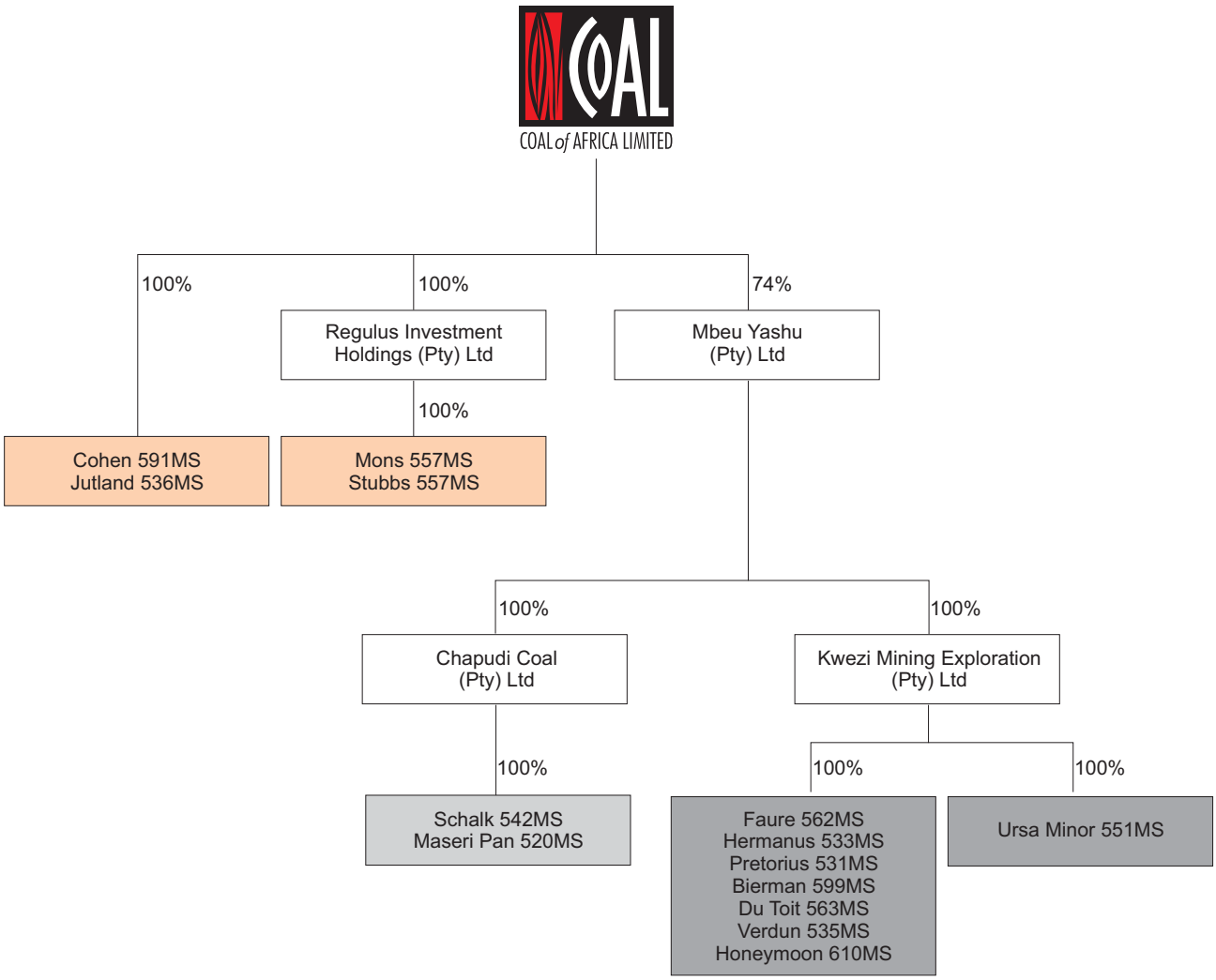



Source: Coal of Africa
VMD1971_CoAL GSP CPR_2015

Figure 28

VenmynDeloitte. Coal of Africa

## OWNERSHIP OF THE JUTLAND SECTION




### JUTLAND TOPOGRAPHY

Source: Coal of Africa

**Table 20 : Summary of the Jutland Section Mineral Tenure**

| SECTION | FARM NAME & NO. | PORTION NO. | AREA (ha) | APPLYING ENTITY | NEW ORDER LICENCE TYPE | LICENCE NO. | SUBMISSION DATE OF MINING RIGHT APPLICATION | DATE OF ACCEPTANCE | SURFACE RIGHTS |
|---|---|---|---|---|---|---|---|---|---|
| Jutland | Schalk 542MS | Whole farm | 482.48 | Regulus Investment Holdings (Pty) Ltd | Mining | LP 30/5/1/2/2/10032 MR | 13/04/2013 | 18/05/2013 | No |
| | Cohen 591MS | Whole farm | 1,771.96 | | Mining | LP 30/5/1/2/2/10035 MR | 13/04/2013 | 17/05/2013 | No |
| | Jutland 536MS | Whole farm | 1,051.32 | | | | | | No |
| | Ursa Minor 551MS | Whole farm | 1,277.89 | | Mining | LP 30/5/1/2/2/10036 MR | 13/04/2013 | 20/05/2013 | No |
| | Bierman 599MS | Whole farm | 1,293.11 | | Mining | LP 30/5/1/2/210029 MR | 13/04/2013 | 17/05/2013 | No |
| | Du Toit 563MS | RE | 927.14 | | | | | | No |
| | Faure 562MS | Whole farm | 1,032.54 | | | | | | No |
| | Hermanus 533MS | Whole farm | 1,384.5 | | | | | | No |
| | Otto 560MS (Now Honeymoon 610MS) | RE | 1,357.37 | | | | | | No |
| | Pretorius 531MS (Now Pretorius 834MS) | Portion 1 & RE | 808.164 | | | | | | No |
| | Verdun 535MS | RE | 510.61 | | | | | | No |
| | Mons 557MS | Whole farm | 1,198.66 | | Mining | LP 30/5/1/2/2/10035 MR | 13/04/2013 | 15/05/2013 | No |
| | Stubbs 558MS | Whole farm | 1,033.81 | | | | | | No |
| | **TOTAL JUTLAND** | | **14,129.55** | | | | | | |

CoAL's interest in the Jutland Section is a consequence of the Soutpansberg Properties Acquisition discussed in Section 6.3.

### 9.5.3. Surface Rights

There are currently agreements with the surface rights owners to access the properties for exploration purposes and access is sufficient for most of their prospecting requirements.

### 9.5.4. Royalties

There are no private royalties payable for the Jutland Section. State royalties, as per the MPRRA will be payable, however, on any future production.

### 9.5.5. Material Contracts

Venmyn Deloitte are not aware of any material contracts in place for the Jutland Section, other than the recent acquisition agreement between CoAL and Rio Tinto.

### 9.5.6. Other Legal Issues

CoAL has informed Venmyn Deloitte of land claims on 6 farms that make up the Jutland Section. A summary of the land claims on the Jutland Section are listed in Table 21.

The land claims on the various properties have been gazetted by the Department of Rural Development and Land Reform (DRDLR). CoAL recognises land claimants as key stakeholders, and the company's engagement is governed by the company's stakeholder engagegemt strategy that ensures regular, meaningful and transparent engagement.

CoAL recognises the legislative framework of the land claims process and will work within that framework.

Venmyn Deloitte is not aware of any litigation or competing rights associated with the Voorburg Section area.

## 9.6. Infrastructure

The project is well situated with respect to the major infrastructural aspects of rail, road and power.

The railway linking Gauteng (in South Africa) and Zimbabwe passes along the southeasternmost boundary of the project area. The Huntleigh Siding, for which CoAL has negotiated the rights, occurs on this portion of the railway on the farm Du Toit 563MS.

Eskom grid powerlines are located 17km to the east of the project area along the N1.

Water for drilling and potable requirements is currently available from local farmers' dams.

Due to the fact that the Jutland Section is still at an early exploration stage, details on the availability and requirements of power, water, tailings disposal and other infrastructural items have not been investigated in detail and are therefore not reported upon in this document. These will be addressed once the project reaches PFS.

### 9.6.1. Local Resources

The nearest towns of Louis Trichardt and Musina are regional centres and provide modern conveniences, including accommodation and services. The towns are also sources of fuel and labour.

**Table 21: Summary of Land Claims for the Jutland Section**

| SECTION | FARM NAME & NO. | PORTION NO. | LAND OWNER | LAND CLAIMANT | OFFICIAL |
|---|---|---|---|---|---|
| Jutland | Schalk 542MS | Whole farm | Douw & Elzie Steyn | No land claimant | Not stated |
| | Cohen 591MS | | Karl Osmers Boerdery (Pty) Ltd | Mulambwane | |
| | Jutland 536MS | | Parnum Inv 139 cc | No land claimant | |
| | Ursa Minor 551MS | | Mollevel Plase Trust | Tshivhula / Leshivha | |
| | Bierman 599MS | | Phindaba Prop (Pty) Ltd | No land claimant | |
| | Du Toit 563MS | RE | Souis Hendrie van der Walt | Mulambwane | |
| | Faure 562MS | Whole farm | Hendrik Francois Stols | | |
| | Hermanus 533MS | | J W Van Der Merwe Trust | No land claimant | |
| | Otto 560MS (Now Honeymoon 610MS) | RE | Otto-Cohen Boerdery (Pty) Ltd | Mulambwane | |
| | Pretorius 531MS (Now Pretorius 834MS) | Portion 1 | J L du Preez & Seuns Verhurings cc | | |
| | | RE | Limpopo Provincial Government | | |
| | Verdun 535MS | | Honeymoon Trust | No land claimant | |
| | Mons 557MS | Whole farm | Lukas & Dina van der Merwe | | |
| | Stubbs 558MS | | | | |

## 9.7. Regional Geological Setting

The Jutland Section is situated within the Mopane Coalfield subdivision of the Soutpansberg Coalfield (Figure 11). The reader is referred to Section 7.3 on the regional geology of this coalfield.

## 9.8. Local Geological Setting

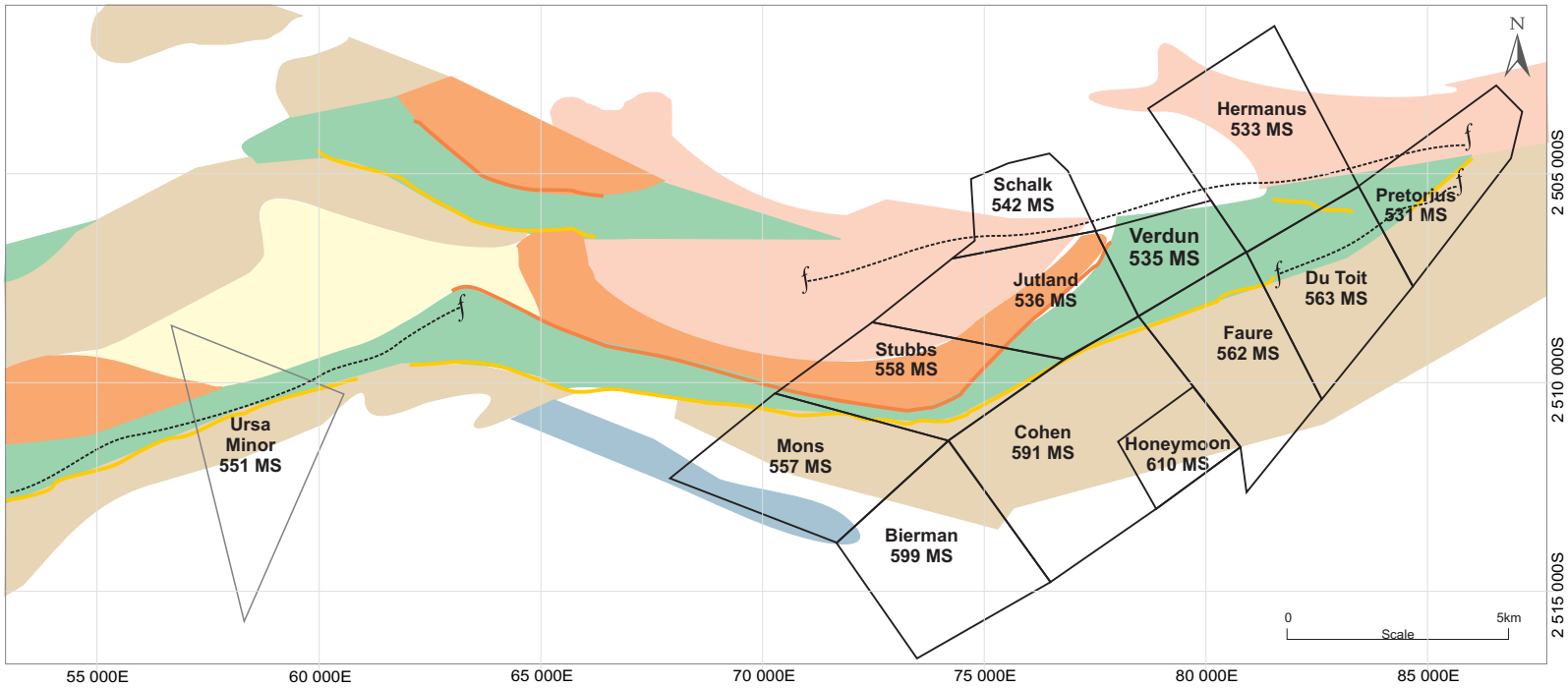
The Karoo sediments of the Jutland Section are preserved as a half graben with an unconformable southern contact. While the lower Karoo sediments are not developed, the coal bearing Mikabeni Formation is present throughout (Figure 30). The Jutland Section area contains sub-cropping coal seams that dip towards the north at between approximately 10º - 12º.

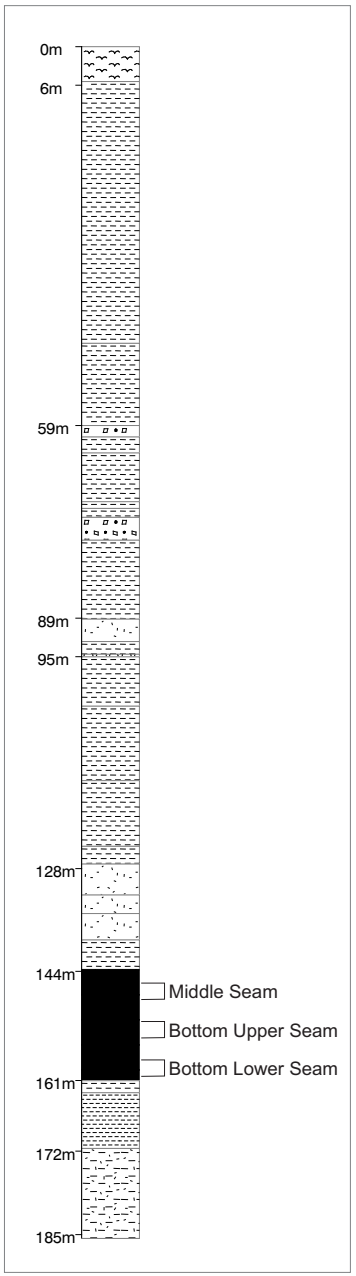
The Karoo age sediments were deposited onto basement granite gneisses. The lowermost sediments include Dykwa tillites, which was followed by the deposition of the coal bearing strata (Figure 32) of the Ecca Group. The Ecca Group sediments comprised sandstones and shales. The Lower Ecca Group appears absent in the area. The coal bearing sediments occur as alternating mudstone laminae and coal bands within the Upper Ecca or Mikabeni Formation. According to CoAL, the coal horizons are divided into five potentially economic seams, namely the Upper, Middle Upper, Middle Lower and Bottom Upper and Bottom Lower seams. The coal bearing strata are overlain by red shales and mudstones belonging to the Beaufort Group. The coarse sandstone and conglomerate marker bed of the Fripp Formation is present within the project area.

## 9.9. Historical Ownership

The historical ownership and associated activities with respect to the Jutland Section is summarised in Table 22.

## LOCAL GEOLOGICAL MAP AND TYPICAL STRATIGRAPHIC COLUMN FOR THE JUTLAND SECTION




- Faults
- Farm Boundary
- Clarens
- Molteno
- Fripp Formation
- Ecca
- Quartenary
- Elliot
- Beaufort
- Mouny Dowe

- Soil
- Mudstone
- Siltstone
- Sandstone and Siltstone laminations
- Coal

Source: Coal of Africa
VMD1971_CoAL GSP CPR_2015

Figure 30

**Table 22 : Jutland Section – Summary of Historical Ownership and Activities**

| DATE | COMPANY | ACTIVITY |
|---|---|---|
| 1968 -1975 | Trans Natal Coal Mining Company | Drilled a total of 53 vertical boreholes, of which only 46 have usable information |
| 1975 - 1982 | Iscor Ltd (now Exxaro Resources Ltd) | Carried out extensive exploration work, including 106 boreholes and bulk sampling on the farms Jutland 536MS, Stubbs 558MS, Mons 557MS and Cohen 591MS. The target is believed to have been coking coal. |
| 1982 | | Conducted a Pre-Feasibility Study targeting underground mining of the No.5 (Middle Lower) No.9 (Bottom Upper) coal seams |
| 2006-2007 | Rio Tinto Mining & Exploration Ltd. (Rio Tinto) | Drilled three RC holes, one on each of the farms Hermanus 533MS, Verdun 535MS and Ursa Minor 551MS. |
| 2011 | CoAL | Concluded transaction with Rio Tinto & KME to acquire rights to their farms, and submitted Section 11 transfer application. |
| 2012 | | Section 11 approval for properties subject to the Soutpansberg Properties Acquisition Agreement. Drilled 15 RC boreholes. |

## 9.10. Historical Exploration and Mining

The earliest known exploration on the Jutland Section was undertaken by Trans Natal Coal Mining Corporation (Trans Natal), between 1968 and 1975. During this time 53 boreholes were drilled within the Jutland Section area. No information is available on the drilling, logging, sampling and surveying methods and standards used, except that the exploration was carried out for reconnaissance purposes.

Iscor carried out extensive exploration work within the Jutland Section area between 1975 and 1982, including 106 boreholes and bulk sampling on the farms Jutland 536MS, Stubbs 558MS, Mons 557MS and Cohen 591MS. The target is believed to have been coking coal. The location of the bulk samples is unknown.

It is not possible to indicate the location of the historical boreholes, as there are no co-ordinates provided among the data currently in CoAL's possession. Attempts, by CoAL, to source the borehole collar information in order to conduct Coal Resource estimation have been unsuccessful, and CoAL consequently plan to re-drill these properties. A summary of the historical exploration activity on the Jutland Section is presented in Table 24.

Published coal quality data and coking qualities for a washed low ash fraction from the bulk sample on the farm Cohen 591MS, is presented in Table 23.

**Table 23 : Properties of Coal from a Washed Bulk Sample (@ RD = 1.4) from the Farm Cohen 591MS (air dried basis)**

| $H_2O$ (%) | ASH (%) | VOLATILES (%) | SULPHUR (%) | CSN | PLASTICITY (ddm) | DILATION | VITRINITE | $R_oV_{max}$ (%) |
|---|---|---|---|---|---|---|---|---|
| 0.8 | 11.4 | 30.9 | 1.2 | 9 | 2,125 | 297 | 93 | 0.97 |

Source: S.C. Greef, 1988.

The drilling and sampling protocols used by Iscor are unknown. However, it is assumed that the drilling methods were conventional and pre-date the more efficient triple-tube wireline techniques that are commonly employed today.

The Iscor boreholes were sampled and sent to their in-house laboratory for analysis. Typically, 13 samples were taken from the top to the base of the coal bearing strata, and numbered consecutively in this order. Raw analyses were carried out on the coal samples. Washed analyses were only undertaken at an RD=1.40. Proximate, CV, Roga and Swell Index testwork was carried out.

In 1982, Iscor conducted a PFS for a proposed mining operation over the farms Mons 557MS, Stubbs 558MS, Jutland 536MS, and Cohen 591MS. This study concluded that approximately 40.7Mt of RoM (25.13Mt of coal) could be economically extracted by underground mining of the No.5 Coal Zone (Middle Lower Seam), using board and pillar methods. Annual production of 2.16Mt of RoM was suggested, for a 20 year LOM (however this could be extended in consideration of the possible exploitation of the No.9 Coal Zone or Bottom Upper Seam). The proposed underground access was via an inclined shaft.

The PFS suggested that additional exploration data was required to make final mine design decisions. It does not appear however, that any additional exploration was carried out.

## 9.11. Recent Exploration

The recent exploration conducted within the Jutland Section area includes boreholes drilled by Rio Tinto over the farms in which they had an interest. Between 2006 and 2007, Rio Tinto drilled three reconnaissance, vertical RC boreholes over the farms Hermanus 533MS, Verdun 535MS and Ursa Minor 551MS. The location of the recent boreholes is indicated on Figure 31.

In 2012 CoAL drilled five PQ3 boreholes for confirmatory purposes and ten RC boreholes for structural interpretation. These have not been used to update the geological model or the Coal Resources. For all exploration procedures followed by CoAL for the 2012 drilling programme and all future CoAL drilling programmes the reader is referred to the protocol document prepared by Venmyn Rand (Pty) Ltd for CoAL on 10 April 2012 named “Coal Exploration Best Practise Guideline for the Greater Soutpansberg Projects (GSP) Prepared for Coal of African Limited (COAL)”, Venmyn Deloitte reference number D1140.

The details of the recent exploration that has been conducted at the Jutland Section area is summarised in Table 24.

### 9.11.1. Remote or Geophysical Exploration

No remote sensing or geophysical exploration has been conducted over the Jutland Section area.

### 9.11.2. Surveying Methods

No specific information concerning the surveying methods of Rio Tinto, at the Jutland Section are available. It is assumed however, that Rio Tinto utilised the same protocols as at the Chapudi Project (Section 13.11.2), and that during the reconnaissance stage the borehole collar coordinates were measured with a handheld GPS.

### 9.11.3. Diamond Drilling

No recent diamond drilling has been conducted within the Jutland Section area.

### 9.11.4. Percussion or Open Hole Drilling

Three vertical RC boreholes were drilled by Rio Tinto between 2006 and 2007. One RC borehole was drilled on each of the farms Hermanus 533MS, Verdun 535MS and Ursa Minor 551MS.

No specific details are available on the drilling, logging and sampling protocols employed by Rio Tinto at the Jutland Section; however, it is assumed that these were the same as that employed at the Chapudi Project (Section 13.11).

### 9.11.5. Down the Hole Geophysics / Wireline Logging

Downhole geophysical surveys were conducted on all the Rio Tinto boreholes as discussed in Section 13.11.5.

### 9.11.6. Bulk Sampling

No recent bulk sampling has been carried out within the Jutland Section area.

### 9.11.7. Laboratory Analyses

It is not known if any samples were submitted for analysis as no analytical results from this drilling have been made available to CoAL.

**Table 24 : Jutland Section – Summary of Historical and Recent Drilling**

| DATE | COMPANY | LOCATION | PURPOSE | SURVEYOR | DRILLING COMPANY | TYPE OF DRILLING | SIZE | RESPONSIBLE GEOLOGIST | TOTAL NO. B/H | WIRELINE LOGGING | SEAMS SAMPLED | QUALITY RESULTS | LABORATORY FOR QUALITY | USED IN MODEL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1968-1975 | TransNatal Coal Mining Company | Mons 557 MS, Stubbs 558MS, Cohen 591MS, Jutland 536MS, Verdun 535MS, Faure 562MS, Hermanus 533MS, Ursa Minor 551MS and Preorius 531MS | Early exploration and resource estimation. | Unknown | Unknown | Diamond core | NQ | J. Raubenheimer, J Liebenberg | 40 | No | All | Yes | Fuels Research Institute of South Africa | No |
| 1975-1982 | Iscor | Mons 557 MS, Stubbs 558MS, Cohen 591MS, Jutland 536MS, Verdun 535MS, Faure 562MS, Hermanus 533MS, Du Toit 563MS and Pretorius 531MS | Early exploration and resource estimation. | Unknown | Unknown | Diamond core | NQ | H. Van den Berg | 84 | No | All | Yes | Iscor | No |
| 2006-2007 | Rio Tinto | Verdun 535MS, Hermanus 533MS, Ursa Minor 551MS | Reconnaissance Drilling | Unknown | Unknown | Reverse Circulation | 8 inch | D. Hirstov | 3 | Yes | Unknown | No | - | No |
| 2011-2012 | CoAL | Jutland 536MS | Confirmatory Drilling | Mathibe & Associates | Drillcon | Diamond core & RC | PQ3 | M. Maphisa | 15 | Yes | Yes | Awaiting | CAM | No |
| | | | | | | | | **TOTAL:** | **132** | | | | | |

## JUTLAND SECTION – LOCATION OF BOREHOLES AND BULK SAMPLES


Source: Coal of Africa
VMD1971_CoAL GSP CPR_2015

Figure 31

### 9.11.8. Data Management

#### 9.11.8.1. Data Acquisition and Validation

CoAL purchased both hard and electronic data copies of the original Iscor database from Exxaro in 2007. The original borehole paper logs were captured into Sable and verified by the responsible geologist. All boreholes are presented graphically as well as plotted on plans for verification by the responsible geologist. Cross section are plotted to confirm correlations. These were then imported directly into the Access database. All laboratory results were received in Excel format and included into the Sable plots for each borehole. The laboratory results were also imported directly into the Access database to eliminate the possibility typing errors.

The Access database was imported into Minex software for orebody modelling purposes. This software package has a series of automatic verification procedures including checking for physical data including overlapping intervals, missing intervals, etc.

It also undertakes automatic quality verifications including increasing cumulative ash values, decreasing cumulative volatile values, totalling proximate analyses to 100%, etc. Any errors identified in Minex are investigated by the responsible geologist.

No data verification has yet been conducted.

#### 9.11.8.2. Database Management

The Access database for the Jutland Section area currently contains data from Iscor and borehole logs for the Rio Tinto boreholes. The Access database is managed and maintained by CoAL's Competent Person, Mr. J. Sparrow (Pr.Sci.Nat). Backups are stored at CoAL's head office in Johannesburg.

## 9.12. Orebody Modelling and Results

No orebody modelling has been undertaken, by CoAL, on the Jutland Section.

It is not possible to indicate the location of the historical boreholes, as there are no co-ordinates provided among the data currently in CoAL's possession. Attempts, by CoAL, to source the borehole collar information in order to conduct orebody modelling and mineral resource estimation have been unsuccessful, and CoAL consequently plan to re-drill these properties (Section 16.22).

## 9.13. Coal Mining

Due to the stage of development of the Jutland Section, no recent investigations have been carried out on the mining of the deposit. However, upon considering the depth from surface of the coal zones, any future mining is expected to be a combination of opencast and underground methods. Details on mining methods and recoveries will be investigated during a PFS on the project.

## 9.14. Coal Processing

The Jutland coal is most likely to yield a coking coal product. No details are currently available on the envisaged processing plant. This study will be undertaken as part of a PFS.

## 9.15. Coal Market

The indications are that the Jutland Section product will be a semi-hard coking coal, based on current geological data. There are currently no contracts in place for the sale of this coal.

## 9.16. Previous Resource Statement

No previous resource statements have been prepared using modern 3D modelling methods and classification schemes, such as JORC or SAMREC. However, in 1982, so called "reserves" were put forward for the No.5 Coal Zone (Middle Lower Seam) of the Jutland Section by Iscor as part of their PFS.

The PFS declared the following:-

- 'Total In-Situ Coal Reserves' of 32.58Mt, of which 1.01Mt were classified as 'Demonstrated Reserves' and 31.57Mt were classified as 'Inferred Reserves';
- 'Total Mineable Reserves' of 25.13Mt, of which 1.01Mt were classified as 'Demonstrated Reserves' and 24.12Mt were classified as 'Inferred Reserves';
- Assuming a 35.8% product yield, 'Total Extractable Reserves' of 23.9Mt; and
- 'Total Saleable Reserves' of 16.9Mt.

It is imperative that the reader understands that the figures quoted cannot be compared to modern classification schemes and that, as a result, have a high risk associated with them.

### 9.17. Current Resource Statement

There is no current resource estimate for the Jutland Section.

### 9.18. Ore Reserve Statement

As a result of the current stage of development of the Jutland Section, no compliant reserves have yet been declared. Reserves can only be declared once a mining plan has been prepared. This will be undertaken during the next stage of development of the project i.e. at Pre-feasibility Stage.

# 10. Telema & Gray Section

The farms Telema 190MS and Gray 189MT are adjacent to the Makhado Project and were previously together with Generaal and Mount Stuart, known as the Makhado Extension Project. Under the new project groupings, these farms comprise an advanced exploration project covered by a prospecting licence containing potential coking coal resources named the Telema and Gray Project (Figure 32)

### 10.1. Locality

The farms Telema 190MS and Gray 189MT are situated in the magisterial district of Vhembe, in the Limpopo Province of South Africa. Figure 1 illustrates the location of the farms Telema 1901MS and Gray 189MT in relation to regional infrastructure and the mineral tenure in the Greater Soutpansberg Project area. The nearest town is Louis Trichardt, situated approximately 35km to the south of the farms Telema 190MS and Gray 189MT. The town of Musina is located approximately 50km north of the farms Telema 190MS and Gray 189MT. The village of Musekwa is located on the farm Telema 190MS.

### 10.2. Access

Access to the Telema and Gray Section area is via the tarred national N1 road from Louis Trichardt to Musina, located immediately west of the project area (Figure 32). The N1 road is in excellent condition. The project area is approximately 370km, by road, from the capital, Pretoria.

The various properties within the project area are accessed by a network of gravel roads that branch off the N1, and which are in good condition.

### 10.3. Climate and Topography

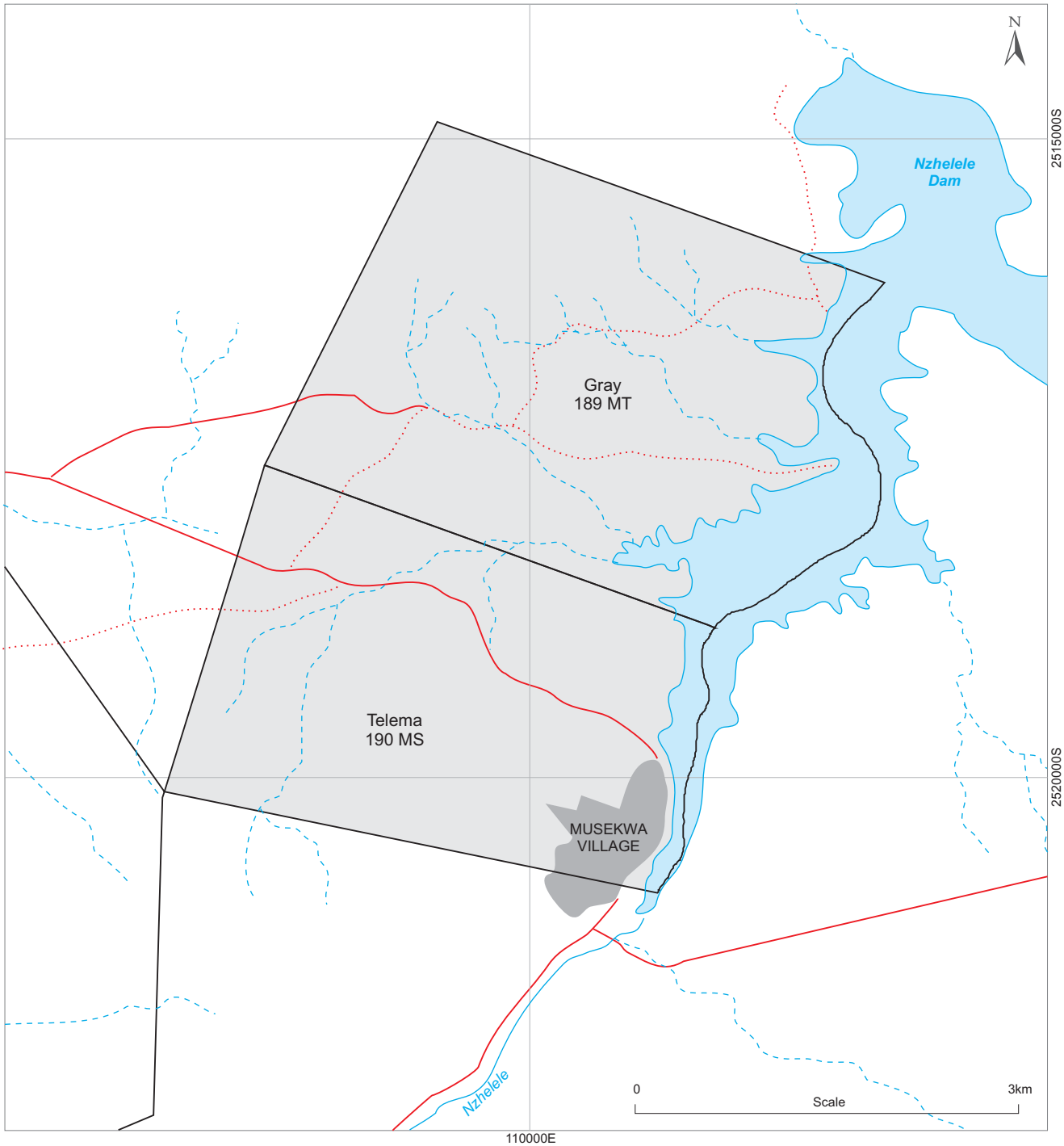
The Telema and Gray Section area experiences a warm, semi-arid climate. Temperatures average 15°C during the winter months (April to September) and may be in excess of 37°C during the summer. Rainfall is highly variable and usually falls during the summer months (October – March). Mean annual rainfall is of approximately 490mm.

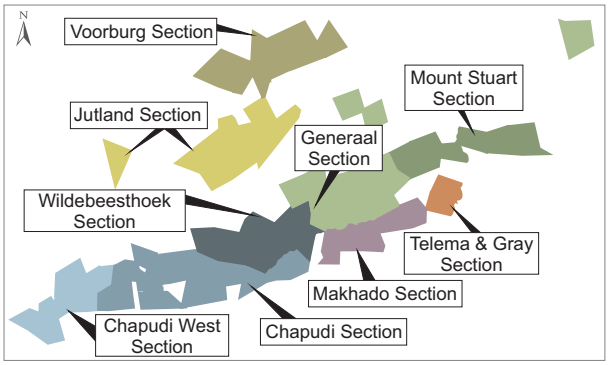
Operations can occur all year around and the climatic conditions generally do not prevent exploration or mining. However, during times of heavy downpours, temporary delays may be experienced.

The topography of the Telema and Gray Section area is relatively flat. The average elevation is 750mamsl, with the Soutpansberg Mountains, bordering the project area to the south, which reach a maximum elevation of 1,747mamsl. The area is drained by the perennial Nzhelele River which flows in a northweasterly direction into the Nzhelele Dam.

VenmynDeloitte. Coal of Africa

## LOCATION OF COAL'S TELEMA AND GRAY SECTION IN RELATION TO LOCAL INFRASTRUCTURE AND MINERAL TENURE




River
Gravel Road
Other Road
Limpopo Coal Company (Pty) Ltd NOPR Application
Built-up Area

## 10.4. Fauna and Flora

The Telema and Gray Section area falls within the North Eastern Mountain Sour Veld and the Soutpansberg Arid Mountain Bushveld biomes, characterised predominantly by a grassy ground layer and an upper layer of woody plants, dominated by sweet thorn and mopane.

The land is mainly given over to cattle and game ranching with localised arable farming.

## 10.5. Legal Aspects

### 10.5.1. Ownership by CoAL

Coal's wholly owned subsidiary, Limpopo Coal Company (Pty) Ltd, holds an accepted application for a New Order Prospecting Right (NOPR) on the farms Telema 190MS and Gray 189MT, that was applied for on 8 April 2013. CoAL has acquired the Telema & Gray Section from Rio Tinto pursuant to the Soutpansberg Properties Acquisition Agreement with Rio Tinto.

The ownership of the Telema and Gray Section is illustrated in Figure 33.

### 10.5.2. Mineral Tenure

All of the two NOPRs held by CoAL for the farms that make up the Telema and Grey Section expired by June 2013. In April 2013, prior to expiry, CoAL applied for a NOPR under its wholly owned subsidiary Limpopo Coal Company (Pty) Ltd for all of the Telema and Grey Section. The DMR issued an acceptance letter for the NOMR application in August 2013. Venmyn Deloitte has viewed the acceptance letters and confirms the security of the mineral tenure.

The rights relating to the farms Telema 190MS and Gray 189MT are summarised in Table 25 and their locations are graphically presented in Figure 32.

### 10.5.3. Surface Rights

CoAL does not currently own any surface rights on the farms Telema 190MS and Gray 189MT. CoAL has agreements with the surface rights owners to access the properties for exploration purposes and access is sufficient for most of its prospecting requirements

### 10.5.4. Royalties

There are no private royalties payable for the farms Telema 190MS and Gray 189MT. State royalties, as per the MPRRA will be payable on any future production.

Rio Tinto retains the option to acquire 50% of the farm Gray 189MT.

### 10.5.5. Material Contracts

Currently there are no offtake agreements, operational contracts or contract mining agreements that are relevant to the farms Telema 190MS and Gray 189MT, as they are still in the early stages of development.

### 10.5.6. Other Legal Issues

Venmyn Deloitte is not aware of any land claims or other litigation or competing rights associated with the farms Telema 190MS and Gray 189MT, which are both state owned land.

## 10.6. Infrastructure

The project is well situated with respect to the major infrastructural aspects of rail, road and power.

The railway linking Gauteng (in South Africa) and Zimbabwe occurs approximately 40km to the west of the westernmost boundary of the project area. CoAL has negotiated the rights to the Huntleigh Siding, located approximately 40km to the west of the project area.

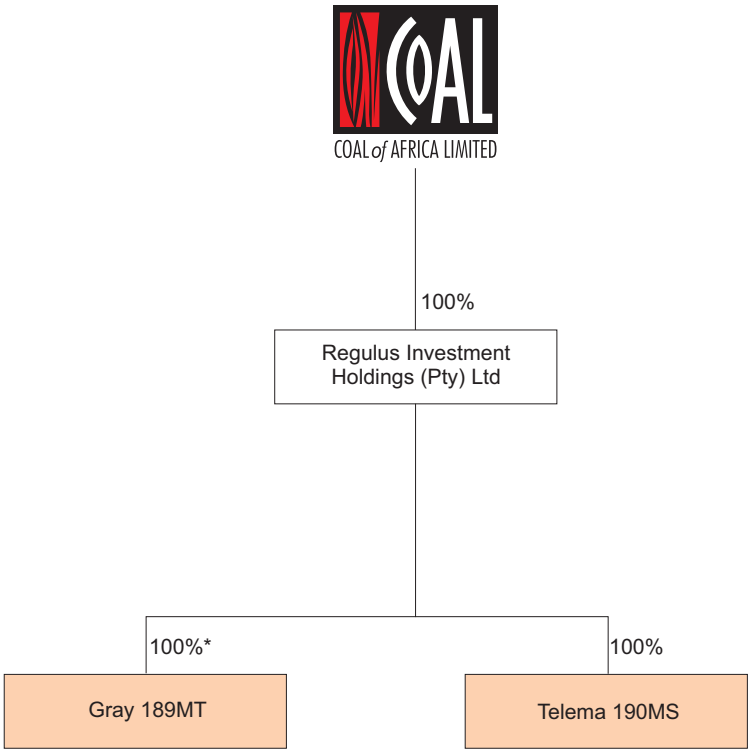
Eskom grid powerlines pass approximately 15 km to the west of the project area.

Water for drilling can be sourced from the Nzhelele River.

**Table 25: Summary of the Telema 190MS and Gray 189MT Mineral Tenure**

| SECTION | FARM NAME & NO. | PORTION NO. | AREA (ha) | COMPANY HOLDING RIGHTS | NEW ORDER LICENCE TYPE | LICENCE NO. | SUBMISSION DATE OF PROSPECTING RIGHT APPLICATION | DATE OF ACCEPTANCE | SURFACE RIGHTS |
|---|---|---|---|---|---|---|---|---|---|
| Telema and Gray | Telema 190MT | Whole Farm | 932.34 | Limpopo Coal Company (Pty) Ltd | Prospecting | LP 30/5/1/1/2/1149 PR | 08/04/2013 | 21/08/2013 | No |
| | Gray189MT | Whole Farm | 1216.28 | | | | | | |
| | **TOTAL Telema & Gray** | | **16,519.32** | | | | | | |

## OWNERSHIP OF THE TELEMA AND GRAY SECTION




*Rio Tinto retains an option to acquire 50% of the rights over this property

**BULK SAMPLE PIT BOX CUT AT MAKHADO**

Source: Coal of Africa

Due to the fact that the Telema and Gray Section is still at an exploration stage, details on the availability and requirements of power, water, tailings disposal and other infrastructural items has not been investigated in detail and is therefore not reported upon in this document. These will be addressed once the project reaches PFS.

The Telema and Gray Section could benefit from the mining infrastructure being considered and being put in place for the adjacent Makhado Project, a distance of less than 10km away to the west.

### 10.6.1. Local Resources

The nearest towns of Louis Trichardt and Musina are regional centres and provide modern conveniences, including accommodation and services. The towns are also sources of fuel and labour.

## 10.7. Regional Geology

The Telema and Gray Section is situated within the Mopane Sector of the greater Soutpansberg Coalfield (Figure 11). The reader is referred to Section 7.2 on the regional geology of this coalfield.

## 10.8. Local Geological Setting

Within the Telema and Gray Section area, a number of seams occur within a 30m to 40m thick carbonaceous zone of the Madzaringwe Formation. Six potential mining horizons (seams) have been identified by CoAL and named Upper Seam, Middle Upper Seam, Middle Lower Seam, Bottom Upper Seam, Bottom Middle Seam and Bottom Lower Seam (Figure 34). The Bottom Middle Seam usually comprises predominantly mudstone and for this reason it has not been included in the resource base; however, in certain areas it has sufficient coal to be considered a potential mining target.

All seams comprise interbanded carbonaceous mudstones and coal. The coal component is usually bright and brittle and contains a high proportion of vitrinite. The seams dip northwards at approximately 12°.

The frequency of smaller scale faulting is not well understood.

The frequency of dolerite dykes is unknown; however, examination of aeromagnetic data (Figure 34) suggests there are relatively few magnetic dykes within the area. GAP Geophysics (Section 10.11.1) has interpreted that identified dykes are about 2m to 5m in thickness and steeply dipping.

## 10.9. Historical Ownership

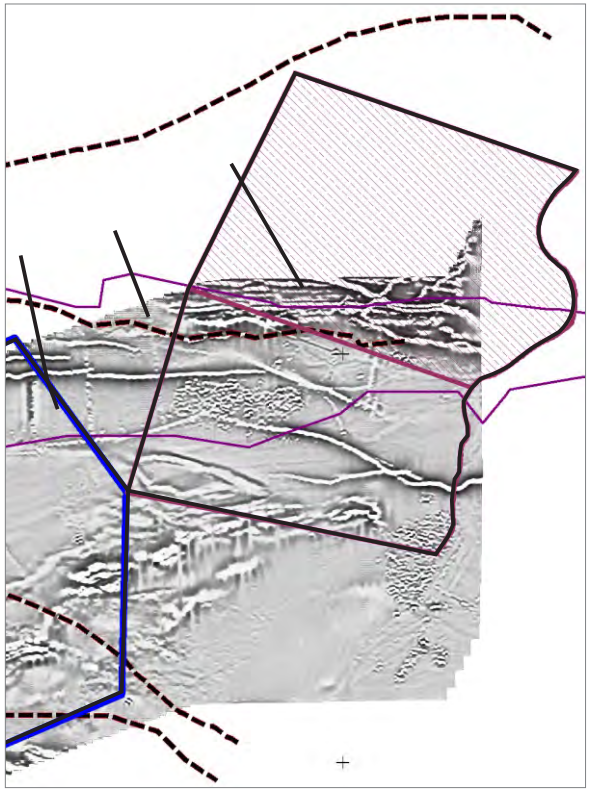
The historical ownership, and associated activities with respect to the Telema and Gray Section, is summarised in Table 26.

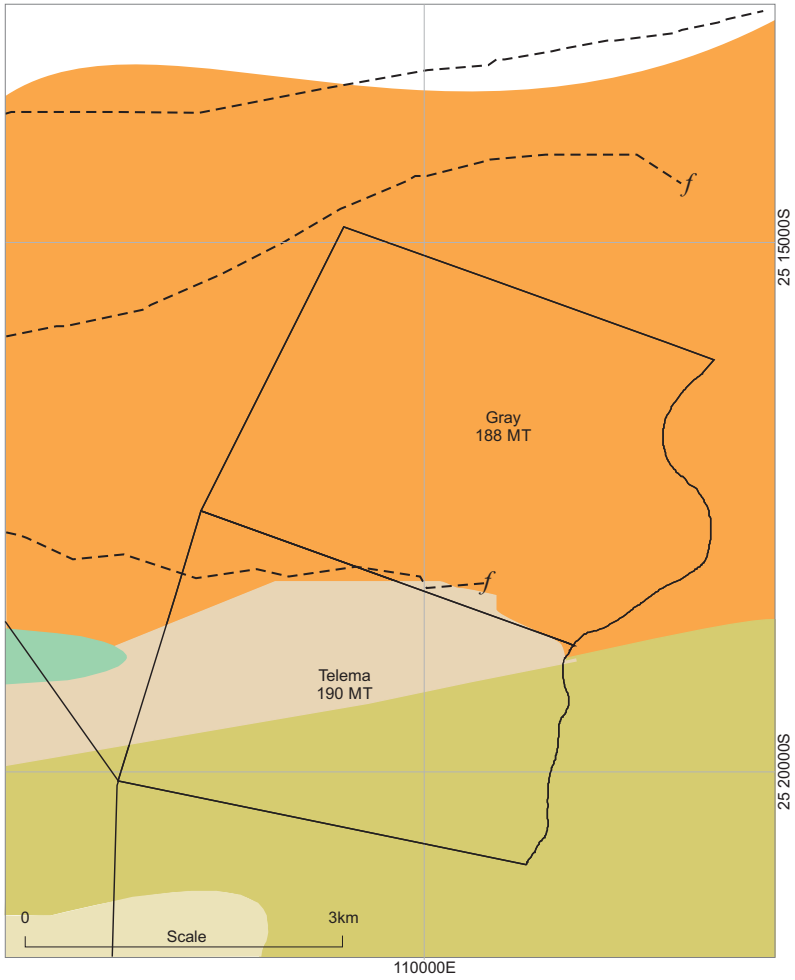
**Table 26: Telema and Gray Section: Summary of Historical Ownership and Activities**

| DATE | COMPANY | ACTIVITY |
|---|---|---|
| 1975 -1984 | ISCOR | Drilled 38 boreholes over Telema (32) and Gray (6). |
| 2006-2007 | Rio Tinto | Drilled 2 boreholes on the farm Gray 189MT. |
| 2007 | GVM (now CoAL) | Purchased the full historical drilling database from Exxaro. |
| 2007 | Regulus Investment Holdings (Pty) Limited | CoAL acquired prospecting rights from Sekoko for 6 farms in the Soutpansberg, including Telema 190MT. Sekoko retained a 5% holding. |
| 2008 | CoAL | Commissioned a photographic/LIDAR survey. |
| 2008 | CoAL | Fugro Airborne Surveys (Pty) Limited conducted helicopter-borne, aerial magnetic and radiometric surveys over the area. |
| 2010 | Regulus Investment Holdings (Pty) Limited | Acquired remaining 5% from Sekoko. |
| 2010 | CoAL | Farm Swap agreement with Rio Tinto and Section 11 transfer of the farm Gray 189MT. |

## LOCAL GEOLOGICAL MAP AND TYPICAL STRATIGRAPHIC COLUMN FOR THE TELEMA AND GRAY SECTION

### AEROMAGNETIC DATA OVER THE TELEMA AND GRAY PROJECT AREA






### STRATIGRAPHY - SAMPLE BOREHOLE LOG AND DOWNHOLE GEOPHYSICS - F645090

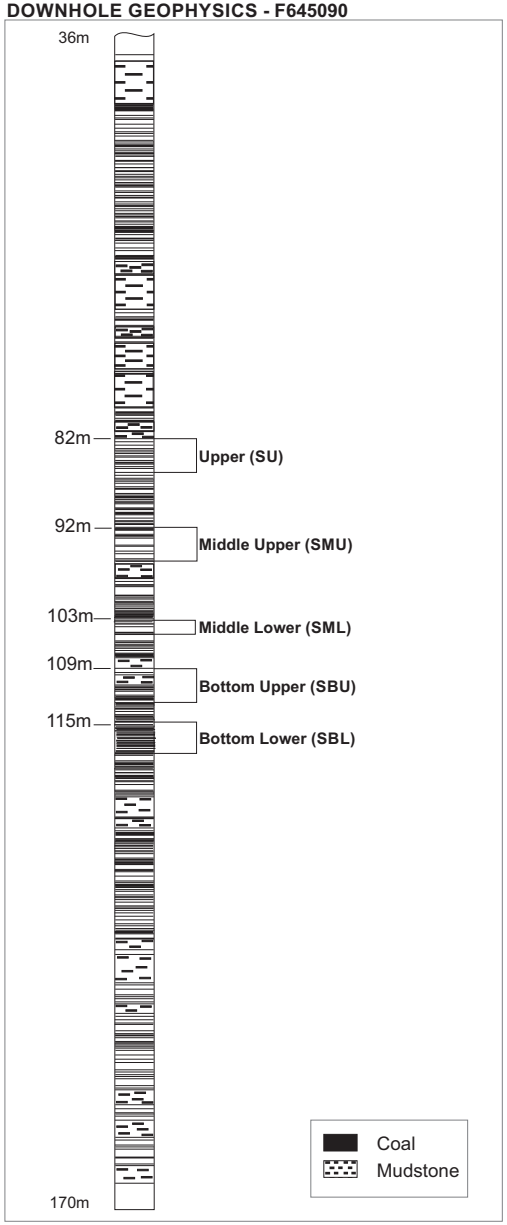



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Figure 34

## 10.10. Historical Exploration and Mining

The Soutpansberg Coalfield was extensively explored by Iscor in the 1970s and 1980s. The full Iscor dataset, containing information from approximately 1,250 boreholes, was purchased by CoAL in 2007 from Exxaro. Of these boreholes, a total of 46 diamond core boreholes were drilled by Iscor on Telema 190MS and four boreholes on and Gray 189MT. The exploration is summarised in Table 27and the location of those boreholes is indicated on Figure 35. The reader should be aware that the focus of the Iscor's exploration programme (an additional 278 boreholes) was on the adjacent farms, which now comprise CoAL's Makhado Project.

The drilling and sampling protocols used by Iscor are unknown; however, it is assumed that the drilling methods were conventional and pre-date the more efficient triple-tube wireline techniques that are commonly employed today.

From the Iscor borehole nomenclature, it is evident that it was common practice to drill a number of deflections off a single "mother" borehole. As samples from the deflections were not combined into composites, it was assumed that this practice was implemented in order to either assess any lateral variability in coal quality or to redrill the intersection to achieve improved core recoveries, rather than to maximise the amount of sample material.

It is not known whether the Iscor borehole collars were professionally surveyed. Except for the deflections, the Iscor boreholes are believed to have been drilled vertically but no directional survey data has been provided.

No historical mining has taken place within the Telema and Gray Section area.

## 10.11. Recent Exploration

Recent exploration has only been conducted, within the Telema and Gray area, by Rio Tinto. The data from two boreholes, drilled by Rio Tinto, were provided to CoAL as part of the Farm Swap Agreement (Section 6). These boreholes were both cored boreholes. Limited details are available concerning the drilling and sampling procedures for the Rio Tinto drilling. The core recoveries are unknown.

No recent exploration has been conducted by CoAL on the two farms in question. However, CoAL has drilled 172 diamond core, 24 LDD, 13 percussion and five geotechnical boreholes along strike of the Telema & Gray Section, within the Makhado Project.

Aerial magnetic and radiometric surveys have been undertaken by CoAL.

The exploration is summarised in Table 27 and the location of those boreholes is indicated on Figure 37.

### 10.11.1. Remote or Geophysical Exploration

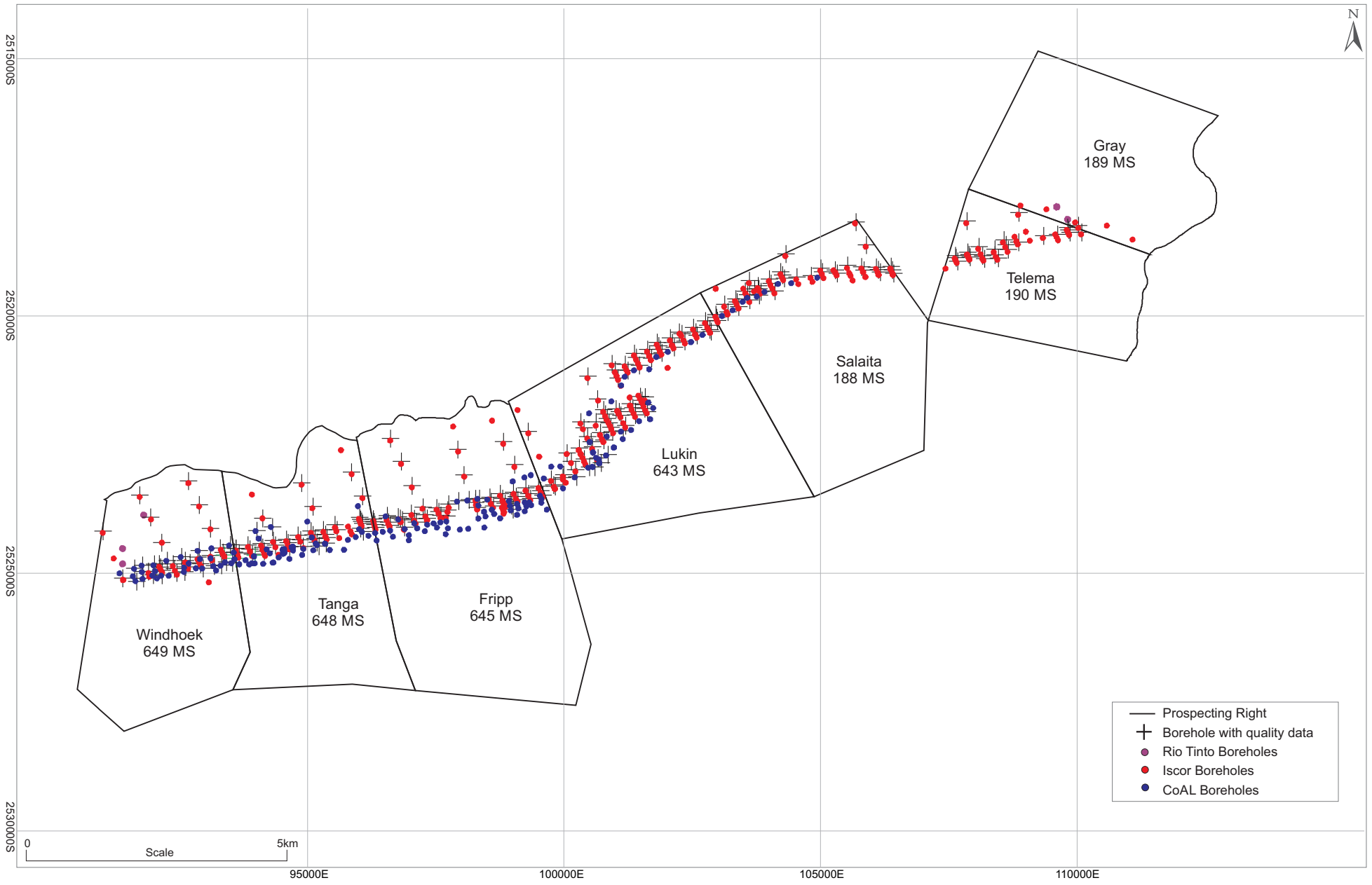
CoAL commissioned EPA to conduct a photographic/LIDAR survey in 2008 over the properties it held at that time. This survey was flown in a fixed wing aircraft at a height of approximately 1,100m above ground surface. A 70kHz laser provided ground elevation data to a 15cm vertical and 30cm horizontal accuracy. Digital colour images were obtained with a pixel size of 15cm and transformed to orthophotos. The survey was based on WGS84 datum and Lo29E projection. Ellipsoidal heights were transformed to orthometric heights in Xform 4.3 using the Southern Africa Quazi geoidal model. No horizontal transformation was carried out because the final survey was required on the WGS84 datum.

In March 2008, Fugro Geophysics (Pty) Limited (Fugro) conducted helicopter-borne, aerial magnetic and radiometric surveys. The line spacing was 50m with a nominal sensor ground clearance of 15m to 25m.

In July 2010, Fugro conducted a LIDAR survey over all the Makhado Project properties, subsequent to the Section 11 transfer of the properties previously held by Rio Tinto.

CoAL acquired aeromagnetic data in Geosoft® format for the property Gray 189MS from Rio Tinto in 2010.

## TELEMA AND GRAY SECTION - LOCATION OF BOREHOLES




Source: Coal of Africa
VMD1971_CoAL GSP CPR_2015

Venmyn Deloitte.

Coal of Africa

Figure 35

**Table 27 : Telema and Gray Section – Summary of Historical and Recent Drilling**

| DATE | COMPANY | LOCATION | PURPOSE | SURVEYOR | DRILLING COMPANY | TYPE OF DRILLING | SIZE | RESPONSIBLE GEOLOGIST | TOTAL NO. B/H | WIRELINE LOGGING | SEAMS SAMPLED | QUALITY RESULTS | LABORATORY FOR QUALITY | USED IN MODEL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Pre 2008 | Iscor | Telema 190MT & Gray 189MT | Early exploration and resource estimation. | Unknow n | Unknown | Diamond core | NQ | Various | 46 | No | All | Yes | Iscor Laboratories | Yes |
| 2006 - 2007 | Rio Tinto | Gray 189MT | Resource estimation. | Unknow n | Unknown | Diamond core | PQ3 | D Hirstov | 2 | Yes | All | Yes | ALS Brisbane | No |
| | | | | | | | | **TOTAL** | **40** | | | | | |

#### 10.11.1.1. Surveying Methods

Details of the surveying methods used by Rio Tinto are not available, however it is understood that the borehole collar elevations were determined from non-differential, hand-held GPS readings. For structural modelling purposes, CoAL has adjusted the reported collar positions for the Rio into boreholes to the LIDAR survey. The Rio Tinto boreholes were not used for resource estimation purposes.

The Rio Tinto boreholes were drilled vertically.

### 10.11.2. Diamond Drilling

Details of the diamond drilling methods used by Rio Tinto are not available. Samples collected by Rio Tinto were allocated numbers corresponding to one of 55 recognised sub-seams or sections. Not all seams were sampled. The sampling protocol is unknown.

### 10.11.3. Percussion or Open Hole Drilling

Venmyn Deloitte is not aware of any recent percussion or open hole drilling having been conducted by CoAL at the Telema & Gray Section.

### 10.11.4. Down the Hole Geophysics / Wireline Logging

Downhole geophysical surveys were conducted on the Rio Tinto boreholes and included calliper, natural gamma, long and short-spaced density, magnetic susceptibility, resistivity, long and short-spaced neutron, directional survey and acoustic televiewer data.

### 10.11.5. Bulk Sampling

No bulk sampling has been conducted within the Telema and Gray Section area. Extensive bulk sampling has however been conducted on the adjacent Makhado Project ((the reader is referred to the 2011 CPR)

### 10.11.6. Laboratory Analyses

Samples from the Rio Tinto drilling campaign were analysed at ALS Brisbane (ISO 17025 accredited). Products were returned to South Africa for petrographic analysis.

### 10.11.7. Data Management

#### 10.11.7.1. Data Acquisition and Validation

CoAL purchased both hard and electronic data copies of the original Iscor database from Exxaro in 2007. This data was characterised by incomplete electronic capture of lithological and sampling data from the Iscor hard copy logs, which is currently being corrected by CoAL.

Borehole and analytical data provided by Rio Tinto were in the form of a series of MS Excel® spreadsheets. Downhole geophysical data were supplied as .LAS (text) files and Wellcad® files. Aeromagnetic and ground magnetic data were provided primarily as Geosoft® grids.

It is not possible to validate the Rio Tinto data further as the original borehole logs and laboratory certificates were not provided.

The two Rio Tinto boreholes have not been incorporated into the current Telema and Gray Model as it proved difficult to reconcile the seam selections and seam nomenclatures. Given that the two Rio Tinto boreholes are located just outside the Defined Resource Area, their exclusion from the resource database is not regarded as material.

CoAL utilises a Sable™ database to store all geological data. The SABLE™ data is imported into Minex™ for geological modelling purposes.

Venmyn Deloitte has randomly selected 10 borehole logs and verified the logs and associated laboratory certificates with the Access database and found no errors.

#### 10.11.7.2. Database Management

The Access database for the Telema and Gray Section area currently contains data from 40 boreholes. These are derived from the following two sources:-

- the Iscor database containing information from 38 boreholes; and
- the Rio Tinto database containing data from two boreholes, obtained as part of the Farm Swap Agreement.

The Access database is managed and maintained by CoAL's Competent Person, Mr. J. Sparrow (Pr.Sci.Nat.), and the Telema and Gray Section geologist, Mr. C. Mafiri. Backups are stored at CoAL's head office in Johannesburg.

## 10.12. Orebody Modelling and Results

A number of independent orebody models have been prepared for the Telema and Gray Section since CoAL's involvement in the project.

The latest model was prepared by Mr. J. Sparrow (Pr.Sci.Nat.), CoAL's Competent Person as at 29 February 2012. The model was prepared in Minex™ Software. The model takes into account all available historical and recent drilling and other geological information as of the 31 August 2011.

Both CoAL and Venmyn Deloitte have a high level of confidence with respect to the current model and the associated resource estimates.

Venmyn Deloitte has reviewed the model and interviewed Mr. J. Sparrow (Pr.Sci.Nat.) concerning his methods of modelling. Venmyn Deloitte has also independently plotted the graphical distribution of the boreholes in Geosoft Target and Micromine and verified the results of the seam thickness variations and resultant volume calculations. Venmyn Deloitte is satisfied with the integrity and results of the model.

The upper surface of the model was sourced from the DTM and is presented in Figure 38. This figure shows the high relief in the north of the farm Gray 189MT and the relatively flat topography over much of the rest of the project area.

Given the location of reliable borehole data, an orebody model and resource estimate has only been conducted, by CoAL, on the farm Telema 190MT.

Both the physical and quality parameters of the various seams were modelled, by CoAL. Grids with a 20m mesh were estimated using Minex's general purpose gridding function using a 2.5km search radius. The model of the physical parameters of the seam was cut along any significant structures, whilst the quality parameters were modelled across it. All physical and quality parameters were plotted and visually inspected to ensure they were acceptable for geological interpretation.

### 10.12.1. Physical Results

The physical parameters of the elevation, in metres above sea level, and the depth from surface of the Upper, Middle Upper, Middle Lower, Bottom Upper and Bottom Lower Seam floors and roofs were modelled, by CoAL.

The seam thicknesses were modelled and used for the calculation of the resource volumes. Although all these parameters were modelled, only the respective seam floor elevations, depths from surface and the seam thicknesses results are presented.

The physical parameters of the elevation, in metres above sea level, and the depth from surface of the respective seam floors and roofs were modelled. The seam thicknesses were modelled and this was used as the basis for the calculation of the resource volumes. Although all these parameters were modelled, only the seam floor elevation, depth from surface and the seam thickness results are presented.

#### 10.12.1.1. Seam Floor Elevation

The Upper, Middle Upper, Middle Lower, Bottom Upper and Bottom Lower Seam floor elevations have been modelled in order to identify any abrupt elevation changes that would indicate the presence of faulting and also to identify the general dip across the project area. The variation in seam floor elevation for the Bottom Lower Seam is presented in
Figure 36.

No abrupt floor elevation differences can be observed on the farm Telema 190MT. The seam floor elevation contours show that the coal within the Telema and Gray Section area dips to the north, with the coal subcropping along the southernmost limit of coal.

#### 10.12.1.2. Depth from Surface

The depth of the seams from surface will influence the mining method (opencast versus underground). The various seam floor depths from surface are presented in Figure 37. The figure indicates that the majority of the coal can be mined using opencast methods. The coal within opencastable areas generally occurs at depths to a maximum of approximately 200m from surface.

#### 10.12.1.3. Seam Thickness

The various seam thickness contours or isopachs are presented in Figure 38. The seam thicknesses are variable across the farm Telema 190MT; however, only small isolated areas of the coal seams with thicknesses of less than 0.5m occur. These areas generally occur near the coal subcrop. The Upper and Middle Lower seams are notably thinner than the other seams, with several isolated areas, less than 0.5m thickness.

The variations of the stripping ratio across the Telema and Gray Section area are shown in Figure 39.

### 10.12.2. Quality Results

The percentage yields, volatiles and CVs for a washed sample product, at an RD of 1.4, were modelled, by CoAL. Raw qualities have not been modelled as raw quality data is not available for all historical boreholes. At a wash RD of 1.4, all recent and historical boreholes can be correlated at the adjacent Makhado Project. Venmyn Deloitte and CoAL therefore have a high degree of confidence in the historical quality data.

#### 10.12.2.1. Coking Potential

Based on the sample testwork at the adjacent Makhado Project, the Telema and Gray Section coal product is expected to be a medium volatile, semi-hard coking coal. The discount to semi-hard, rather than hard, is due to the relatively high ash in comparison to most commercially traded hard coking coals.

#### 10.12.2.2. Washed Calorific Value

The modelled CV content of the drill sample washed products at an RD of 1.4 for the Telema and Gray Section is graphically presented in Figure 40. The wash product CV while variable, is broadly consistent within the various seams and across the project area, varying between 31MJ/kg and 33MJ/kg.

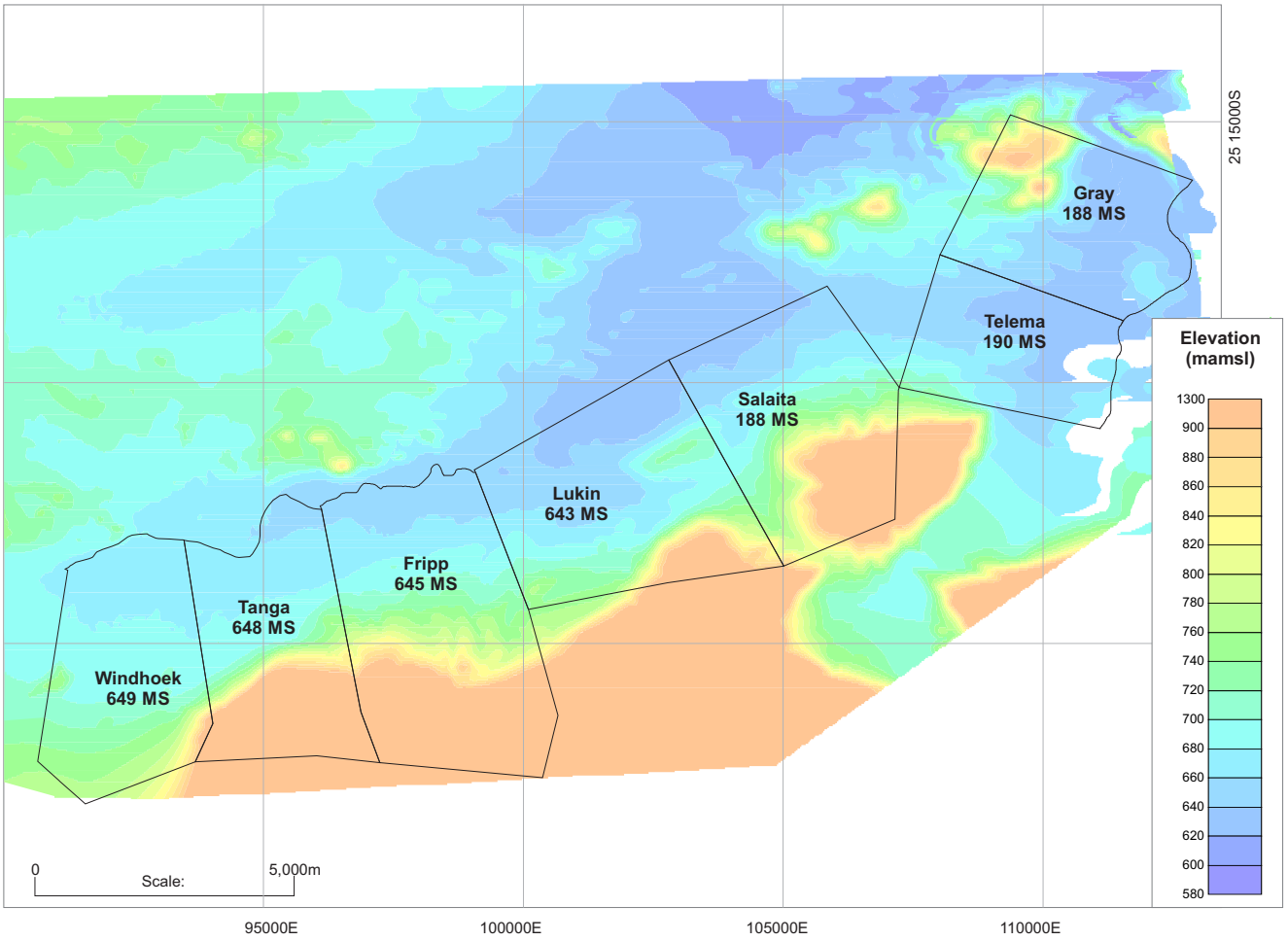
#### 10.12.2.3. Washed Ash

The modelled ash content of the drill sample washed products at an RD of 1.4 for the Telema and Gray Section is graphically presented in Figure 41. The ash content has an inverse relationship with the CV and this is clearly evident in the respective contour plots. Raw ash is variable within the various seams and across the project area, but generally ranges between 8% and 12% for a 1.4 RD wash product.

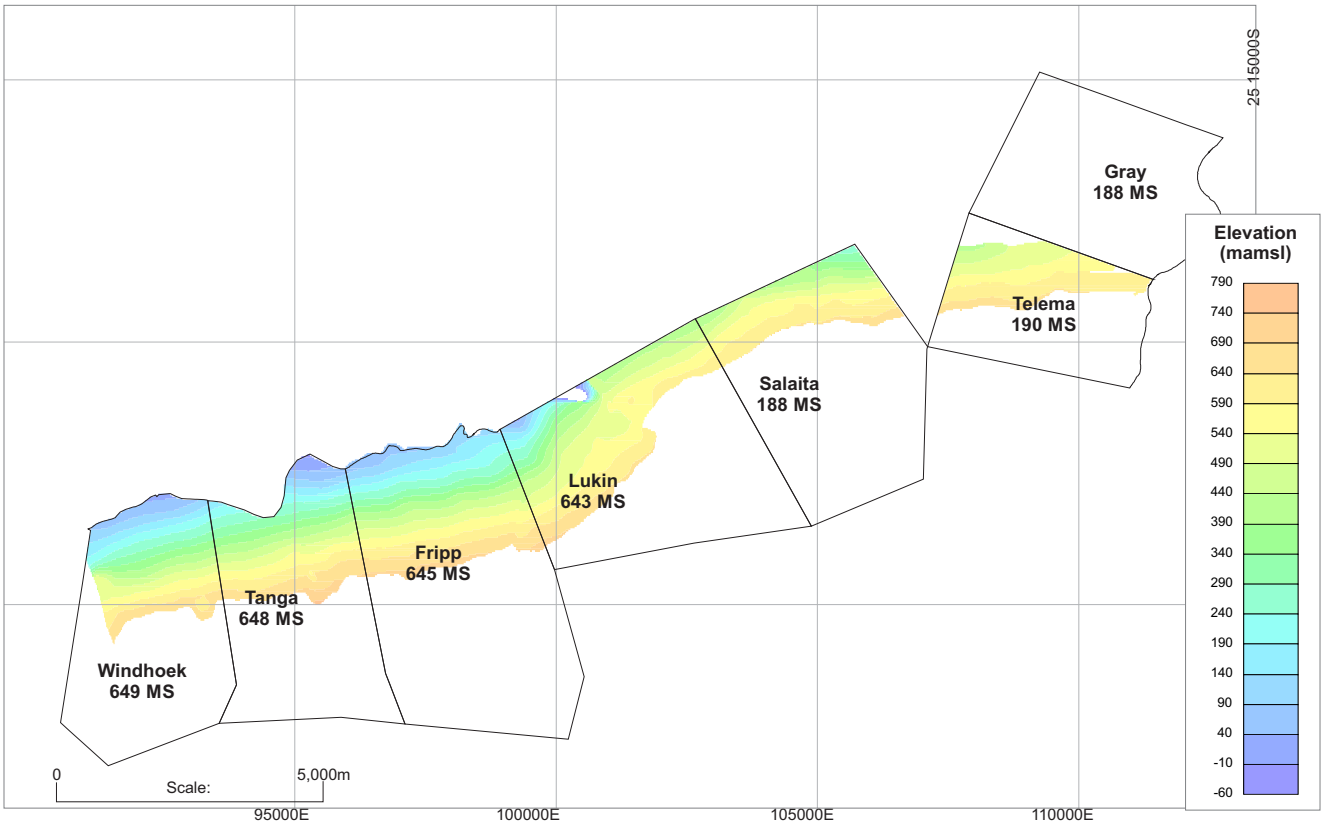
Venmyn Deloitte. Coal of Africa

## TELEMA AND GRAY SECTION - SURFACE CONTOURS AND BOTTOM LOWER SEAM FLOOR ELEVATION

### TOPOGRAPHY




### BOTTOM LOWER SEAM FLOOR ELEVATION

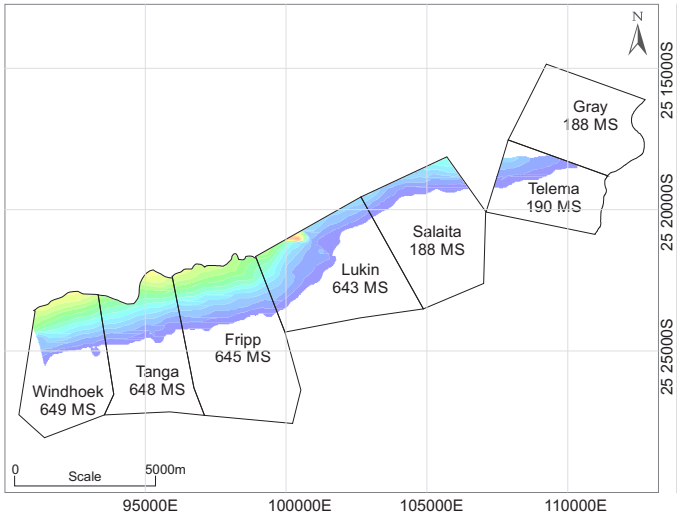



Source: Coal of Africa

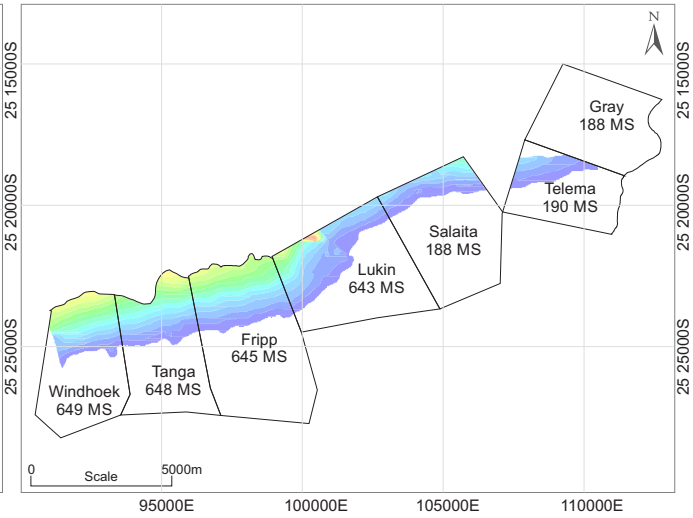
VMD1971_CoAL GSP CPR_2015

## TELEMA AND GRAY SECTION - SEAM DEPTHS FROM SURFACE

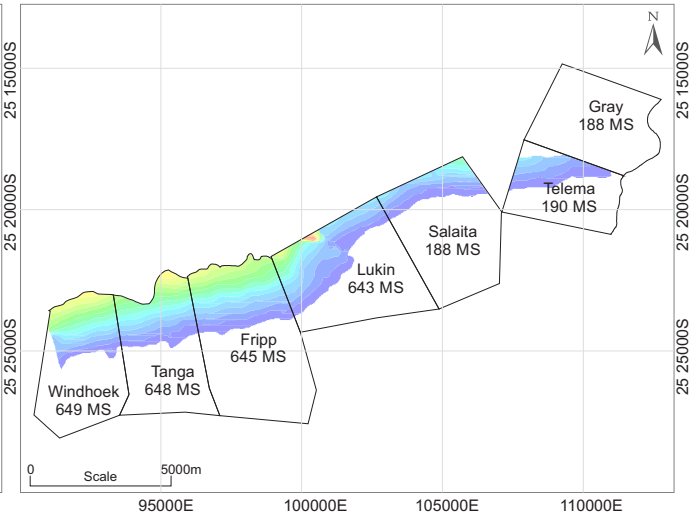
### UPPER SEAM DEPTH

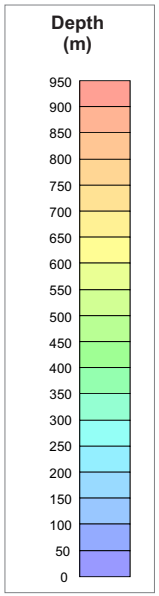



### MIDDLE SEAM DEPTH

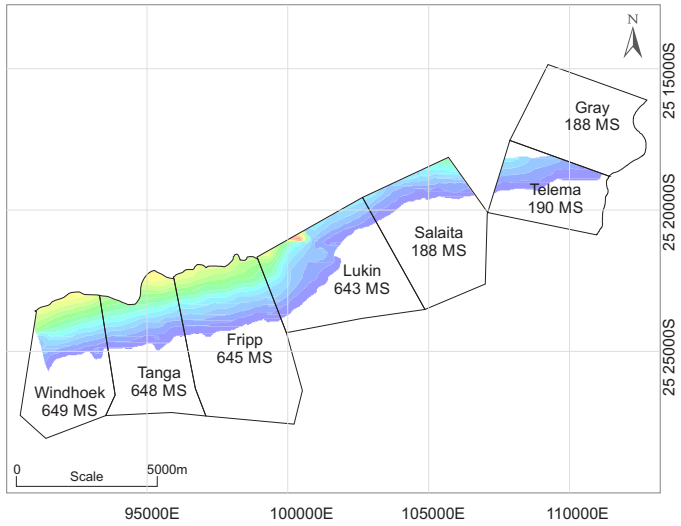



### MIDDLE LOWER SEAM DEPTH

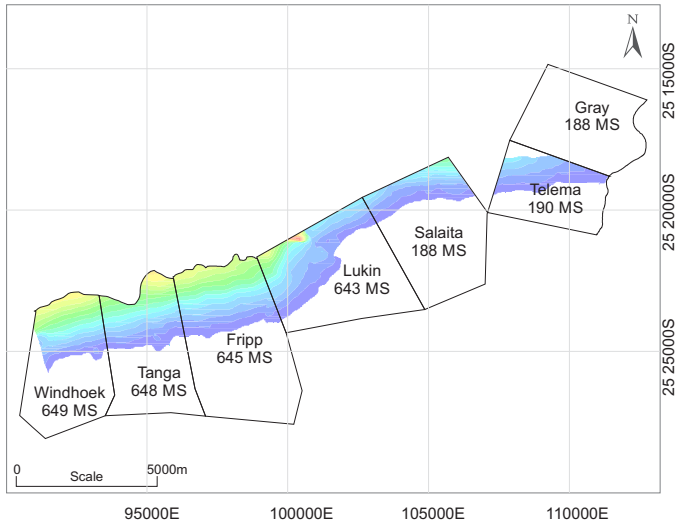



### BOTTOM UPPER SEAM DEPTH




### BOTTOM LOWER SEAM DEPTH




Source: Coal of Africa
VMD1971_CoAL GSP CPR_2015

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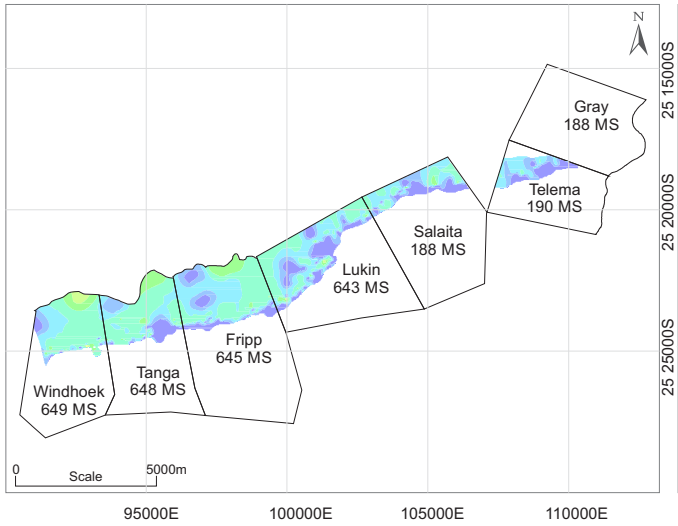
Figure 37

## TELEMA AND GRAY SECTION - ISOPACH CONTOURS

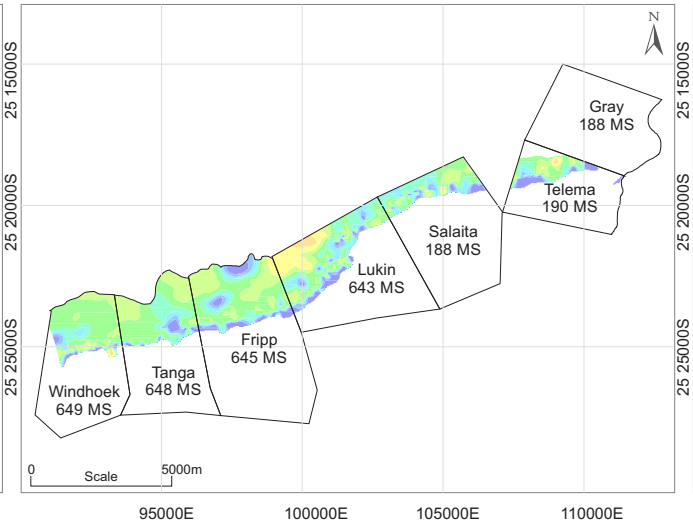
### UPPER SEAM







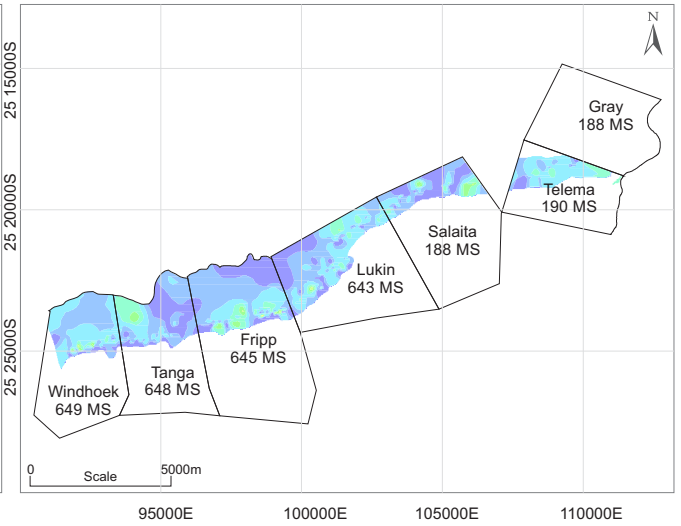
### MIDDLE SEAM





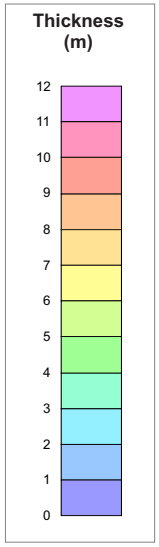


### MIDDLE LOWER SEAM

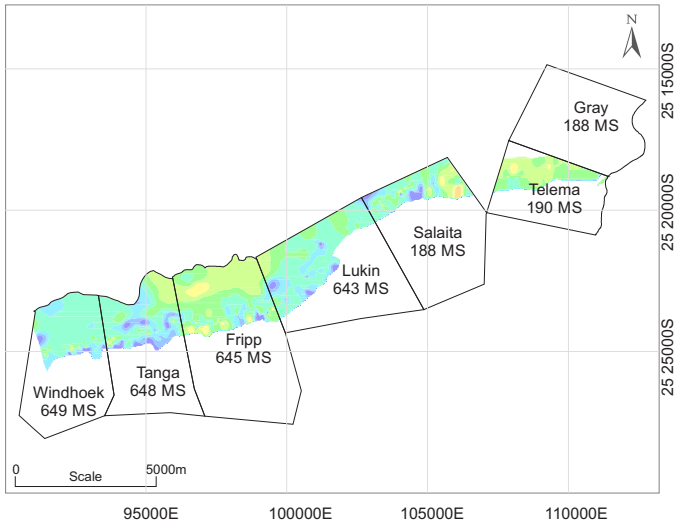








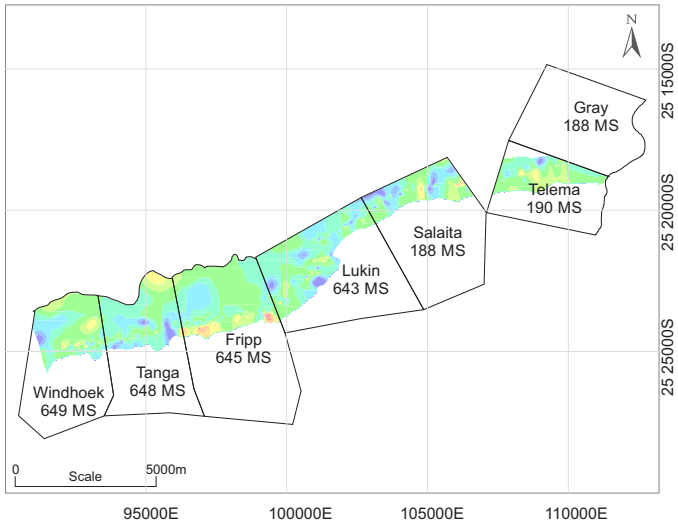

### BOTTOM UPPER SEAM







### BOTTOM LOWER SEAM







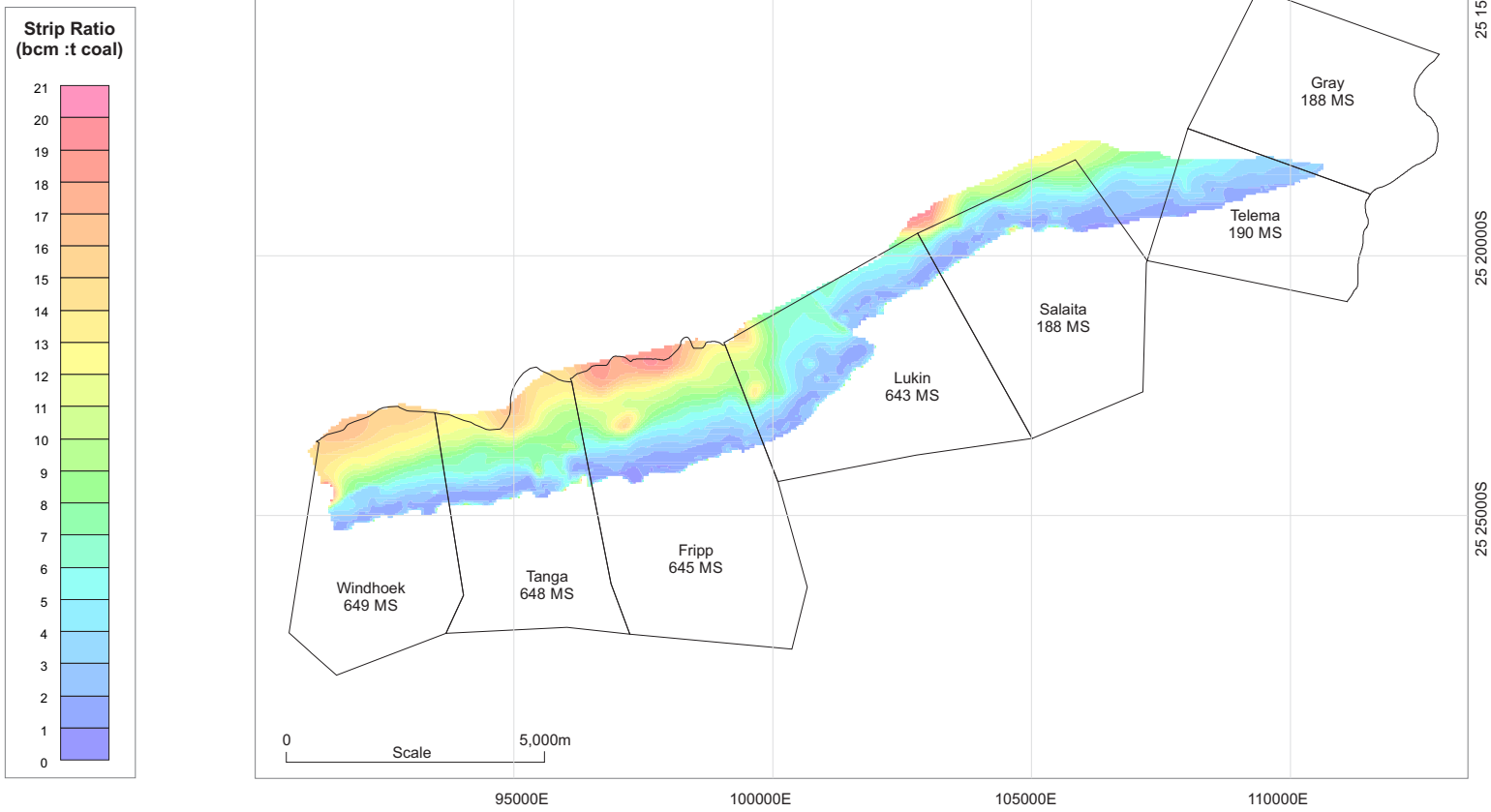
Source: Coal of Africa
VMD1971_CoAL GSP CPR_2015

Venmyn Deloitte.

Coal of Africa

Figure 38

## TELEMA AND GRAY SECTION -STRIP RATIOS AND MINING AREAS

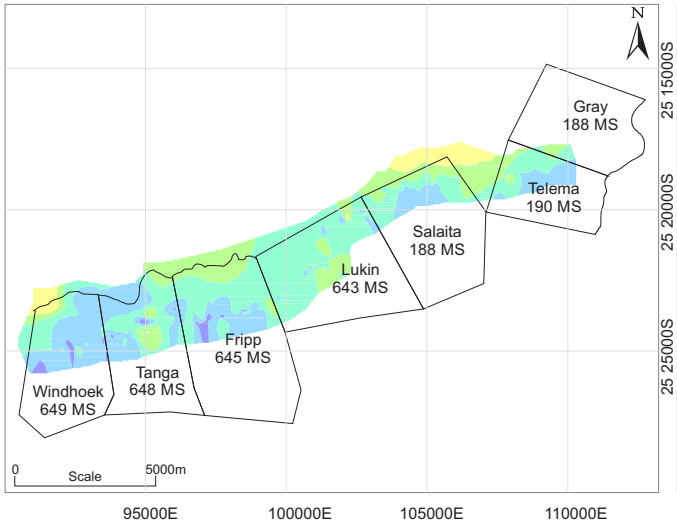



Source: Coal of Africa
VMD1971_CoAL GSP CPR_2015

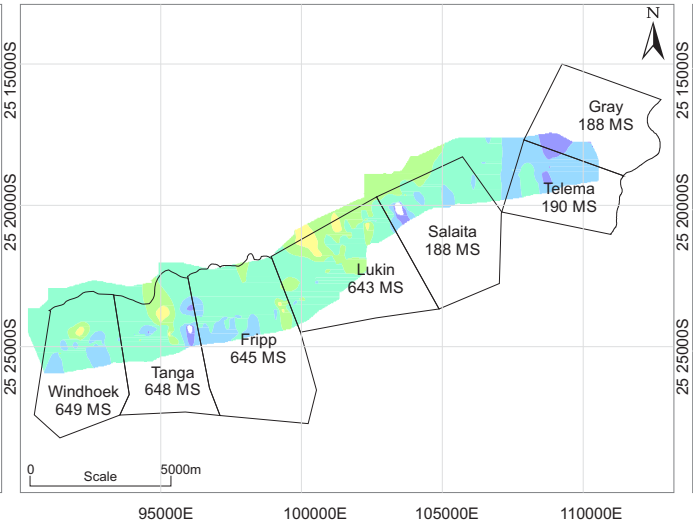
Figure 39

## TELEMA AND GRAY - THEORETICAL PRODUCT CV CONTOURS (@RD = 1.40)

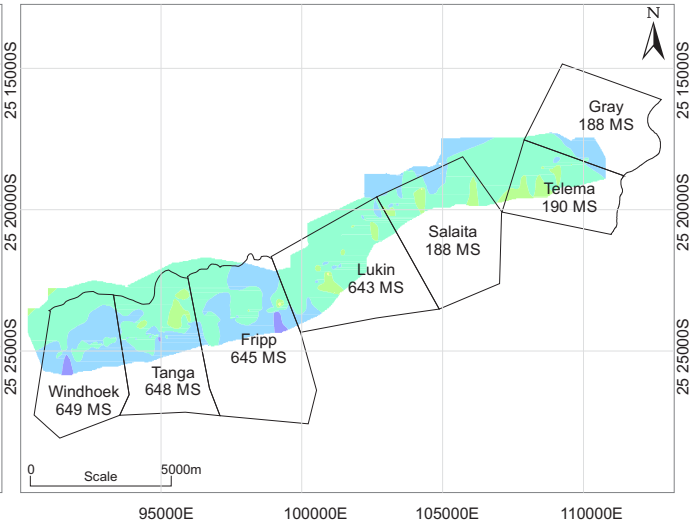
### UPPER SEAM



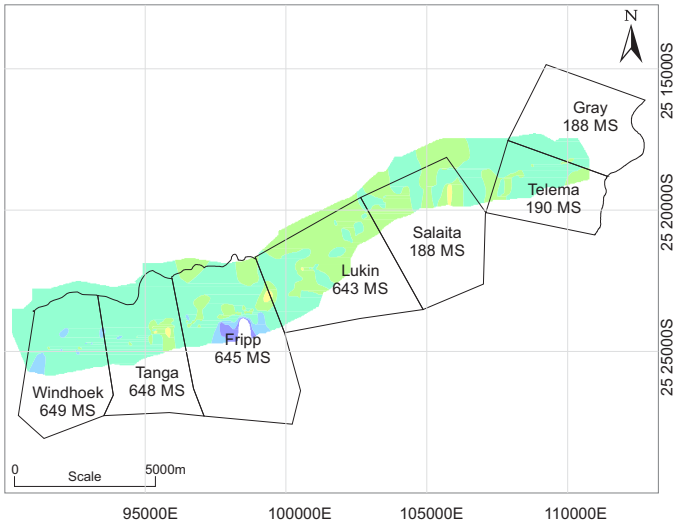

### MIDDLE SEAM



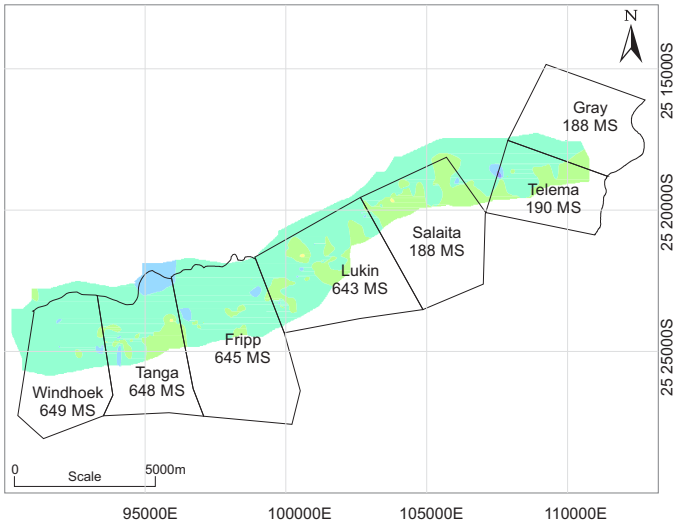

### MIDDLE LOWER SEAM

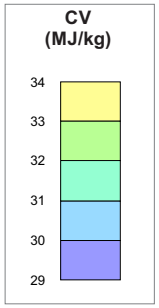



### BOTTOM UPPER SEAM




### BOTTOM LOWER SEAM



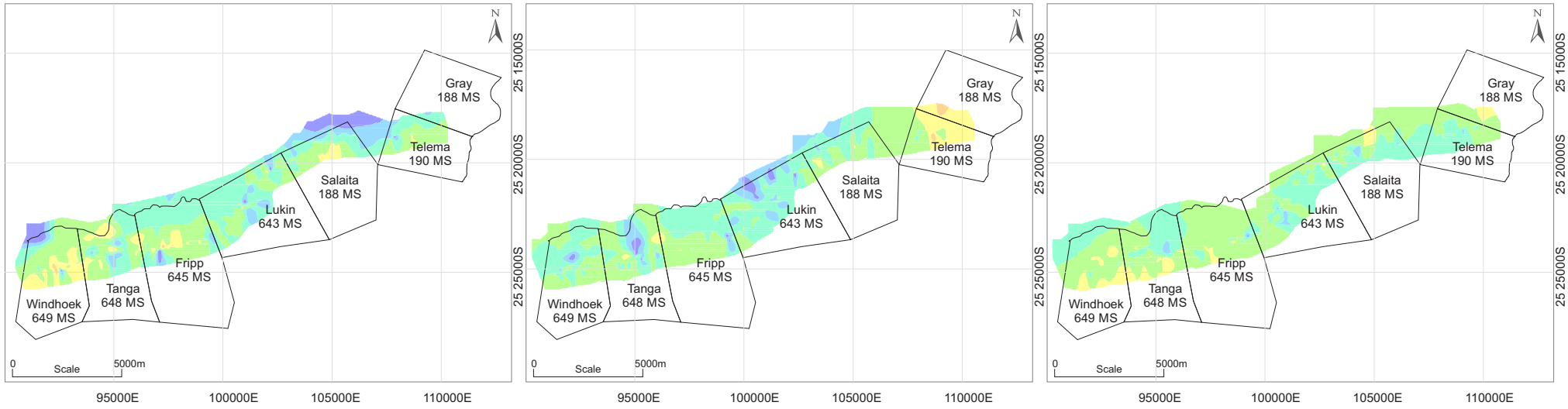

Source: Coal of Africa

VMD1971_CoAL GSP CPR_2015

Figure 40

## TELEMA AND GRAY SECTION - THEORETICAL PRODUCT ASH CONTOURS (@RD = 1.40)

### UPPER SEAM



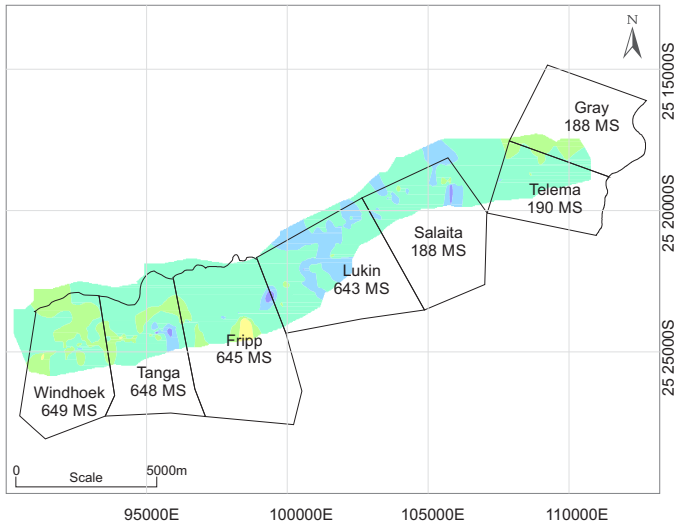

### MIDDLE SEAM



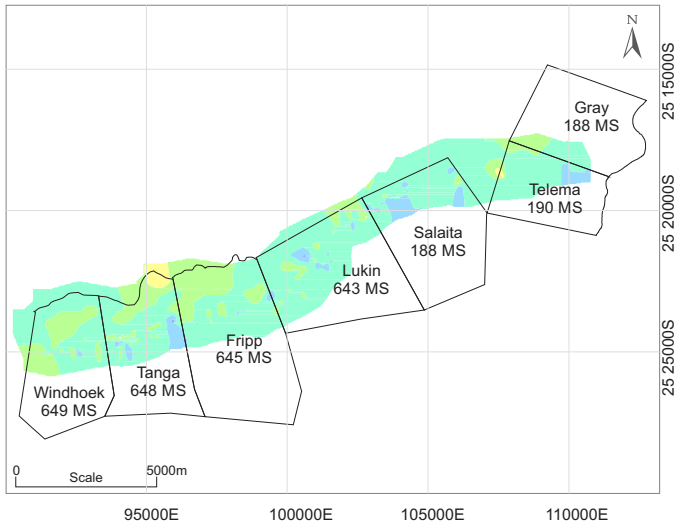

### MIDDLE LOWER SEAM

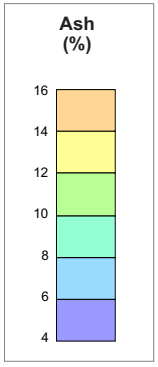



### BOTTOM UPPER SEAM




### BOTTOM LOWER SEAM




Source: Coal of Africa
VMD1971_CoAL GSP CPR_2015

Figure 41

Coal of Africa

#### 10.12.2.4. Washed Volatiles

The modelled volatile content of the drill sample washed products at an RD of 1.4 for the Telema and Gray Section is graphically presented in Figure 42. A relatively consistent volatile content profile across the project area is apparent from Figure 42. Volatiles generally exceed 26% for a 1.4 RD wash product. Small, localised areas characterised by volatile contents of less than 20% may indicate areas where dolerites cut through the coal seams.

#### 10.12.2.5. Potential Yields

The theoretical yield variations at the Telema and Gray Section, based on a 1.4 RD wash product are presented in Figure 43. This yield plot provides the reader with an indication of the yield potential of the coal. While the yields are highly variable, in general, yields of in excess of 15% and up to 35% are achieved at a 1.4 RD wash.

It is generally accepted that reliable estimates of coking coal product yields are often not achievable from the testing of slim core samples and that results obtained from bulk sample pits give the most accurate estimates.

## 10.13. Coal Mining

Due to the stage of development of the Telema and Gray Section, no detailed investigations have been carried out on the potential mining of the deposit. However, upon considering the depth from surface of the coal zones, any future mining is expected to be mostly opencast, with limited additional underground methods.

Details on mining methods and recoveries will be investigated during a Pre-Feasibility Study on the project.

## 10.14. Coal Processing

The Telema and Gray coal is most likely to yield a coking coal product. This product is briefly discussed in Section 8.12.2.1. No details are currently available on the envisaged processing plant. This study will be undertaken as part of a Pre-Feasibility Study.

## 10.15. Coal Market

The indications are that the Telema and Gray product will be a semi-hard coking coal, based on current geological data and plant assumptions. There are currently no contracts in place for the sale of this coal.

## 10.16. Previous Resource Statement

A Coal Resource was declared, by CoAL, as at 30 September 2012 in the CPR entitled “Independent Competent Persons’ Report on Certain Coal Assets Within the Soutpansberg Coalfield of Coal Of Africa Limited”. No additional changes have been made by CoAL to the geological model or resource estimation for the Telema and Gray Section since the 2012 CPR.

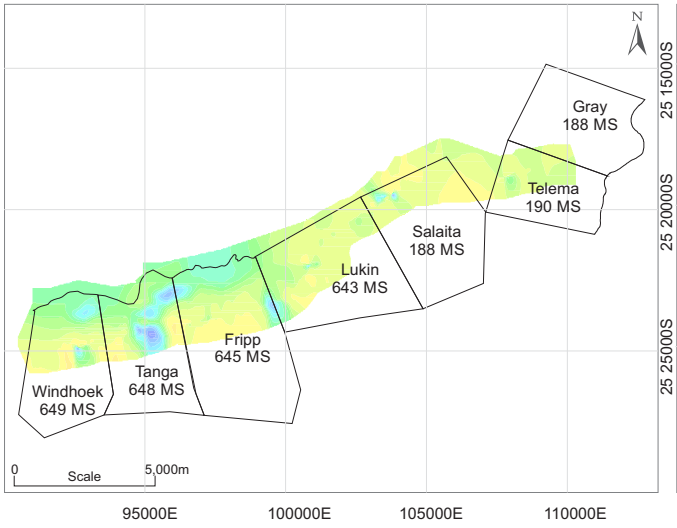
## 10.17. Current Resource Statement

The JORC compliant Coal Resource for the Telema and Gray Project, as at 31st December 2015, was estimated and signed off by CoAL's Competent Person, Mr J Sparrow (Pr.Sci.Nat.), CoAL's Group Geologist. Venmyn Deloitte reviewed CoAL’s estimation procedures and considers the Coal Resource estimates and classification as prepared and declared by CoAL as reasonable and compliant with JORC.

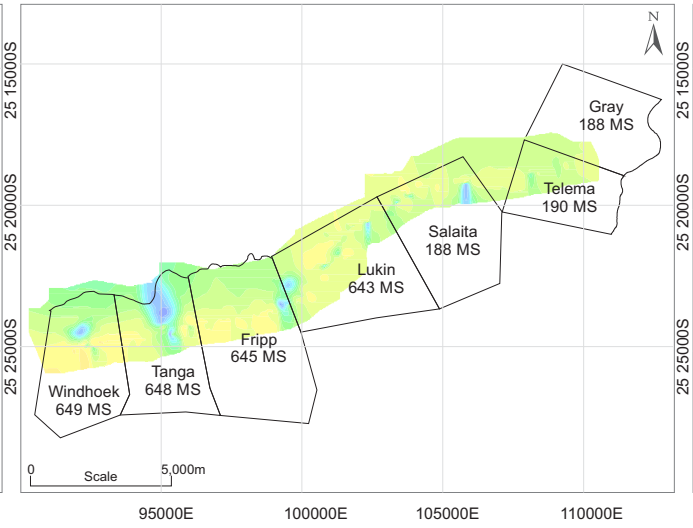
The classification into the various resource categories, by CoAL, is primarily based upon the relative spacing of points of observation with both quantitative and qualitative results. Venmyn Deloitte is confident that the logging, sampling, data density and distribution are suitable for the Coal Resource estimation. The estimation of each of the parameters required for the reporting of coal resources is presented in the section to follow. The Coal Resource Statement for the farm Telema 190MT, is presented in Table 28 and the location of the coal resources in relation to the NOMRs boundary is illustrated in Figure 44.

## TELEMA AND GRAY SECTION - THEORETICAL PRODUCT VOLATILE CONTOURS (@RD = 1.40)

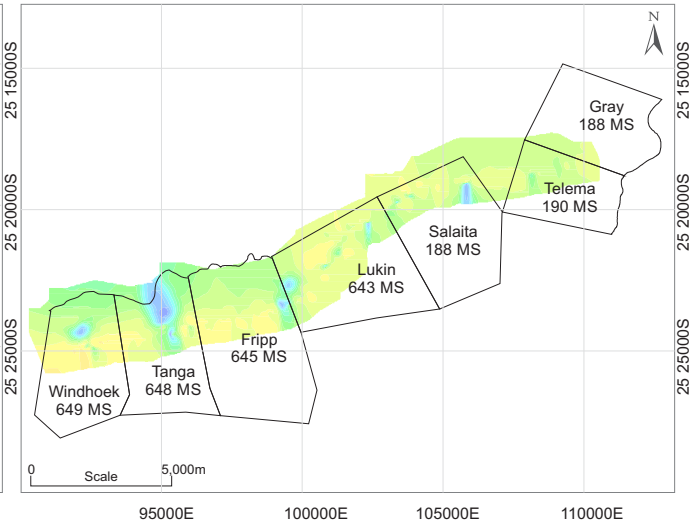
### UPPER SEAM 140 VOLATILE RESOURCE



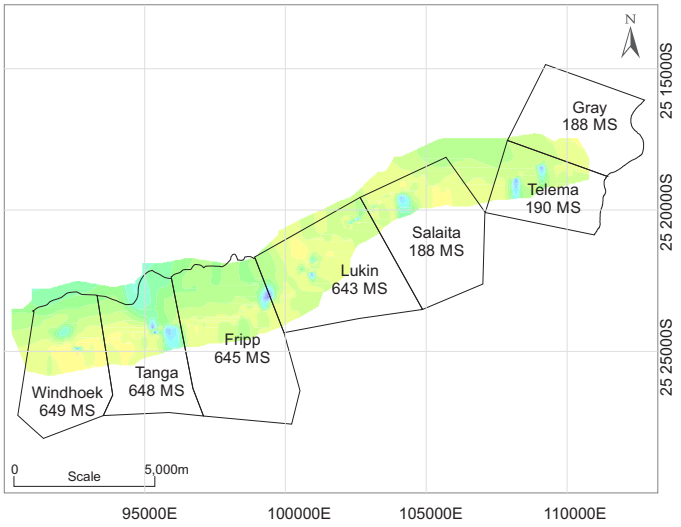

### MIDDLE SEAM 140 VOLATILE RESOURCE



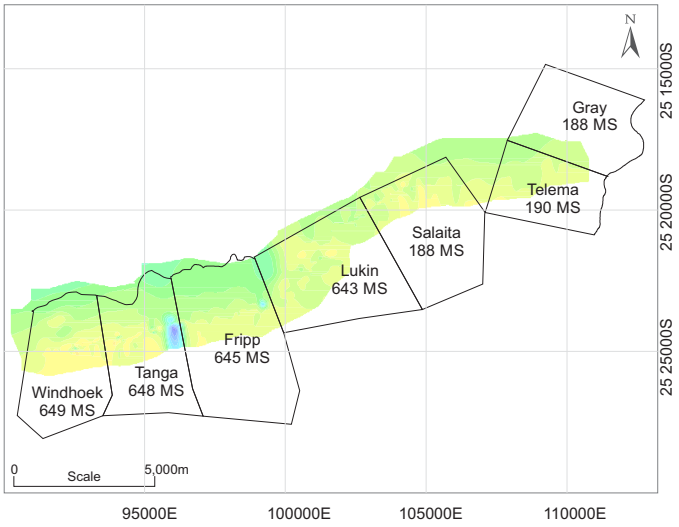

### MIDDLE LOWER SEAM 140 VOLATILE RESOURCE

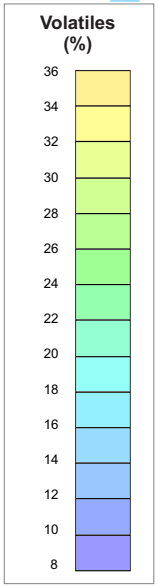



### BOTTOM UPPER SEAM 140 VOLATILE RESOURCE




### BOTTOM LOWER SEAM 140 VOLATILE RESOURCE



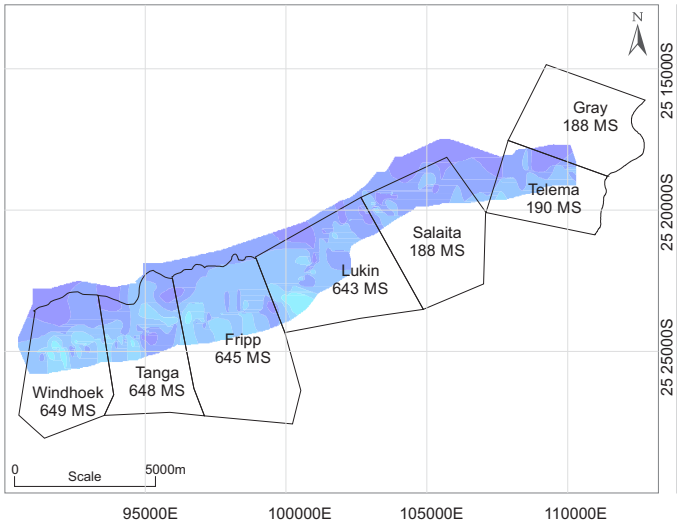

Source: Coal of Africa
VMD1971_CoAL GSP CPR_2015

Figure 42

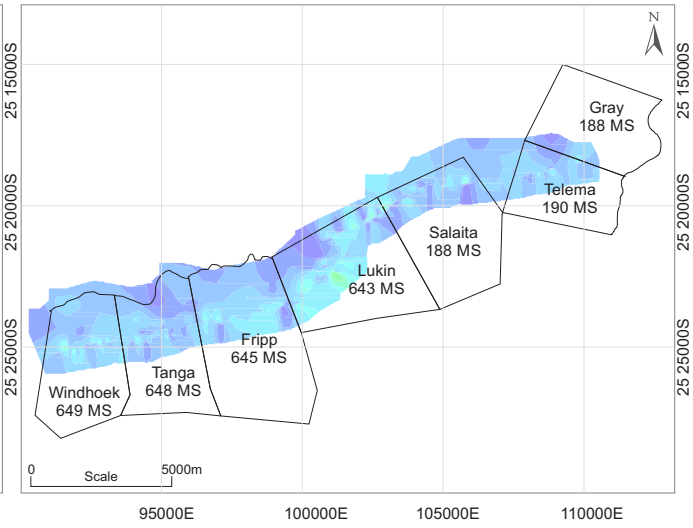
Coal of Africa

## TELEMA AND GRAY SECTION - THEORETICAL PRODUCT YIELD CONTOURS (@RD = 1.40)

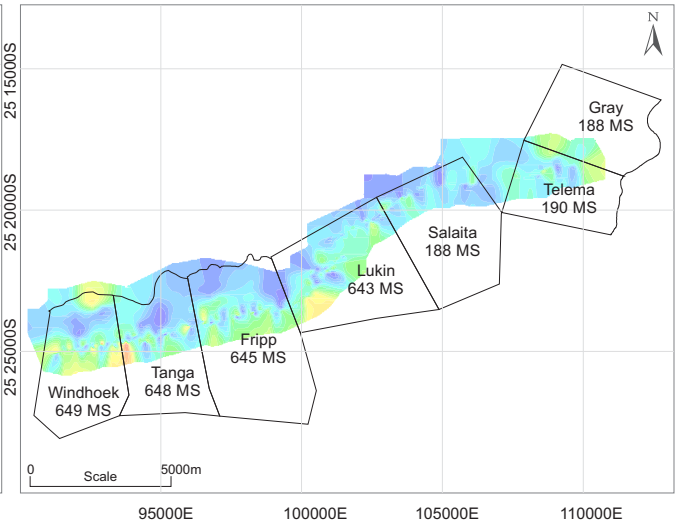
### UPPER SEAM

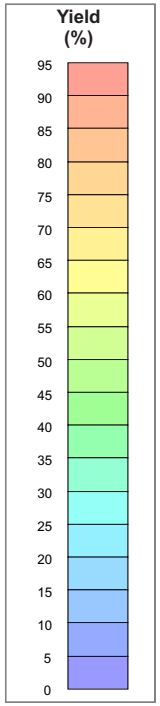



### MIDDLE SEAM

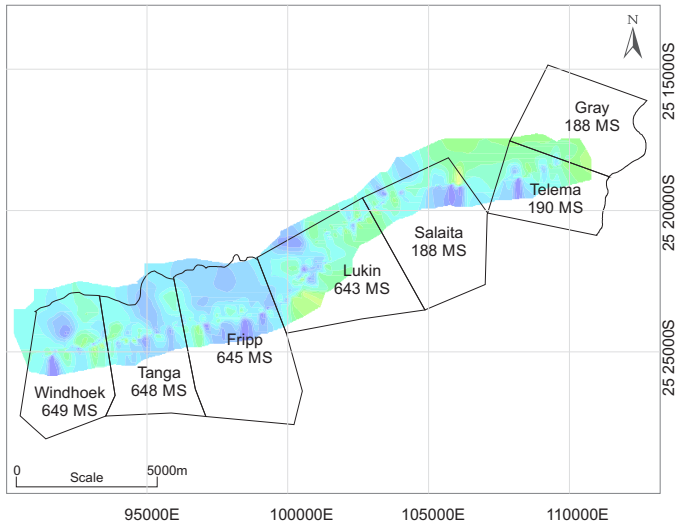



### MIDDLE LOWER SEAM

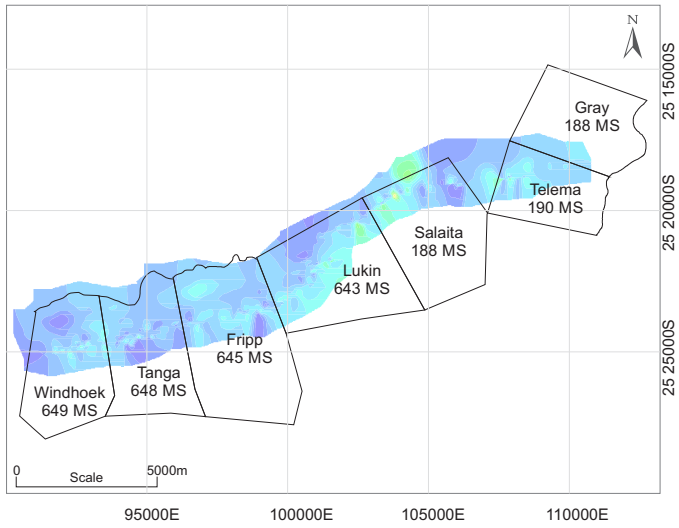



### BOTTOM UPPER SEAM




### BOTTOM LOWER SEAM




VMD1971_CoAL GSP CPR_2015

Source: Coal of Africa

Figure 43

**Table 28 : Telema and Gray Section - Resource Statements (31 December 2015) - CoAL**

RESOURCE CALCULATED AT 0.5mm MINIMUM SEAM THICKNESS

| FARM | RESOURCE CATEGORY | SEAM | AVE WIDTH (m) | COAL RAW RD (t/m³) | GROSS TONNES IN SITU | GEOL. LOSSES (%) | TOTAL TONNES IN SITU | AIR DRIED WASHED QUALITIES @ RD = 1.4 | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | YIELD (%) | CV (MJ/kg) | ASH (%) | VOL (%) | FIXED CARBON (%) | SULPH. (%) | MOIST. (%) |
| Telema190MT | Measured | Upper | 1.89 | 1.99 | 2,514,692 | 10.00 | 2,263,200 | 7.72 | 31.57 | 9.65 | 29.96 | | 1.04 | 0.69 |
| | | Middle Upper | 4.20 | 1.80 | 9,303,701 | 10.00 | 8,373,300 | 14.48 | 30.43 | 12.43 | 29.06 | | 1.12 | 0.52 |
| | | Middle Lower | 2.29 | 1.80 | 5,897,314 | 10.00 | 5,307,500 | 27.10 | 31.56 | 9.67 | 28.15 | | 1.06 | 0.62 |
| | | Bottom Upper | 5.01 | 1.75 | 13,083,456 | 10.00 | 11,775,100 | 29.47 | 31.83 | 9.02 | 27.86 | | 0.85 | 0.63 |
| | | Bottom Lower | **4.32** | **1.95** | **11,445,691** | **10.00** | **10,301,100** | 20.53 | 31.83 | 9.01 | 29.55 | | 1.12 | 0.51 |
| | **TOTAL/AVERAGE MEASURED RESOURCES** | | **4.09** | **1.84** | **42,244,854** | **10.00** | **38,020,200** | **22.12** | **31.47** | **9.90** | **28.75** | | **1.02** | **0.58** |
| | Indicated | Upper | 1.98 | 2.13 | 2,668,764 | 15.00 | 2,268,000 | 5.64 | 31.73 | 9.29 | 30.25 | | 1.03 | 0.57 |
| | | Middle Upper | 3.75 | 1.78 | 3,692,748 | 15.00 | 3,138,000 | 15.14 | 30.54 | 12.16 | 29.03 | | 1.14 | 0.49 |
| | | Middle Lower | 2.29 | 1.79 | 3,894,195 | 15.00 | 3,310,000 | 28.83 | 31.52 | 9.79 | 28.11 | | 1.13 | 0.70 |
| | | Bottom Upper | 4.97 | 1.74 | 9,130,168 | 15.00 | 7,760,000 | 30.38 | 31.80 | 9.11 | 27.77 | | 0.89 | 0.63 |
| | | Bottom Lower | **4.23** | **1.98** | **10,195,277** | **15.00** | **8,665,000** | 19.31 | 31.92 | 8.79 | 29.71 | | 1.20 | 0.56 |
| | **TOTAL/AVERAGE INDICATED RESOURCES** | | **3.97** | **1.87** | **29,581,152** | **15.00** | **25,141,000** | **22.23** | **31.64** | **9.49** | **28.86** | | **1.07** | **0.59** |
| | Inferred | Upper | 2.18 | 2.05 | 369,507 | 20.00 | 290,000 | 6.86 | 32.21 | 8.15 | 30.26 | | 0.94 | 0.57 |
| | | Middle Lower | 2.92 | 1.66 | 1,260,302 | 20.00 | 1,000,000 | 44.81 | 31.28 | 10.38 | 27.31 | | 1.34 | 1.01 |
| | | Bottom Upper | 4.49 | 1.68 | 3,319,263 | 20.00 | 2,650,000 | 36.18 | 31.99 | 8.64 | 28.63 | | 1.17 | 0.72 |
| | | Bottom Lower | 4.58 | 1.98 | 7,352,156 | 20.00 | 5,880,000 | 19.63 | 32.25 | 8.03 | 30.55 | | 1.54 | 0.76 |
| | **TOTAL/AVERAGE INFERRED RESOURCES** | | **4.30** | **1.87** | **12,301,228** | **20.00** | **9,820,000** | **26.28** | **32.08** | **8.44** | **29.69** | | **1.40** | **0.77** |
| | **TOTAL/ AVERAGE TELEMA & GRAY** | | **4.08** | **1.85** | **84,127,234** | **13.00** | **72,981,200** | **22.72** | **31.61** | **9.56** | **28.92** | | **1.09** | **0.61** |

**Notes:**
Rounding down of tonnages to 100t; 1,000t and 10,000t for Measured, Indicated and Inferred, respectively.
No resources have been estimated on Gray 188MT

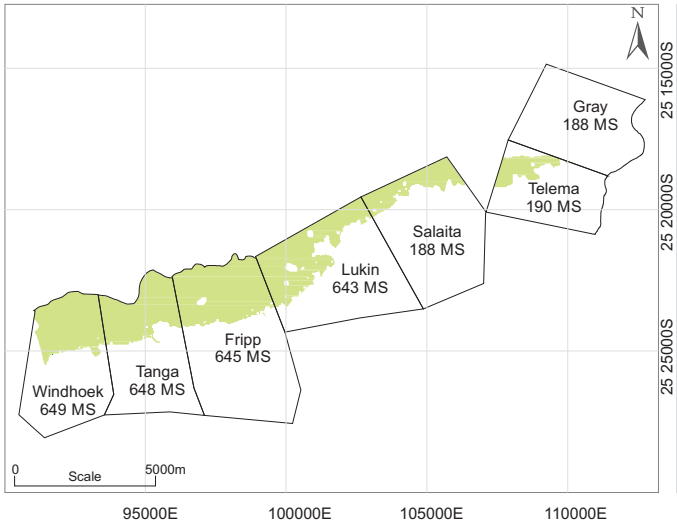
**RESOURCE CALCULATED FOR MAXIMUM SEAM DEPTH OF 200m FOR O/C MINING, NO U/G MINING CONSIDERED, COAL WITH VOLATILE CONTENT <20% EXCLUSED**

| FARM | RESOURCE CATEGORY | SEAM | AVE WIDTH (m) | COAL RAW RD (t/m³) | GROSS TONNES IN SITU | GEOL. LOSSES (%) | TOTAL TONNES IN SITU | MINING BLOCK LAYOUT LOSSES (%) | MINEABLE TONNES IN SITU | AIR DRIED WASHED QUALITIES @ RD = 1.4 | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | YIELD (%) | CV (MJ/kg) | ASH (%) | VOL (%) | FIXED CARBON (%) | SULPH. (%) | MOIST. (%) |
| Telema 190MT | Measured | Upper | 1.89 | 1.99 | 2,514,692 | 10.00 | 2,263,223 | 2.00 | 2,217,900 | 7.72 | 31.57 | 9.65 | 29.9 | | 1.04 | 0.69 |
| | | Middle Upper | 4.20 | 1.80 | 9,303,701 | 10.00 | 8,373,331 | 2.00 | 8,205,800 | 14.48 | 30.43 | 12.4 | 29.0 | | 1.12 | 0.52 |
| | | Middle Lower | 2.27 | 1.79 | 5,591,880 | 10.00 | 5,032,692 | 2.00 | 4,932,000 | 27.98 | 31.53 | 9.75 | 28.8 | | 1.06 | 0.60 |
| | | Bottom Upper | 5.03 | 1.75 | 12,233,712 | 10.00 | 11,010,341 | 2.00 | 10,790,100 | 30.59 | 31.82 | 9.04 | 28.6 | | 0.87 | 0.61 |
| | | Bottom Lower | 4.32 | 1.95 | 11,445,691 | 10.00 | 10,301,122 | 2.00 | 10,095,000 | 20.53 | 31.83 | 9.01 | 29.5 | | 1.12 | 0.51 |
| | **TOTAL/AVERAGE MEASURED** | | **4.09** | **1.84** | **41,089,676** | **10.00** | **36,980,708** | **2.00** | **36,240,800** | **22.39** | **31.45** | **9.93** | **29.1** | | **1.03** | **0.57** |
| | Indicated | Upper | 1.98 | 2.13 | 2,668,764 | 15.00 | 2,268,449 | 2.00 | 2,223,000 | 5.64 | 31.73 | 9.29 | 30.2 | | 1.03 | 0.57 |
| | | Middle Upper | 3.75 | 1.78 | 3,692,748 | 15.00 | 3,138,836 | 2.00 | 3,076,000 | 15.14 | 30.54 | 12.1 | 29.0 | | 1.14 | 0.49 |
| | | Middle Lower | 2.29 | 1.78 | 3,672,048 | 15.00 | 3,121,241 | 2.00 | 3,058,000 | 29.52 | 31.51 | 9.83 | 28.3 | | 1.13 | 0.70 |
| | | Bottom Upper | 4.99 | 1.73 | 8,305,104 | 15.00 | 7,059,338 | 2.00 | 6,918,000 | 31.08 | 31.81 | 9.08 | 28.2 | | 0.91 | 0.63 |
| | | Bottom Lower | 4.24 | 1.98 | 9,544,196 | 15.00 | 8,112,567 | 2.00 | 7,950,000 | 19.68 | 31.95 | 8.73 | 29.8 | | 1.22 | 0.57 |
| | **TOTAL/AVERAGE INDICATED** | | **3.96** | **1.87** | **27,882,860** | **15.00** | **23,700,431** | **2.00** | **23,225,000** | **22.43** | **31.64** | **9.49** | **29.1** | | **1.09** | **0.59** |
| | Inferred | Upper | 2.18 | 2.05 | 369,507 | 20.00 | 295,606 | 2.00 | 280,000 | 6.86 | 32.21 | 8.15 | 30.2 | | 0.94 | 0.57 |
| | | Middle Lower | 2.86 | 1.66 | 925,071 | 20.00 | 740,057 | 2.00 | 720,000 | 44.81 | 31.28 | 10.3 | 27.3 | | 1.34 | 1.01 |
| | | Bottom Upper | 4.60 | 1.68 | 2,435,331 | 20.00 | 1,948,265 | 2.00 | 1,900,000 | 36.18 | 31.99 | 8.64 | 28.6 | | 1.17 | 0.72 |
| | | Bottom Lower | 4.79 | 1.98 | 5,639,986 | 20.00 | 4,511,989 | 2.00 | 4,420,000 | 19.63 | 32.25 | 8.03 | 30.5 | | 1.54 | 0.76 |
| | **TOTAL/AVERAGE INFERRED** | | **4.43** | **1.87** | **9,369,895** | **20.00** | **7,495,916** | **2.00** | **7,320,000** | **25.91** | **32.09** | **8.42** | **29.7** | | **1.40** | **0.77** |
| **TOTAL/ AVERAGE TELEMA & GRAY** | | | **4.08** | **1.85** | **78,342,431** | **13.00** | **68,177,055** | **2.00** | **66,785,800** | **22.79** | **31.59** | **9.61** | **29.1** | | **1.09** | **0.60** |

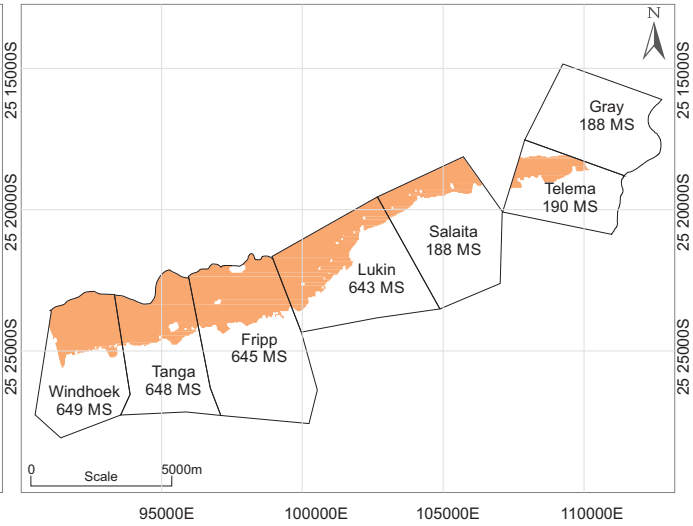
**Notes:**
Rounding down of tonnages to 100t; 1,000t and 10,000t for Measured, Indicated and
No resources have been estimated on Gray

## TELEMA AND GRAY SECTION - LOCATION OF RESOURCES AT 0.5m (TTIS) CUTOFF SEAM THICKNESSES

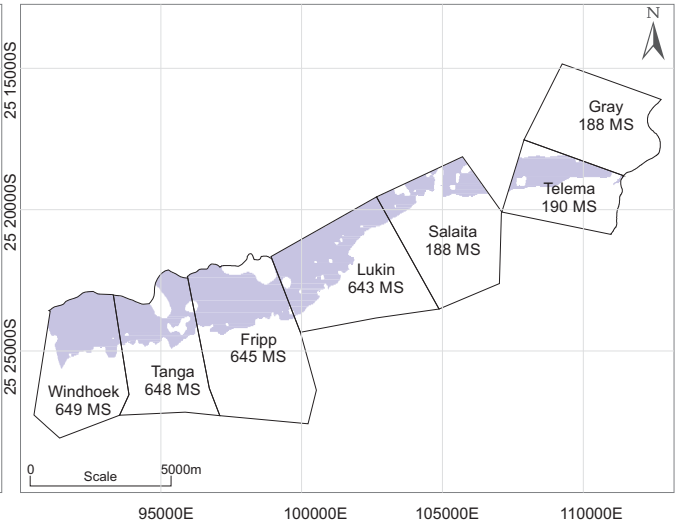
### UPPER SEAM RESOURCE



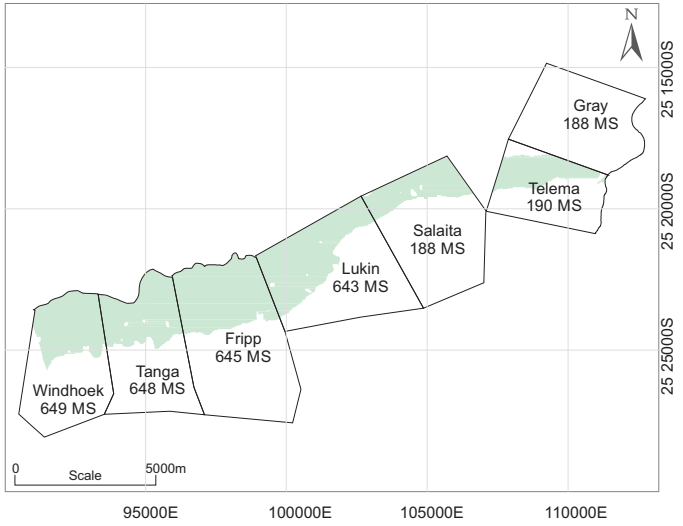

### MIDDLE SEAM RESOURCE



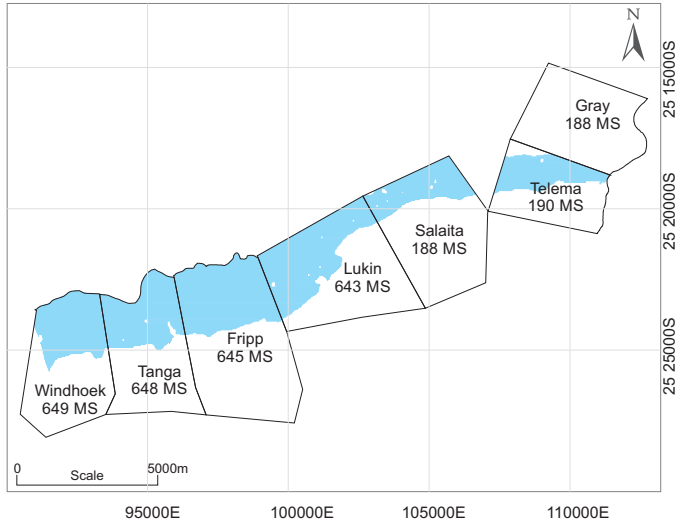

### MIDDLE LOWER SEAM RESOURCE




### BOTTOM UPPER SEAM RESOURCE




### BOTTOM LOWER SEAM RESOURCE




**Mineral Resource**

- Prospecting Rights Boundary
- Upper Seam
- Middle Seam
- Middle Lower Seam
- Bottom Upper Seam
- Bottom Lower Seam

Source: Coal of Africa
VMD1971_CoAL GSP CPR_2015

Deloitte. Coal of Africa

Figure 44

The estimated resources and qualities for in situ raw coal, and a theoretical washed coal product with an ash content of 12% are presented in Table 28. Resources have been categorised as Measured, Indicated and Inferred according to observation point halos in accordance with JORC reporting standards. Only opencast resources have been considered in the reporting of MTIS

## 10.17.1. Resource Classification

The Telema 190MT resources were classified, by CoAL, according to the relative spacing of points of observation with both quantitative and qualitative results and in consideration of all the recent and historical data from the adjacent Makhado Project. The spacing defined in the Australian Guidelines is summarised in Table 12, and used to classify the resources, as presented in Figure 45.

## 10.17.2. Input Parameters and Limits

The detailed Coal Resource Statement for Telema 190MT is presented in Table 28. This table presents CoAL's input parameters, the calculations and limits used in a stepwise process to obtain the resultant resource tonnages and associated qualities.

### 10.17.2.1. Volume

All boreholes with seam intersection data were used to generate the physical seam models on which the estimates of seam volumes were based. The volume of the various seam resources were estimated using the Minex™ model of the seam thickness.

### 10.17.2.2. Density

The Minex™ modelled average raw density per resource block was used to calculate the tonnage from the volume. The raw density of every sample is measured in the laboratory.

### 10.17.2.3. Tonnage

The tonnage is calculated on a block by block basis from the volume multiplied by the average raw density. The resource tonnages are reported according to the following:-

- Gross Tonnes In Situ (GTIS);
- Total Tonnes in Situ (TTIS); and
- Mineable Tonnes in Situ (MTIS).

GTIS, TTIS and MTIS resources have been estimated for the Upper Seam, Middle Upper Seam, Middle Lower Seam, Bottom Upper Seam and Bottom Lower Seam. The Bottom Middle Seam is not considered economic and has been excluded from the resource database. The MTIS resources have only considered potential opencastable coal to a maximum depth of 200m.

### 10.17.2.4. Quality

Each of the quality parameters are modelled in Minex™ and the average quality per block is reported in the Coal Resource Statement. Average raw coal qualities were weighted by GTIS.

### 10.17.2.5. Losses and Limits

The following cutoffs or limits are applied to the resources:-

- the resource blocks are limited according to the boundaries of the respective NOPRs;
- the resource blocks are limited to the seam sub-crop;
- the resource blocks are limited to the resource extrapolation limits;

- a minimum seam thickness limit of 0.5m is applied prior to the reporting of GTIS;
- a limit of oxidation of 18m, based on the actual results from the bulk sampling pit at the Makhado Project;
- limit of 20% volatile matter. All material less than 20% volatiles were excluded;
- a limit of 50m around all known geological structures and dykes;
- maximum depth of 200m for opencastable resources in the calculation of MTIS; and
- geological losses of 10%, 15% and 20% are applied to Measured, Indicated and Inferred Resources, respectively, prior to the reporting of TTIS. These losses take into account any unforeseen geological features, such as dykes and faults, which have not been identified in the drilling and which may have a negative impact on the coal resources. The percentages applied increase with decreasing borehole spacing.

### 10.17.3. Differences Between Resource Statements

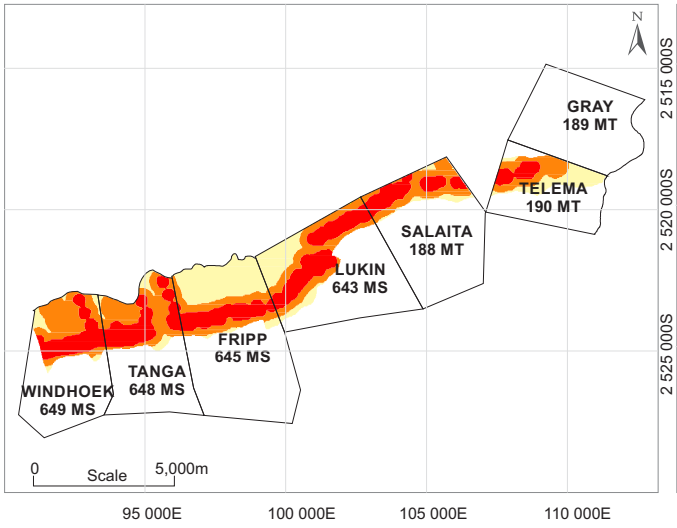
There are no differences between the 30 September 2012 and 31 December 2015 Coal Resource Statements. No additional changes have been made by CoAL to the geological model or resource estimation for the Telema and Gray Section since the 2012 CPR.

### 10.17.4. Ore Reserve Statement

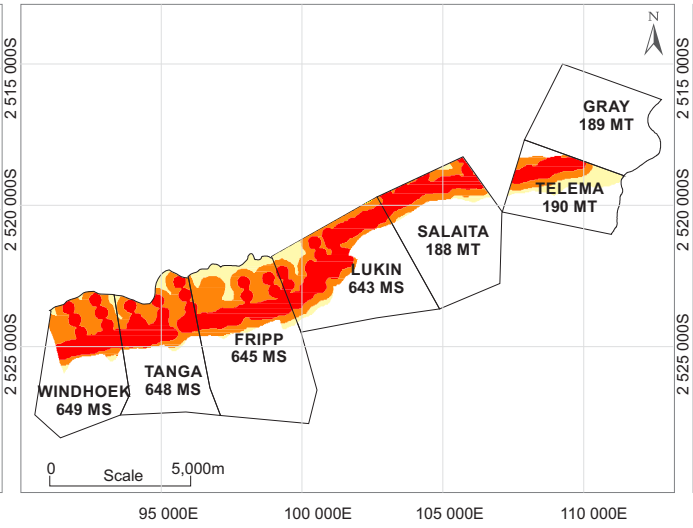
As a result of the current stage of development of the Telema and Gray Section, no reserves have yet been declared. Reserves can only be declared once a mining plan has been prepared. This will be undertaken during the next stage of development of the project i.e. at Pre-feasibility Stage.

## TELEMA AND GRAY SECTION – OBSERVATION POINT HALOS IN ACCORDANCE WITH JORC REPORTING STANDARDS

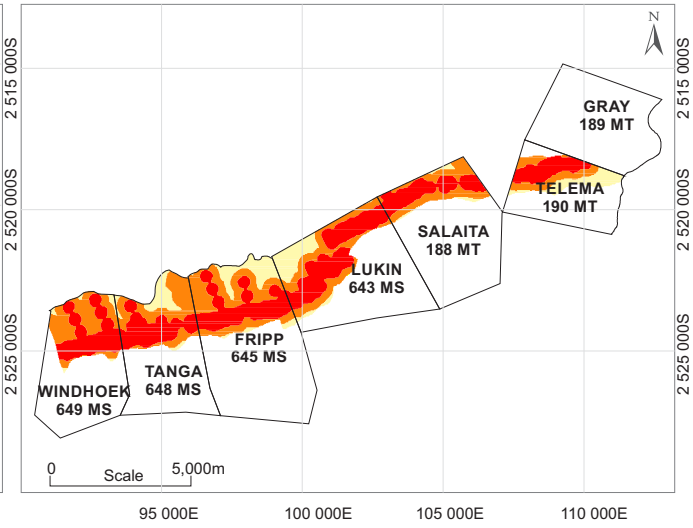
### UPPER SEAM



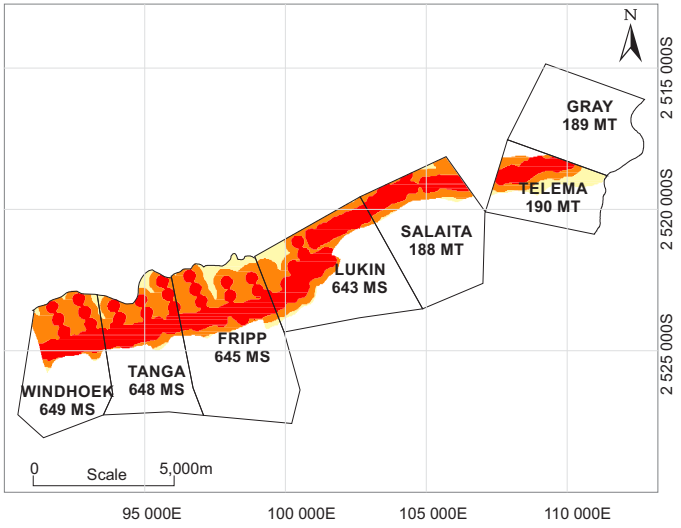

### MIDDLE SEAM



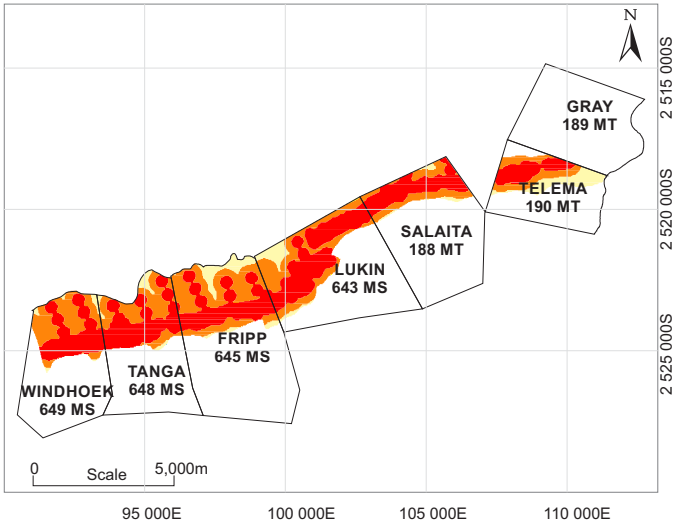

### MIDDLE LOWER SEAM




### BOTTOM UPPER SEAM




### BOTTOM LOWER SEAM




**Mineral Resource**

- Measured (250m radius from borehole with quality data)
- Indicated (500m radius from borehole with quality data)
- Inferred (2,000m radius from borehole with quality data)

VMD1971_CoAL GSP CPR_2015

Venmyn Deloitte.

Coal of Africa

Figure 45

# 11. Mount Stuart

The Mount Stuart Section, located within the Soutpansberg Coalfield, is an advanced exploration project which contains coking coal resources. It represents the most advanced section of the Makhado Extension Project.

## 11.1. Location

The Mount Stuart Section is situated in the magisterial district of Vhembe, in the Limpopo Province of South Africa (Figure 1). The location of the Mount Stuart Section area in relation to regional infrastructure and the mineral tenure in the greater Soutpansberg Project area is provided in Figure 46.

The nearest town is Musina, situated approximately 35km to the north of the Mount Stuart Section area. Louis Trichardt is located approximately 40km to the southwest of the project area.

## 11.2. Access

Access to the Mount Stuart Section area is via the tarred national N1 road from Louis Trichardt to Musina. Approximately 40km north of Louis Trichardt take the R525 dirt road travelling eastwards for 20km (Figure 46) until the farm Riet 182MT is reached. The gravel road is in a good condition, whilst the N1 road is in an excellent condition. The project area is approximately 400km, by road from the capital, Pretoria. The various properties within the project area are accessed by a network of gravel farm roads that branch off the R525.

## 11.3. Climate and Topography

Mount Stuart area experiences a warm, semi-arid climate as described in Section 10.3. Operations can occur all year around and the climatic conditions generally do not prevent exploration or mining. However, during times of heavy downpours, temporary delays may be experienced.

The topography of the Mount Stuart Section area is characterised by a flat valley floor oriented east-west which lies at an average elevation of 750mamsl, bordered by steep valley slopes of the Soutpansberg in the south and the so-called Red Beds (Stormberg basalts and Clarens sediments) in the north. The area is drained by the non-perennial Nzhelele River which flows in a north-easterly direction across the western area of the project.

## 11.4. Fauna & Flora

The Mount Stuart Section area falls within the North Eastern Mountain Sour Veld and the Soutpansberg Arid Mountain Bushveld biomes, characterised predominantly by a grassy ground layer and an upper layer of woody plants, dominated by sweet thorn and mopane. The land is mainly given over to cattle and game ranching with localised arable farming.

## 11.5. Legal Aspects

### 11.5.1. Ownership

Through its wholly owned subsidiary, Kwezi Mining & Exploration (Pty) Ltd (subsequent to Section 11 transfer and Section 102 approval), CoAL holds an accepted application for a NOMR for the Mount Stuart Section comprised of seven farms, namely Stayt 183MT, Nakab 184MT, Riet 182MT, Schuitdrift 179MT, Mount Stuart 153MT, Ter Blanche 155MT and Septimus 156MT. CoAL has acquired the Mount Stuart Section from Rio Tinto pursuant to the Soutpansberg Properties Acquisition Agreement with Rio Tinto. The rights pertaining to the Mount Stuart Section are shown in Figure 47.

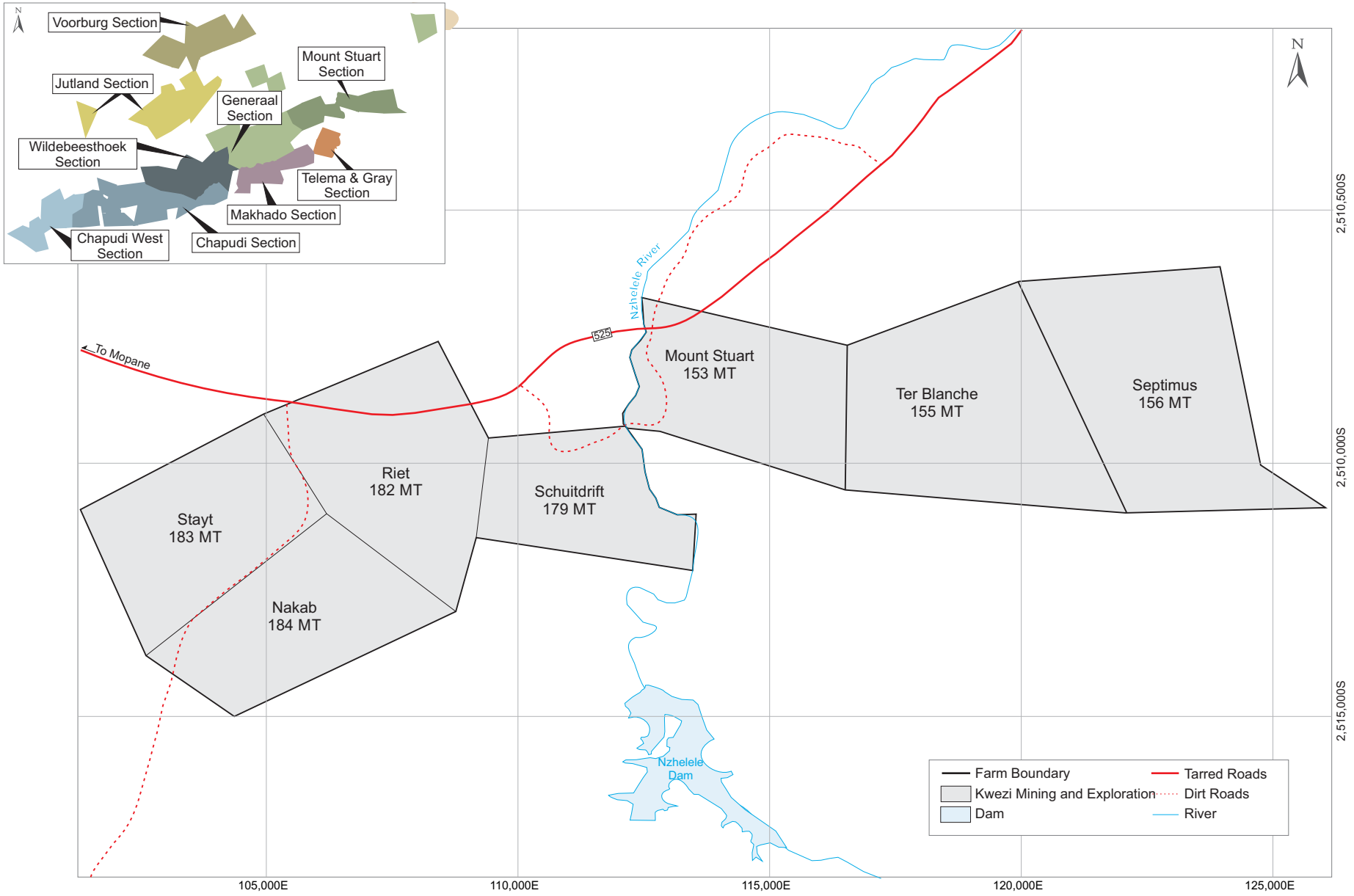
### 11.5.2. Mineral Tenure

All of the three NOPRs held by CoAL for the farms that make up the Mount Stuart Section expired by April 2013. In May 2013 CoAL applied for a NOMR under its wholly owned subsidiary Kwezi Exploration and Mining (Pty) Ltd for all of the Mount Stuart Section. The DMR issued an acceptance letter for the NOMR application in July 2013. Venmyn Deloitte has viewed the acceptance letters and confirms the security of the mineral tenure. The rights relating to the Mount Stuart Section are summarised in Table 29 and their locations are graphically presented in Figure 46.

**Table 29 : Mount Stuart - Summary of Mineral Tenure**

| PROJECT | FARM NAME & NO. | PORTION NO. | AREA (ha) | APPLYING ENTITY | NEW ORDER LICENCE TYPE | LICENCE NO. | SUBMISSION DATE OF MINING RIGHT APPLICATION | DATE OF ACCEPTANCE | SURFACE RIGHTS |
|---|---|---|---|---|---|---|---|---|---|
| Mount Stuart | Mount Stuart 153MT | Portion 2 & RE | 1,149.93 | Kwezi Mining Exploration (Pty) Ltd | Mining | LP 30/5/1/1/2/38 PR/ 10047 MR | 10/05/2013 | 24/07/2013 | No |
| | Nakab 184MT | Whole farm | 1,155.75 | | | | | | No |
| | Septimus 156MT | Whole farm | 1,676 .00 | | | | | | No |
| | Ter Blanche 155MT | Portion 1 & RE | 1731.85 | | | | | | No |
| | Schuitdrift 179MT | Whole farm | 868.05 | | Mining | LP 30/5/1/1/2/431 PR/ 10057 MR | 10/05/2013 | 30/07/2010 | No |
| | Riet 182MT | Portions 1, 2 & RE | 1,347.29 | | Mining | LP 30/5/1/1/2/153 PR/ 10069 MR | 10/05/2013 | 01/07/2013 | No |
| | Stayt 183MT | Whole farm | 1,184.28 | | | | | | No |
| | | **TOTAL MOUNT STUART** | **7,437.15** | | | | | | |

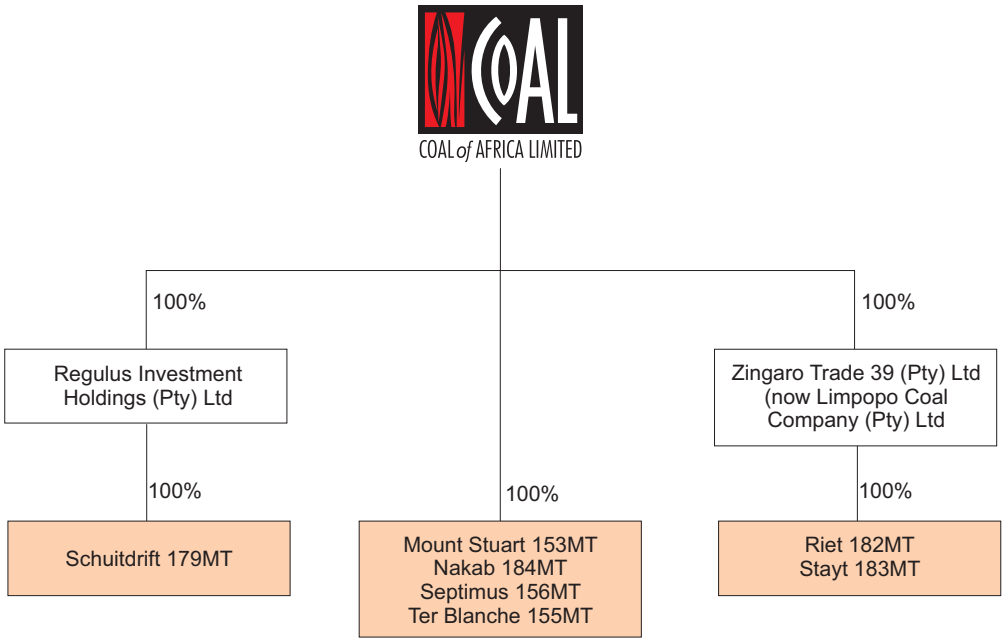
## LOCATION OF CoAL'S MOUNT STUART SECTION IN RELATION TO LOCAL INFRASTRUCTURE AND MINERAL TENURE




Source: Coal of Africa
VMD1971_CoAL GSP CPR_2015

Figure 46

## OWNERSHIP OF THE MOUNT STUART SECTION




**MOUNT STUART PROJECT TOPOGRAPHY**

Source: Coal of Africa

### 11.5.3. Surface Rights

CoAL does not currently own any surface rights in the Mount Stuart Section area. CoAL has agreements with most of the surface rights owners to access the properties for exploration purposes and access is sufficient for most of its prospecting requirements. The exception is the farm Mount Stuart 153MT, where the farmer is only prepared to grant CoAL access once he has been compensated for the damage done by Iscor during its prospecting programme in the 1970s.

### 11.5.4. Royalties

There is no private royalties payable for the Mount Stuart Section. State royalties, as per the MPRRA will be payable on any future production, however.

### 11.5.5. Material Contracts

Currently there are no offtake agreements, operational contracts or contract mining agreements that are relevant to the Mount Stuart Section, as it is still in the early stages of development.

### 11.5.6. Other Legal Issues

CoAL has informed Venmyn Deloitte of land claims on the seven of the farms that form part of the Mount Stuart Section. A summary of the land claims on the Mount Stuart Section are listed in Table 30.

The land claims on the various properties have been gazetted by the Department of Rural Development and Land Reform (DRDLR). CoAL recognises land claimants as key stakeholders, and the company's engagement is governed by the company's stakeholder engagegemt strategy that ensures regular, meaningful and transparent engagement.

CoAL recognises the legislative framework of the land claims process and will work within that framework.

Venmyn Deloitte is not aware of any litigation or competing rights associated with the Mount Stuart Section area.

## 11.6. Infrastructure

The project is well situated with respect to the major infrastructural aspects of rail, road and power.

The railway linking Gauteng (in South Africa) and Zimbabwe occurs approximately 20km to the west of the westernmost boundary of the Mount Stuart Section area (Figure 46). CoAL has negotiated the rights to the Huntleigh Siding, located approximately 20km to the west of the project area.

Eskom grid powerlines traverse the farm Riet 182MT. The powerlines then follow the R525 to the town of Tshipise. The Paradise substation occurs at the village of Ha-Rabali, south of the Mount Stuart Section area.

Water for drilling can be sourced from the Nzhelele River.

Due to the fact that the Mount Stuart Section is still at an exploration stage, details on the availability and requirements of power, water, tailings disposal and other infrastructural items has not been investigated in detail and is therefore not reported upon in this document. These will be addressed once the project reaches pre-feasibility stage.

### 11.6.1. Local Resources

The nearest towns of Louis Trichardt and Musina are regional centres and provide modern conveniences, including accommodation and services. The towns are also sources of fuel and labour.

**Table 30: Summary of Land Claims for the Mount Stuart Section**

| PROJECT | FARM NAME & NO. | PORTION NO. | LAND OWNER | LAND CLAIMANT | OFFICIAL |
|---|---|---|---|---|---|
| Mount Stuart | Mount Stuart 153MT | Portion 2 & RE | Mount Stuart Boerdery (Pty) Ltd | Mamilwe | Bongani Hlatshwayo |
| | Nakab 184MT | Whole farm | Clint Howes Family Trust | | |
| | Septimus 156MT | | Not stated | No land claimant | |
| | Ter Blanche 155MT | RE | Joy Stella Amm | | |
| | | Portion 1 | Julius &Louisa Petronella Raal | Mamilwe | |
| | Schuitdrift 179MT | Whole farm | Masiri (Pty) Ltd | Mamuhohi | |
| | Riet 182MT | RE | Inyanga Trading 523 (Pty) Ltd | Mamilwe / Mamuhohi | Mpoi Charles Hamese |
| | | Portion 1 | Clint Howes Family Trust | | |
| | | Portion 2 | Masiri (Pty) Ltd | | |
| | Stayt 183MT | Whole farm | Clint Howes Family Trust | | |

## 11.7. Regional Geological Setting

The Mount Stuart Section is situated within the Tshipise North Coalfield subdivision of the greater Soutpansberg Coalfield (Figure 11). The reader is referred to Section 7.2 on the regional geology of this coalfield.

## 11.8. Local Geological Setting

The Mount Stuart Section represents an isolated and upfaulted block of Karoo age sediments, which lies approximately 6km to the north of the Tshipise South Basin in which the Makhado Project occurs (Figure 48). The Karoo strata represented in the project area is underlain by the 10m thick conglomerate-diamictite of the Tshidzi Formation, which can be correlated to the glacial Dwyka tillite in the Main Karoo Basin. The basal unit is overlain by the 190m thick succession of alternating black shale, micaceous sandstone, siltstones and interbedded coal seams of the Madzaringwe Formation.

The formations overlying these units are described below, from the Madzaringwe Formation upwards:-

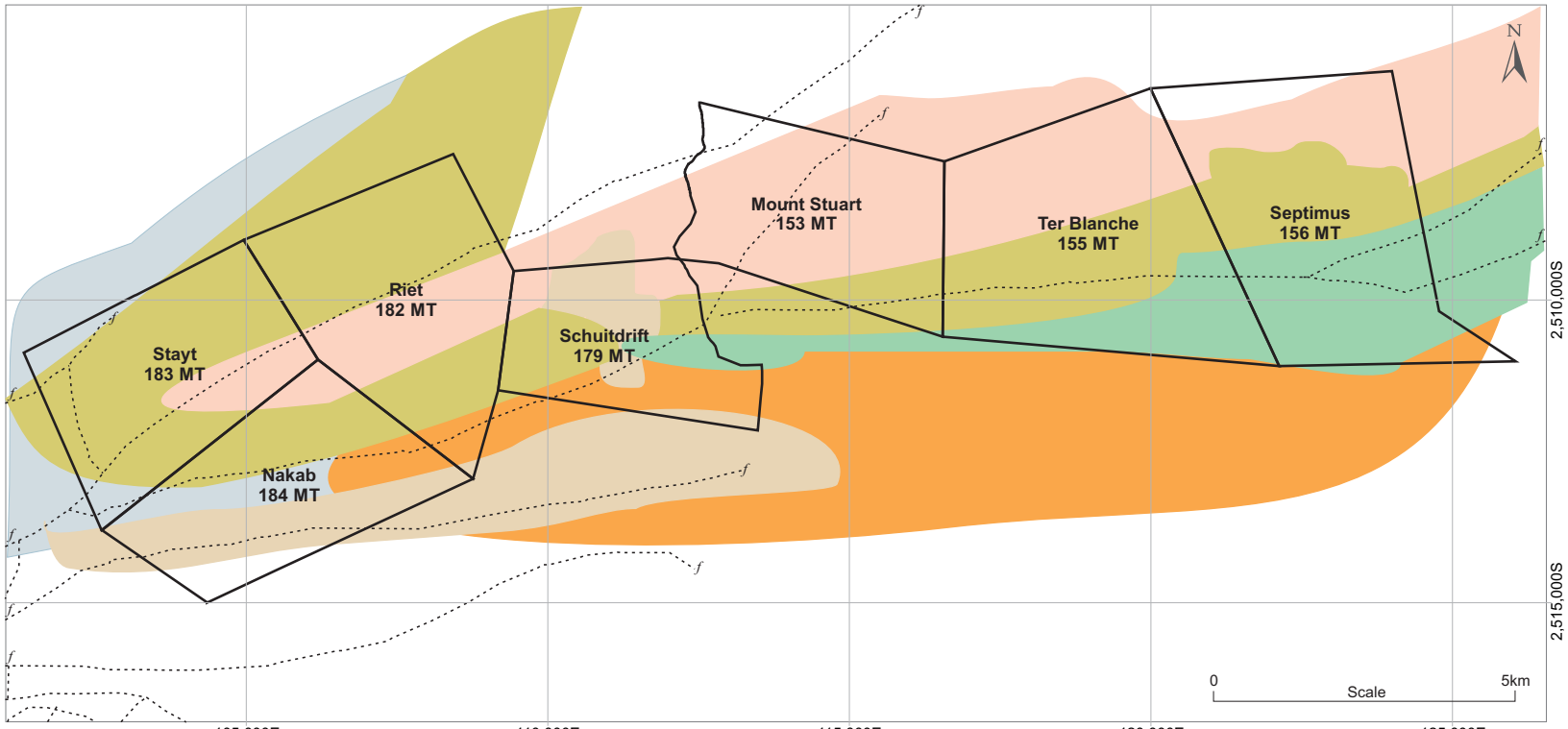
- 140m thick Mikambeni Formation – dark mudstone and shale with subordinate sandstone;
- 60m thick Fripp Formation – coarse feldspathic sandstone bands that form an E-W trending line of low hills;
- 110m thick Solitude Formation – interlayered grey and purple shale with minor sandstone and grit intercalations;
- Klopperfontein Formation – resembles the Fripp Formation as coarse feldspathic gritty sandstone; and
- the 300m thick Bosbokpoort Formation – red, very fine sandstone and dark red silty mudstone.

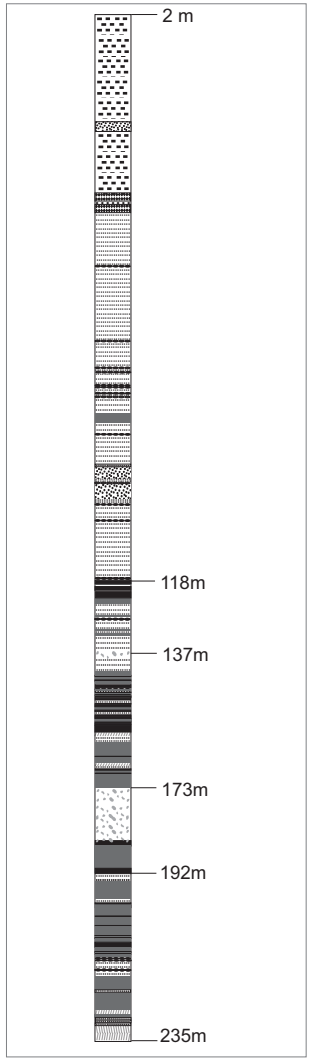
In the Mount Stuart Section area only four seams of commercial interest have been identified (Upper, Middle Upper, Bottom Upper and Lower seams). No Middle Lower Seam has been identified from the Iscor sample nomenclature.

## 11.9. Historical Ownership

The historical ownership and associated activities with respect to the Mount Stuart Section is summarised in Table 31

## LOCAL GEOLOGICAL MAP AND TYPICAL STRATIGRAPHIC COLUMN FOR THE MOUNT STUART SECTION




Faults
Prospecting Rights Boundary
Clarens
Ecca
Beaufort
Mouny Dowe
Bulai Gneiss

Shale
Sandstone
Quartz
Mudstone
Clay
Coal
Carbonaceous Mudstone
Siltstone
Dolorite
Carbonaceous Shale

Source: Coal of Africa
VMD1971_CoAL GSP CPR_2015

Venmyn Deloitte.

Coal of Africa

Figure 48

**Table 31 : Mount Stuart – Summary of Historical Ownership and Activities**

| DATE | COMPANY | ACTIVITY |
|---|---|---|
| 1975 - 1978 | Iscor (now Exxaro) | Drilled 238 boreholes on Nakab 184MT, Mount Stuart 153MT, Ter Blanche 155MT and Septimus 156MT. LDD bulk sampling appears to have been conducted over the properties, but no information is available. |
| 2002 - 2009 | Rio Tinto Mining & Exploration Ltd. (Rio Tinto) | Drilled 9 boreholes on Nakab 184MT, Schuitdrift 179MT, Mount Stuart 153MT and Septimus 156MT. |
| 2005 | Limpopo Coal | Acquired NOPRs over Stayt 183MT and Riet 182MT. |
| 2006 | GVM (now CoAL) | Acquired 60% of Limpopo Coal. |
| 2008 | | Acquired the remaining 40% of Limpopo Coal. |
| 2009 | CoAL | Drilled 7 boreholes on Riet 182 MT. |
| 2009 - 2010 | | Acquired Nakab 184MT, Schuitdrift 179MT, Mount Stuart 153MT and Septimus 156MT, as part of the Farm Swap Agreement with Rio Tinto. |

## 11.10. Historical Exploration

Between 1975 and1978, Iscor drilled a total of 417 boreholes, excluding a number of borehole deflections over the Mount Stuart Section area. The location of the boreholes is indicated on Figure 51. The Iscor boreholes are believed to have been drilled vertically, with deflections drilled on a number of the boreholes.

There is evidence that Iscor also drilled LDD holes, however no specific locality or sampling information is available.

The drilling and sampling protocols used by Iscor are unknown. However, it is assumed that the drilling methods were conventional and pre-date the more efficient triple-tube wireline techniques that are commonly employed today.

It is not known whether the Iscor borehole collars were professionally surveyed. This together with the absence of recent confirmatory drilling, in the resource area, has resulted in all resources within the Mount Stuart resource area being downgraded to the Inferred Category.

The Iscor holes were sampled and sent to their in-house laboratory for analysis. Typically 13 samples were taken from the top to the base of the coal bearing strata, and numbered consecutively in this order. Raw analyses were carried out on the coal samples. Washed analyses were only undertaken at an RD=1.40. Proximate, CV, Roga and Swell Index testwork was carried out.

The Iscor borehole database was acquired in 2007 by CoAL.

## 11.11. Recent Exploration

Limited recent exploration has been conducted, within the Mount Stuart area, by both Rio Tinto and CoAL.

Data from nine boreholes drilled over the Mount Stuart area, by Rio Tinto, were provided to CoAL as part of the Farm Swap Agreement signed in October 2009. Seven of these boreholes (over Nakab 184MT, Schuitdrift 179MT, Mount Stuart 153MT and Ter Blanche 155MT) were diamond core boreholes, while two (over Nakab 184MT) were percussion boreholes.

Limited exploration drilling by CoAL commenced in 2009 on the farm Riet 182MT. Only nine boreholes have been drilled by CoAL to-date. All drilling has been managed by CoAL, with Mr. C. Mafiri (Pr.Sci.Nat) as the responsible geologist.

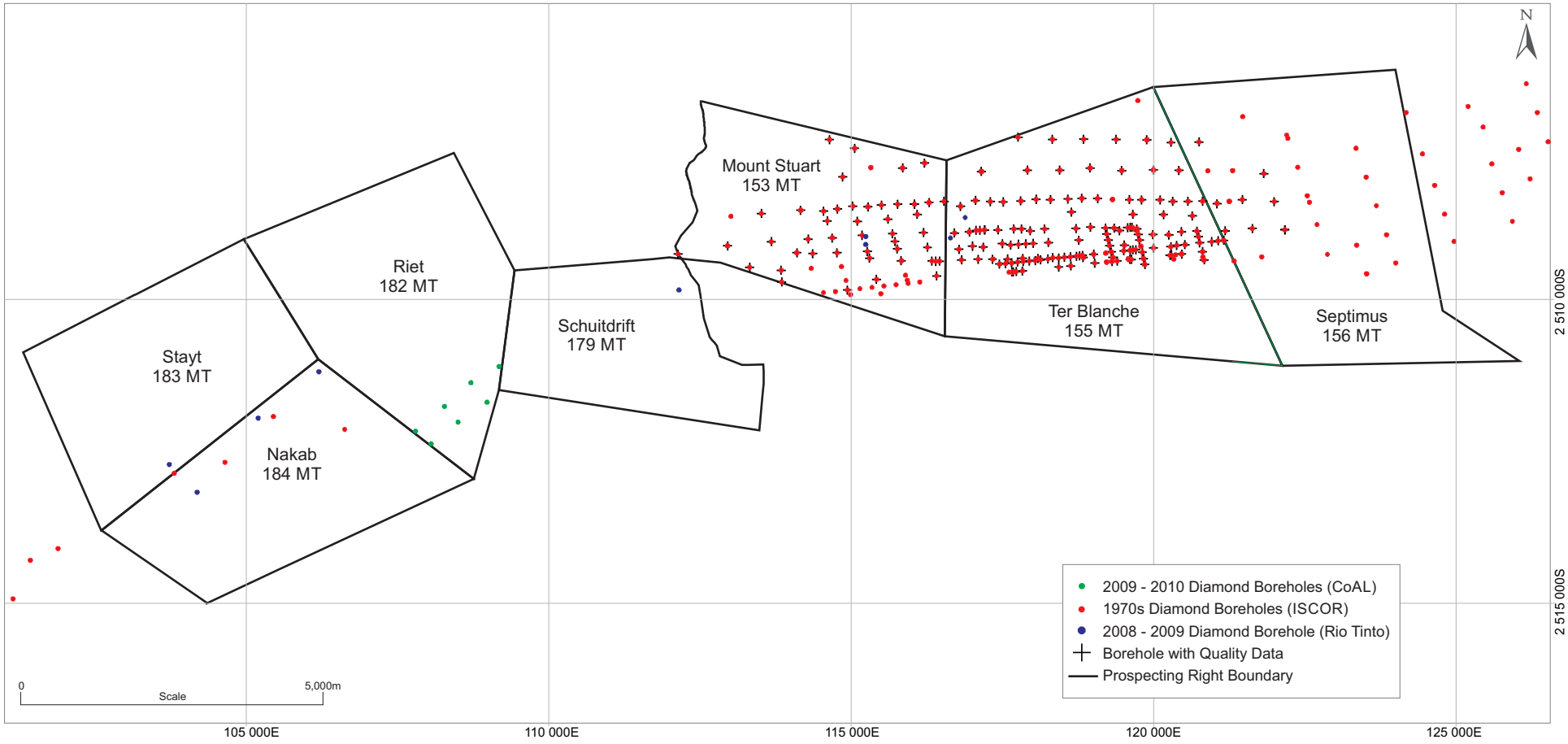
The exploration is summarised in Table 32 and the location of those boreholes is indicated on Figure 49.

No LDD or bulk sampling has been conducted by either Rio Tinto or CoAL over the Mount Stuart Section area.

### 11.11.1. Remote or Geophysical Exploration

CoAL acquired ground magnetic data over the farm Nakab 184MT and aeromagnetic data over the farm Schuitdrift 179MT from Rio Tinto, as part of the Farm Swap Agreement.

## MOUNT STUART - LOCATION OF BOREHOLES




VMD1971_CoAL GSP CPR_2015

Venmyn Deloitte

Coal of Africa

Figure 49

**Table 32 : Mount Stuart - Summary of Historical and Recent Drilling**

| DATE | COMPANY | LOCATION | PURPOSE | SURVEYOR | DRILLING COMPANY | TYPE OF DRILLING | SIZE | RESPONSIBLE GEOLOGIST | TOTAL NO. B/H | WIRELINE LOGGING | SEAMS SAMPLED | QUALITY RESULTS | LABORATORY FOR QUALITY | USED IN MODEL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1975 - 1978 | Iscor | Nakab 184MT, Mount Stuart 153MT, Ter Blanche 155MT and Septimus 156MT | Early exploration and resource estimation. | Unknow n. | Unknown. | Diamond core | NQ | Various | 417 | No | All | Yes | Iscor | Yes |
| 2002 - 2009 | Rio Tinto | Nakab 184MT, Schuitdrif t 179MT, Mount Stuart 153MT and Septimus 156MT | Confirmatory drilling. | Unknown | Unknown. | Diamond core | PQ3 | D. Hirstov | 7 | Yes | All | Yes | ALS Brisbane | No |
| | | Nakab 184MT | | Unknown . | Unknown. | Reverse Circulation | 8 inch | D. Hirstov | 2 | Yes | All | Yes | | No |
| 2008 - 2010 | CoAL | Riet 182 MT | In-fill drilling and Measured Resource definition. | P Matibe and Associates | Unknown. | Diamond core | PQ3 | C. Maf iri | 9 | Yes | All | Yes | Inspectorate | No |
| | | | | | | | | **TOTAL** | **254** | | | | | |

### 11.11.2. Surveying Methods

All of Rio Tinto's boreholes were located by hand-held GPS only. All Rio Tinto boreholes were drilled vertically. No down-hole directional surveys were undertaken. Given the relatively shallow depths involved, this is not considered a deficiency.

The CoAL boreholes were generally initially sited in the field using a hand-held Garmin™ GPS device. Following completion of the boreholes, the collar positions were accurately surveyed using Leica™ GPS equipment by P Matibe and Associates, who are registered (No. PLS0915) with PLATO.

All CoAL boreholes were drilled vertically. No down-hole directional surveys were undertaken. Given the relatively shallow depths involved, this is not considered a deficiency.

### 11.11.3. Diamond Drilling

CoAL's diamond drilling was carried out by Scott Drilling (Pty) Ltd. The geologist responsible for the drilling and sampling was Mr. C. Mafiri (Pr.Sci.Nat). The purpose of the drilling was to look for possible extensions of the Mount Stuart Resource.

Venmyn Deloitte has not independently witnessed the drilling and sampling protocols as no exploration drilling is currently taking place. However, Venmyn Deloitte is confident that the drilling was carried out to the required standard as the drilling programmes have been independently supervised or verified by other reputable consulting companies.

#### 11.11.3.1. Drilling

All boreholes were drilled at a core size of PQ3 (83mm) to obtain sufficient sample material for analytical purposes and to reduce core loss. Drilling was undertaken using triple tube techniques in order to minimise core loss.

The CoAL drilling contracts demanded a minimum recovery of 98% within coal horizons and 95% in non-coal sediments. CoAL reported that, throughout the exploration drill programmes, every effort was made to achieve maximum core recovery and minimise loss of fines.

The following general drilling techniques were employed:-

- • each drill run was limited to 3m in length which was reduced if poor recoveries or difficult drilling conditions were experienced;
- • the core was placed in steel trays and enclosed in bubble-wrap; and
- • full core trays were stacked, covered and transported to the core storage facility at the end of each shift.

Core was transported to the core shed by the drilling contractor, received by the geologist and stacked. In the case of coal intersections, the core was stored in a refrigerated container. When both the core and the geophysical logs were received, the borehole was considered to have been completed. Core recovery within individual coal plies was measured with reference to the geophysical logs and, if found to be acceptable, logging commenced. CoAL did not retain records of core recovery.

#### 11.11.3.2. Logging

Core was not split prior to logging in order to minimise the effects of oxidation. Lithological depths were finalised only after reconciliation with the geophysical wireline logs. Field logs were generated using printed logging forms and are archived at the CoAL offices in Johannesburg. The logging data was subsequently captured to a dedicated Sable™ database.

Borehole core photography using a hand-held digital camera was initiated in January 2009 and was sporadic until November 2009. Since that time all core has been photographed.

Geotechnical logging has not been undertaken.

#### 11.11.3.3. Sampling Method

On the basis of the Iscor data, CoAL defined seams or selected mining cuts by firstly selecting intervals comprising predominantly coal and then by identifying the sample names associated with those intervals and automatically allocating them to the seam. This process was recently revised for the Iscor boreholes by re-selecting the seam intervals based on a visual assessment of the Iscor hand-written graphic logs. The process was deemed necessary as CoAL geologists were not satisfied that the allocation of sample numbers to seams by Iscor was sufficiently consistent.

For the CoAL boreholes, the field geologists were responsible for the selection of seam intervals under the supervision of the responsible geologist, Mr. C. Mafiri (Pr.Sci.Nat).

Details on the sampling nomenclature are reported in Section 8.11.3.3.

CoAL conducted whole core sampling and sample intervals were selected on the basis of the geophysical logs. Samples were numbered from the base upwards and correspond to the same stratigraphic interval in every borehole.

CoAL has identified six potentially mineable seams within the Coal Zone. The nomenclature of samples taken from the various seams is summarised in Table 16.

Samples were double-bagged with each bag sealed with cable ties and labelled. Manila tags identifying the borehole and sample numbers were placed inside the inner bag (with the sample material) and also attached to the cable tie around the neck of the inner bag. Bagged samples were stored in a locked refrigerated container prior to transportation to the laboratory in a closed truck.

### 11.11.4. Percussion or Open Hole Drilling

Two boreholes drilled by Rio Tinto were percussion boreholes. While it is understood that samples were taken every 1m, no other details of the drilling and sampling protocols are available.

### 11.11.5. Down the Hole Geophysics / Wireline Logging

Downhole geophysical surveys were conducted on all Rio Tinto and CoAL boreholes. Heavy dependence is placed on the geophysical log and a borehole is not considered complete until a geophysical log has been generated.

The geophysical logs are used as the basis for identifying, correlating and sampling the coal horizons. A basic suite of tools is run for dual density, natural gamma and calliper measurements.

### 11.11.6. Bulk Sampling

No recent bulk sampling has been carried out on the Mount Stuart Section.

### 11.11.7. Laboratory Analyses

Samples from the Rio Tinto drilling campaign were analysed at ALS Brisbane (ISO 17025 accredited). Products were returned to South Africa for petrographic analysis. Samples from CoAL's drilling campaign were sent to Inspectorate's SANAS accredited laboratory in Polokwane (No. T0476).

#### 11.11.7.1. Sample Preparation and Analysis

The laboratories followed the ISO and SANAS standard set of tests and methods which are used for coal analyses by South African laboratories. The standard method of coal sample preparation is summarised in Section 8.11.7.1. The standard tests utilised by South African coal laboratories, in particular Inspectorate are listed in Table 18, with those tests carried out on Mount Stuart's exploration samples indicated in the relevant column.

No standard or duplicate samples were submitted by CoAL for analysis and no repeat or laboratory cross checks were requested. This is not an uncommon practice in the South African coal industry where reliance is often placed on the internal quality controls of the laboratories.

#### 11.11.7.2. Security

All samples were stored within a locked refrigerated container, before despatch to the laboratories. Once at the laboratories, the samples were subject to the standard security measures of the respective laboratories.

#### 11.11.7.3. QA/QC

Laboratories are required to calibrate their coal analytical equipment daily and are also required to partake in round robin proficiency tests to ensure a high standard of results. All result reports are verified by the laboratory manager and any inconsistencies or variations about the laboratory's specifications are reanalysed. CoAL has specifically requested that the laboratories plot ash versus CV curves for all samples. Any samples with a correlation of less than 0.90 are reanalysed.
CoAL has validated all results in Sable, by doing basic tests on cumulative results and checking of logs.

### 11.11.8. Data Management

#### 11.11.8.1. Data Acquisition and Validation

CoAL purchased both hard and electronic data copies of the original Iscor database from Exxaro in 2007.

The complete set of CoAL borehole results, i.e. lithology, collar and raw and washed laboratory results, is currently stored in an Access database along with the Iscor and Rio Tinto data and identified separately based upon borehole nomenclature.

The original borehole paper logs, where available, were captured into Sable and verified by the responsible geologist. All boreholes are presented graphically as well as plotted on plans for verification by the responsible geologist. Cross sections are plotted to confirm correlations. These were then imported directly into the Access database.

All CoAL laboratory results were received in Excel format and included into the Sable plots for each borehole. The laboratory results were also imported directly into the Access database to eliminate the possibility typing errors.

The Access database is imported into Minex software for orebody modelling purposes. This software package has a series of automatic verification procedures including checking for physical data including overlapping intervals, missing intervals, etc.

It also undertakes automatic quality verifications including increasing cumulative ash values, decreasing cumulative volatile values, totalling proximate analyses to 100%, etc. Any errors identified in Minex are investigated by the responsible geologist.

Venmyn Deloitte has randomly selected ten Iscor boreholes and two CoAL boreholes from the database and independently cross checked the data. No errors were identified.

Venmyn Deloitte has also performed independent validations on the input parameters of the modelling database using Geosoft Target. These included checking the “from” and “to” and collar information files. Two duplicate collars were discovered by Venmyn Deloitte during the validation process, which represent redrill boreholes. It was also noticed that a number of boreholes did not have end of hole depths. These boreholes were removed from the borehole database.

#### 11.11.8.2. Database Management

The Access database for the Mount Stuart Section area currently contains data from Iscor, Rio Tinto and CoAL boreholes. The Access database is managed and maintained by CoAL’s Competent Person, Mr. J. Sparrow (Pr.Sci.Nat). Backups are stored at CoAL’s head office in Johannesburg.

## 11.12. Orebody Modelling and Results

The orebody model on the Mount Stuart Section has been prepared by Mr. J. Sparrow (Pr.Sci.Nat), CoAL’s Competent Person, as at September 2012. The model was prepared in Minex Software. The model takes into account all available historical drilling and other geological information over the resource area (Mount Stuart, Ter Blanche and Septimus) as of the 31 December 2015.

Venmyn Deloitte has reviewed the model and interviewed Mr. J. Sparrow (Pr.Sci.Nat) concerning his methods of modelling. Venmyn Deloitte also independently plotted the graphical distribution of the boreholes and morphology of the seams in Geosoft Target and Micromine and found the results to be satisfactory. Venmyn Deloitte is satisfied with the integrity and results of the model.

Both CoAL and Venmyn Deloitte have a reasonable level of confidence with respect to the current model and the associated resource estimates.

The upper surface of the model was sourced from the digital terrain model and is presented in Figure 52. A major northeast – southwest trending fault is apparent in the western sector of the farm Mount Stuart 153MT, which has displaced the coal seams. A number of other faults over the area (Figure 50) have not noticeably displaced the coal.

Both the physical and quality parameters of the various seams were modelled, by CoAL, across the area of closely spaced exploration data points (i.e. from Mount Stuart 153MT in the west to Septimus 156MT in the east). Grids with a 25m mesh were estimated using Minex’s general purpose gridding function using a 3km search radius. The model of the physical parameters of the seam was cut along any significant structures, whilst the quality parameters were modelled across it. All physical and quality parameters were plotted and visually inspected to ensure they were acceptable from the perspective of geological interpretation.

### 11.12.1. Physical Results

The physical parameters of the elevation, in metres above sea level, and the depth from surface of the Upper, Middle, Bottom Upper, and Bottom Lower seams’ floors and roofs were modelled. The seam thicknesses were modelled for each and this was used as the basis for the calculation of the resource volumes.

Although all these parameters were modelled, only the respective seam floor elevations, depths from surface and the seam thicknesses results are presented below. Physical models have been generated for depth, seam thickness, and seam qualities for each of the coal seams modelled. Descriptions and plots of these parameters are detailed in the sections to follow.

#### 11.12.1.1. Seam Floor Elevation

The Bottom Lower Seam floor elevation has been modelled in order to identify any abrupt elevation changes which would indicate the presence of faulting and also to identify the dip across the project area. The variations in seam floor elevations are presented in Figure 50.

This figure illustrates that the coal seams dip towards the north, with the shallowest part of the basin located in the south.

The coal within the resource area generally appears undisturbed by faults; however a large northeast-southwest trending fault is present in the western sector of the farm Mount Stuart 153MT, which has displaced the coal vertically.

#### 11.12.1.2. Depth from Surface

The depth of the seams from surface will have an impact on the mining method (opencast versus underground). The seam floor depth from surface for each of the seams is presented in Figure 51.

The coal seams vary in depth from surface from a minimum of less than 50m in the south to a maximum of almost 900m for the Bottom Lower Seam in the north.

The figure indicates that the coal can only be mined using opencast methods from the suboutcrop in the south. The dip of the coal towards the north would necessitate underground mining methods on selected seams toward the northern limit of the project area as the depth from surface increases.

To further illustrate this, Figure 52 presents the calculated strip ratios including all economic seams. The areas with stripping ratios greater than 7bcm:t coal have the potential to be mined using opencast method. This figure shows that the majority of the opencastable coal occurs in the south of the resource area.

#### 11.12.1.3. Seam Thickness

The seam thickness contours or isopachs are presented in Figure 53. The seams vary in thickness from less than 0.5m to a maximum of over 9.0m. It is apparent that the seams generally tend to thicken to the north of the resource area. The Upper Seam is generally the thinnest seam.

### 11.12.2. Quality Results

Although quality results for the raw proximate (ash, volatile, fixed carbon, moisture and sulphur) and the raw CV laboratory results were available for the recent boreholes, these were not available for the historical boreholes. The historical boreholes were not analysed raw. They were washed and analysed at an RD of 1.40. Therefore, the most appropriate and common parameter available for both sets of data are the analyses of a washed product at an RD of 1.40. This approximately equates to a 12% ash product. Due to this situation, only the washed proximate results were modelled and are presented below. The product yield at this RD is also presented.

#### 11.12.2.1. Coking Potential

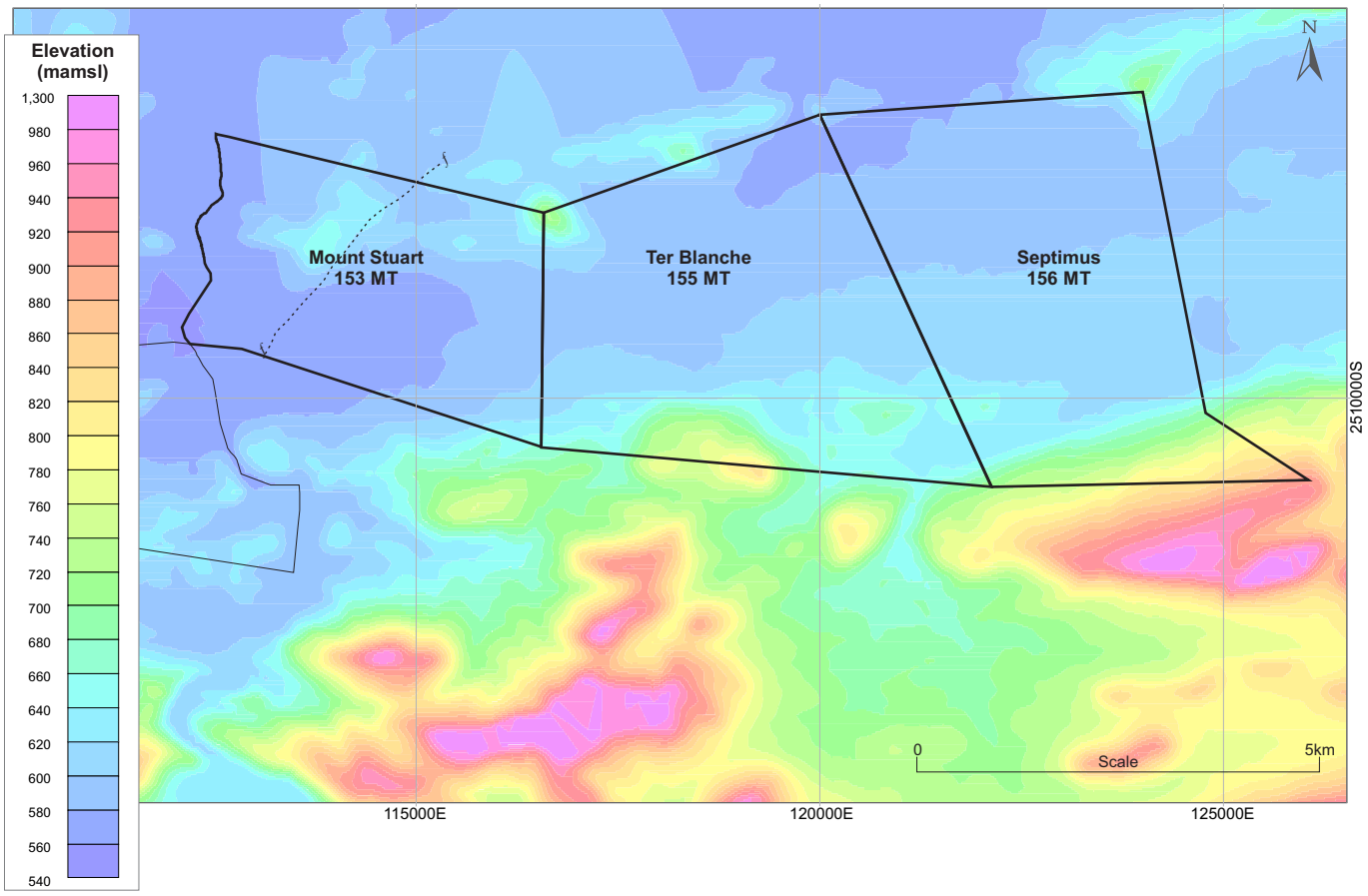
The coking potential of Mount Stuart is good and the project has the potential to produce a hard coking coal (Figure 22), with samples indicating an RoVmax of 1.2.

No other specific coking coal tests were carried out.

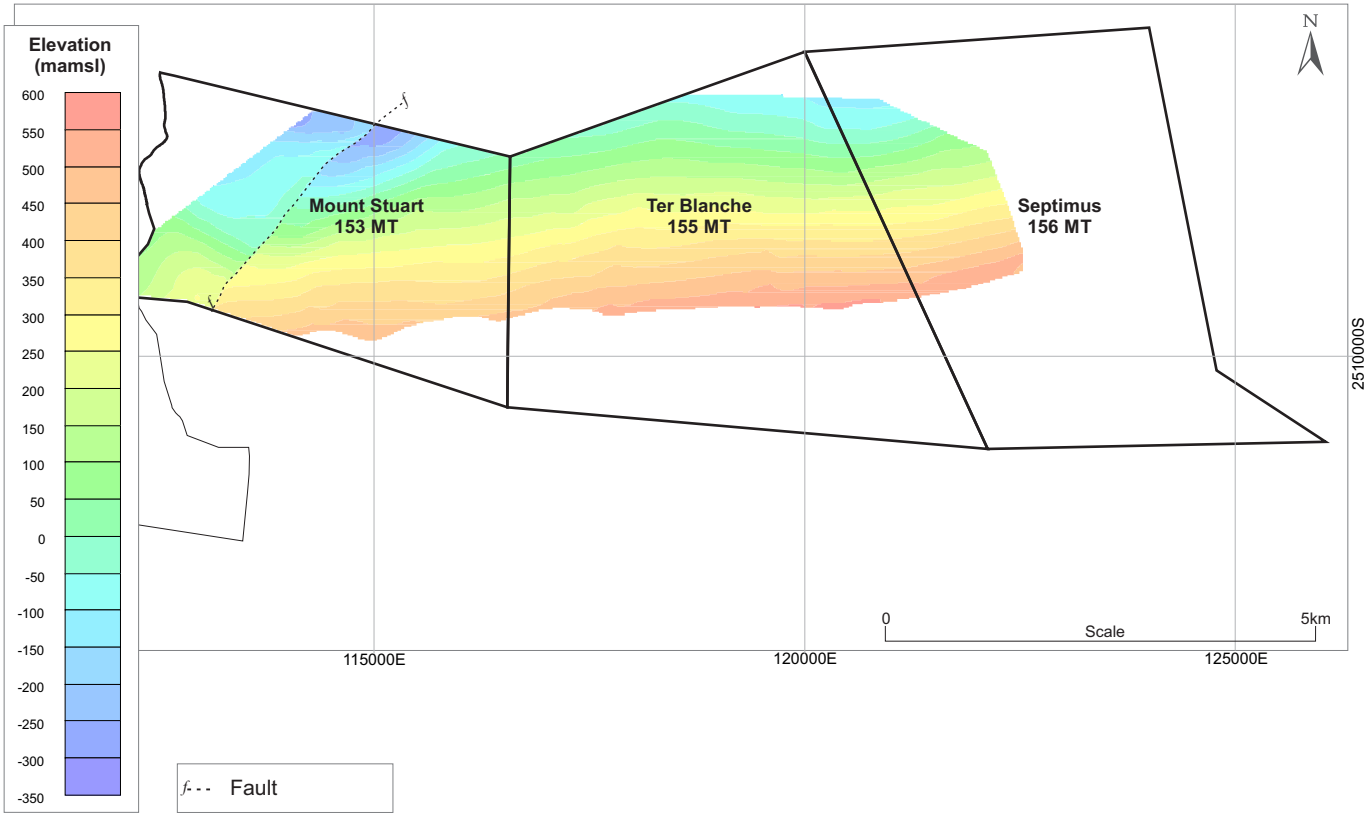
VenmynDeloitte. Coal of Africa

## MOUNT STUART SECTION – SURFACE CONTOURS AND BOTTOM LOWER SEAM FLOOR ELEVATION

### TOPOGRAPHY



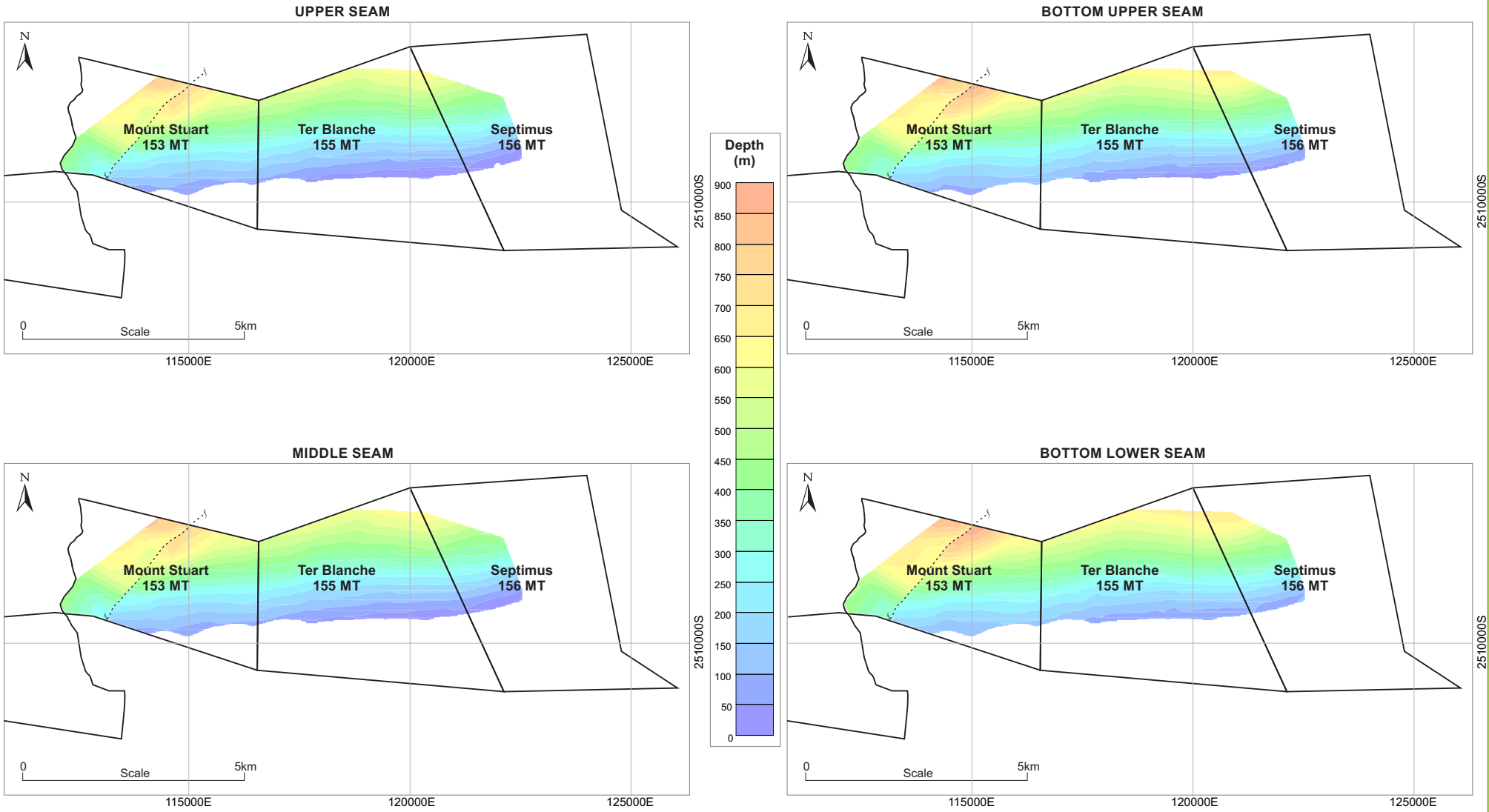

### BOTTOM LOWER SEAM FLOOR ELEVATION




Source: Coal of Africa

VMD1971_CoAL GSP CPR_2015

## MOUNT STUART SECTION – SEAM DEPTHS FROM SURFACE



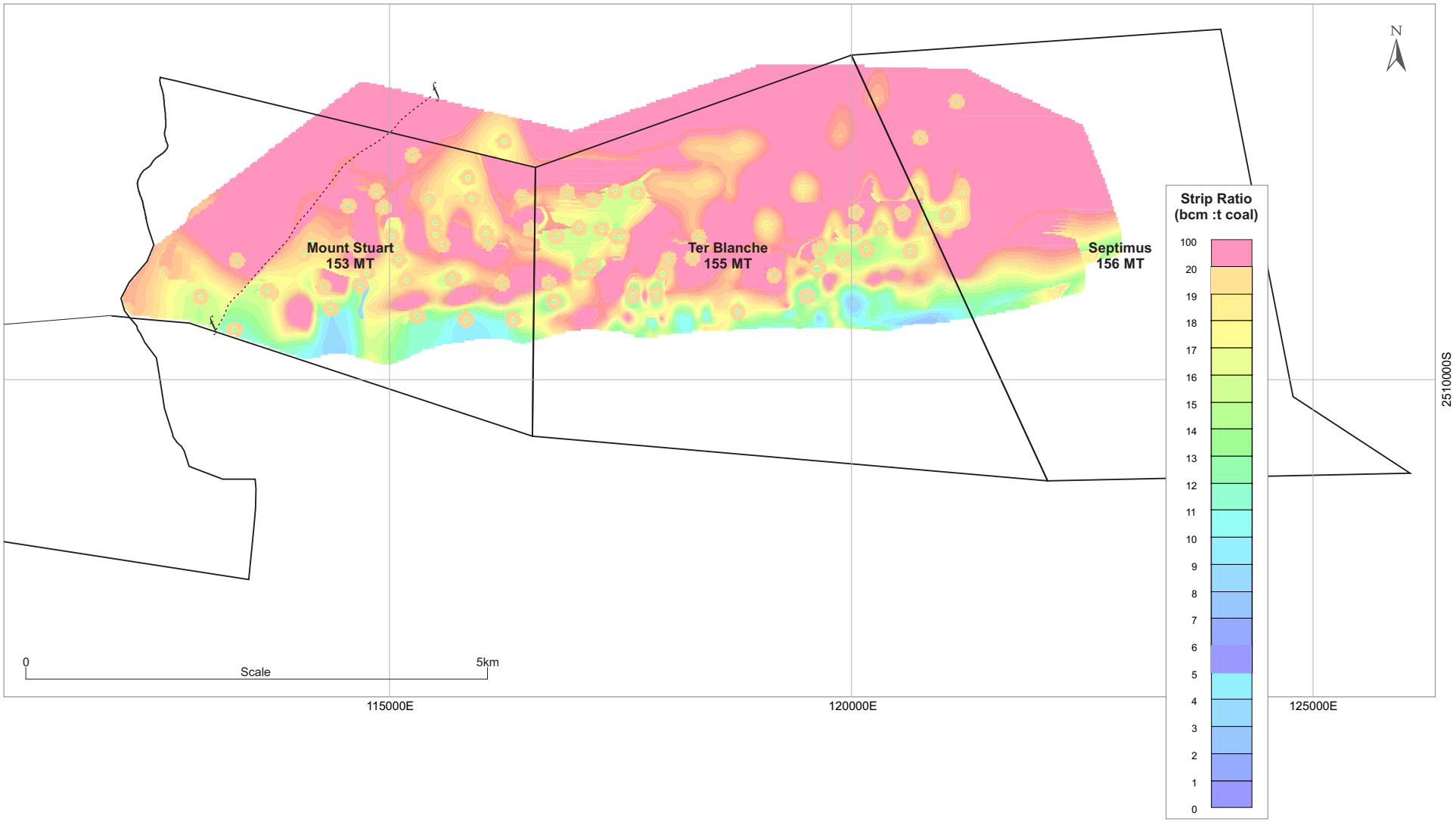

Source: Coal of Africa
VMD1971_CoAL GSP CPR_2015

VennynDeloitte.

Coal of Africa

Figure 51

## MOUNT STUART SECTION – STRIP RATIO INCLUDING ALL ECONOMIC SEAMS




Source: Coal of Africa
VMD1971_CoAL GSP CPR_2015

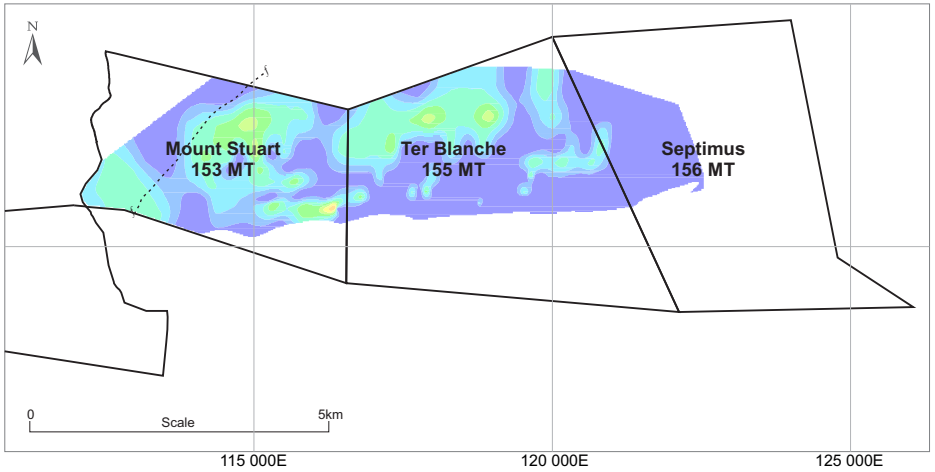
VennynDeloitte.

Coal of Africa

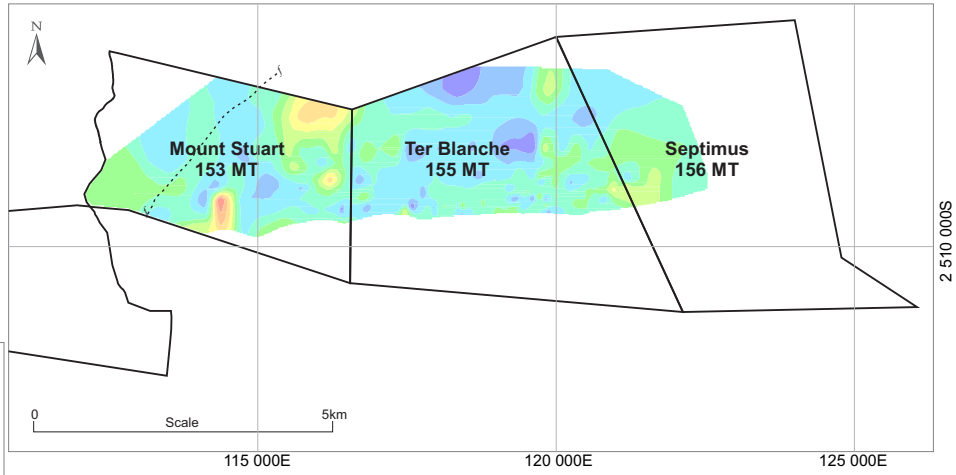
Figure 52

## MOUNT STUART SECTION – ISOPACH CONTOURS

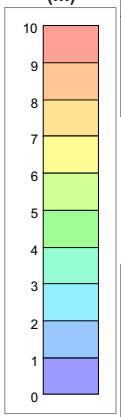
### UPPER SEAM



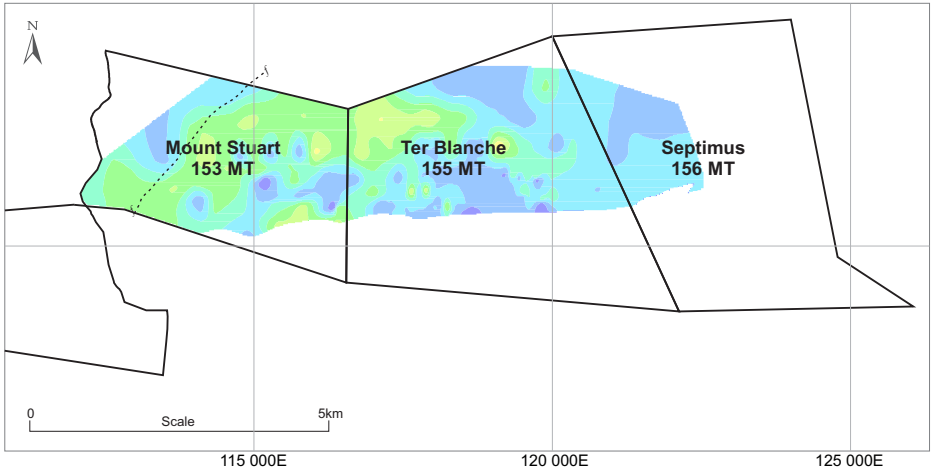

### BOTTOM UPPER SEAM



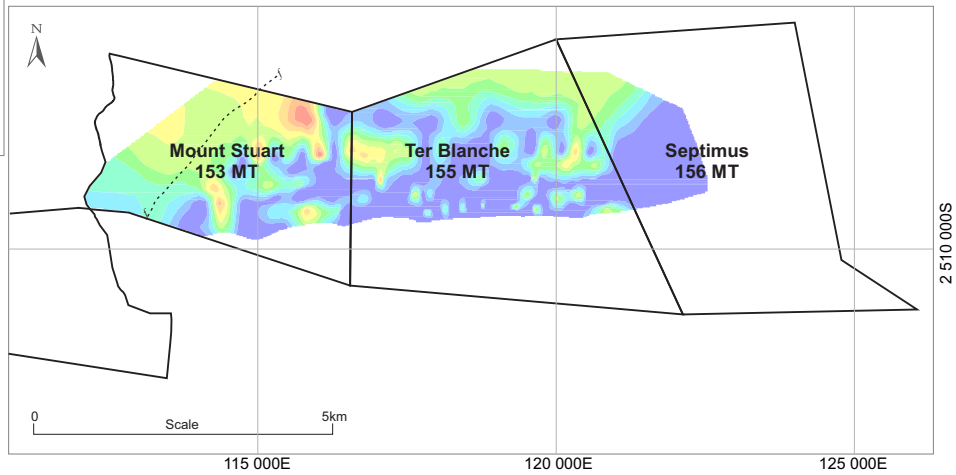

Thickness (m)




### MIDDLE SEAM




### BOTTOM LOWER SEAM




VMD1971_CoAL GSP CPR_2015

Venmyn Deloitte.

Coal of Africa

Figure 53

#### 11.12.2.2. Washed Calorific Value

No information is available on CV for the historical boreholes. Therefore this parameter has not been modelled or plotted. It must be noted that CV is not a critical parameter for coking coal and therefore this omission is not material to the assessment of the coal and declaration of resources.

#### 11.12.2.3. Washed Ash

The modelled product ash content of the various seams at Mount Stuart for a wash at an RD = 1.40 is graphically presented in Figure 54.

Due to the fact that a product coal is presented at a fixed RD, the natural variability of the ash content of the raw coal is not clearly portrayed. The coal therefore varies in a small range, in this case between 5% and 20% for the various seams.

#### 11.12.2.4. Washed Volatiles

The modelled product volatile content of the various seams at Mount Stuart for a wash at an RD = 1.40 is graphically presented in Figure 55.

Although the plot presents a product volatile content, the trends in the inherent volatile content of the coal are evident. The washed volatile content varies between 10% and 30% for the various seams.

#### 11.12.2.5. Potential Yields

The washability of the coal was tested at an RD = 1.40 which roughly equates to a 12% Ash product coal, as stated above. The theoretical yields of the various seams are graphically presented in Figure 56.

The yields vary widely, between 0% and 50% as indicated in Figure 56. This is indicative of the relative percentage of shale or mudstone within the coal seams. The Upper and Bottom Lower seams show the lowest average yields, of generally less than 10%. However, the technology used in the 1970s was single-tube NX drilling, which provides insufficient sample with significant loss of material. CoAL and Venmyn Deloitte therefore consider the yield data unreliable and most likely grossly underestimated.

## 11.13. Coal Mining

Due to the stage of development of the Mount Stuart Section, no detailed investigations have been carried out on the potential mining of the deposit. However, upon considering the depth from surface of the coal zones, any future mining is expected to be mostly opencast, with limited additional underground methods.

Details on mining methods and recoveries will be investigated during a PFS on the project.

## 11.14. Coal Processing

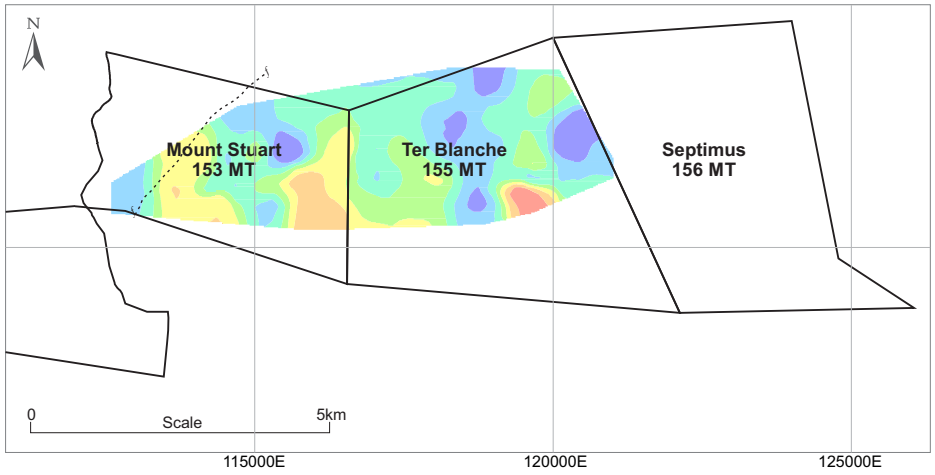
The Mount Stuart Section coal is most likely to yield a coking coal product. This product is briefly discussed in Section 8.12.2.1. No details are currently available on the envisaged processing plant. This study will be undertaken as part of a Pre-Feasibility Study.

## 11.15. Coal Market

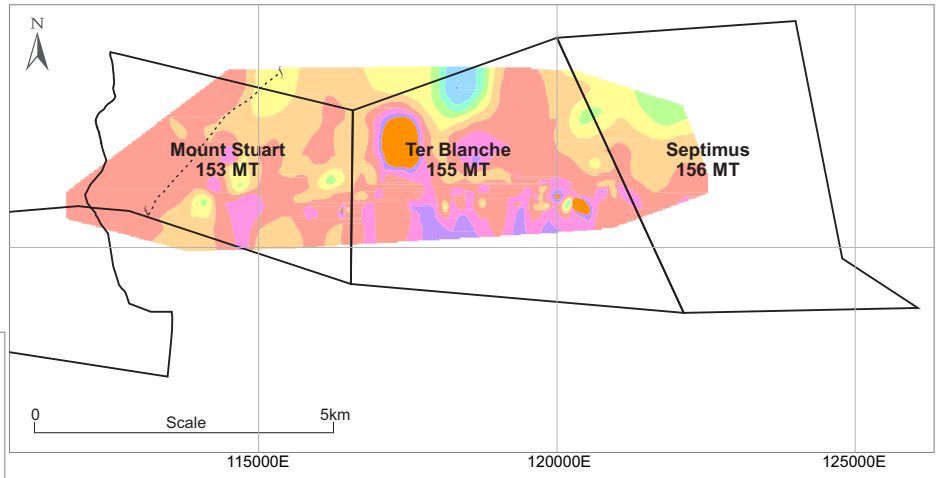
The indications are that the Mount Stuart product will be a hard coking coal, based on current geological data and plant assumptions, with $R_oV_{max}$ of 1.2. There are currently no contracts in place for the sale of this coal.

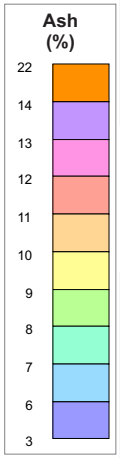
## MOUNT STUART SECTION – THEORETICAL PRODUCT ASH CONTOURS (@ RD = 1.40)

### UPPER SEAM

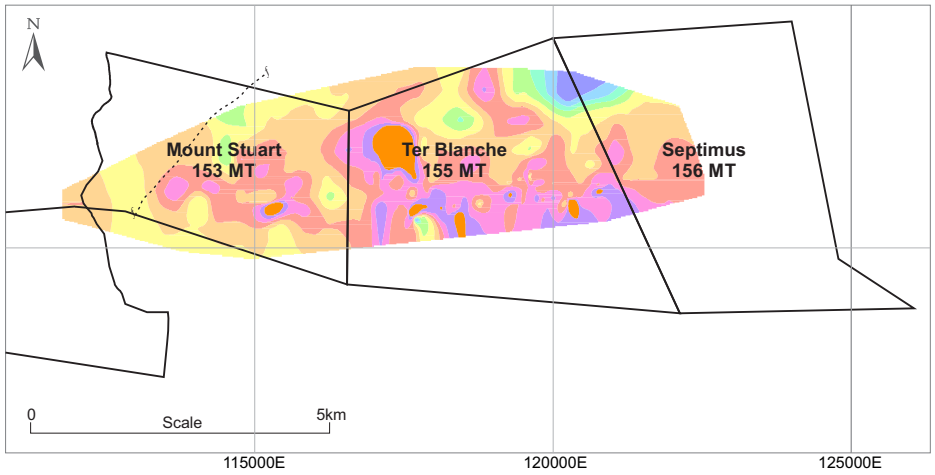



### BOTTOM UPPER SEAM

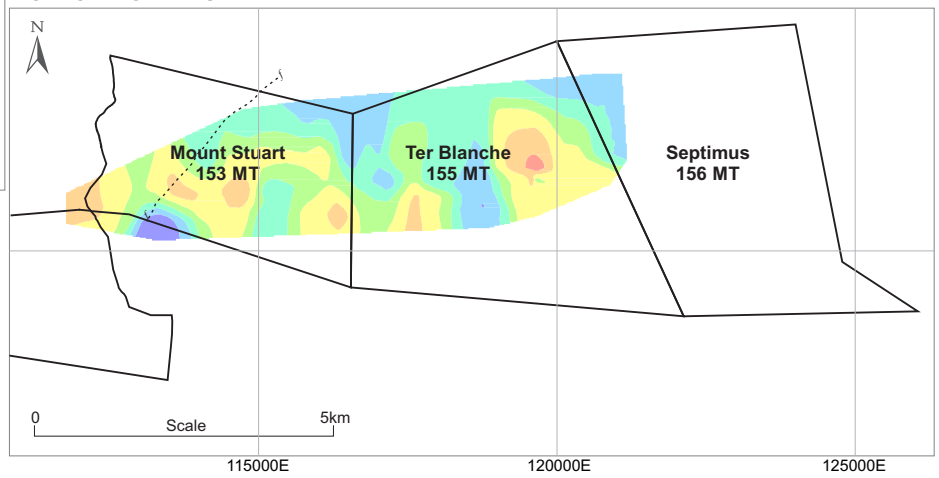



### MIDDLE SEAM




### BOTTOM LOWER SEAM

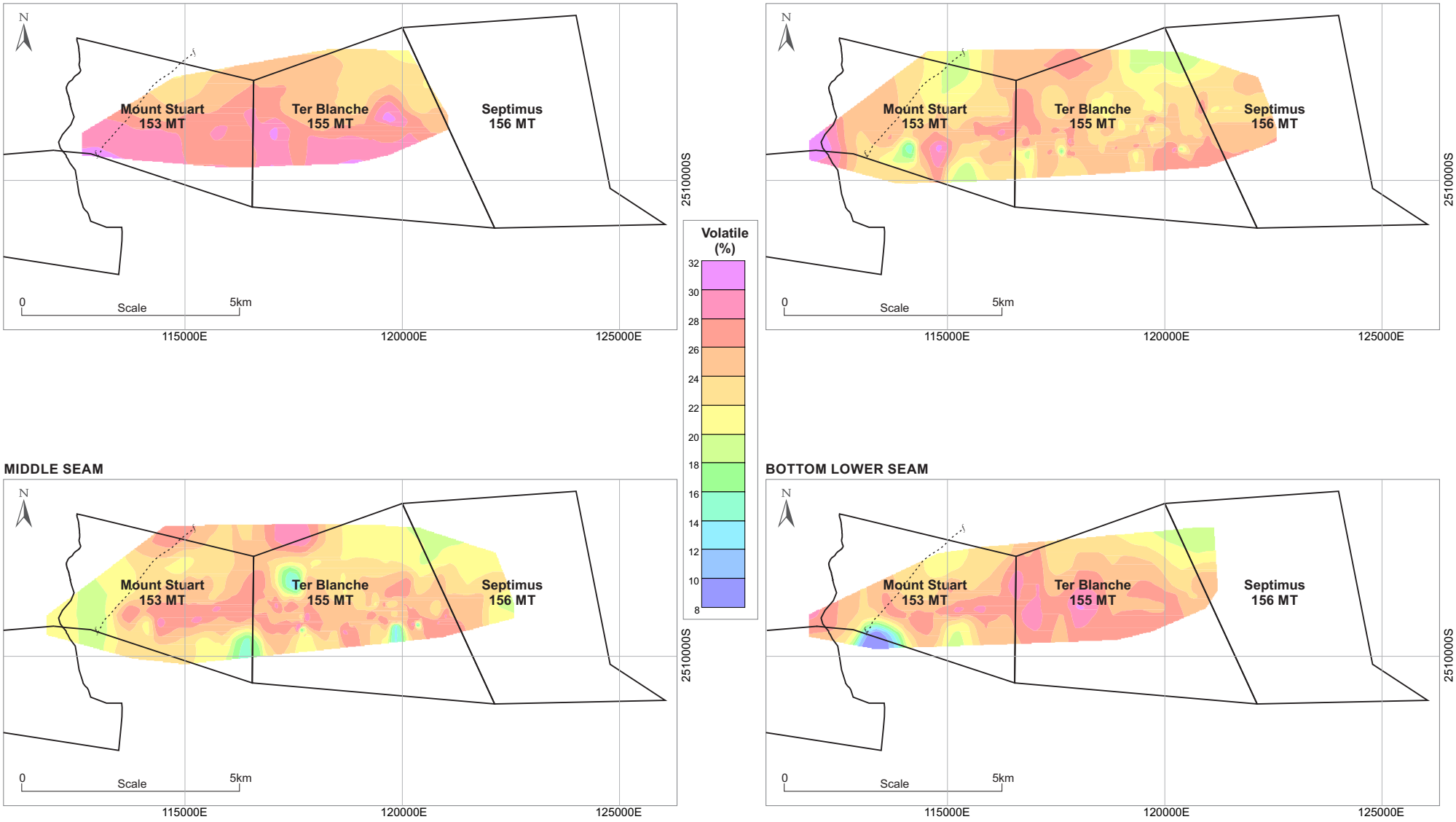



Source: Coal of Africa
VMD1971_CoAL GSP CPR_2015

Figure 54

Venmyn Deloitte.
Coal of Africa

## MOUNT STUART SECTION – THEORETICAL PRODUCT VOLATILE CONTOURS (@ RD = 1.40)

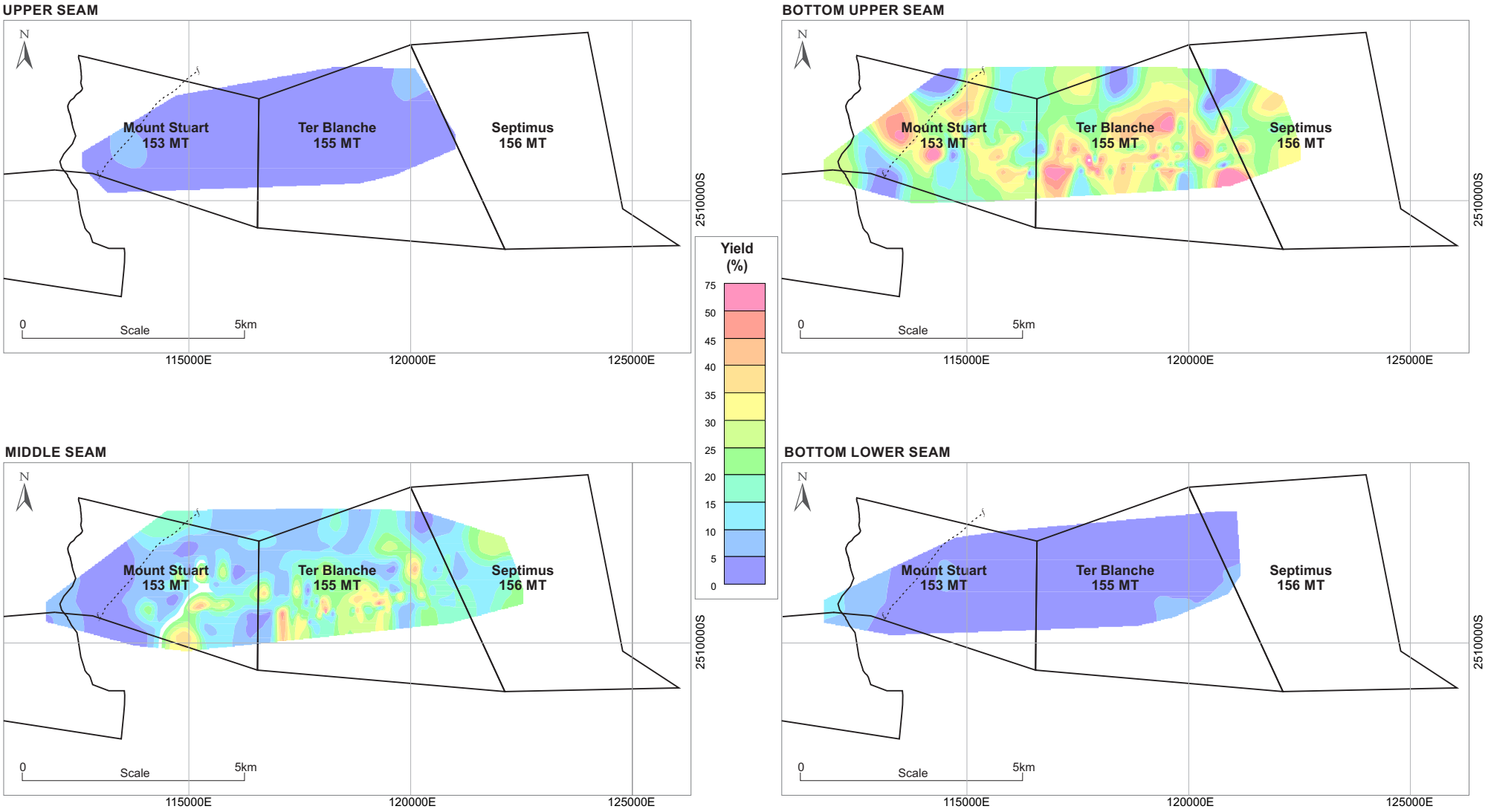



Source: Coal of Africa
VMD1971_CoAL GSP CPR_2015

Figure 55

Coal of Africa

## MOUNT STUART SECTION – THEORETICAL PRODUCT YIELD CONTOURS (@ RD = 1.40)




Source: Coal of Africa
VMD1971_CoAL GSP CPR_2015

Figure 56

## 11.16. Previous Resource Statement

A Coal Resource was declared, by CoAL, as at 30 September 2012 in the CPR entitled “Independent Competent Persons’ Report on Certain Coal Assets Within the Soutpansberg Coalfield of Coal Of Africa Limited”. No additional changes have been made by Venmyn Deloitte to the geological model or resource estimation for the Mount Stuart Section since the 2012 CPR.

## 11.17. Current Resource Statement

The JORC compliant Coal Resource for the Mount Stuart Project, as at 31st December 2015, was estimated and signed off by CoAL's Competent Person, Mr J Sparrow (Pr.Sci.Nat.), CoAL's Group Geologist. Venmyn Deloitte reviewed the estimation procedures and considers the Coal Resource estimates and classification as prepared and declared by CoAL as reasonable and compliant with JORC.

The classification into the various resource categories, by CoAL, is primarily based upon the relative spacing of points of observation with both quantitative and qualitative results. While cognisance has been taken of the resource categories defined by the JORC Code, all resources have been classified, by CoAL, in the Inferred Category as a consequence of the resource area being defined on the basis of historical data, with no recent verification drilling or sampling by CoAL on farms within the resource area. The location of the resources in relation to the mineral rights boundary is illustrated in Figure 57.

A detailed Coal Resource Statement, by property, is available and this presents the input parameters, the calculations and limits used in a stepwise process to obtain the resultant resource tonnages and associated qualities. Table 33 presents CoAL’s estimated resources and qualities for a theoretical washed coal product at an ash content of 10%. Resources have been categorised as Inferred according to JORC Code guidelines. Only opencast resources have been considered in the reporting of MTIS.

The volume of the seams was estimated, by CoAL, using the Minex$^{TM}$ model of the seam thickness, divided into the various farms or blocks. The Minex$^{TM}$ modelled average raw density per resource block was used to calculate the tonnage from the volume. The raw density of every sample is measured in the laboratory. The tonnage is calculated on a block by block basis from the volume multiplied by the average raw density.

Each of the quality parameters were modelled, by CoAL, in Minex$^{TM}$ and the average quality per farm is reported in the Coal Resource Statement.

**Table 33 : Mount Stuart – Coal Resource Statements (30 September 2012) – CoAL**

**RESOURCE CALCULATED AT 0.5mm MINIMUM SEAM THICKNESS**

| FARM | RESOURCE CATEGORY | SEAM | AVE WIDTH (m) | COAL RAW RD (t/m³) | GROSS TONNES IN SITU | GEOL. LOSSES (%) | TOTAL TONNES IN SITU | AIR DRIED WASHED QUALITIES @ RD = 1.4 | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | YIELD (%) | CV (MJ/kg) | ASH (%) | VOL (%) | FIXED CARBON (%) | SULPH. (%) | MOIST. (%) |
| Mount Stuart 153MT | Inferred | Upper | 2.46 | 1.92 | 33,367,022 | 20.00 | 26,690,000 | 2.59 | | 8.02 | 26.65 | 64.94 | 0.98 | 0.39 |
| | | Middle Upper | 3.66 | 1.82 | 55,499,570 | 20.00 | 44,390,000 | 9.40 | | 10.6 | 23.61 | 65.29 | 1.00 | 0.46 |
| | | Bottom Upper | 3.73 | 1.69 | 52,650,930 | 20.00 | 42,120,000 | 21.84 | | 11.0 | 23.96 | 64.48 | 0.78 | 0.49 |
| | | Bottom Lower | 4.26 | 1.93 | 62,926,086 | 20.00 | 50,340,000 | 3.21 | | 8.49 | 24.01 | 66.99 | 0.84 | 0.52 |
| | **TOTAL/AVERAGE INFERRED** | | **3.55** | **1.84** | **204,443,608** | **20.00** | **163,540,00** | **9.59** | | **9.66** | **24.32** | **65.55** | **0.89** | **0.47** |
| | **TOTAL/ AVERAGE MOUNT STUART** | | **3.55** | **1.84** | **204,443,608** | **20.00** | **163,540,00** | **9.59** | | **9.66** | **24.32** | **65.55** | **0.89** | **0.47** |
| Ter Blanche 155MT | Inferred | Upper | 2.34 | 1.96 | 27,322,124 | 20.00 | 21,850,000 | 2.80 | | 7.15 | 24.88 | 67.48 | 0.89 | 0.49 |
| | | Middle Upper | 2.86 | 1.78 | 48,979,847 | 20.00 | 39,180,000 | 14.47 | | 11.4 | 23.53 | 64.54 | 0.93 | 0.50 |
| | | Bottom Upper | 2.86 | 1.64 | 44,940,267 | 20.00 | 35,950,000 | 29.26 | | 11.5 | 23.88 | 64.18 | 0.73 | 0.42 |
| | | Bottom Lower | 2.96 | 1.98 | 45,126,342 | 20.00 | 36,100,000 | 2.02 | | 8.04 | 24.44 | 66.89 | 0.73 | 0.63 |
| | **TOTAL/AVERAGE INFERRED** | | **2.79** | **1.82** | **166,368,580** | **20.00** | **133,080,00** | **13.17** | | **9.83** | **24.09** | **65.56** | **0.81** | **0.51** |
| | **TOTAL/ AVERAGE TER BLANCHE** | | **2.79** | **1.82** | **166,368,580** | **20.00** | **133,080,00** | **13.17** | | **9.83** | **24.09** | **65.56** | **0.81** | **0.51** |
| Septimus 156MT | Inferred | Upper | 1.21 | 1.83 | 529,443 | 20.00 | 420,000 | 1.96 | | 6.31 | 23.91 | 68.84 | 0.88 | 0.94 |
| | | Middle Upper | 2.05 | 1.72 | 9,665,623 | 20.00 | 7,730,000 | 14.61 | | 10.3 | 22.20 | 67.15 | 0.95 | 0.35 |
| | | Bottom Upper | 3.56 | 1.68 | 17,952,506 | 20.00 | 14,360,000 | 22.82 | | 10.4 | 23.58 | 65.68 | 0.76 | 0.32 |
| | | Bottom Lower | 3.38 | 1.93 | 8,203,068 | 20.00 | 6,560,000 | 2.08 | | 6.90 | 20.21 | 72.25 | 0.73 | 0.64 |
| | **TOTAL/AVERAGE INFERRED** | | **2.88** | **1.75** | **36,350,640** | **20.00** | **29,070,000** | **15.66** | | **9.53** | **22.46** | **67.60** | **0.81** | **0.41** |
| | **TOTAL/ AVERAGE SEPTIMUS** | | **2.88** | **1.75** | **36,350,640** | **20.00** | **29,070,000** | **15.66** | | **9.53** | **22.46** | **67.60** | **0.81** | **0.41** |
| | **GRAND TOTAL/ AVERAGE MOUNT STUART** | | **3.13** | **1.82** | **407,162,828** | **20.00** | **325,690,00** | **11.59** | | **9.72** | **24.06** | **65.74** | **0.85** | **0.48** |

**Notes:**

GTIS & TTIS - At minimum seam thickness cutoff of

MTIS - at maximum opencast mining depth of 200m. No underground mining considered. Excludes all coal with

Rounding down of tonnages to 10,000t for Inferred

Weighted average qualities calculated on MTIS

**RESOURCE CALCULATED FOR MAXIMUM SEAM DEPTH OF 200m FOR O/C MINING, NO U/G MINING CONSIDERED, COAL WITH VOLATILE CONTENT <18% EXCLUSED**

| FARM | RESOURCE CATEGORY | SEAM | AVE WIDTH (m) | COAL RAW RD (t/m³) | GROSS TONNES IN SITU | GEOL. LOSSES (%) | TOTAL TONNES IN SITU | MINING BLOCK LAYOUT LOSSES (%) | MINING BLOCK LAYOUT LOSSES (t) | MTIS No rounding | MINEABLE TONNES IN SITU |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Mount Stuart 153MT | Inferred | Upper | 2.33 | 1.97 | 6,211,181 | 20.00 | 4,968,945 | 2.00 | 99,379 | 4,869,566 | 4,860,000 |
| | | Middle Upper | 3.27 | 1.79 | 10,233,374 | 20.00 | 8,186,699 | 2.00 | 163,734 | 8,022,965 | 8,020,000 |
| | | Bottom Upper | 3.78 | 1.75 | 9,824,154 | 20.00 | 7,859,323 | 2.00 | 157,186 | 7,702,137 | 7,700,000 |
| | | Bottom Lower | 2.98 | 1.96 | 4,774,622 | 20.00 | 3,819,698 | 2.00 | 76,394 | 3,743,304 | 3,740,000 |
| | **TOTAL/AVERAGE INFERRED RESOURCES** | | **3.13** | **1.84** | **31,043,331** | **20.00** | **24,834,665** | **2.00** | **496,693** | **24,337,972** | **24,320,000** |
| | **TOTAL/ AVERAGE MOUNT STUART** | | **3.13** | **1.84** | **31,043,331** | **20.00** | **24,834,665** | **2.00** | **496,693** | **24,337,972** | **24,320,000** |
| Ter Blanche 155MT | Inferred | Upper | 1.53 | 1.94 | 2,277,591 | 20.00 | 1,822,073 | 2.00 | 36,441 | 1,785,631 | 1,780,000 |
| | | Middle Upper | 2.33 | 1.72 | 12,759,480 | 20.00 | 10,207,584 | 2.00 | 204,152 | 10,003,432 | 10,000,000 |
| | | Bottom Upper | 3.23 | 1.69 | 16,182,106 | 20.00 | 12,945,685 | 2.00 | 258,914 | 12,686,771 | 12,680,000 |
| | | Bottom Lower | 1.71 | 1.95 | 3,054,226 | 20.00 | 2,443,381 | 2.00 | 48,868 | 2,394,513 | 2,390,000 |
| | **TOTAL/AVERAGE INFERRED RESOURCES** | | **2.52** | **1.74** | **34,273,403** | **20.00** | **27,418,722** | **2.00** | **548,374** | **26,870,348** | **26,850,000** |
| | **TOTAL/ AVERAGE TER BLANCHE** | | **2.52** | **1.74** | **34,273,403** | **20.00** | **27,418,722** | **2.00** | **548,374** | **26,870,348** | **26,850,000** |
| Septimus 156MT | Inferred | Upper | 0.53 | 1.88 | 32.00 | 20.00 | 26.00 | 2.00 | 1.00 | 25.00 | 0.00 |
| | | Middle Upper | 2.38 | 1.72 | 3,501,716 | 20.00 | 2,801,373 | 2.00 | 56,027 | 2,745,345 | 2,740,000 |
| | | Bottom Upper | 4.48 | 1.68 | 1,985,775 | 20.00 | 1,588,620 | 2.00 | 31,772 | 1,556,848 | 1,550,000 |
| | | Bottom Lower | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| | **TOTAL/AVERAGE INFERRED RESOURCES** | | **2.87** | **1.71** | **5,487,523** | **20.00** | **4,390,018** | **2.00** | **87,800** | **4,302,218** | **4,290,000** |
| | **TOTAL/ AVERAGE SEPTIMUS** | | **2.87** | **1.71** | **5,487,523** | **20.00** | **4,390,018** | **2.00** | **87,800** | **4,302,218** | **4,290,000** |
| | **GRAND TOTAL/ AVERAGE MOUNT STUART** | | **2.78** | **1.78** | **70,804,257** | **20.00** | **56,643,406** | **2.00** | **1,132,868** | **55,510,537** | **55,460,000** |

**Table 33 (cont)**

| AIR DRIED WASHED QUALITIES @ RD = 1.4 | | | | | | |
|---|---|---|---|---|---|---|
| YIELD (%) | CV (MJ/kg) | ASH (%) | VOL (%) | FIXED | SULPH. (%) | MOIST. (%) |
| 1.82 | | 9.11 | 27.85 | 62.64 | 1.00 | 0.40 |
| 13.12 | | 11.12 | 24.24 | 63.96 | 1.04 | 0.68 |
| 20.51 | | 11.43 | 24.03 | 63.93 | 0.73 | 0.61 |
| 3.20 | | 9.19 | 24.73 | 65.63 | 0.95 | 0.44 |
| **11.67** | | **10.52** | **24.97** | **63.94** | **0.92** | **0.56** |
| **11.67** | | **10.52** | **24.97** | **63.94** | **0.92** | **0.56** |
| 2.57 | | 8.19 | 27.84 | 65.14 | 0.98 | 0.56 |
| 18.94 | | 12.10 | 25.38 | 61.61 | 0.90 | 0.47 |
| 32.22 | | 11.89 | 24.66 | 62.69 | 0.71 | 0.50 |
| 4.43 | | 9.06 | 26.97 | 63.63 | 0.74 | 0.53 |
| **22.83** | | **11.47** | **25.35** | **62.53** | **0.80** | **0.50** |
| **22.83** | | **11.47** | **25.35** | **62.53** | **0.80** | **0.50** |
| 1.62 | | 6.75 | 25.19 | 67.05 | 0.96 | 1.01 |
| 15.63 | | 11.36 | 23.36 | 64.88 | 1.07 | 0.40 |
| 27.63 | | 11.15 | 24.81 | 63.38 | 0.76 | 0.47 |
| 0.00 | | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| **19.97** | | **11.28** | **23.88** | **64.34** | **0.96** | **0.43** |
| **19.97** | | **11.28** | **23.88** | **64.34** | **0.96** | **0.43** |
| **17.72** | | **11.04** | **25.07** | **63.29** | **0.87** | **0.52** |

The following cutoffs or limits were applied to the coal resources:-

- the limit of the NOPRs boundary;
- the limit of the occurrence of the coal seams in the south;
- a minimum seam thickness limit of 0.5m was applied prior to the reporting of GTIS;
- a minimum volatile content of 18% for the calculation of MTIS. This is due to the fact that the rank of the coal at Mount Stuart is significantly higher than at Makhado;
- all coal resources were classified as Inferred and therefore geological losses of 20% were applied prior to the reporting of TTIS. These losses take into account any unforeseen geological features, such as dykes and faults, which have not been identified in the drilling and which may have a negative impact on the coal resources; and
- mining layout losses of 2% were applied prior to the calculation of MTIS.

## 11.17.1. Resource Classification

While cognisance has been taken of the resource categories defined by the JORC Code (Table 12), all resources have been classified, by CoAL, in the Inferred Category as a consequence of the resource area being defined on the basis of historical data, with no recent verification drilling or sampling by CoAL on farms within the resource area.

Only Points of Observation with seam quality data have been used to define the resources. The coal seams have been classified in the Inferred Category based on an Inferred Resource limit of a maximum of 4,000m between Points of Observation. For any seam, the resource limits were extrapolated no more than 500m beyond the last line of Points of Observation.

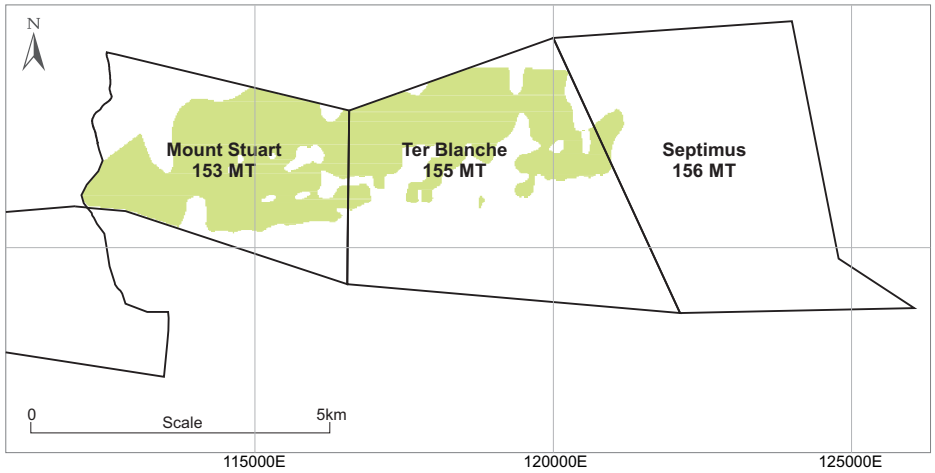
While the borehole density is, in places, sufficient to classify Indicated and Measured resources, these areas have all been downgraded to the Inferred Category due to the lack of recent verification. The observation point halos in accordance with JORC reporting standards are presented in Figure 58.

## 11.17.2. Input Parameters and Limits

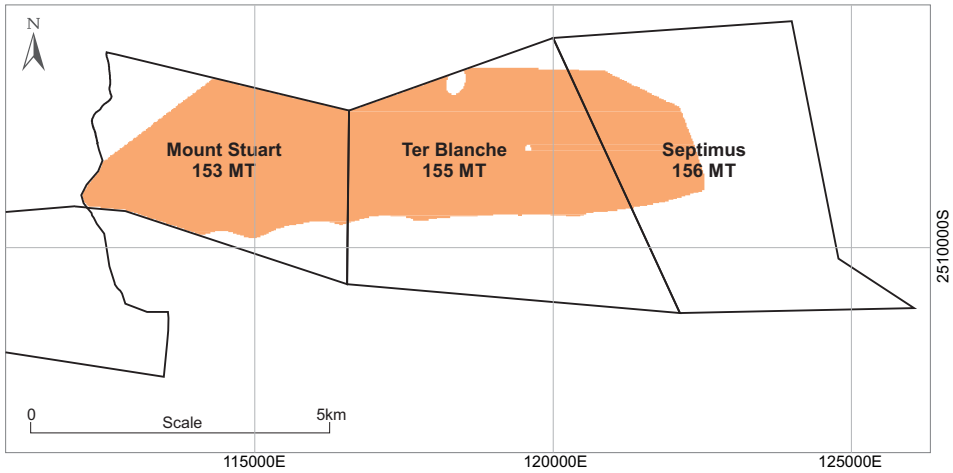
CoAL's Coal Resource Statement, by farm, is presented in Table 33. This table presents the input parameters, the calculations and limits used in a stepwise process to obtain the resultant resource tonnages and associated qualities.

## MOUNT STUART SECTION – LOCATION OF RESOURCES

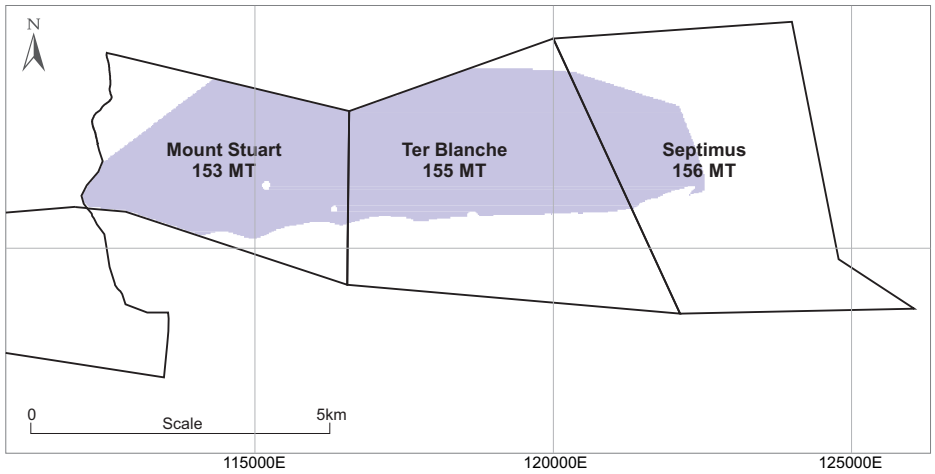
### UPPER SEAM



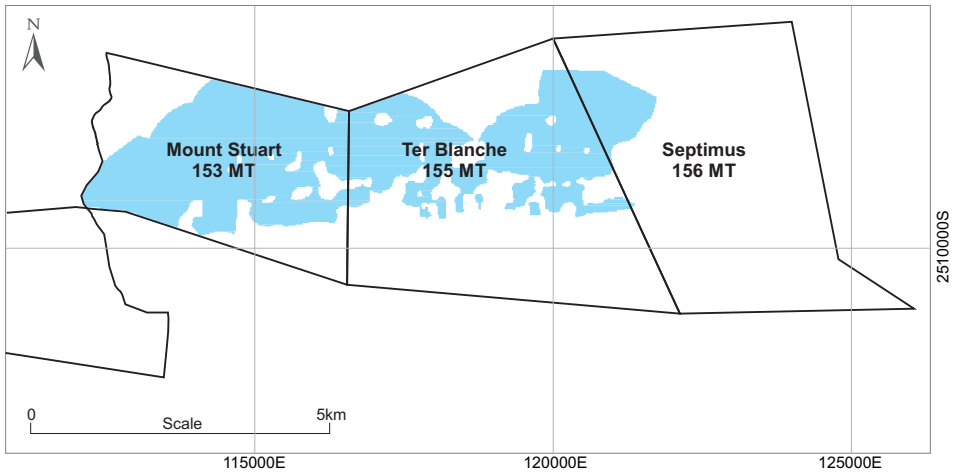

### BOTTOM UPPER SEAM




### MIDDLE SEAM




### BOTTOM LOWER SEAM




**Mineral Resource**

- Prospecting Rights Boundary
- Upper Seam
- Middle Seam
- Bottom Upper Seam
- Bottom Lower Seam

Source: Coal of Africa
VMD1971_CoAL GSP CPR_2015

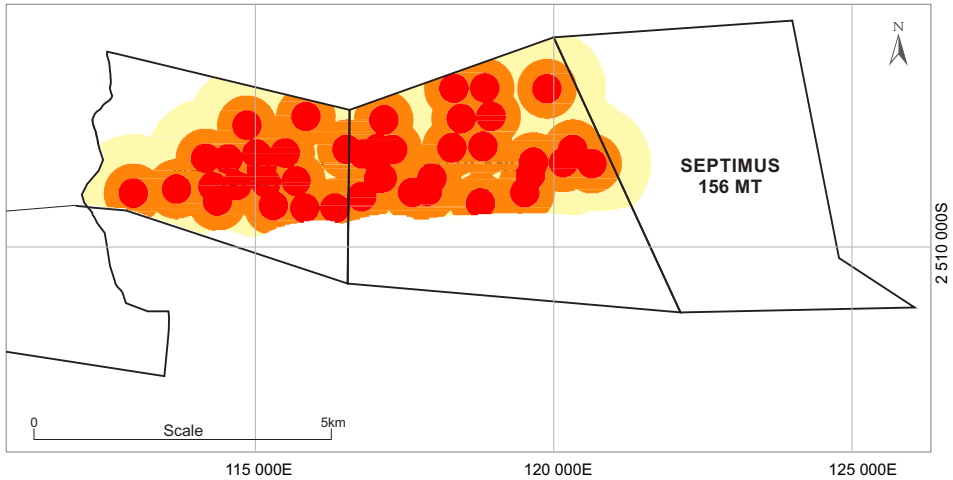
Venmyn Deloitte.

Coal of Africa

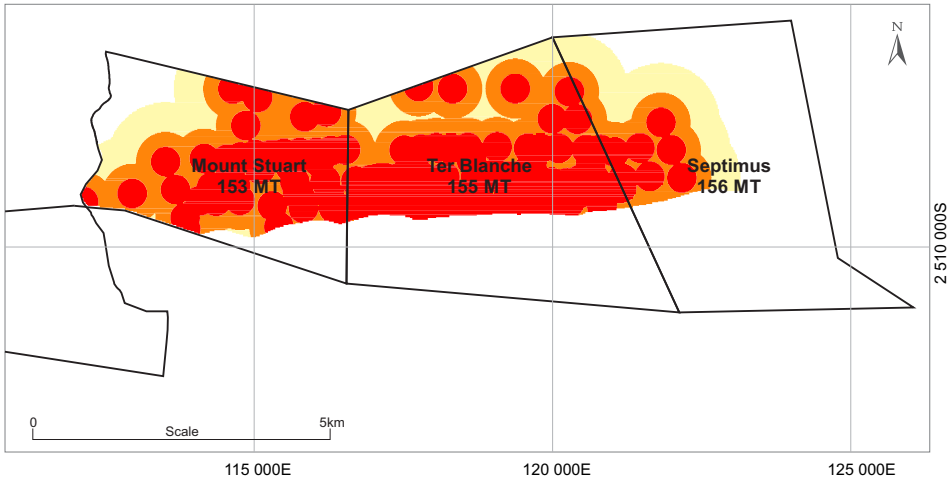
Figure 57

## MOUNT STUART SECTION – OBSERVATION POINT HALOS IN ACCORDANCE WITH JORC REPORTING STANDARDS

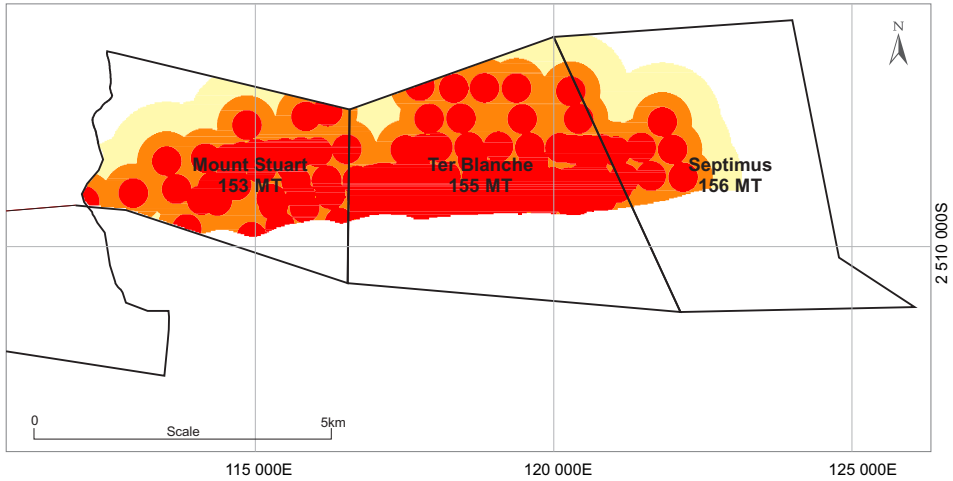
### UPPER SEAM



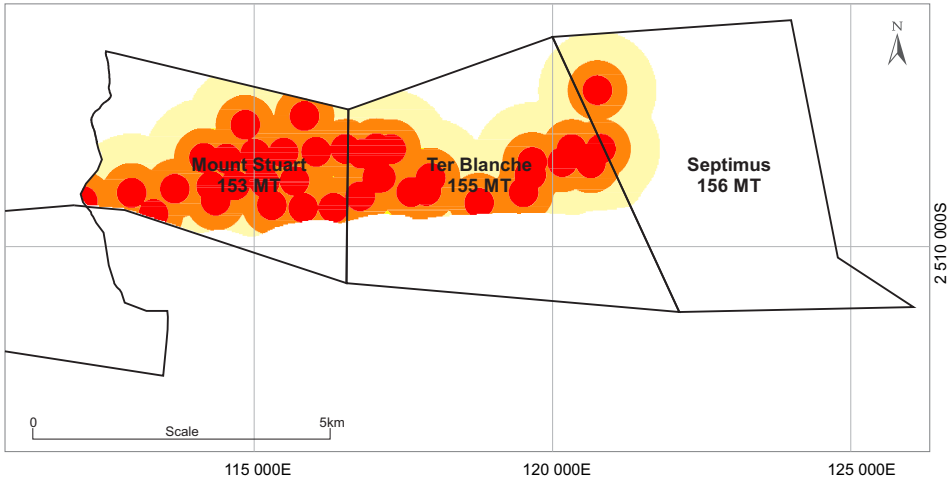

### BOTTOM UPPER SEAM




### MIDDLE SEAM




### BOTTOM LOWER SEAM




**Mineral Resource**

- Measured (250m radius from borehole with quality data)
- Indicated (500m radius from borehole with quality data)
- Inferred (2,000m radius from borehole with quality data)
- Prospecting Rights Boundary

*Note: All resources downgraded to Inferred Category*

Source: Coal of Africa
VMD1971_CoAL GSP CPR_2015

Venmyn Deloitte.

Coal of Africa

Figure 58

#### 11.17.2.1. Volume

The volume of the seams was estimated using the Minex™ model of the seam thickness, divided into the various farms or blocks.

#### 11.17.2.2. Density

The Minex™ modelled average raw density per resource block was used to calculate the tonnage from the volume. The raw density of every sample is measured in the laboratory.

#### 11.17.2.3. Tonnage

The tonnage is calculated on a block by block basis from the volume multiplied by the average raw density.

#### 11.17.2.4. Quality

Each of the quality parameters were modelled in Minex™ and the average quality per farm is reported in the Coal Resource Statement.

#### 11.17.2.5. Losses and Limits

The following cutoffs or limits were applied to the coal resources:-

- the limit of the NOPRs boundary;
- the limit of the occurrence of the coal seams in the south;
- a minimum seam thickness limit of 0.5m was applied prior to the reporting of GTIS;
- a minimum volatile content of 18% for the calculation of MTIS. This is due to the fact that the rank of the coal at Mount Stuart is significantly higher than at Makhado;
- all coal resources were classified as Inferred and therefore geological losses of 20% were applied prior to the reporting of TTIS. These losses take into account any unforeseen geological features, such as dykes and faults, which have not been identified in the drilling and which may have a negative impact on the coal resources; and
- mining layout losses of 2% were applied prior to the calculation of MTIS.

### 11.17.3. Differences Between Resource Statements

No additional changes have been made by CoAL since the Coal Resource statement of 2912 February 2012 and 31 December 2015 to the geological model or resource estimation for the Mount Stuart Section.

## 11.18. Ore Reserve Statement

As a result of the current stage of development of the Mount Stuart Section, no reserves have yet been declared. Reserves can only be declared once a mining plan has been prepared. This will be undertaken during the next stage of development of the project i.e. at Pre-feasibility Stage.

# 12. Generaal

The Generaal Section, located within the Soutpansberg Coalfield, is an early-stage exploration project. It represents the least developed section within the Makhado Extension Project. There are currently no coal resources associated with the project, but the presence of coal is known. CoAL acquired the Generaal Section from Rio Tinto, as part of the Soutpansberg Properties Acquisition Agreement.

## 12.1. Location

The Generaal Section is situated in the magisterial district of Vhembe, in the Limpopo Province of South Africa (Figure 1). The location of the Generaal Section area in relation to regional infrastructure and the mineral tenure in the greater Soutpansberg Project area is illustrated in Figure 59.

The nearest town is Louis Trichardt, situated approximately 30km to the south of the Generaal Section area. Musina is located approximately 40km to the north of the project area.

## 12.2. Access

Access to the Generaal Section area is via the tarred national N1 road (which traverses the project area) from Louis Trichardt to Musina. The various properties can be accessed by a network of gravel roads that branch off the N1 and R525. The gravel roads are in a good condition, whilst the N1 road is in an excellent condition. The project area is approximately 400km, by road from the capital, Pretoria.

## 12.3. Climate and Topography

The Generaal area experiences a warm, semi-arid climate as described in Section 10.3. Operations can occur all year around and the climatic conditions generally do not prevent exploration or mining. However, during times of heavy downpours, temporary delays may be experienced.

The topography of the Generaal Section area is essentially flat and lies at an average elevation of about 750mamsl. The area is drained by the non-perennial Nzhelele River which flows in a north-easterly direction across the westernmost corner of the project.

## 12.4. Fauna and Flora

The Generaal Section area falls within the North Eastern Mountain Sour Veld and the Soutpansberg Arid Mountain Bushveld biomes, characterised predominantly by a grassy ground layer and an upper layer of woody plants, dominated by sweet thorn and mopane.

The land is mainly given over to cattle and game ranching with localised arable farming.

## 12.5. Legal Aspects

### 12.5.1. Ownership by CoAL

Through its wholly owned subsidiary, Kwezi Mining & Exploration (Pty) Ltd (subsequent to Section 11 transfer and Section 102 approval), CoAL holds an accepted application for a NOMR for the Generaal Section comprised of 16 farms, namely Boas 642MS, Generaal 587MS, Phantom 640MS, Van Deventer 641MS, Coen Britz 646MS, Juliana 647MS, Fanie 578MS, Joffre 584MS, Rissik 637MS, Bekaf 650MS, Chase 576MS, Kleinenberg 636MS and Wild Goose 577MS. CoAL has acquired the Generaal Section from Rio Tinto pursuant to the Soutpansberg Properties Acquisition Agreement with Rio Tinto.

The ownership and the NOMRs relevant to the Generaal Section are graphically represented in Figure 60.

### 12.5.2. Mineral Tenure

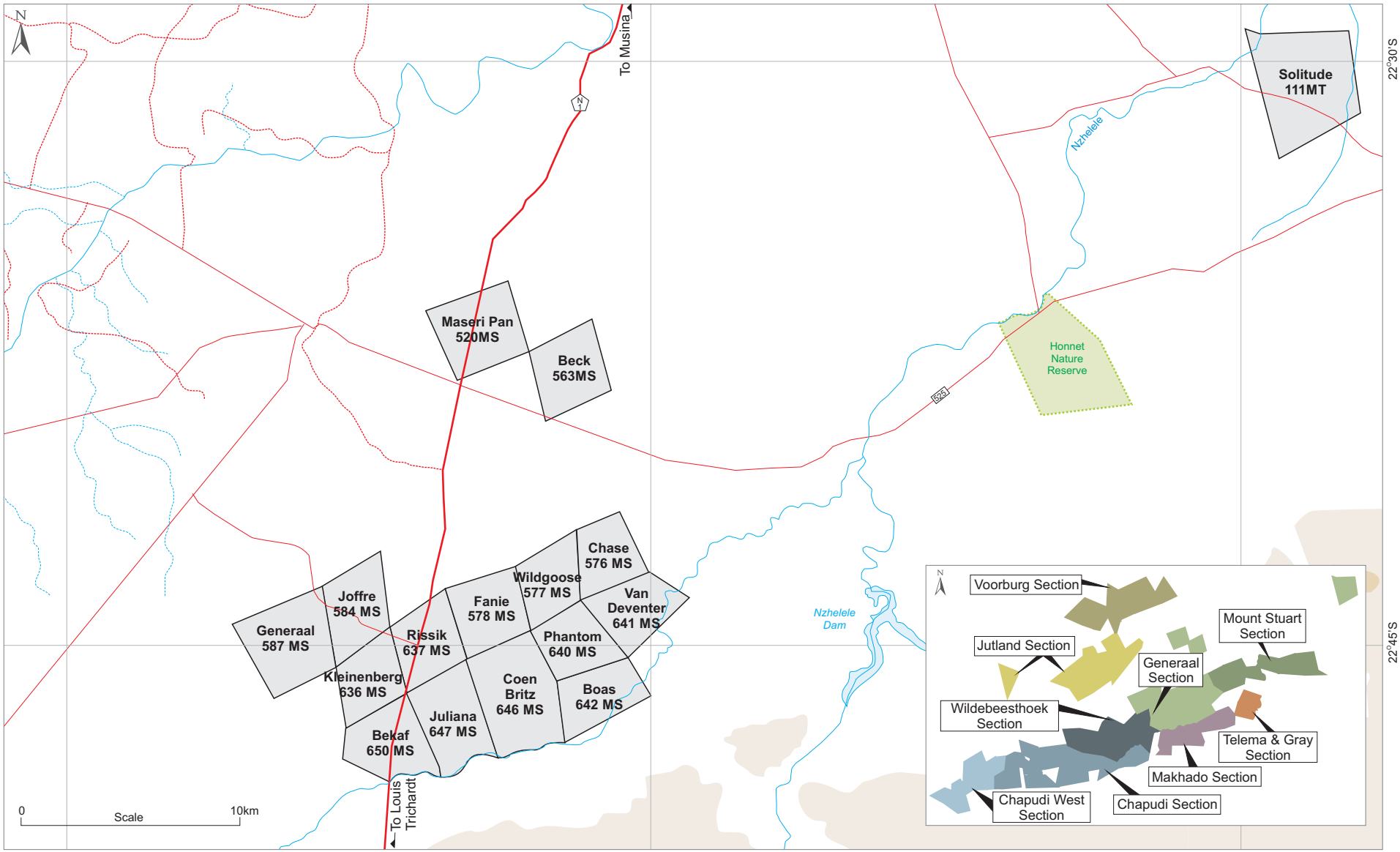
All of the four NOPRs held by CoAL for the farms that make up the Generaal Section expired by June 2013. In May 2013 CoAL applied for a NOMR under its wholly owned subsidiary Kwezi Exploration and Mining (Pty) Ltd for all of the Generaal Section. The DMR issued an acceptance letter for the NOMR application in July 2013. Venmyn Deloitte has viewed the acceptance letters and confirms the security of the mineral tenure.

The rights relating to the Generaal Section are summarised in Table 34 and their locations are graphically presented in Figure 59. CoAL's interest in the mineral rights within the Generaal Section is a consequence of the acquisition agreement discussed in Section 6.3.

### 12.5.3. Surface Rights

There are currently agreements with the surface rights owners to access the properties for exploration purposes and access is sufficient for most of their prospecting requirements.

## LOCATION OF THE GENERAAL SECTION IN RELATION TO LOCAL INFRASTRUCTURE AND MINERAL TENURE




Source: Coal of Africa
VMD1971_CoAL GSP CPR_2015

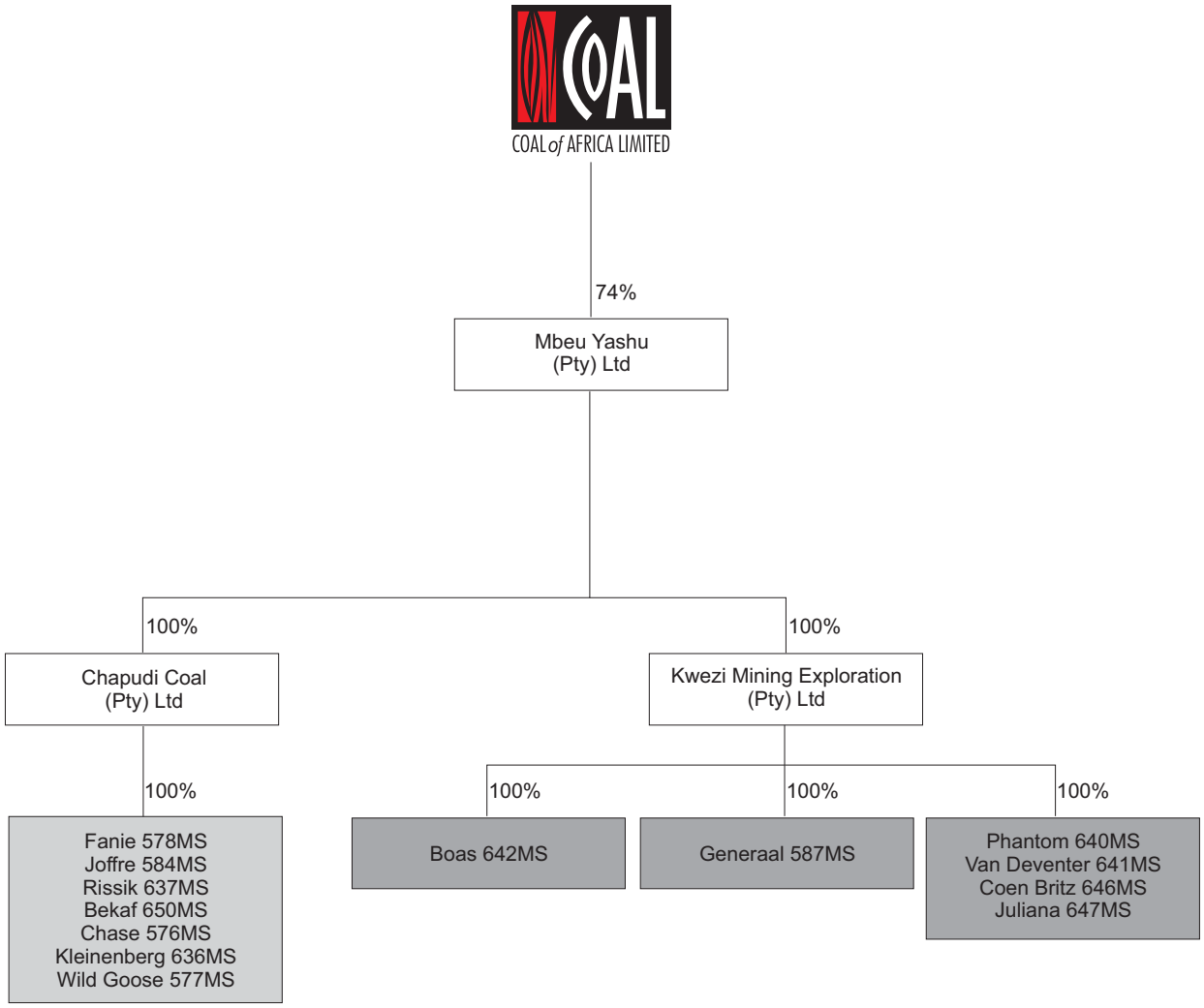
Venmyn Deloitte

Coal of Africa

Figure 59

VenmynDeloitte. Coal of Africa

## OWNERSHIP OF THE GENERAAL SECTION




Source: Coal of Africa

**Table 34 : Summary of the Generaal Section Mineral Tenure**

| SECTION | FARM NAME & NO. | PORTION NO. | AREA (ha) | APPLYING ENTITY | NEW ORDER LICENCE TYPE | LICENCE NO. | SUBMISSION DATE OF MINING RIGHT APPLICATION | DATE OF MINING RIGHT APPLICATION ACCEPTANCE LETTER | SURFACE RIGHTS |
|---|---|---|---|---|---|---|---|---|---|
| Generaal | Bekaf 650MS | Whole farm | 1055.02 | Chapudi Coal (Pty) Ltd | Mining | LP 30/5/1/2/2/ 10044 MR | 10/05/2013 | 13/08/2013 | No |
| | Chase 576MS | Whole farm | 845.4 | | | | | | |
| | Fanie 578MS | Whole farm | 1046.67 | | | | | | |
| | Joffre 584MS | Whole farm | 631.91 | | | | | | |
| | Kleinenberg 636MS | Whole farm | 881.06 | | | | | | |
| | Rissik 637MS | Whole farm | 827.57 | | | | | | |
| | Wild Goose 577MS | Whole farm | 800.79 | | | | | | |
| | Maseri Pan 520MS | Whole farm | 1301.96 | | | | | | No |
| | Solute 111MS | Whole farm | 2356.09 | | | | | | No |
| | Beck | Whole farm | 1047.27 | Kwezi Mining Exploration (Pty) Ltd | Mining | LP 30/5/1/2/2/ 10058 MR | 10/05/2013 | 16/07/2013 | |
| | Boas 642MS | Portion 00 & 1 | 855 | | Mining | LP 30/5/1/1/2/ 10054 MR | 10/05/2013 | 16/07/2013 | No |
| | Generaal 587MS | Portions 1, 2 & RE | 1446 | | Mining | LP 30/5/1/2/2/ 10053 MR | 10/05/2013 | 16/07/2013 | No |
| | Juliana 647MS | Whole farm | 1207.97 | | Mining | LP 30/5/1/2/2/ 10050 MR | 10/05/2013 | 16/07/2013 | No |
| | Phantom 640MS | Whole farm | 869.69 | | | | | | No |
| | Coen Britz 646MS | Whole farm | 1668.92 | | | | | | No |
| | Van Deventer 641MS | Whole farm | 725.27 | | | | | | No |
| | **TOTAL GENERAAL** | | **17,566.59** | | | | | | |

### 12.5.4. Royalties

There are no private royalties payable for the Generaal Section. State royalties, as per the MPRRA will be payable on any future production, however.

### 12.5.5. Material Contracts

Venmyn Deloitte is not aware of any material contracts in place for the Generaal Section, other than the recent acquisition agreement between CoAL and Rio Tinto.

### 12.5.6. Any Other Legal Issues

CoAL has informed Venmyn Deloitte of land claims on the 15 of the farms in the Generaal Section. A summary of the land claims on the Generaal Section are listed in Table 35.

The land claims on the various properties have been gazetted by the Department of Rural Development and Land Reform (DRDLR). CoAL recognises land claimants as key stakeholders, and the company's engagement is governed by the company's stakeholder engagegemt strategy that ensures regular, meaningful and transparent engagement.

CoAL recognises the legislative framework of the land claims process and will work within that framework.

Venmyn Deloitte is not aware of any litigation or competing rights associated with the Mount Stuart Section area.

## 12.6. Infrastructure

The project is well situated with respect to the major infrastructural aspects of rail, road and power.

The railway linking Gauteng (in South Africa) and Zimbabwe occurs approximately 20km to the west of the westernmost boundary of the Generaal Section area (Figure 61). CoAL has negotiated the rights to the Huntleigh Siding, located approximately 14.5km to the northwest of the project area.

Eskom grid powerlines traverse the centre the project area.

Water for drilling can be sourced from farmers' dams.

Due to the fact that the Generaal Section is still at an exploration stage, details on the availability and requirements of power, water, tailings disposal and other infrastructural items have not been investigated in detail and are therefore not reported upon in this document.

### 12.6.1. Local Resources

The nearest towns of Louis Trichardt and Musina are regional centres and provide modern conveniences, including accommodation and services. The towns are also sources of fuel and labour.

**Table 35: Summary of Land Claims for the Generaal Section**

| SECTION | FARM NAME & NO. | PORTION NO. | LAND OWNER | LAND CLAIMANT | OFFICIAL |
|---|---|---|---|---|---|
| Generaal | Bekaf 650MS | Whole farm | Manupont 124 (Pty) Ltd | Mulambwane | Thanyani Muronga |
| | Chase 576MS | | Born Free Investments 399 (Pty) Ltd | No land claimant | |
| | Fanie 578MS | | Anna Susanna van der Merwe | | |
| | Joffre 584MS | | Mulambwane Communal Trust | Mamuhohi / Mulambwane | |
| | Kleinenberg 636MS | | Manupont 124 (Pty) Ltd | No land claimant | |
| | Rissik 637MS | Portion 1 | Wesley Christoffel Fourie | Mulambwane | |
| | | Portion 2 | Siphuma Petrus Matodzi | Not stated | |
| | Wild Goose 577MS | Whole farm | Ptyprops 197 (Pty) Ltd | No land claimant | |
| | Maseri Pan 520MS | RE | Richmond Boerdery (Pty) Ltd | | |
| | Solitude 111MS | RE, 3 | Kongo Trust | Not stated | |
| | | Portion 1 | Wesley Christoffel Fourie | | |
| | | Portion 2 | Hendrik & Ronel van der Walt | | |
| | Boas 642MS | RE | Fumaria Property Holdings (Pty) Ltd | No land claimant | Mokhalo Pitsi |
| | | Portion 1 | Not stated | | |
| | Coen Britz 646MS | Whole farm | Manupont 124 (Pty) Ltd | | |
| | Generaal 587MS | Portions 1, 2 & RE | Not stated | Mulambwane | |
| | Juliana 647MS | Whole farm | Manupont 124 (Pty) Ltd | No land claimant | |
| | Phantom 640MS | | Ptyprops 197 (Pty) Ltd | | |
| | Van Deventer 641MS | | Born Free Investments 399 (Pty) Ltd | | |

## 12.7. Regional Geological Setting

The Generaal Section is situated within the Tshipise North Coalfield subdivision of the greater Soutpansberg Coalfield (Figure 11). The reader is referred to Section 7.2 on the regional geology of this coalfield.

## 12.8. Local Geological Setting

The Generaal Section represents a 20km long, east-west striking, up-faulted block within the northern part of the Waterpoort Basin, immediately north of the Makhado Project (Figure 61).

The coal bearing Mikabeni Formation is present within the northern parts of the project area (Figure 61), and contains a thick (20m – 30m) package of heavily stone banded coal units. Within this package, three 'cleaner' coal seams have been identified with average thicknesses of 2.9m – 3.9m. Dips in the area are generally 4º-5º, although the central portion of the block is associated with steeper dips.

## 12.9. Historical Ownership

The historical ownership and associated activities with respect to the Generaal Section is summarised in Table 36.

## 12.10. Historical Exploration

Between 1975 – 1978, Iscor drilled a total of 64 boreholes over the Generaal Section area. The location of the boreholes is indicated on Figure 62. The Iscor boreholes are believed to have been drilled vertically.

There is evidence that Iscor also drilled LDD holes; however, no specific locality or sampling information is available. The drilling and sampling protocols used by Iscor are unknown. However, it is assumed that the drilling methods were conventional and pre-date the more efficient triple-tube wireline techniques that are commonly employed today. It is not known whether the Iscor borehole collars were professionally surveyed.

**Table 36 : Generaal Section – Summary of Historical Ownership and Activities**

| DATE | COMPANY | ACTIVITY |
|---|---|---|
| 1975 - 1978 | Iscor Ltd (now Exxaro Resources Ltd) | Drilled 48 boreholes over the Generaal Section area. |
| 2004 - 2009 | Rio Tinto Mining & Exploration Ltd. (Rio Tinto) | Four diamond core holes and one RC hole drilled on the farms Generaal 587MS, Fanie 578MS and Van Deventer 641MS. |
| 2009 | | Farm Swap Agreement finalised and executed. |
| 2011 | CoAL | Concluded transaction with Rio Tinto & Kwezi Mining to acquire rights to their farms, and submitted Section 11 transfer application. |
| 2012 | | Section 11 approval for properties subject to the Soutpansberg Properties Acquisition Agreement |

The Iscor holes were sampled and sent to their in-house laboratory for analysis. Typically 13 samples were taken from the top to the base of the coal bearing strata, and numbered consecutively in this order. Raw analyses were carried out on the coal samples. Washed analyses were only undertaken at an RD=1.40. Proximate, CV, Roga and Swell Index testwork was carried out.

The Iscor borehole database was acquired in 2007 by CoAL. Downhole logging and partial coal quality data is available for 13 of these boreholes.

## 12.11. Recent Exploration

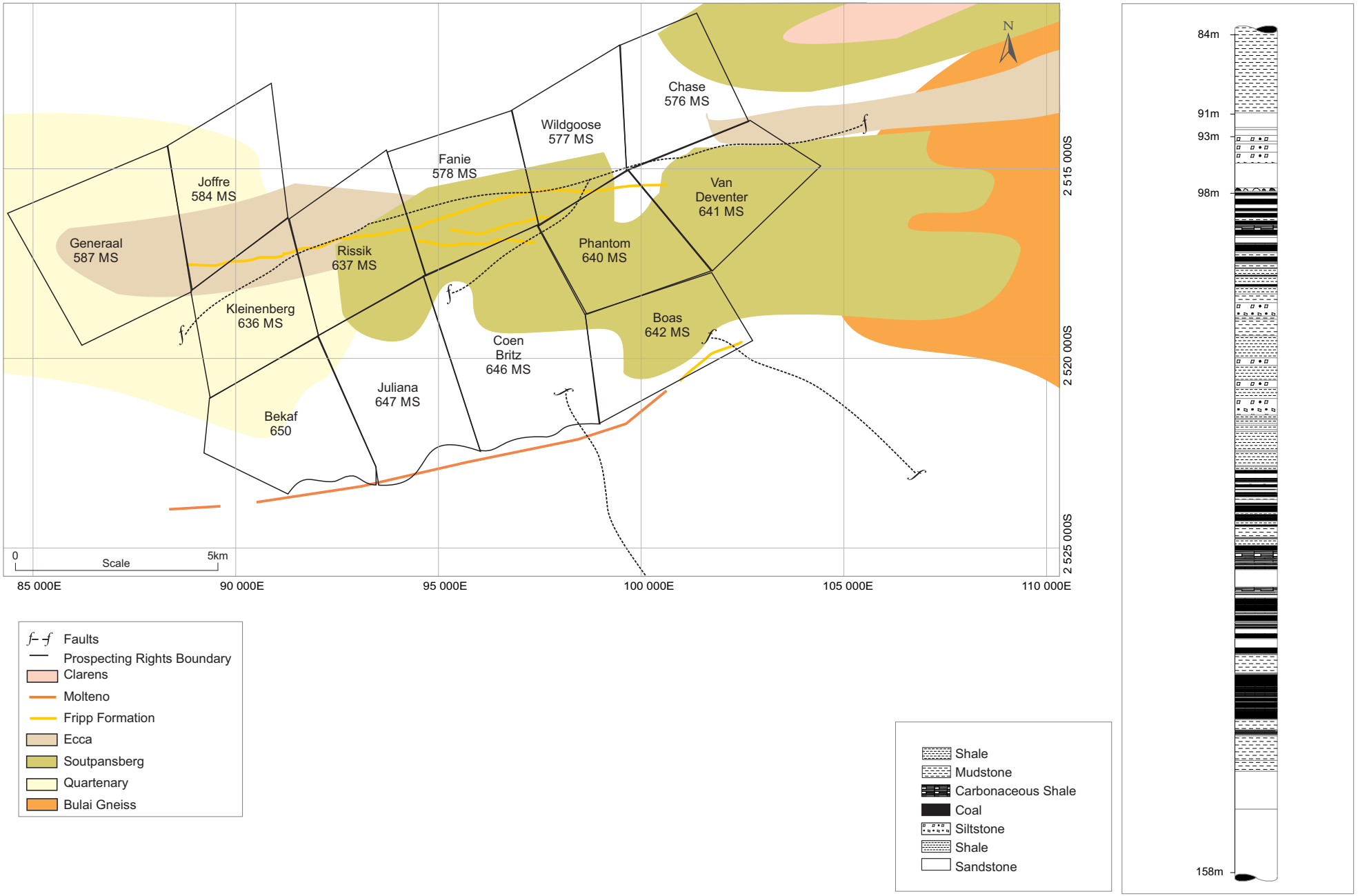
Rio Tinto drilled 11 boreholes within the Generaal Section area on the farms Generaal 587MS, Fanie 578MS and Van Deventer 641MS. No specific details are available regarding Rio Tinto's drilling and sampling protocols, but it is assumed that they implemented the same protocols as discussed for the Chapudi Project (Section 13.11).

In 2013 CoAL drilled 26 boreholes that were used to update the geological model. This included eight diamond core boreholes, four water boreholes and eight RC boreholes. The boreholes do not contain any quality information and the historical quality data is unreliable for a JORC compliant estimation, therefore no Coal Resources have been declared on the Generaal Section. For all exploration procedures followed by CoAL for the 2012 drilling programme and all future CoAL drilling programmes the reader is referred to the protocol document prepared by Venmyn Rand (Pty) Ltd for CoAL on 10 April 2012 named "Coal Exploration Best Practise Guideline for the Greater Soutpansberg Projects (GSP) Prepared for Coal of African Limited (COAL)", Venmyn Deloitte reference number D1140.

A summary of historical and recent drilling is shown in Table 37 and the location of these boreholes are indicated on Figure 62.

Drilling has intercepted two distinct, thick, interbanded coal seams separated by approximately 15m. These seams can be roughly correlated to Seam 6 and Seam 7, observed in the Chapudi Project area (Section 13.11).

## LOCAL GEOLOGICAL MAP AND TYPICAL STRATIGRAPHIC COLUMN FOR THE GENERAAL SECTION



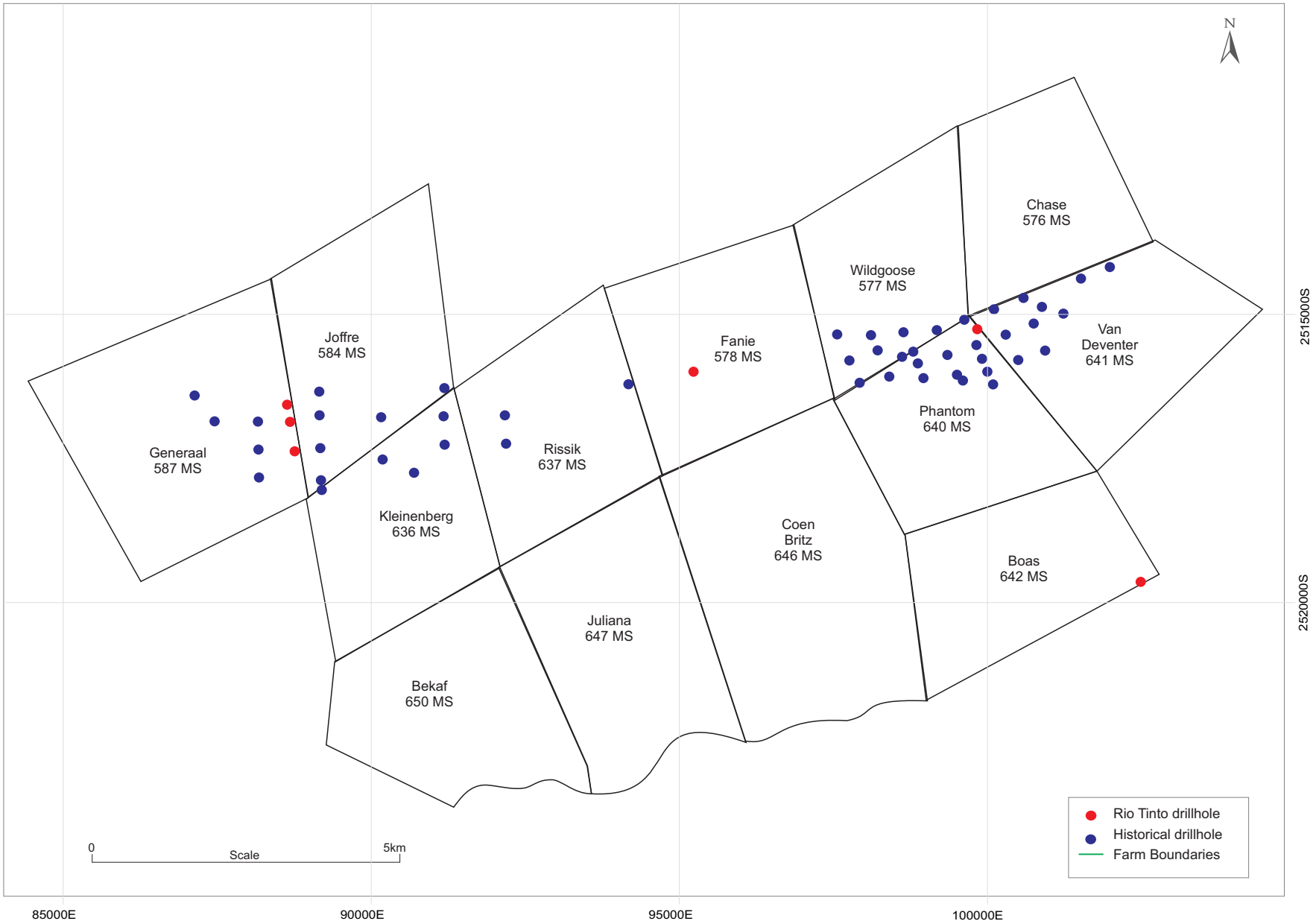

Source: Coal of Africa
VMD1971_CoAL GSP CPR_2015

Figure 61

**Table 37 : Generaal - Summary of Historical and Recent Drilling**

| DATE | COMPANY | LOCATION | PURPOSE | SURVEYOR | DRILLING COMPANY | TYPE OF DRILLING | SIZE | RESPONSIBLE GEOLOGIST | TOTAL NO. B/H | WIRELINE LOGGING | SEAMS SAMPLED | QUALITY RESULTS | LABORATORY FOR QUALITY | USED IN MODEL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1975-1982 | Iscor | Generaal 587MS, Joffre 584MS, Kleinenberg 636MS, Rissik 637MS, Wildgoose 557MS, Phantom 640MS, Boas 642MS, Van Deventer 641MS | Early exploration and resource estimation. | Unknown. | Unknown. | Diamond core | NQ | H. Van den Berg | 64 | No | All | Yes | Iscor | No |
| 2006-2007 | Rio Tinto | Generaal 587MS, Fanie 578MS, Boas 642MS, Van Deventer 641MS | Reconnaissance Drilling | Unknown. | Unknown. | Reverse Circulation | 8 inch | D. Hirstov | 11 | Yes | Unknown | No | - | No |
| 2011-2012 | CoAL | Boas 642MS | Confirmatory Drilling | Unknown. | Unknown. | Diamond core | PQ3 | John Sparrow | 26 | Unknown | none | No | - | No |
| | | | | | | | | **TOTAL** | **46** | | | | | |

## GENERAAL SECTION – LOCATION OF BOREHOLES




Source: Coal of Africa
VMD1971_CoAL GSP CPR_2015

Venmyn Deloitte

Coal of Africa

Figure 62

### 12.11.1. Remote or Geophysical Exploration

No remote sending or geophysical exploration has been carried out on the Generaal Section.

### 12.11.2. Surveying Methods

No borehole surveying has been carried out on the Generaal Section.

### 12.11.3. Diamond Drilling

No diamond drilling has been carried out on the Generaal Section.

### 12.11.4. Percussion or Open Hole Drilling

No percussion or open hole drilling has been carried out on the Generaal Section.

### 12.11.5. Down the Hole Geophysics/Wireline Logging

No down the hole or wireline logging has been carried out on the Generaal Section.

### 12.11.6. Bulk Sampling

No bulk sampling has been carried out on the Generaal Section.

### 12.11.7. Laboratory Analyses

Samples from the Rio Tinto drilling campaign were analysed at ALS Brisbane (ISO 17025 accredited). Products were returned to South Africa for petrographic analysis.

Washability and coal quality data has been obtained from all four diamond core boreholes.

Coal rank, across the Generaal Section, varies from 0.9 in the west to 1.1 in the east, following the regional trend of rank increase to the east. There is a general high vitrinite content of between 85% -90%. This corresponds well with rank and vitrinite contents established from the historical data.

No specific details are available regarding Rio Tinto's analytical, QA/QC and security protocols for the Generaal Section, but it is assumed that they implemented the same protocols as discussed for the Chapudi Project (Section 13.11.7).

### 12.11.8. Data Management

#### 12.11.8.1. Data Acquisition and Validation

CoAL purchased both hard and electronic data copies of the original Iscor database from Exxaro in 2007. CoAL acquired the exploration data from Rio Tinto 2011. This data is stored in an Access database.

No data verification has yet been conducted.

#### 12.11.8.2. Database Management

The Access database for the Generaal Section area currently contains data from Iscor and Rio Tinto boreholes. The Access database is managed and maintained by CoAL's Competent Person, Mr. J. Sparrow (Pr.Sci.Nat). Backups are stored at CoAL's head office in Johannesburg.

## 12.12. Orebody Modelling and Results

No orebody modelling has been undertaken, by CoAL, on the Generaal Section.

## 12.13. Coal Mining

Due to the stage of development of the Generaal Section, no detailed investigations have been carried out on the potential mining of the deposit.

### 12.14. Coal Processing

Due to the stage of development of the Generaal Section, no detailed investigations have been carried out on the potential processing of the coal.

### 12.15. Coal Market

Due to the stage of development of the Generaal Section, no detailed investigations have been carried out on the potential coal market. Initial indications are that the Generaal product will be a coking coal, based on current geological data.

### 12.16. Previous Resource Statement

There are no known previous resource estimates for the Generaal Section.

### 12.17. Current Resource Statement

The contributing coal assets of the Generaal Section can be defined as early exploration projects, with no JORC Code compliant coal resources.

### 12.18. Ore Reserve Statement

As a result of the current stage of development of the Generaal Section, no reserves have yet been declared.

# 13. Chapudi

The Chapudi Section is an advanced exploration project, with potential for coking coal and possibly a middlings fraction for power generation. The Chapudi Section represents the most advanced section of the Chapudi Project.

The Chapudi Section comprises 21 farms, (Figure 63) four of which were acquired by Rio Tinto as part of a Farm Swap Agreement.

## 13.1. Location

The Chapudi Section is situated in the magisterial district of Vhembe, in the Limpopo Province of South Africa and extend over a total strike length of approximately 35km. The location of the Chapudi Section area in relation to regional infrastructure and the mineral tenure in the GSP area is illustrated in Figure 66. The Chapudi Section lies along strike and to the west of the Makhado Project and is directly adjacent to the south of the Generaal Section.

The nearest town is Louis Trichardt, situated approximately 35km to the south of the easternmost extent of the Chapudi Section area (Figure 63). The town of Musina is located approximately 50km north of the Chapudi Section area. The village of Waterpoort is located within the Chapudi Section area on the farm Dorpsrivier 696MS.

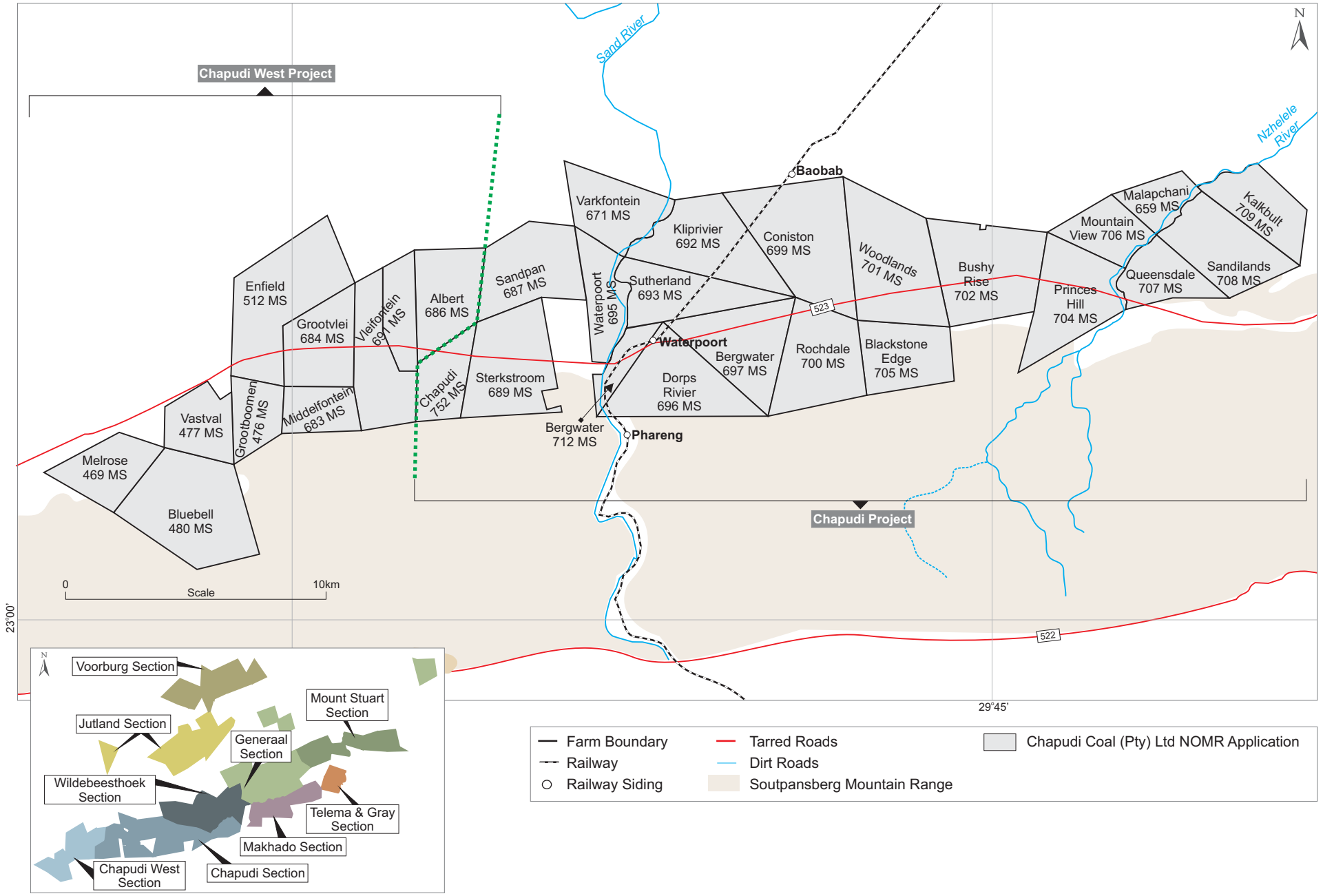
## 13.2. Access

Access to the Chapudi Section area is via the tarred national N1 road from Louis Trichardt to Musina, located immediately east of the project area. The N1 road is in excellent condition. The project area is easily accessed via the R523 off the N1 (Figure 65). This well maintained tarred road runs along the entire length of the Chapudi and Chapudi West section areas roughly bisecting the project area through its centre. The project area is approximately 370km, by road from the capital, Pretoria. Further access on the various properties within the project area is via by a network of gravel farm roads that branch off the R523.

## 13.3. Climate and Topography

Chapudi experiences a warm, semi-arid climate. The area has an average maximum summer temperature of 32°C and an average maximum temperature of 26°C. The region receives an average annual rainfall of 356mm in the form of summer thunderstorms. The average evaporation rate is between 1,700mm and 2,000mm per annum.

## LOCATION OF CoAL'S CHAPUDI SECTION IN RELATION TO LOCAL INFRASTRUCTURE AND MINERAL TENURE




Source: Coal of Africa
VMD1971_CoAL GSP CPR_2015

Venmyn Deloitte.

Coal of Africa

Figure 63

Operations can occur all year round and the climatic conditions generally do not prevent exploration or mining operations. However, during times of heavy downpours, temporary delays may be experienced.

The topography of the majority of the Chapudi Section area is relatively flat and lies at an average elevation of about 750mamsl. The Soutpansberg Mountain Range runs along the southern edge of the project area, as indicated on Figure 11, which reaches a maximum elevation of 1,747mamsl in the south of the project.

The area is drained by the perennial Sand River which flows in a northerly direction through a poort or ravine in the Soutpansberg Mountains and the Muamba River. The Sand River flows into the Limpopo River near Musina. The main railway line between Gauteng and Zimbabwe utilises this ravine as an access route through the Soutpansberg Mountain Range.

## 13.4. Fauna & Flora

The Chapudi Section area falls within the North Eastern Mountain Sour Veld and the Soutpansberg Arid Mountain Bushveld biomes, characterised predominantly by a grassy ground layer and an upper layer of woody plants, dominated by sweet thorn and mopane.

The land is mainly given over to commercial crop and cattle farming as well as game ranching in less arable areas.

## 13.5. Legal Aspects

### 13.5.1. Ownership by CoAL

The Chapudi Section comprises 21 farms, or portions thereof, held by an accepted application for a NOMR by CoAL's wholly owned subsidiary company, Chapudi Coal (Pty) Ltd. CoAL's interest in the mineral rights within the Chapudi Section is a consequence of the Soutpansberg Properties Acquisition Agreement. Figure 64

The ownership and the NOMRs relevant to the Chapudi Section are presented in Figure 66.

### 13.5.2. Mineral Tenure

Four of the six NOPRs held by CoAL for the farms that make up the Chapudi Section expired by June 2011. The other two NOPR were due to expire in December 2015. In May 2013 CoAL applied for a NOMR under its wholly owned subsidiary Chapudi Coal (Pty) Ltd (subsequent to Section 11 transer and Section 102 approval), for all of the Chapudi Section. The DMR issued an acceptance letter for the NOMR application in July 2013. Venmyn Deloitte has viewed the acceptance letters and confirms the security of the mineral tenure

The rights relating to the Chapudi Sections are summarised in Table 38 and their locations are graphically presented in Figure 63.

### 13.5.3. Surface Rights

CoAL will re-negotiate access to all Chapudi Section properties, except for the so-called ZZ2 farms, for which a Land Use Agreement is already in place with Chapudi Coal and KME.

### 13.5.4. Royalties

There are no private royalties payable for the Chapudi Section. State royalties, as per the MPRRA will be payable, however, on any future production.

### 13.5.5. Material Contracts

Currently there are no offtake agreements, operational contracts or contract mining agreements that are relevant to the Chapudi Section, as it is still in the early stages of development.

#### 13.5.5.1. Chapudi Land Use Agreement

In May 2010, a Land Use Agreement was entered into between Van Collerspas Boerdery (Pty) Limited, Bertie van Zyl (Pty) Limited, Sitapo Boerdery (Pty) Limited, Chapudi Coal and KME.

This agreement was in respect of portions 3, 5, and 6 of Waterpoort 695MS, portion 2 of Bergwater 697MS and the farm Bergwater 712MS (the ZZ2 properties).

This agreement allows Chapudi Coal (Pty) Ltd and Kwezi Mining and Exploration (Pty) Ltd access to the land owners land for the purposes of coal prospecting. This precludes certain areas such as those associated with a homestead or garden, fixed improvements and any area which will have a material and direct adverse impact on the tomato farming activities over the properties.

### 13.5.6. Other Legal Issues

CoAL has informed Venmyn Deloitte of land claims on 21 the farms that form part of the Chapudi Section. A summary of the land claims on the Chapudi Section are listed in Table 39.

The land claims on the various properties have been gazetted by the Department of Rural Development and Land Reform (DRDLR). CoAL recognises land claimants as key stakeholders, and the company's engagement is governed by the company's stakeholder engagegemt strategy that ensures regular, meaningful and transparent engagement.

CoAL recognises the legislative framework of the land claims process and will work within that framework.

Venmyn Deloitte has not been made aware of any litigation or competing rights associated with the Chapudi or Chapudi West Section areas.

## 13.6. Infrastructure

The project is well situated with respect to the major infrastructural aspects of rail, road and power.

The railway linking Gauteng (in South Africa) and Zimbabwe traverses several of the farms in the centre of the project area with the nearest rail siding, Waterpoort, being located on the farm Dorpsrivier 696MS (Figure 65).

Eskom grid powerlines are located parallel to the N1 and are situated approximately 5km west of the farm Kalkbult 709MS at their closest point. Although an Options Study on power was undertaken by Rio Tinto in 2009, Venmyn Deloitte has not had sight of this report.

Water for drilling and potable requirements is currently available from the local surface owner's farm dams.

If CoAL obtains the rights to the Chapudi Section, the company will undertake its own infrastructural and waste disposal studies. These studies will be carried out taking cognisance of CoAL's strategy for the Soutpansberg regions as well as the results obtained for the nearby Makhado Project.

### 13.6.1. Local Resources

Louis Trichardt and Musina are regional centres and provide modern conveniences, including accommodation and services. The towns are also sources of fuel and labour. A small village exists at Waterpoort.

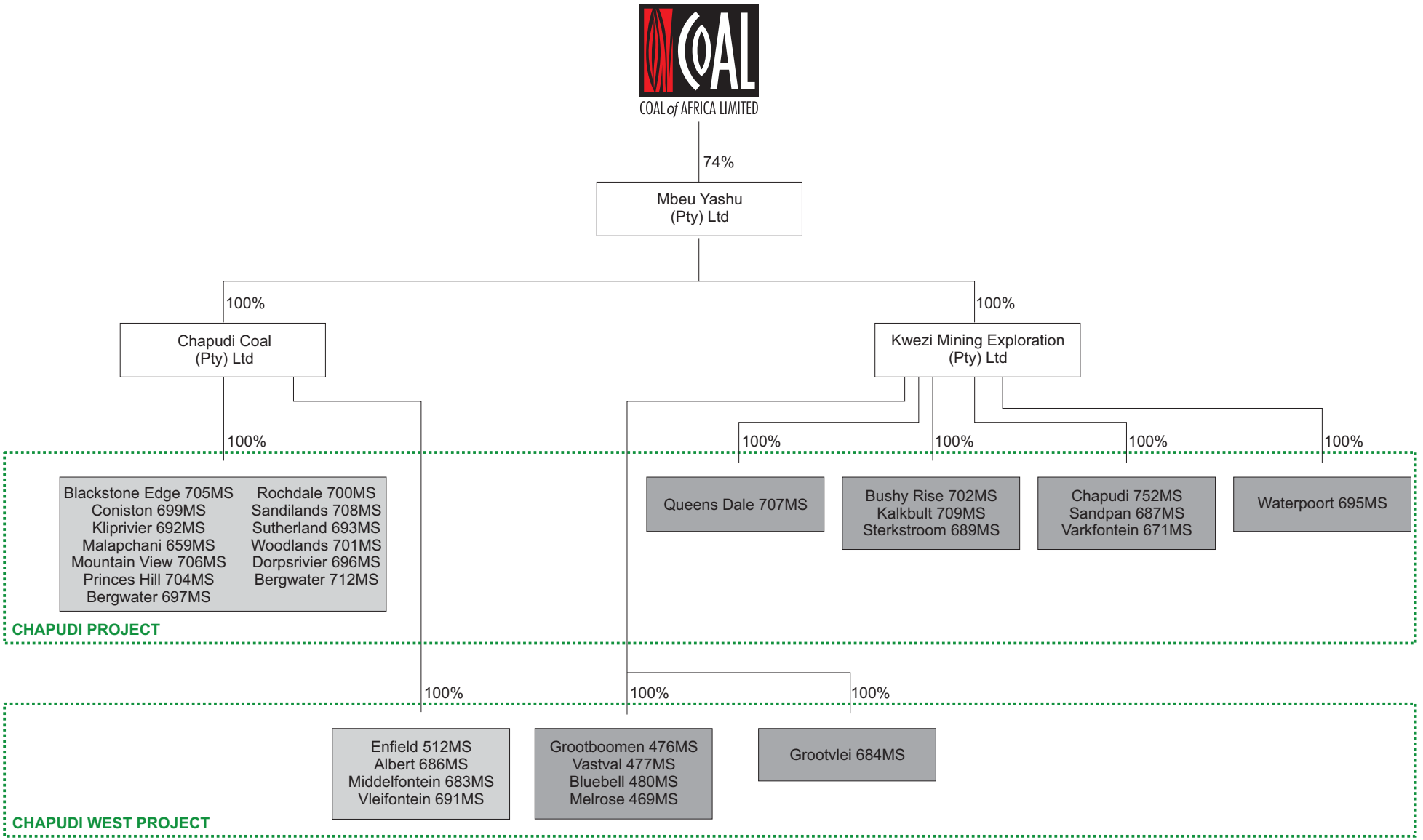
## 13.7. Regional Geological Setting

The Chapudi Section is situated within an extension of the Tshipise Coalfield, a subdivision of the Soutpansberg Coalfield (Figure 11). This extension is referred to as the Waterpoort Coalfield in some of the literature. The reader is referred to Section 7.2 on the regional geology of the Tshipise Coalfield, as described for the Makhado Project. As stated in this earlier section, the Tshipise Coalfield comprises a number of east-west trending half-graben structures in which Upper Group are preserved. The geology is generally broken up into fault blocks by a number of parallel strike faults.

**Table 38 : Summary of the Chapudi Section Mineral Tenure**

| SECTION | FARM NAME & NO. | PORTION NO. | AREA (ha) | APPLYING ENTITY | NEW ORDER LICENCE TYPE | LICENCE NO. | SUBMISSION DATE OF MINING RIGHT APPLICATION | DATE OF MINING RIGHT APPLICATION ACCEPTANCE LETTER | SURFACE RIGHTS |
|---|---|---|---|---|---|---|---|---|---|
| Chapudi | Bergwater 697MS | Portion 2 | 373.82 | Chapudi Coal (Pty) Ltd | Mining | LP/30/5/1/1/2/1151 PR/ 10048 MR | 10/05/2013 | 16/07/2013 | No |
| | Bergwater 712MS | Whole farm | 320.82 | | | | | | No |
| | Blackstone Edge 705MS | Whole farm | 860.32 | Kwezi Mining Exploration (Pty) Ltd | Mining | LP 30/5/1/2/2/51 PR/ 10056 MR | 10/05/2013 | 09/07/2013 | No |
| | Coniston 699MS | Portions 1, 3, 4 & RE | 1,652.18 | | | | | | No |
| | Dorpsrivier 696 MS | RE | 1,192.96 | | | | | | No |
| | Kliprivier 692MS | Portions 1 , 4 - 8, RE of portions 2 & 3 and RE | 1,263.14 | | | | | | No |
| | Malapchani 659MS | Whole farm | 417.00 | | | | | | No |
| | Mountain View 706MS | Whole farm | 571.27 | | Mining | LP 30/5/1/2/2/676 PR/ 10043 MR | 10/05/2013 | 15/07/2013 | No |
| | Princes Hill 704MS | Portion 1 & RE | 1,161 | | | | | | No |
| | Rochdale 700MS | Portion 1 & RE | 1,149 | | | | | | No |
| | Sandilands 708MS | Whole farm | 1,071.82 | | | | | | No |
| | Sutherland 693MS | Portion 1 & RE | 920.47 | | | | | | No |
| | Waterpoort 695MS | Portions 1, 2 & 7 | 416.81 | | Mining | LP 30/5/1/2/2/ 10059 MR | 10/05/2013 | 15/07/2013 | No |
| | Queens Dale 707MS | Whole farm | 629.98 | | Mining | LP 30/5/1/2/2/170 PR/ 10052 MR | 10/05/2013 | 23/07/2013 | No |
| | Bushy Rise 702MS | Whole farm | 1,427.39 | | Mining | LP 30/5/1/2/2/ 10059 MR | 10/05/2013 | 15/07/2013 | No |
| | Kalkbult 709MS | Whole farm | 767.94 | | | | | | No |
| | Sterkstroom 689MS (698MS) | Whole farm | 1287 | | | | | | No |
| | Chapudi 752MS | Whole farm | 562.62 | | Mining | LP 30/5/1/2/2/51 PR/ 10056 MR | 10/05/2013 | 09/07/2013 | No |
| | Sandpan 687MS | Portions 1 & 2 | 1,098.64 | | | | | | No |
| | Varkfontein 671MS | Portion 1 & RE | 778.64 | | | | | | No |
| | Woodlands 701 MS | Whole farm | 1,563.83 | | Mining | LP 30/5/1/2/2/676 PR/ 10043 MR | 10/05/2013 | 09/07/2013 | No |
| | **TOTAL CHAPUDI** | | **19,486.65** | | | | | | |

## OWNERSHIP OF THE CHAPUDI SECTION




Source: Coal of Africa
VMD1971_CoAL GSP CPR_2015

**Table 39: Summary of Land Claims for the Generaal Section**

| SECTION | FARM NAME & NO. | PORTION NO. | LAND OWNER | LAND CLAIMANT | OFFICIAL |
|---|---|---|---|---|---|
| Chapudi | Bergwater 697MS | Portion 2 | Tiverton Trading (Pty) Ltd | Mulambwane | Mokhalo Pitsi |
| | Bergwater 712MS | Whole farm | Tiverton Trading (Pty) Ltd | | |
| | Blackstone Edge 705MS | Whole farm | Brink Schlessinger Family Trust | | Cate Mashaphu |
| | Coniston 699MS | RE, Portion 3 | Koedoepan Boerdery cc | | |
| | | Portion 1 | Business Zone 260 cc | | |
| | | Portion 4 | Mulambwane Communal Pro Assoc (Roelof Jacobus Venter) | | |
| | Dorpsrivier 696 MS | RE | Not stated | | |
| | Kliprivier 692MS | Portions 4,5 and RE | Fanya Trust | | |
| | | Portions 1 | NT Truck & Car Leasing (Pty) Ltd | | |
| | | RE of portions 2 | Ektos Inv (Pty) Ltd | | |
| | | RE of portion 3 | Anru Trust | | |
| | | Portion 6 | Oyama &Heinrich Schneider | | |
| | | Portions 7-8 | Johannes Petrus de Jager | | |
| | Malapchani 659MS | Whole farm | Berta Trust | | |
| | Mountain View 706MS | Whole farm | Lourens & Noeline Erasmus | No land claimant | Not stated |
| | Princes Hill 704MS | Portion 1 & RE | Not stated | Mulambwane | |
| | Rochdale 700MS | RE | Andy Miles | | |
| | | Portion 1 | Isak Stephanus Wilson | | |
| | Sandilands 708MS | Whole farm | Manupont 124 (Pty) Ltd | No land claimant | |
| | Sutherland 693MS | RE | Fanya Trust | Tshivhula / Leshiba | |
| | | Portion 1 | Anna Susanna & Johan Christoffel Barwise | Not stated | |
| | Waterpoort 695MS | Portions 3, 4, 5 & 6 | Sitapo Boerdery (Pty) Ltd | Tshivhula / Leshivha | Mokhalo Pitsi |
| | Queens Dale 707MS | Whole farm | Hector Kincaid Smith | Mulambwane | Degrecia Tshibudzi |
| | Bushy Rise 702MS | Portion 1 & RE | Pieter Brink Schlesinger | | Rofhiwa Mudau |
| | Kalkbult 709MS | Whole farm | Manupont 124 (Pty) Ltd | Ramalamula MJ and Musekwa | |
| | Sterkstroom 689MS | RE of portions 2 & 3 | Not stated | Lishivha | |
| | Chapudi 752MS | Whole farm | Andre Francois Pauer | Tshivhula | Cate Mashaphu |
| | Sandpan 687MS | Portion 1 | Sitapo Boerdery (Pty) Ltd | Lishivha | |
| | | Portion 2 | Not stated | | |
| | Varkfontein 671MS | RE | Varkfontein Boerdery (Pty) Ltd | Leshiba | |
| | | Portion 1 | Varkfontein Boerdery (Pty) Ltd | | |
| | Woodlands 701 MS | Whole farm | Brink Schlessinger Family Trust | Mulambwane | Not stated |

## 13.8. Local Geological Setting

Within the Chapudi Section area, seven coal zones (or seams) are recognised, three of which occur in the Lower Ecca Group with the remaining four occurring in the Upper Ecca Group. In the literature, these seams are numbered from Seam 1 at the base to Seam 7 at the top, near the gritty sandstone marker horizon of the Fripp Formation which occurs in the Beaufort Group. The Fripp Formation reaches a maximum thickness of 40m in the Chapudi Section area.

Although coal zones are referred to as “seams” they are effectively selected, potential mining horizons within the coal bearing-package. All seams comprise interbanded carbonaceous mudstones and coal. The coal component is usually bright and brittle and contains a high proportion of vitrinite. The seams dip northwards at approximately 12°.

Rio Tinto initially considered Seams 6 and 7 as having potential for economic consideration as they were the best developed seams within the package. Seam 6 is typically 30m-41m in thickness, while Seam 7 attains an average thickness of 12-15m. Seam 6 is the only seam to contain bright coal, while all the others are classified as dull coal.

As a result of CoAL's extensive experience in the Soutpansberg Coalfield, the company has recognised that only Seam 6 has economic potential at present. Upon consideration of the exploration results, Rio Tinto came to the same conclusion as CoAL. This was due to Seam 7 having a high ash content and a low yield, i.e. a 40% ash product with a yield of 10%.

CoAL has divided Rio Tinto's Seam 6 into six potential mining horizons or coal dominated seams. These have been named as the Upper Seam, Middle Upper Seam, Middle Lower Seam, Bottom Upper Seam, Bottom Middle Seam and Bottom Lower Seam (Figure 65).

The Bottom Middle Seam usually comprises predominantly mudstone and for this reason it has not been included in the resource base, however in certain areas it is sufficiently coaly to be considered a potential mining target.

A major fault marks the western and eastern limits of the resource area along strike (Figure 65) and another fault divides the project area along the Sand River into the western section of the Chapudi Section area. The frequency of smaller scale faulting is not well understood.

Dolerite intrusions within the project area are significant and are generally E-W trending (Figure 65). Only minor intrusion occurs in the western and central parts of the area, with a single 5-10m wide dyke being identified. Only minor portions of Seam 7 material have been replaced within this area. Dolerite intersections of up to 80m thick in places are common within the eastern section. However, these do not impact significantly on Seam 6 above depths of 150m.

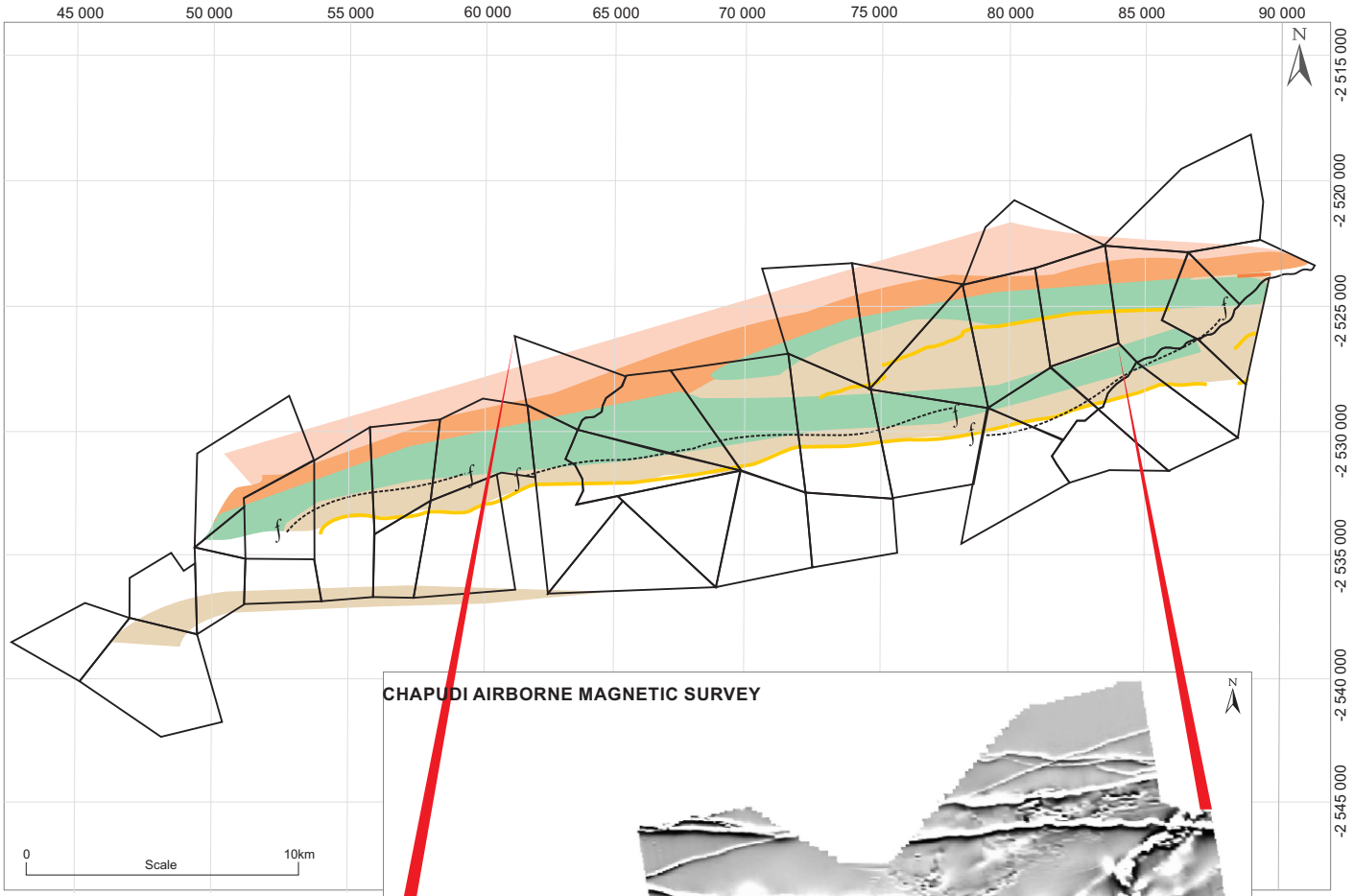
## 13.9. Historical Ownership

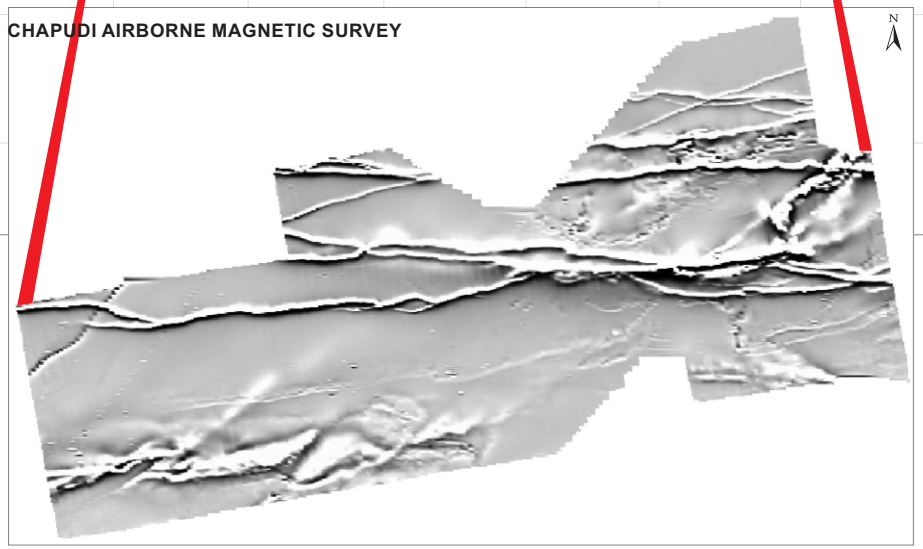
The historical ownership and associated activities with respect to the Chapudi Section is summarised in Table 40.

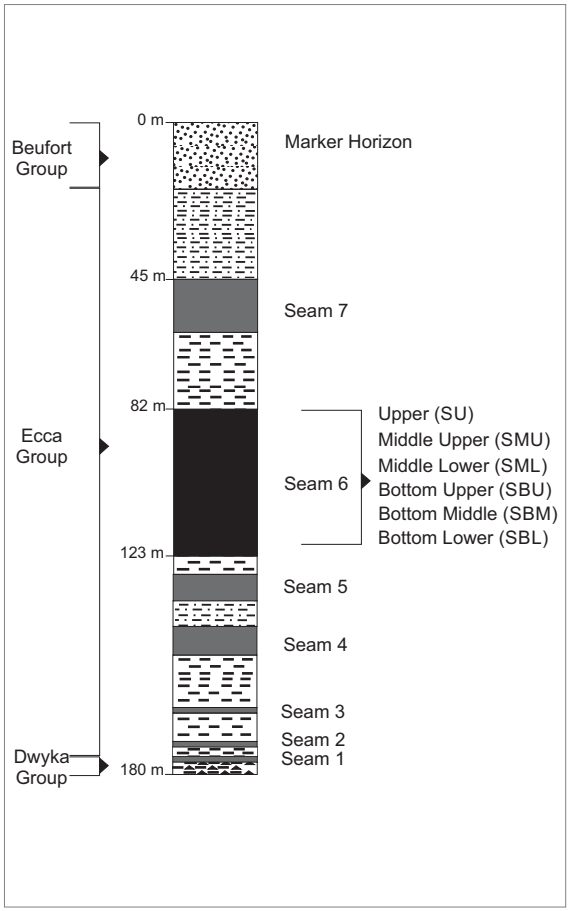
**Table 40 : Summary of Historical Ownership and Activities**

| DATE | COMPANY | ACTIVITY |
|---|---|---|
| 2005 | Rio Tinto | Acquires old order prospecting rights on 13 farms held in the name of Chapudi Coal (Pty) Ltd (Chapudi). |
| | | Commenced drilling on farm Chapudi. |
| 2006 | | Conversion of previous prospecting rights to NOPRs and additional 4 farms applied for over Chapudi West Section. |
| | KME | KME obtains NOPRs over 13 farms. |
| | | Rio Tinto enters discussions with Kwezi Mining concerning the formation of two JV companies, Chapudi Coal and KME. |
| | | Rio Tinto signs shareholders agreement with KME. |
| 2007 | Rio Tinto | Order of Magnitude Study (OMS) exploration and orebody modelling completed on Chapudi. |
| 2008 | | Announces open-pittable thermal coal resource of 1.04Bt for the Chapudi Section in Seam 6. |
| | | Initiates further drilling programme. |
| 2009 | Rio Tinto & KME | Acquires 3 farms related to the Chapudi Section and the Chapudi West Section, as part of Farm Swap Agreement from CoAL. |
| | Snowden Mining Industry Consultants (Snowden) | Completes Underground and Opencast Mining Options Studies on Chapudi Section for Rio Tinto. |
| | Rio Tinto | Additional drilling on Chapudi Section completed and update of geological model. |
| | | Processing, infrastructure and water sourcing Option Studies completed. |
| | | Environmental and social baseline studies undertaken. |
| | Rio Tinto & KME | Enter bidding process to sell all their Soutpansberg coal assets. |
| 2011 | CoAL | Enters into discussions with Rio Tinto to acquire the Chapudi and Chapudi West project areas. |
| 2012 | | Section 11 approval for properties subject to the Soutpansberg Properties Acquisition Agreement. |

## LOCAL GEOLOGICAL MAP AND TYPICAL STRATIGRAPHIC COLUMN FOR THE CHAPUDI SECTION




- Faults
- Farm Boundary
- Clarens
- Elliot
- Molteno
- Beaufort
- Fripp Formation
- Ecca

Source: Coal of Africa
VMD1971_CoAL GSP CPR_2015

Deloitte. Coal of Africa

Figure 65

## 13.10. Historical Exploration and Mining

Little is known about historical drilling on Chapudi. CoAL obtained the historical database from the Council for Geological Sciences in 2013 that included 162 boreholes drilled by Iscor (now Exxaro) on Chapudi. It is assumed that the drilling, logging and sampling methods applied during this drilling were the same as other Iscor drilling programmes at the time.

## 13.11. Recent Exploration

Recent and comprehensive exploration has been conducted, within the Chapudi Section area, by Rio Tinto. The exploration has included a number of phases of drilling and sampling, as well as remote forms of exploration. It is important to note that Rio Tinto considered this property as having potential to produce thermal power station coal and/or a coking export coal fraction. CoAL's interest in the Chapudi Section is primarily as a source of coking coal, with the possibility of producing a middlings fraction for use in power generation. As a result of this change in strategy, CoAL will reassess all previous results in light of this and plan future work streams to meet this goal. Therefore, Venmyn Deloitte has only reported on the relevant exploration and testwork results, (i.e. only relevant testwork and results relating to Seam 6).

Rio Tinto's exploration drilling commenced in 2003 on the farm Chapudi 752MS. To-date, a total of 125 boreholes have been drilled along the strike length of the project, primarily focused on the areas close to suboutcrop and at short distances down dip. Three deep holes were drilled to verify down dip continuity. The exploration boreholes comprised both diamond and open hole drilling methods.

The drilling was undertaken in four stages, namely Reconnaissance Stage, Order of Magnitude (OMS) Domestic Thermal Stage, Down Depth and PFS) Stage. The location of the boreholes is indicated on Figure 66. The exploration is summarised in Table 41.

In 2011, when the companies began negotiations for CoAL to acquire the Chapudi Section area assets, Rio Tinto provided CoAL with the full borehole database, detailed reports on the dataset, sampling, analytical and modelling methodologies utilised, as well as the complete geological model. The content of these reports are described in the section to follow.

CoAL has not drilled any confirmatory quality boreholes into this project. This is now a priority for CoAL, especially in light of the change of product direction which CoAL would take for the project.

In 2012 CoAL drilled three RC boreholes for structural purposes and these have been used to update the geological model but not the Coal Resources. For all exploration procedures followed by CoAL for the 2012 drilling programme and all future CoAL drilling programmes the reader is referred to the protocol document prepared by Venmyn Rand (Pty) Ltd for CoAL on 10 April 2012 named "Coal Exploration Best Practise Guideline for the Greater Soutpansberg Projects (GSP) Prepared for Coal of African Limited (COAL)", Venmyn Deloitte reference number D1140.

### 13.11.1. Remote or Geophysical Exploration

In 2005, Fugro conducted a 124km$^2$ helicopter-borne, aerial magnetic and radiometric surveys. A total of 1,330 line kilometres were flown at a line spacing of 100m. The results of the reduced to pole airborne magnetic data were used to identify intrusions and lineaments over the central area of the Chapudi Section. The results are presented on Figure 67 and discussed in the section on local geology. The Fugro survey also provided DTM data of the surface.

In 2006, GAP Geophysics carried out three resistivity traverses and four vertical electrical sounding traverses along a distance of approximately 1,500m on the farms Coniston 699MS, Rochdale 700MS, Woodlands 701MS and Blackstone Edge 705MS.

In 2007, two north/south seismic traverses were carried out on Sterkstroom 689MS and Coniston 699MS. Although these were useful in identifying the depth of weathering, they did not prove useful for the mapping of the deeper coal.

Additional DTM data was obtained from aerial photograph interpretation with a resolution of 25m by 25m. This was obtained from the South African Chief Directorate: Surveys and Mapping datasets.

### 13.11.2. Surveying Methods

During the Reconnaissance Stage, the borehole collar coordinates were measured with a handheld GPS.

From 2005 onward, all collar coordinates were surveyed using a Trimble GeoExplorer XRSPro GIS grade real-time differential GPS unit. The three deep boreholes, however, were surveyed using a handheld GPS. The protocol of using the differential GPS included a series of check and repeat measurements to ensure the accuracy of the survey results. The accuracy level obtained was 1m horizontally and 3m vertically.

Rio Tinto also performed a verification of the collar survey data with the DTM and found them to be correct.

All collars were surveyed in the South African LO projection system, Zone 29, Cape 1880 datum.

All survey data was acquired by CoAL from Rio Tinto in 2011, as part of the borehole database. Both Venmyn Deloitte and CoAL are comfortable with the accuracy of the surveying as Rio Tinto is a reputable company which employs industry best practise standards. However, no independent verification of the survey data has been carried out.

### 13.11.3. Diamond Drilling

All the exploration drilling was undertaken by Earth Resources (Pty) Ltd. All drilling has been managed by Rio Tinto, with Mr. D. Hristov as the geologist responsible for the drilling and sampling.

Neither CoAL nor Venmyn Deloitte have independently witnessed the Rio Tinto drilling and sampling protocols as no exploration drilling is currently taking place. However, Venmyn Deloitte is confident that the drilling was carried out to the required standard as these programmes were undertaken by a large international and reputable company utilising best practise standards. The details on the drilling, sampling and analytical methods and protocols are very well documented in reports prepared by Rio Tinto, as summarised in this section, and this adds to the confidence which CoAL and Venmyn Deloitte have in the integrity of the data and accuracy of the results.

#### 13.11.3.1. Drilling

Diamond drilling was carried out using PQ3 drilling, at a core size of 82mm, or LDD, at a core size of 123mm. HQ drilling was used where RC boreholes failed due to technical reasons. These holes were treated the same as the PQ3 holes. All boreholes were drilled vertically. The location of the boreholes is indicated on Figure 68. All holes were drilled between 5m and 10m below the target Seam 6.

The borehole numbering protocol used the farm number, followed by an underscore and then the sequential number of the borehole (e.g. 499_001). Immediately after drilling was completed, the geologist carried out the following:-

- marked the borehole number on the casing with black ink;
- marked the position of ground level, also on the casing;
- measured the casing stick up;
- made note of the total depth of the borehole, and the depths and thicknesses of the intersected coal seams; and
- made note of the depth of the water in the hole.

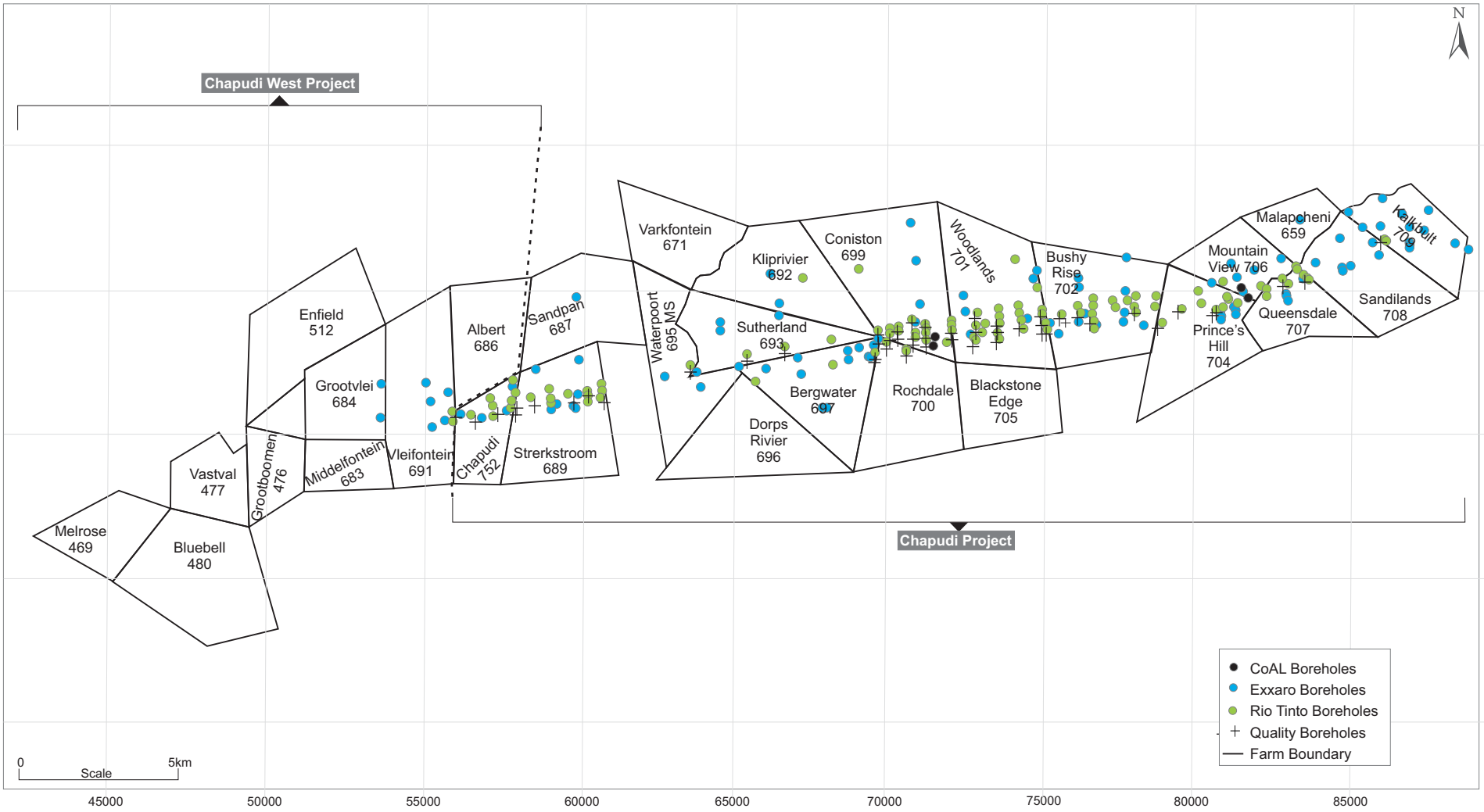
During the Reconnaissance stage drilling, a total of 20 diamond boreholes were drilled along the strike length of the Chapudi Section, 20 of PQ3 diameter and one LDD hole.

**Table 41 : Chapudi Section – Summary of Historical and Recent Drilling**

| DATE | COMPANY | LOCATION | PURPOSE | SURVEYOR | DRILLING COMPANY | TYPE OF DRILLING | SIZE | RESPONSIBLE GEOLOGIST | TOTAL NO. B/H | WIRELINE LOGGING | SEAMS SAMPLED | LABORATORY FOR QUALITY | USED IN MODEL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1939 - 1981 | Iscor | Bergwater 697MS, Bushy Rise 702MS, Chapudi 752MS, Coniston 699MS, Kalkbult 709MS, Kliprivier 692MS, Malapchani 659MS, Mountain View 706MS, Princess Hill 704MS, Queens Dale 707MS, Sandilands 708MS, Sandpan 687MS, Sterkstrom 689MS, Sutherland 639MS, Waterpoort 695MS, Woodlands 701MS | Unknown | Unknown | Unknown | Diamond | Unknown | Unknown | 162 | Unknown | Unknown | Unknown | No |
| 2003 - 2005 | Rio Tinto | Sterkstroom 689MS, Sutherland | Regional reconnaissance to evaluate coking potential. | In house | Earth Resources | Diamond | PQ3 | D. Hristov | 23 | Yes | Seams 6 & 7 | Inspectorate, SABS & ALS | Yes |
| | | 693MS, Rochdale 700MS, Woodlands | | | | | | | | | | | |
| | | 701MS, Prince's Hill 704MS, Blackstone Edge 705MS & Chapudi | | | | RC | - | | 1 | Yes | None | | Yes |
| | | 752MS. | | | | Diamond | LDD | | 1 | Yes | Seams 6 & 7 | | Yes |
| 2006 - 2008 | | Sterkstroom 689MS, Sutherland | OMS Domestic Thermal for bulk mining | | | Diamond | PQ3 | | 22 | Yes | Seam 6 | SABS | Yes |
| | | 693MS, Coniston 699MS, Rochdale | | | | Diamond | HQ | | 8 | Yes | Seam 6 | SABS | Yes |
| | | 700MS, Woodlands 701MS, Bushy Rise 702MS, Queen's Dale 707MS & Kalkbult 709MS. | | | | RC | - | | 12 | | | | |
| | | | | | | Diamond | LDD | | 4 | Yes | Seam 6 | SABS | Yes |
| | | | Along suboutcrop to identify line of oxidation | | | RC-LOX | - | | 23 | Yes | None | | Yes |
| | | | | | | | | | | | | | |
| 2009 | | Kliprivier 692MSr, Coniston 699MS & Woodlands 701MS. | Depth study | | | Diamond | PQ3 | | 3 | Yes | Seam 6 | SABS | Yes |

| DATE | COMPANY | LOCATION | PURPOSE | SURVEYOR | DRILLING COMPANY | TYPE OF DRILLING | SIZE | RESPONSIBLE GEOLOGIST | TOTAL NO. B/H | WIRELINE LOGGING | SEAMS SAMPLED | LABORATORY FOR QUALITY | USED IN MODEL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Sterkstroom 689MS, Waterpoort, Sutherland 693MS, Coniston 699MS, Woodlands 701MS, Bushy Rise | PFS stage and for low ash product. | | | Diamond | PQ3 | | 16 | Yes | Seam 6 | SABS | Yes |
| | | 702MS & Prince's Hill 704MS . | | | | Diamond | HQ | | 11 | Yes | Seam 6 | SABS | Yes |
| | | | | | | RC | - | | 4 | Yes | None | SABS | Yes |
| 2012 | CoAL | Coniston 699MS, Mountain View 706MS | Structure | Unknown | | RC | - | John Sparrow | 3 | No | Seam 6 | No | No |
| | | | | | | | | **TOTAL** | **277** | | | | |

## CHAPUDI SECTION – LOCATION OF BOREHOLES




Source: Coal of Africa
VMD1971_CoAL GSP CPR_2015

Figure 66

In 2006, Rio Tinto commenced with the OMS stage which focused on the potential to bulk mine the deposit and produce a domestic thermal product. During this phase 36 diamond boreholes were drilled along the strike length of the Chapudi Section, 22 of PQ3 diameter, 8 of HQ diameter and four LDD holes.

In 2009, Rio Tinto carried out a so-called Depth Study. This entailed the drilling of three deep PQ3 boreholes to confirm the potential for down dip extensions to the coal.

Later in 2009, Rio Tinto commenced with the PFS Stage exploration. This stage was very similar to the OMS except that a low ash composite was investigated. During this phase, 27 diamond boreholes were drilled along the strike length of the Chapudi Section, 16 of PQ3 diameter and 11 HQ holes.

No core recovery data was provided to Venmyn Deloitte.

### 13.11.3.2. Logging

Geotechnical and initial lithological logging was carried out whilst the core was in the split inner tube. Core was then transferred into numbered core trays. Core was not split prior to logging in order to minimise the effects of oxidation. The core boxes were then transported to a refrigerated container for storage.

Geotechnical logging was introduced in 2006 and based upon the Laubscher system logging sheet. Data captured on the logging sheets included rock mass, recovery, RQD and MRQD, rock type, colour and strength. Fractures were classified according to fracture type, class, index, spacing, micro roughness coefficient, infill and wall characteristics.

Detailed lithological logging was carried out once the depths were finalised after reconciliation with the geophysical wireline logs and during the sampling process. The detailed coal logging was carried out at the refrigerator.

All core was photographed, on site, as it was removed from the barrel as well as later when packed in the core trays.

During the Reconnaissance stage lithological logging was carried out recording primary, secondary and tertiary lithologies plus comments.

During the later stages of exploration, the boreholes were logged using an industry standard sedimentological logging dictionary. These two datasets were then merged into a single database with the dictionary codes having being converted into words for ease of use.

Downhole visual geotechnical logging on non-orientated drillcore was undertaken from the OMS stage drilling onwards. This information, together with the Acoustic Televiewer dataset, was used to make geotechnical interpretations on the core. It was also used to confirm the physical logging of the borehole cores.

### 13.11.3.3. Sampling Method

Two types of samples were collected from the Rio Tinto drilling. These included samples for coal quality and washability testing and samples for petrographical analysis.

The Rio Tinto field geologist would have been responsible for the selection of seam intervals.

During the reconnaissance stage, samples were selected based upon the proportion of coal. Any waste bands thicker than 50cm were not sampled and any coal bands thinner than 50cm associated with waste were also not sampled. The sampling nomenclature system for Seam 6, used by Rio Tinto, is presented in relation to the CoAL seam nomenclature in Table 42.

**Table 42 : Chapudi Section - CoAL and Rio Tinto Sample Nomenclature**

| SEAM | CoAL SAMPLING NOMENCLATURE | RIO TINTO SEAM NAME | RIO TINTO SAMPLING NOMENCLATURE |
|---|---|---|---|
| Upper | 14C (14CA, 14CB, 14CC) | Seam 6 | 6D (3 samples) |
| Middle Upper | 14A (14AA, 14AB, 14AC), 14BA | | 6C (4 samples) |
| Middle Lower | 12A (12AA, 12AB), 12B, 12C, (12CA, 12CB) | | |
| Bottom Upper | 11A (11AA, 11AB, 11AC), 11B, 11BA | | |
| Bottom Middle | 10A (10AA, 10AB) | | 6CL (2 samples) |
| Bottom Lower | 9A (9AA, 9AB, 9AC), 9B | | |

During the OMS stage of exploration, a change in focus resulted in a bulk sampling procedure being implemented. This meant that Seam 6 was sampled over its entire thickness, including the partings, and all samples were combined or composited into a single bulk mineable seam. This *modus operandi* was modified after the Acoustic Televiewer results of the first six holes when three thick (3.5m – 5.5m) and correlated waste partings were identified. Thereafter, it was decided that both coal plies and waste intervals will be sampled and analysed separately, but using the same analytical flowsheet. This would enable the recombination of the samples into a bulk seam, or alternatively into selected mining horizons.

During the PFS stage of exploration, the sampling was carried out in much the same way as the OMS sampling, i.e. sampling according to the three main coal horizons with two thick parting samples. The differences in sampling were as follows:-

- each of the three coal samples taken were considered as a separate working section; and
- the partings were not sampled as sufficient information regarding them had been obtained in the OMS stage.

CoAL will re-interpret all the Rio Tinto boreholes according to their own nomenclature in order for the previous drilling results to be comparable to CoAL's conventions used across the Soutpansberg and to future drilling which CoAL will carry out.

According to general best practice, coal quality samples would have been double-bagged with each bag sealed with cable ties and labelled. Manila tags identifying the borehole and sample numbers were placed inside the inner bag (with the sample material) and also attached to the cable tie around the neck of the inner bag. Bagged samples were not stored in a locked refrigerated container prior to transportation to the laboratory.

## 13.11.4. Reverse Circulation (RC) or Open Hole Drilling

Two types of open hole drilling were carried out by Rio Tinto, one for general exploration and the other specifically for the determination of the depth of weathering.

### 13.11.4.1. Drilling

A single RC borehole was drilled during the Reconnaissance Phase. A series of 12 RC holes were drilled as part of the OMS stage of exploration, and four boreholes during the PFS.

A series of 23 short RC boreholes were drilled along strike on the Chapudi Section. These boreholes were drilled specifically to map the depth of weathering or level of coal oxidation near the coal sub-outcrop (Figure 69 70), and were separately identified as the Line of Oxidation (LOX) holes in the database. This is an important parameter, as the quality of weathered or oxidised coal typically deteriorates to such an extent that it will not meet the required quality specification and therefore cannot be included in the resources.

All the RC drilling was carried out by Earth Resources (Pty) Ltd.

#### 13.11.4.2. Logging

The RC drill cuttings or chips were collected in poly weave bags at 1m intervals using a cyclone attached to the rig. Each bag was labelled according to the borehole number and depth.

For each metre interval, a small sub sample was placed into a chip tray for logging. A spade full from each bag was also laid out in 20m lengths for logging. All bags are sealed and then stored in a refrigerated container.

The chips of the LOX holes were logged to identify the depth of weathering. Chips were collected at 1m intervals for this purpose. These holes were also logged using an Acoustic Televiewer.

The chips of the LOX boreholes were logged to identify the depth of weathering. These holes were also logged using an Acoustic Televiewer.

#### 13.11.4.3. Sampling Method

No samples were taken of the coal chips produced through the open hole drilling, except for borehole 499MS_001 on the Chapudi West Section, which was sampled and subject to coal quality and washability testing.

### 13.11.5. Down the Hole Geophysics / Wireline Logging

Downhole geophysical surveys were conducted on the majority of the Rio Tinto boreholes and included the following:-

- a three-arm calliper with a 40mm – 320mm range to provide hole diameter measurements. These measurements are used to check for poor borehole conditions which would impact of core recovery;
- a dual density, gamma and calliper tool to measure density in g/cc. The density measurements were used to identify lithology boundaries and to augment density measurements from the samples measured in the laboratory;
- high sensitivity natural gamma tool which provides information on lithology, mineralogy and geochemical associations;
- a full wave sonic tool which measures P-wave seismic velocities in the various lithologies;
- an EAL resistivity tool to provide resistivity measurements for the various formations and to accurately identify water levels;
- a dual neutron-neutron tool for measuring hydrogen content in the various lithologies;
- a magnetic susceptibility tool for magnetic susceptibility readings; and
- an Acoustic Televiewer. This tool provides high resolution borehole wall images for identification of thin beds, fractures, etc. It is also used to identify dips. This tool is particularly useful for visually logging RC boreholes. The televiewer datasets are also used for geotechnical interpretations.

The company responsible for the geophysical logging was initially Reeves and later GAP Geophysics. The Reeves data was supplied in standard LAS format whilst the GAP Geophysics data was made available in both WellCAD and LAS format.

## 13.11.6. Bulk Sampling

No bulk sampling has been carried out on the Chapudi Section.

## 13.11.7. Laboratory Analyses

The early reconnaissance samples were sent to Inspectorate, a SANAS accredited laboratory (No T0313). According to Rio Tinto, Inspectorate provided some invalid analytical data due to not maintaining a mass balance between fractions post the drop shatter stage in the analysis process.

As a result, Rio Tinto then sent the remaining samples to the SABS laboratory in Secunda. SABS is accredited (No T0230) through the South African National Accreditation System (SANAS) and SABS/ISO/IEC 17025:2005. All the OMS samples were sent to the SABS laboratory.

Some samples from the Rio Tinto drilling campaign were also analysed at ALS Brisbane (ISO 17025 accredited). Products were returned to South Africa for petrographic analysis. This laboratory is highly rated for the analysis, particularly, of coking coal samples.

Due to the interbanded nature of the coal horizons, the flowsheet for sample analysis focussed on the following testwork during the various exploration stages with minor variations:-

- drop testing to determine the breakage characteristics;
- tumble testing to determine further breakage characteristics during transport and processing; and
- high resolution washing characteristics at 13 different relative density settings between RD = 1.03 to 2.20, in increments of 0.05.

Details on the analytical flowsheets are reported in the section to follow.

### 13.11.7.1. Sample Preparation and Analysis

The laboratory followed the ISO standard set of tests and methods which are used for coal analyses by international laboratories. The standard method of coal sample preparation is summarised in Section 8.11.7.1.
A standard process flowsheet for all core samples taken in the reconnaissance stage was used by Rio Tinto in their coal analyses. Rio Tinto undertook far more extensive analyses than are usually carried out, certainly at the reconnaissance stages of an exploration project. These analytical protocols are detailed in Section 8.11.7.1.

The laboratories followed the ISO and SANAS standard set of tests and methods which are used for coal analyses by South African laboratories. The standard method of coal sample preparation is summarised below:-

- samples were combined into working sections. Free moisture and apparent relative density (ARD) were determined;
- the composite sample was drop-shattered 10 times with Particle Size Distribution (PSD) determined after each drop;
- ARD was determined on all fractions coarser than 1mm. Samples from early boreholes were also analysed for ash content on each size fraction at this stage; and

- the working section sample was recombined and subjected to dry tumble for three minutes with subsequent determination of the PSD and fractional ash content followed by:-
    - wet tumble for five minutes and determination of PSD; and
    - each working section sample was split into three or four size fraction ranges and each range was washed at 13 densities with ash determination on each of the float fractions.

Based on the washability results, the laboratory was instructed to prepare a low ash composite and a middlings composite. Coal quality and petrographic analyses were undertaken on the composites for the following parameters: proximate analysis, CV, total sulphur, forms of sulphur, ultimate analysis, ash fusion temperatures, plasticity, dilatometry and ash composition. Separate samples were submitted for reflectance and/or petrographic analysis.

The following tests were performed on the LDD sample composite:-

- proximates, CV, TS (primary and secondary products, discard and fines);
- ultimate analysis (primary and secondary products);
- forms of sulphur (primary and secondary products);
- ash fusion temperature (primary and secondary products);
- chlorine (primary and secondary products);
- Hardgrove Grindability Index (secondary product);
- Free Swelling Index (primary product);
- Grey King Index (primary product);
- Roga Index (primary product);
- ash analysis (primary product);
- petrographic analysis (primary product);
- dilatation (primary product); and
- fluidity (primary product).

There was reportedly insufficient sample material available to allow CSR, CRI and coke-making tests to be conducted.

For the single RC borehole which was sampled, the following analytical protocol was applied:-

- samples combined into working sections;
- determination of PSD and rejection of the -0.075mm fraction;
- material split into +1.0-31.5mm and +0.075-1.0mm fractions for a coarse and fine wash. Only part of the fines split was washed;
- based upon the washability results, a cumulative RD=1.40 low ash composite wash was undertaken; and
- measurements of proximate, CV and total sulphur carried out on each of the above.

The list of tests carried out on the reconnaissance samples is presented in Table 18. However, in some cases the full suite of tests was not carried out due to the slow turnaround time at the laboratory which had resulted in the degradation of the sample such that the results would have been meaningless.

Petrographic analyses were taken on a number of the reconnaissance boreholes at Chapudi. The earlier exploration samples were only analysed for mean maximum reflectance of vitrinite ($R_oV_{max}$). The following was performed on the later samples:-

- a full maceral analysis;
- random reflectance of vitrinite; and
- maximum reflectance calculated from the random reflectance results.

During the OMS stage of exploration, an analytical flowsheet was designed to accommodate the modelling of partial or full wash optional scenarios at different size cut-offs. This entailed the following:-

- sample reception, registration at the laboratory, weighing and compositing all samples into a working section;
- determine ARD and free moisture of total sample. ARD is determined using non-destructive methods;
- drop shatter coal 10 times. After every drop the PSD was determined at each size fraction (63.0mm; 50.0mm; 31.5mm; 25.0mm; 12.5mm; 8.0mm; 6.3mm; 4.0mm; 2.0mm; 1.0mm; 0.5m and 0.075mm). ARD by Archimedes measured on all fractions greater than and equal to 1mm;
- separate the +63mm fraction and determine ash, moisture and density;
- screening at 25mm, with crushing of oversize to 25mm, to ensure sufficient material for testwork. It was later identified that the crushing was causing ash to “leak” into the finer fractions. Therefore, crushing to 25mm after drop tests was abandoned for the subsequent LDD cores;
- recombine sample and then -63mm fraction dry tumbled for three minutes. Determine PSD and ash on each size fraction (50.0mm; 31.5mm; 25.0mm; 12.5mm; 8.0mm; 6.3mm; 4.0mm; 2.0mm; 1.0mm; 0.5m and 0.075mm). This allowed for fraction size cutoff to be applied for different scenarios;
- after the results for the first three boreholes were obtained, the size fraction intervals used for all future work included the following:-
    - -12.5mm dry bypass. Material of -63mm+12.5mm is washed and the fractions product yield determined using a cut-off of RD=1.80;
    - -6.3mm dry bypass; Material of -63mm+6.3mm is washed and the -6.3mm fraction bypassed to product. The product yields are determined using a cut-off of RD=1.80;
    - -6.3mm wet bypass. Material of -63mm+6.3mm is washed and the -6.3mm fraction bypassed to product. In this model the -6.3mm material is wet and de-sliming is required prior to washing.

The product yields are determined using a cut-off of RD=1.80; and

- Washed. The -63mm+0.075mm material is fully washed as 13 different densities, with the product yield determined using a cut-off of RD=1.80.

An additional test, the Abrasion Index, was carried out during the OMS stage on the middlings fraction. This was specifically required by Eskom.

During the PFS sampling, the analytical flowsheet was similar to that of the OMS, with the following exceptions:-

- the drop shatter tests were carried out 12 times;
- froth flotation and washing was carried out on the -0.25mm fraction;
- thermal -12.5mm bypass composite for various coarse size fractions (-25.0mm; 12.5mm; 8.0mm; 2.0mm and 0.25mm);
- middlings composite at the full range of size fractions (-25.0mm; 12.5mm; 8.0mm; 2.0mm and 0.25mm); and
- analyses were undertaken for a low ash composite at various size fractions (-12.5mm; 8.0mm; 2.0mm; 0.25mm and 0.075mm).

### 13.11.7.2. Security

All samples were stored within a locked refrigerated container, before despatch to the laboratories. Once at the laboratories, the samples were subject to the standard security measures of the respective laboratories.

### 13.11.7.3. QA/QC

Laboratories are required to calibrate their coal analytical equipment daily and are also required to partake in round robin proficiency tests to ensure a high standard of results. All result reports are verified by the laboratory manager and any inconsistencies or variations about the laboratory's specifications are reanalysed.

Rio Tinto has its own internal QA/QC procedures and these identified a number of issues with the laboratory results.
During the early reconnaissance programme, samples were sent to Inspectorate, a SANAS accredited laboratory (No T0313). According to Rio Tinto, Inspectorate provided some invalid analytical data due not maintaining a mass balance between fractions post the drop shatter stage in the analysis process. This resulted in three Seam 6 intersections being invalid for one borehole drilled on Sterkstroom 689MS, one on Prince's Hill 704MS and one on Chapudi 752MS. These results were excluded from the data set.

During the OMS, when samples were sent to SABS laboratory in Secunda (No T0230), Rio Tinto identified errors in the results for borehole 699MS_008. This was a result of the laboratory not maintaining the correct mass balance when preparing the composites. These results were excluded from the database.

Although Venmyn Deloitte and CoAL have not performed their own verification of the laboratory results, they are comfortable that, due to the high standard of Rio Tinto's QA/QC procedures, the laboratory results used for modelling are reliable.

## 13.11.8. Data Management

### 13.11.8.1. Data Acquisition and Validation

Rio Tinto used the acQuire Technology Solutions' (ATS) Geoscientific Data Management System (GDMS) from the start of the exploration. Rio Tinto and ATS developed this proprietary software specifically for the storage of coal exploration data for this project. This software covers the whole suite of applications from data entry in the field, through to QA/QC at head office. The software includes specially designed validation protocols using the standard dictionaries for the logging of sedimentary deposits. This software also generates dispatch numbers which are used by the laboratory.

Data entry was carried out in the field with regular synchronisation of the GDMS with head office.

Import routines were designed for the various analytical stages, with each import from the laboratory passing through a series of validation tests prior to inclusion into the final database. This validation technique proved highly successful and highlighted the inconsistencies reported in the previous section.

The GDMS is housed within a SQL database and can therefore be easily exported into the various 3D modelling software packages.

In addition to the above noted validation procedures, Rio Tinto compiled a specific QA/QC system to ensure the following:-

- all relevant data is obtained from the boreholes;
- boreholes logged by different geologists correlate;
- the sampling methods were consistent across all boreholes; and
- an auditable trail existed between the source and final data in the database.

CoAL acquired electronic data copies of the Rio Tinto database in 2011 as well as the complete geological model. Borehole and analytical data provided by Rio Tinto were in the form of a series of MS Excel® spreadsheets. Downhole geophysical data were supplied as .LAS (text) files and Wellcad® files. Aeromagnetic and ground magnetic data was provided primarily as Geosoft® grids.

In addition, Rio Tinto provided detailed written reports and descriptions, for each exploration stage, on the sampling methods, analytical flowsheets, naming protocols and resultant Excel files.

CoAL has reviewed and re-interpreted the logs in line with CoAL's exploration procedures. It is not possible to validate the Rio Tinto data further as the original borehole logs and laboratory certificates were not provided.

CoAL has compiled an Access database from the Rio Tinto Excel files. CoAL utilise Minex™ for internal modelling purposes, and all data is housed with an Access database which was imported into this programme for modelling.

The following checks were conducted by CoAL, during its review of the database, prior to modelling:-

- collar elevations were checked against the LIDAR contour data; and
- Minex conducts its own automatic verification procedures including checking for physical data including overlapping intervals, missing intervals, etc;

- Minex also undertakes automatic quality verifications including increasing cumulative ash values, decreasing cumulative volatile values, totalling proximate analyses to 100%, etc.

Venmyn Deloitte has randomly selected 14 boreholes and checked the original Excel logs with the logs included in the modelling database. Minor differences in coal intersection depths or thicknesses, of less than 1m, were noted in two boreholes (689MS_013 and 702MS_017). No checks could be carried out of the database against the original borehole logs as the latter were not available. In addition, no checks could be carried out comparing the database to the laboratory certificates as the latter were not available.

Venmyn Deloitte has reviewed the Rio Tinto reports and is comfortable with the level of detail and the high standard of validation protocols used by the company and considers that the database is sufficiently accurate for use in geological modelling and resource estimation.

#### 13.11.8.2. Database Management

Rio Tinto used the acQuire Technology Solutions' (ATS) Geoscientific Data Management System (GDMS) from the start of the exploration. Rio Tinto and ATS developed this proprietary software specifically for the storage of coal exploration data. This software covers the whole suite of applications from data entry in the field, through to QA/QC at head office. The GDMS is housed within a SQL database and can therefore be exported into the various 3D modelling software packages.

CoAL obtained an export of the database in .csv format for the Chapudi Section directly from Rio Tinto, and this was imported into a CoAL Access database. CoAL also acquired the various grid files as well as the 3D wireframes.

The Access database is managed and maintained by CoAL's Competent Person, Mr. J. Sparrow (Pr.Sci.Nat). Backups are stored at CoAL's head office in Johannesburg.

### 13.12. Orebody Modelling and Results

An orebody model was prepared by Rio Tinto, which was used to generate the resource statement issued in 2008. This resource statement was prepared at the conclusion of the OMS study and included the reconnaissance and OMS drilling. The resource was estimated for the coal horizons within Seam 6 and extended to a maximum depth of 200m.

The latest model was prepared by Mr. J. Sparrow (Pr.Sci.Nat), CoAL's Competent Person, as at 29th February 2012. The model was prepared in Minex Software. The model takes into account all available recent drilling and other geological information as of 29 February 2012.

During the OMS, Rio Tinto sampled the entire Seam 6 in one metre intervals, including coal and waste. CoAL was able to re-correlate these samples into their classification, i.e. into the Upper, Middle Upper, Middle Lower, Bottom Upper, Bottom Middle and Bottom Lower seams, for 48 of the 125 boreholes drilled on the Chapudi Section NOPRs. As a result of not being able to re-correlate all the boreholes, CoAL was forced to adopt Rio Tinto's approach at this time and has modelled the coal horizons within Seam 6.

It must be noted that due to Rio Tinto's method of sample analysis, i.e. drop shatter testing on all samples, compositing of all samples into three horizons within Seam 6, scalping off of the +63mm fraction and removal of fines of -0.075mm and then full washability test work, CoAL could not reconstitute the quality results according to their classification of the coal seams either. Therefore all quality modelling results are for the +0.075mm-63mm fraction of the coal within Rio Tinto's Seam 6.

CoAL drilled the Chapudi Section in 2012 and logged and sampled the holes according to their methods and protocols in order to carefully evaluate the deposit in line with their corporate strategy for the Soutpansberg Coalfield. Information from the 2012 boreholes were not included in the 29 February 2012 Coal Resource statement as they were drilled for structural purposes only. CoAL plans to drill further boreholes on the Chapudi Section for quality, which may significantly change future Resource Statements.

It is for this reason, and the others noted above, that all resources have been classified as Inferred, even though these points of information may meet the JORC standards of a higher classification category.

Both CoAL and Venmyn Deloitte have a reasonable level of confidence with respect to the current model and the associated resource estimates based upon the currently available information.

Venmyn Deloitte has reviewed the model and interviewed Mr. J. Sparrow (Pr.Sci.Nat) concerning his methods of modelling. Venmyn Deloitte has also independently plotted the graphical distribution of the boreholes in Geosoft Target and Micromine and verified the results of the seam thickness variations and resultant volume calculations. Venmyn Deloitte is satisfied with the integrity and results of the model.

The upper surface of the model was sourced from the digital terrain model and is presented in Figure 69. Dolerite dykes, as well as fault planes, were incorporated into the 3D structural model. The structural model is presented in Figure 67.

Both the physical and quality parameters of the coal within Seam 6 only were modelled, by CoAL. Grids with a 20m mesh were estimated using Minex's general purpose gridding function using a 2.5km search radius. The model of the physical parameters of the seam was cut along any significant structures, whilst the quality parameters were modelled across it. All physical and quality parameters were plotted and visually inspected to ensure they were acceptable from the perspective of geological interpretation.

### 13.12.1. Physical Results

The physical parameters of the elevation, in metres above sea level, and the depth from surface of the floor and roof of Seam 6 was modelled. The coal thickness within Seam 6 was modelled and this was used as the basis for the calculation of the resource volumes. Although all these parameters were modelled, only the respective seam floor elevation, depths from surface and the seam thickness results are presented below.

#### 13.12.1.1. Seam Floor Elevation

The Seam 6 floor elevation has been modelled in order to identify any abrupt elevation changes which would indicate the presence of faulting and also to identify the dip across the project area. The variations in the seam floor elevation are presented in Figure 67.

This figure clearly illustrates that the coal seams dip towards the north northwest, with the shallowest part of the basin located in the south. The figure indicates that the dips become flatter towards north, in the deeper portion of the basin. No faults within the modelled areas are evident as changes in elevation are continuous and steady.

#### 13.12.1.2. Depth from Surface

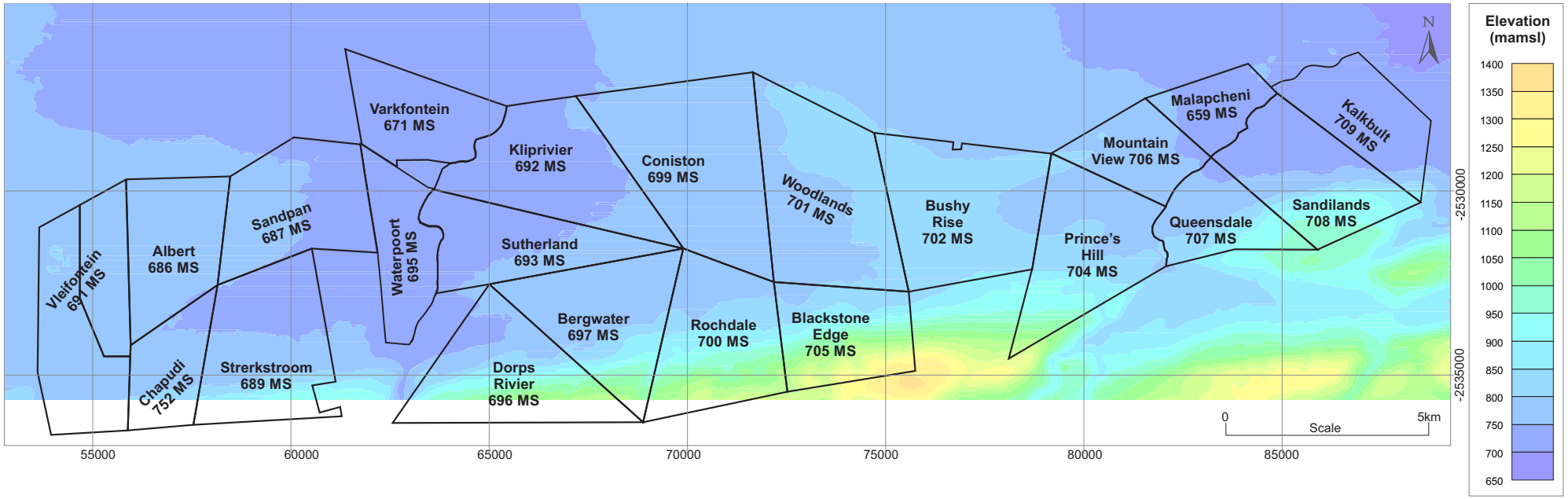
The depth of the seams from surface will have an impact on the mining method (opencast versus underground) and the extraction safety factors and pillar sizes for an underground operation. The floor depth from surface for Seam 6 is illustrated in Figure 68.

Seam 6 varies in depth from the subcrop (and unweathered depth of coal) at approximately 18m to a maximum depth of over 800m in the north.

The figure clearly indicates that the coal can be mined using opencast methods from the suboutcrop in the south. The dip of the coal towards the north would necessitate underground mining methods on selected seams toward the northern limit of the project area as the depth from surface increases.

## CHAPUDI SECTION – SURFACE CONTOURS AND BOTTOM LOWER SEAM ELEVATION

TOPOGRAPHY




VMD1971_CoAL GSP CPR_2015

Source: Coal of Africa

Figure 67

The stripping ratio has not been plotted as this needs to be carefully estimated once CoAL has drilled additional boreholes and assessed the project in relation to the potential selective mining of its five seams within the Rio Tinto Seam 6.

#### 13.12.1.3. Seam Thickness

The thickness contours or isopachs for the entire Seam 6 are presented in Figure 69, as is the thickness of the coal only within Seam 6. The entire Seam 6 varies from 15m to 65m in thickness.

The coal only within the seam varies in thickness from less than 5m, on the farm Coniston 699MS, to a maximum of 50m, on the farm Malapcheni 659MS. The majority of the Chapudi Section area has a Seam 6 coal only thickness of approximately 25m. The thickness of the coal only forms the basis for the resource estimation.

The combination of thick coal sequences at or near the surface has resulted in favourable stripping ratios for an opencast operation. The stripping ratios of overburden and waste to tonnes of coal within Seam 6 are presented in Figure 70. This diagram indicates that the ratios increase steadily northwards from the suboutcrop position in the south. Stripping ratios are estimated to be low, an average of approximately 2bcm:t coal, in the area planned for opencast mining.

### 13.12.2. Quality Results

As noted in Section 13.12, the quality results for the coal within Seam 6 are available for the +0.075mm-63mm fraction only. All qualities are reported as raw, on a dry mineral matter free (dmmf) basis. This is an analysis of a coal sample expressed on the basis from which the total moisture and the mineral matter (or ash) has in theory been removed, and the parameter recalculated.

#### 13.12.2.1. Coking Potential

The coking properties for the Chapudi Section are relatively good, with a typical low ash (10%) washed product from a borehole on the farm Coniston 699MS, having a Gray King test result of G9 and an $R_oV_{max}$ of 0.86. The fluidity was high at 64,000ddpm. The coking properties are indicated diagrammatically in Figure 22. Rio Tinto considered the entire Seam 6 as a single unit and as a result the typical yield to produce a coal of this nature was low, at 13%.

During the depth study, the deep boreholes showed significantly improved coking potential for a 10% ash product. With Gray King test results of G12 and an $R_oV_{max}$ of 1.00. The fluidity was improved at around 10,000ddpm. The yields to produce this coal were also improved, at approximately 20%.

The initial indications on the coking potential for the Chapudi Section are good. This was based upon limited testwork carried out on two boreholes. The coal rank is good ($R_oV_{max}$ = ~0.81), as is the vitrinite content as approximately 90% (Figure 22).

#### 13.12.2.2. Calorific Value

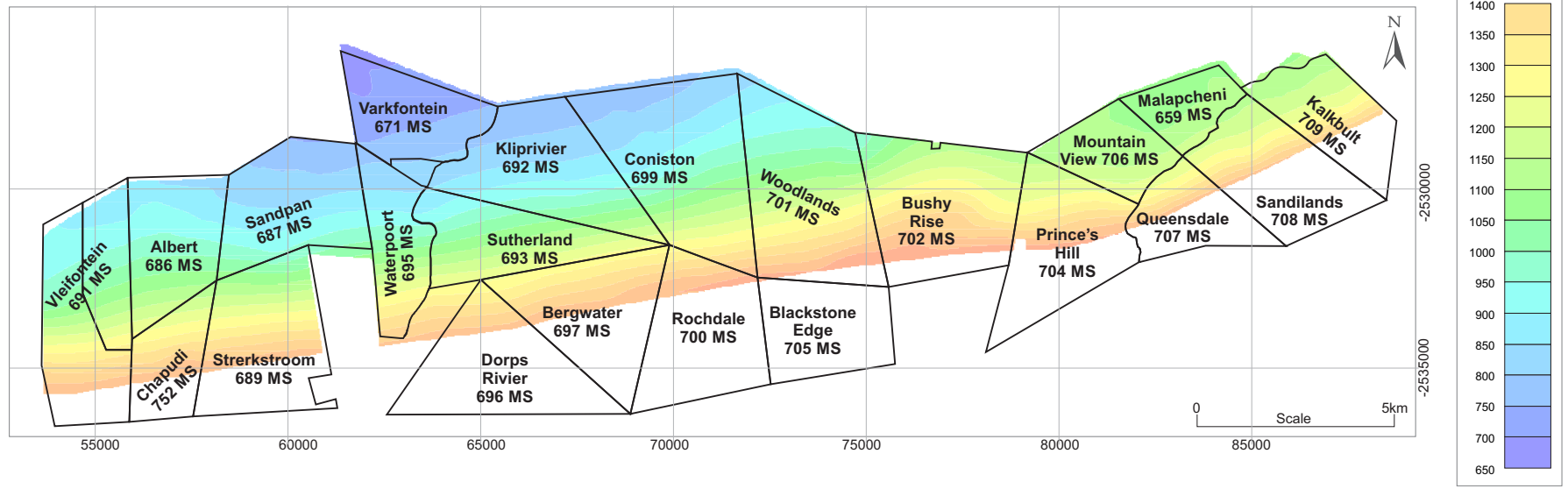
The variation of CV for the coal only within Seam 6 is illustrated in Figure 72. The diagram indicates that the CV varies from 33.5MJ/kg to 36Mj/kg on a dmmf basis. There is generally a low variance in the CV range with the majority of the Chapudi Section having a CV of approximately 35MJ/kg.

#### 13.12.2.3. Ash

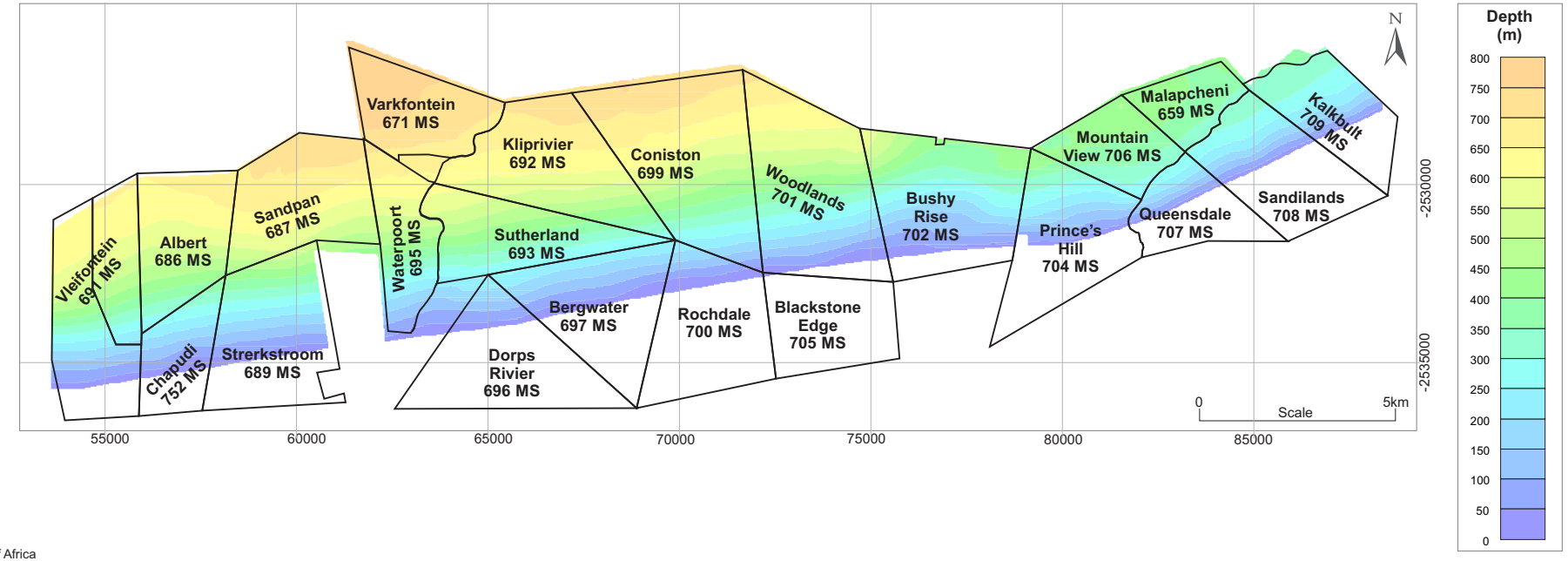
The variation of ash content, on a dmmf basis, is shown in Figure 71. This figure illustrates that the ash content is highly variable and ranges from a minimum of 26% to a maximum of 60%.

## CHAPUDI SECTION – SEAM 6 FLOOR ELEVATION AND DEPTH FROM SURFACE

### SEAM 6 FLOOR ELEVATION




### SEAM 6 FLOOR DEPTH

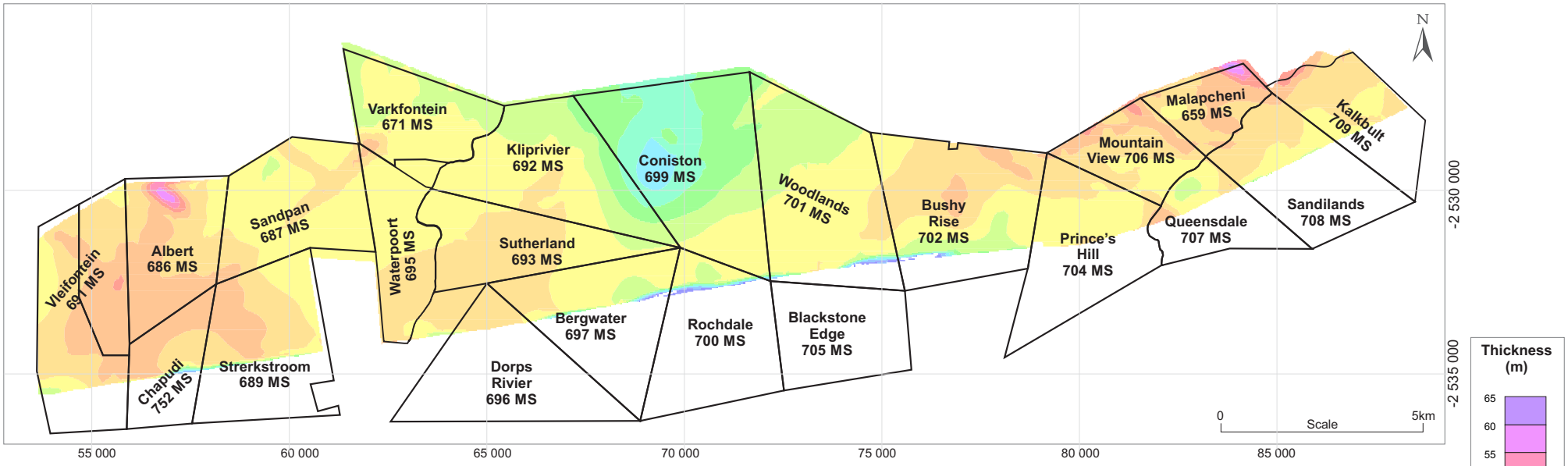



Source: Coal of Africa
VMD1971_CoAL GSP CPR_2015

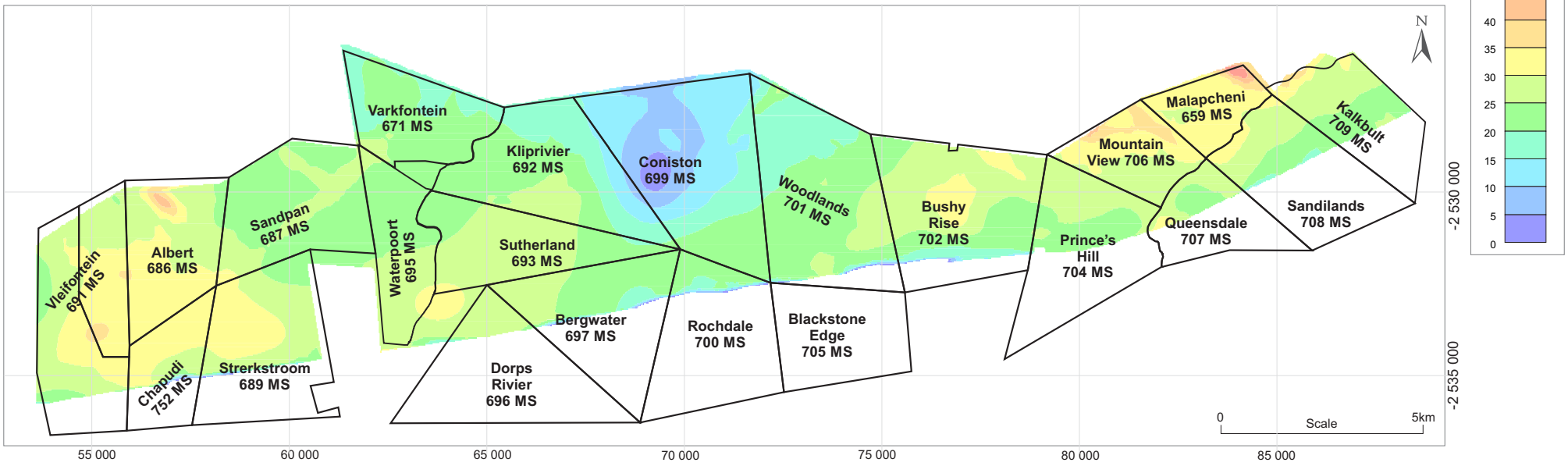
Figure 68

## CHAPUDI SECTION – ENTIRE SEAM 6 AND SEAM 6 COAL ONLY ISOPACH CONTOURS

### SEAM 6 THICKNESS




### SEAM 6 COAL ONLY THICKNESS



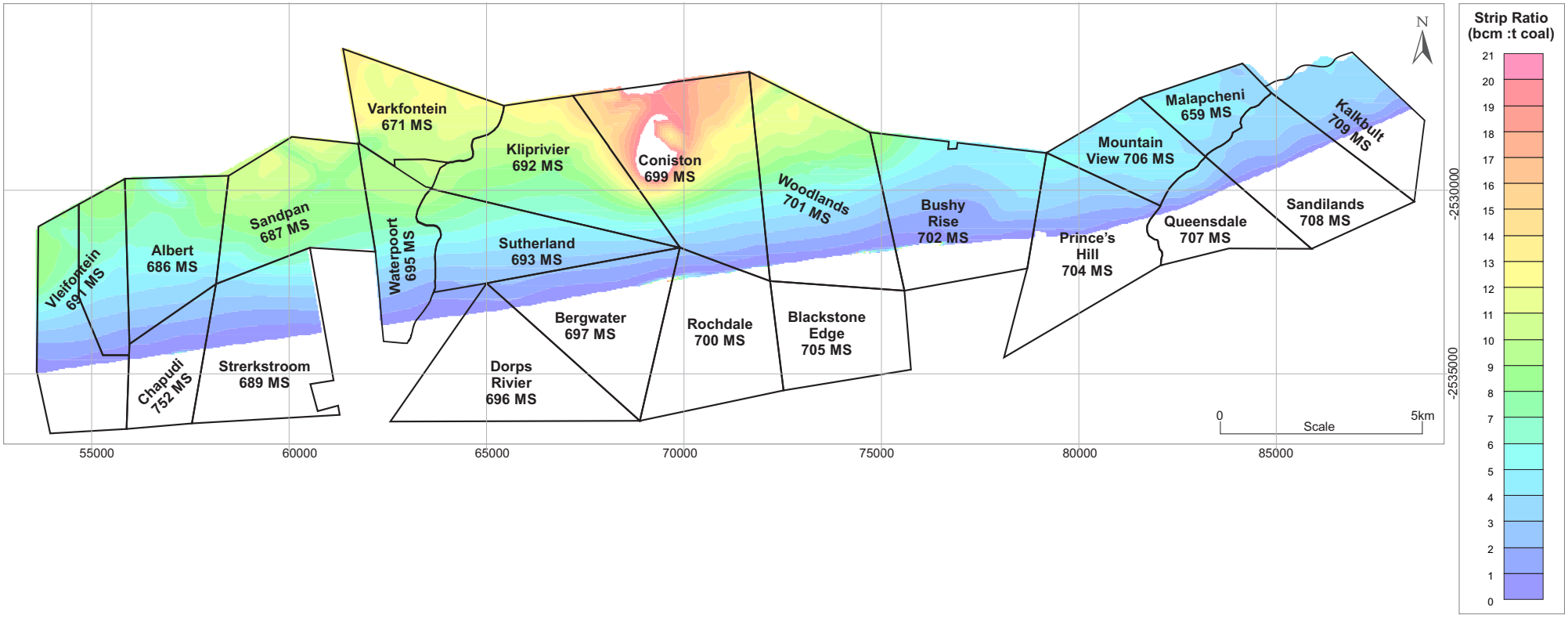

VMD1971_CoAL GSP CPR_2015

Venmyn Deloitte

Coal of Africa

Figure 69

## CHAPUDI SECTION – STRIPPING RATIOS




Source: Coal of Africa
VMD1971_CoAL GSP CPR_2015

Figure 70

The areas of lower ash are located in the central farms from Waterpoort 695MS, in the west, to Woodlands 701MS, in the east. There is a rapid increase in ash content across this farm from west to east.

#### 13.12.2.4. Volatiles

The volatile content variation for the coal in Seam 6, on a dmmf basis, is presented in Figure 72. This figure indicates that the volatile content varies from a minimum of 37% to a maximum of 44%, in isolated areas. The optimal volatile content of 41% occurs in the central portion of the project area from Waterpoort 695MS, in the west, to Woodlands 701MS, in the east.

#### 13.12.2.5. Potential Yields

No potential yields have been modelled by CoAL for the Chapudi Section as the company has not finalised a decision on the product specifications.

## 13.13. Coal Mining

No commercial mining has taken place at the Chapudi Section. However, an Options Study was conducted by Snowden Mining Industry Consultants (Pty) Ltd (Snowden) in June 2009, which outlines the various mining methods and associated cost which were considered by Rio Tinto. The most recent results of this study are summarised in this Section.

### 13.13.1. Mining Method

Both opencast and underground methods were considered in the Snowden reports (2009). Snowden considered truck and shovel methods as well as dragline methods of overburden removal for a single seam (Seam 6 only) and a two seam (Seam 6 and Seam 7) operation. A truck & shovel operation was considered for coal extraction.
In the case of opencast truck & shovel overburden removal, two methods were considered, namely Down Dip Mining and Along Strike Mining.

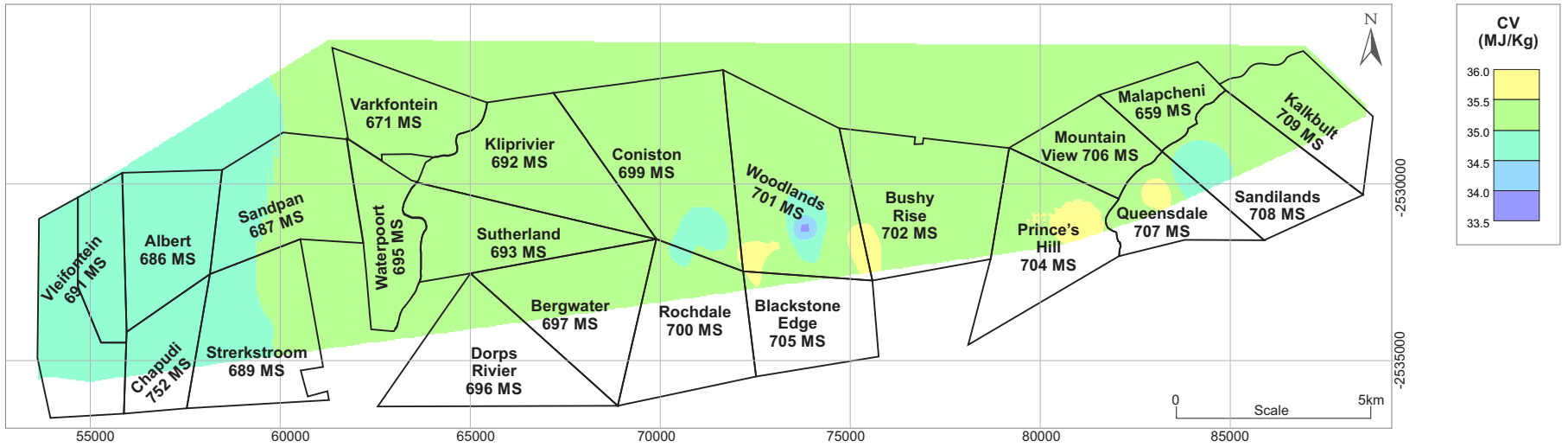
In the case of Down Dip overburden removal, the mining strips were orientated along strike and the pit developed in a down dip direction. The mining was designed to progress from the shallowest part of the resource to the deepest part of the resource, with mining ending along the highwall. As a result of the relatively steep dips present at Chapudi, it was established that this method will require that significant amounts of the overburden will need to be hauled out of the pit to dumping facilities. As the pit deepens the required number of trucks required to move the overburden would increase. According to Snowden, the total operating and ownership cost of overburden removal could range from ZAR18/bcm to ZAR24/bcm bcm (at 2009 money term).

In the case of the Along Strike overburden removal method, mining strips were orientated down dip from the suboutcrop to the maximum depth of mining. The design was such that the pit then advances along strike as each adjacent panel is mined. This method was investigated as an alternative to hauling overburden out of the pit and also to limit any highwall stability issues. This method yielded the optimal costs, estimated by Snowden at a total operating and ownership cost for overburden removal of ZAR18/bcm bcm (at 2009 money term).

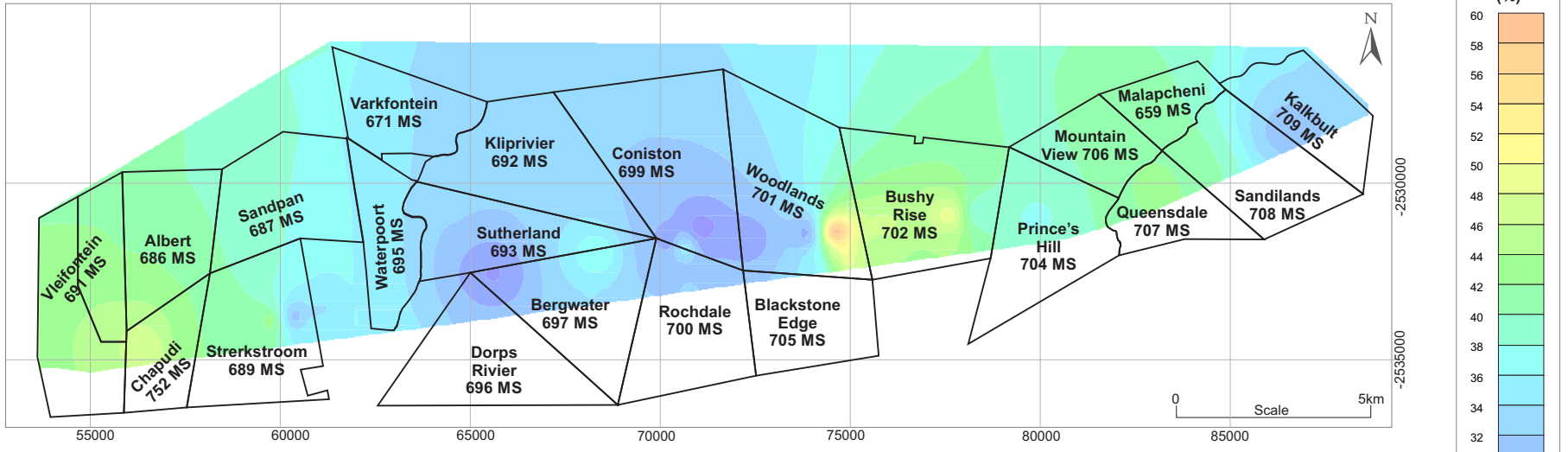
Overburden removal by dragline was also considered for both a single seam (Seam 6 only) and a two seam (Seam 6 and Seam 7) operation. The estimated cost for a single seam overburden removal was between ZAR20/bcm (40m thickness) and ZAR22/bcm (80m thickness). With respect to a two seam operation, the total cost for overburden removal ranged between ZAR23/bcm (30m) to ZAR25/bcm (70m) bcm (at 2009 money term).

## CHAPUDI SECTION – COAL IN SEAM 6 RAW CV AND RAW ASH CONTENT (DRY MINERAL MATTER FREE BASIS)

### SEAM 6 CV DRY MINERAL FREE




### SEAM 6 RAW ASH



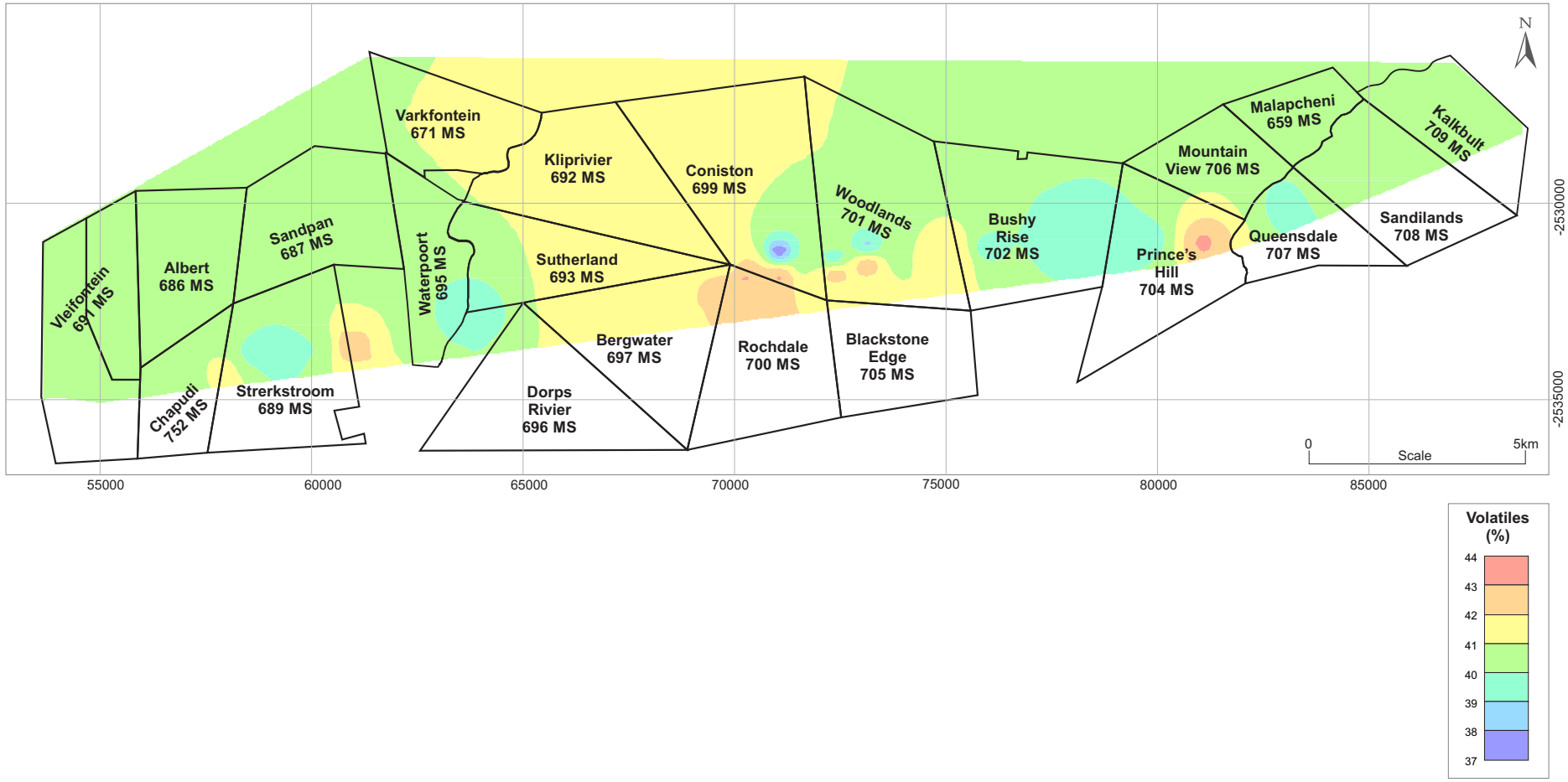

Source: Coal of Africa
VMD1971_CoAL GSP CPR_2015

Figure 71

Deloitte. Coal of Africa

## CHAPUDI SECTION – COAL IN SEAM 6 RAW VOLATILE CONTENT (DRY MINERAL MATTER FREE BASIS)

SEAM 6 RAW VOLATILES CONTENT




Source: Coal of Africa
VMD1971_CoAL GSP CPR_2015

Figure 72

For coal extraction, a truck & shovel method was considered. An estimate of total cost of mining and haulage (excluding the coarse reject haulage) is as follows:-

$$Total\ Cost\ \left(\frac{ZAR}{t}\right) = 10.2 + (0.029\ x\ depth\ of\ cover\ to\ Seam\ 6\ in\ m) + (0.81\ x\ incremental\ haulage\ distance\ in\ km)$$

Should the scalped coarse fraction be back hauled into the pit, then the total cost is estimated as follows:-

$$Total\ Cost\ \left(\frac{ZAR}{t}\right) = 13.9 + (0.029\ x\ depth\ of\ cover\ to\ Seam\ 6\ in\ m) + (1.00\ x\ incremental\ haulage\ distance\ in\ km)$$

Snowden also investigated the potential for underground mining using longwall mining, top coal caving (or sub level caving) in longwall sections and bord & pillar methods of extraction. Snowden stated that, taking cognisance of the geotechnical information and downhole logs, it believed there is limited potential for underground mining. and that it is a high risk strategy that could only be considered as a downdip extension to the opencast method. Snowden further to stated that mining the steep dips using bord & pillar methods would not be economic and that the longwall mining has the potential for significant dilution. The roof conditions are generally poor and this would further jeopardise underground mining practises.

Once CoAL obtains the rights to the Chapudi Section, the company will re-assess the mine plan and associated costs in light of the planned mining of up to five separate seams using opencast methods. Experience gained from the Makhado Project will be considered when preparing a mine plan for the Chapudi Section.

### 13.13.2. Historical Production

There has been no previous coal production from the Chapudi Section area.

### 13.13.3. Future Production

No future production schedule has yet been prepared for the Chapudi Section by CoAL. This will only be considered when CoAL carries out its own PFS on the project, in line with its own strategy for development.

### 13.13.4. Costs

Costs will be estimated during a PFS.

## 13.14. Coal Processing

### 13.14.1. Processing Plant

Extensive and highly detailed testwork has been carried out on the samples derived from the various exploration campaigns carried out at the Chapudi Section. The initial reconnaissance campaign focused on a low ash coking product with a middlings fraction for domestic power generation. This was followed by the OMS phase which primarily investigated the potential to produce a domestic power station product only. Later the low ash primary product, with a middlings fraction of power station coal, was also reconsidered.

Significant testwork was undertaken to determine the breakage characteristics of the coal. The aim of this testwork was to identify if the “stony” or high ash coal preferentially reported to the large size fraction during crushing. The results of Rio Tinto’s analyses showed that the ash preferentially reported to the +63mm fraction. This fraction typically contained in excess of 75% ash and as a result this fraction, in order to produce a low ash coal the +63mm fraction would be “scalped” off during processing. Desliming of the 0.075mm fraction would take place prior to washing.
As described in Section 13.12.2.1, the coking potential is good and improves with increasing depth.

For a domestic thermal coal product, a typical CV to be extracted from Seam 6 would be in the order of 22MJ/kg at a yield of approximately 40%. Washed volatile content of this product would typically be 28%. This meets the requirements for a domestic thermal product.

A number of coal processing studies were undertaken by Rio Tinto, the latest of which was a report prepared in 2009 as part of the PFS options phase. The report investigated the coal handling and processing for the Chapudi Section. The report concluded conventional gravity processes to produce a saleable product. The recommendations originating from the study included the following:-

- all process designs should include a rotary breaker to reject the coarse (+63mm) high ash fractions prior to further beneficiation. This is estimated to be a rejection of 37% of the RoM tonnes;
- jig and fine bypass designs could be suited to the production of a thermal coal, but not a low ash coal. Yields for a thermal coal are estimated to be 33% and 38%;
- a low ash product (Ash = 12%) may be extracted using two product heavy medium separation plants with a parallel production of the thermal middlings coal. Expected yields for a 12% Ash product are expected to be 11%;
- a single product heavy medium separation cyclone plant may be suitable for a 30% Ash product, but not for a low ash product due to the prohibitively low yields; and
- the conversion from laboratory (theoretical) yield to plant yields is expected to be a 4% yield loss and a 1% ash gain.

Snowden also investigated the potential for underground mining using longwall mining, top coal caving (or sub level caving) in longwall sections and bord & pillar methods of extraction. Snowden stated that, taking cognisance of the geotechnical information and downhole logs, it believed there is limited potential for underground mining. and that it is a high risk strategy that could only be considered as a downdip extension to the opencast method. Snowden further to stated that mining the steep dips using bord & pillar methods would not be economic and that the longwall mining has the potential for significant dilution. The roof conditions are generally poor and this would further jeopardise underground mining practises.

CoAL will initiate a PFS for the project in order to consider the optimal product stream. This will be done in light of CoAL's strategy for the Soutpansberg and its experience gained at the Makhado Project.

### 13.14.2. Historical Production

There has been no historical coal production from the Chapudi Section area.

### 13.14.3. Future Production

The future production will only be considered during a pre-feasibility study to be carried out by CoAL.

### 13.14.4. Costs

Production costs will be estimated when a proposed processing flowsheet has been designed. This can only be done when the specifications of the end product have been decided by CoAL.

## 13.15. Coal Market

No coal market has yet been identified for the Chapudi Section. However, synergies may exist to market the coal in a similar manner to that of CoAL's Makhado Project.

## 13.16. Previous Resource Statement

A Coal Resource was declared, by CoAL, as at 30 September 2012 in the CPR entitled “Independent Competent Persons’ Report on Certain Coal Assets Within the Soutpansberg Coalfield of Coal Of Africa Limited”. No additional changes have been made by CoAL to the geological model or resource estimation for the Chapudi Section since the 2012 CPR.

## 13.17. Current Resource Statement

The JORC compliant Coal Resource for the Chapudi Project, as at 31 December 2015, was estimated and signed off by CoAL's Competent Person, Mr J Sparrow (Pr.Sci.Nat.), CoAL's Group Geologist. Venmyn Deloitte reviewed the estimation procedures and considers the coal resource estimates and classification as prepared and declared by CoAL as reasonable and compliant with JORC.

The classification into the various resource categories, by CoAL, is primarily based upon the relative spacing of points of observation with both quantitative and qualitative results.
Venmyn Deloitte is confident that the logging, sampling, data density and distribution are suitable for the Coal Resource estimation. The estimation of each of the parameters required for the reporting of coal resources is presented in the section to follow. The Coal Resource Statement for the Chapudi Section, as at 29th February 2012, is presented in Table 43 and the location of the coal resources in relation to the NOMRs boundary is illustrated in Figure 73.

The estimated resources and qualities for in situ raw coal on a dmmf basis is presented in Table 39. All quality results are for the +0.075mm-63mm fraction of the coal within Rio Tinto’s Seam 6. Resources have been categorised as Inferred according to JORC Code guidelines. Only opencast resources have been considered in the reporting of MTIS.

### 13.17.1. Coal Resource Classification

While cognisance has been taken of the resource categories defined by the JORC Code (Table 12), all resources have been classified, by CoAL, in the Inferred Category as a consequence of the resource area being defined on the basis of data obtained from Rio Tinto, with no recent verification drilling or sampling by CoAL. In addition, and due to the sampling and analysing methods used by Rio Tinto, CoAL was unable to re-correlate Seam 6 into their nomenclature, i.e. into the Upper, Middle Upper, Middle Lower, Bottom Upper, Bottom Middle and Bottom Lower seams. As a result, CoAL has adopted the Rio Tinto approach and has modelled coal only within Seam 6.

Only Points of Observation with seam quality data have been used to define the resources.

While the borehole density is, in places, sufficient to classify Indicated and Measured resources, these areas have all been downgraded to the Inferred Category (Figure 74).

CoAL plans to drill the Chapudi Section and log and sample the holes according to their methods and protocols in order to carefully evaluate the deposit in line with their corporate strategy for the Soutpansberg Coalfield. Therefore future Resource Statements may be significantly different to the current estimates. It is for this reason, and the others noted above, that all resources have been classified as Inferred, even though these points of information may meet the JORC halo requirements of a higher classification category.

The observation point halos in accordance with JORC reporting standards are presented in Figure 76.

### 13.17.2. Input Parameters and Limits

CoAL’s Resource Statement, by farm, is presented in Table 43. This table presents the input parameters, the calculations and limits used in a stepwise process to obtain the resultant resource tonnages and associated qualities.

It must be noted that the resource tonnages are estimated as the volume of coal within Seam 6.

### 13.17.2.1. Volume

The volume of the seam was estimated, by CoAL, using the MinexTM model of the Seam 6 volume and percentage of coal within it, divided into the various farms or blocks. It must be noted that this calculated volume may change once CoAL has reclassified Seam 6 into its recognised coal seam nomenclature. It is therefore also for this reason that all the resources are classified as Inferred.

### 13.17.2.2. Density

The MinexTM modelled average raw density per resource block was used to calculate the tonnage from the volume. The raw density was measured from either the downhole geophysics or in the laboratory. The laboratory densities were measured using a density bottle from 1m HQ core samples over the entire seam thickness.

### 13.17.2.3. Tonnage

The tonnage is calculated, by CoAL, on a farm by farm basis from the volume multiplied by the average raw density.

### 13.17.2.4. Quality

Each of the quality parameters were modelled in Minex$^{TM}$ and the average quality per farm is reported in the Coal Resource Statement. The coal quality represents the +0.075mm-63mm fraction of the coal within Rio Tinto's Seam 6, on a dmmf basis.

### 13.17.2.5. Losses and Limits

The following cutoffs or limits were applied to the coal resources:-

- the limit of the NOPR boundary;
- the limit of the occurrence of the coal seams in the south;
- a minimum seam thickness limit of 0.5m was applied prior to the reporting of GTIS;
- all coal resources were classified as Inferred and therefore geological losses of 20% were applied prior to the reporting of TTIS. These losses take into account any unforeseen geological features, such as dykes and faults, which have not been identified in the drilling and which may have a negative impact on the coal resources; and
- no resources were classified on the farms Vleifontein 691MS and Albert 686MS (part of the Chapudi West Section) as well as on Sandpan 687MS, Waterpoort 695MS and Varkfontein 671MS. The reason for this is that no boreholes have been drilled on these particular farms (except one on Vleifontein 691MS) and the datapoint halos for Inferred Resources (Figure 76) only covers a small proportion of the farms. This has decreased the MTIS marginally;
- in the case of the farms Sutherland 693MS, Kliprivier 692MS and Coniston 699MS the resources have been extended down dip to the northern limit of the NOPRs, a small distance outside the datapoint Inferred halos. This has been considered possible as there are deep boreholes on these farms and there is no evidence of a faulting in this area from the geological map. This increase has no impact on the MTIS;

**Table 43 : Chapudi Section – Summary Resource Statement (29th February 2012) - CoAL**

RESOURCE CALCULATED AT 0.5mm MINIMUM SEAM THICKNESS

| FARM | RESOURCE CATEGORY | SEAM | AVE WIDTH (m) | COAL RAW RD (t/m³) | GROSS TONNES IN SITU | GEOL. LOSSES (%) | TOTAL TONNES IN SITU | RAW QUALITIES OF -63mm+0.075mm FRACTION ON DMMF | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | YIELD (%) (-63+0.075mm) | CV (MJ/kg) | ASH (%) | VOL (%) | FIXED CARBON (%) | SULPH. (%) | MOIST. (%) |
| Bergw after 697MS | Inferred | Coal horizons in Seam 6 | 36.61 | 2.00 | 67,580,040 | 20.00 | 54,060,000 | | 35.06 | 31.97 | 39.74 | | | |
| Bergw ater 697MS | | | 31.80 | 2.00 | 233,368,480 | 20.00 | 186,690,000 | | 35.19 | 32.32 | 41.78 | | | |
| Bushy Rise 702MS | | | 34.82 | 2.00 | 758,357,696 | 20.00 | 606,680,000 | | 35.38 | 42.47 | 40.07 | | | |
| Chapudi 752MS | | | 38.12 | 2.00 | 161,975,200 | 20.00 | 129,580,000 | | 34.85 | 44.13 | 40.45 | | | |
| Coniston 699MS | | | 22.79 | 2.00 | 743,123,328 | 20.00 | 594,490,000 | | 35.07 | 31.33 | 41.06 | | | |
| Dorpsrivier 696MS | | | 38.12 | 2.00 | 36,675,492 | 20.00 | 29,340,000 | | 35.10 | 29.83 | 40.67 | | | |
| Kalkbult 709MS | | | 37.11 | 2.00 | 325,130,688 | 20.00 | 260,100,000 | | 35.18 | 33.23 | 40.36 | | | |
| Kliprivier 692MS | | | 30.31 | 2.00 | 759,053,056 | 20.00 | 607,240,000 | | 35.13 | 32.72 | 41.40 | | | |
| Malapcheni 659MS | | | 41.11 | 2.00 | 337,437,248 | 20.00 | 269,940,000 | | 35.21 | 39.88 | 40.37 | | | |
| Mountain View 706MS | | | 37.55 | 2.00 | 432,923,008 | 20.00 | 346,330,000 | | 35.37 | 40.59 | 40.54 | | | |
| Prince's Hill 704MS | | | 34.10 | 2.00 | 289,911,616 | 20.00 | 231,920,000 | | 35.47 | 39.08 | 40.69 | | | |
| Queensdale 707MS | | | 33.43 | 2.00 | 92,603,448 | 20.00 | 74,080,000 | | 35.33 | 42.06 | 40.02 | | | |
| Rochdale 700MS | | | 24.30 | 2.00 | 37,282,280 | 20.00 | 29,820,000 | | 35.13 | 31.33 | 42.65 | | | |
| Sandilands 708MS | | | 36.39 | 2.00 | 284,823,520 | 20.00 | 227,850,000 | | 35.03 | 37.44 | 40.41 | | | |
| Sterkstroom 689MS | | | 37.21 | 2.00 | 413,309,600 | 20.00 | 330,640,000 | | 35.01 | 38.91 | 40.31 | | | |
| Sutherland 693MS | | | 35.23 | 2.00 | 638,265,152 | 20.00 | 510,610,000 | | 35.13 | 32.01 | 41.14 | | | |
| Woodlands 701MS | | | 30.35 | 2.00 | 787,203,584 | 20.00 | 629,760,000 | | 35.12 | 35.86 | 40.85 | | | |
| **TOTAL/ AVERAGE** | | **CHAPUDI** | **32.30** | **2.00** | **6,399,023,436** | **20.00** | **5,119,130,000** | | **35.17** | **36.24** | **40.75** | | | |

**Notes:**

Qualities reported as -63mm+0.075mm fraction.

Rounding down of tonnages to 100t; 1,000t and 10,000t for Measured, Indicated and Inferred, respectively.

**RESOURCE CALCULATED FOR MAXIMUM SEAM DEPTH OF 200m FOR OPENCAST ST MINING. NO UNDERGROUND MINING**

| FARM | RESOURCE CATEGORY | SEAM | AVE WIDTH (m) | COAL RAW RD (t/m³) | GROSS TONNES IN SITU | GEOL. LOSSES (%) | TOTAL TONNES IN SITU | MINING BLOCK LAYOUT LOSSES (%) | MINEABLE TONNES IN SITU | RAW QUALITIES OF -63mm+0.075mm FRACTION ON DMMF | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | YIELD (%) - 63+0.075 mm | CV (MJ/kg) | ASH (%) | VOL (%) | FIXED CARBON (%) | SULPH. (%) | MOIST. (%) |
| Bergwater 697MS | Inferred | Coal horizons in Seam 6 | 36.61 | 2.00 | 67,580,040 | 20.00 | 54,064,032 | 2.00 | 52,980,000 | 59.15 | 35.06 | 31.97 | 39.74 | | | |
| Bergwater 697MS | | | 31.76 | 2.00 | 233,050,672 | 20.00 | 186,440,538 | 2.00 | 182,710,000 | 54.33 | 35.19 | 32.33 | 41.78 | | | |
| Bushy Rise 702MS | | | 28.75 | 2.00 | 246,136,192 | 20.00 | 196,908,954 | 2.00 | 192,970,000 | 74.83 | 35.43 | 44.62 | 39.82 | | | |
| Chapudi 752MS | | | 34.97 | 2.00 | 126,749,520 | 20.00 | 101,399,616 | 2.00 | 99,370,000 | 78.21 | 34.84 | 44.71 | 40.44 | | | |
| Coniston 699MS | | | 26.37 | 2.00 | 77,145,680 | 20.00 | 61,716,544 | 2.00 | 60,480,000 | 58.61 | 35.07 | 30.07 | 41.55 | | | |
| Dorpsrivier 696MS | | | 38.12 | 2.00 | 36,675,492 | 20.00 | 29,340,394 | 2.00 | 28,750,000 | 55.38 | 35.10 | 29.83 | 40.67 | | | |
| Kalkbult 709MS | | | 29.30 | 2.00 | 83,771,560 | 20.00 | 67,017,248 | 2.00 | 65,670,000 | 72.87 | 35.18 | 32.03 | 40.39 | | | |
| Kliprivier 692MS | | | 9.47 | 2.00 | 350,811 | 20.00 | 280,649 | 2.00 | 270,000 | 57.35 | 35.33 | 30.07 | 41.47 | | | |
| Malapcheni 659MS | | | | | | | | | | | | | | | | |
| Mountain View 706MS | | | 24.10 | 2.00 | 3,851,371 | 20.00 | 3,081,097 | 2.00 | 3,010,000 | 72.43 | 35.44 | 41.33 | 40.85 | | | |
| Prince's Hill 704MS | | | 29.96 | 2.00 | 144,293,072 | 20.00 | 115,434,458 | 2.00 | 113,120,000 | 72.00 | 35.49 | 38.89 | 40.97 | | | |
| Queensdale 707MS | | | 31.28 | 2.00 | 63,764,528 | 20.00 | 51,011,622 | 2.00 | 49,990,000 | 71.93 | 35.33 | 42.06 | 40.06 | | | |
| Rochdale 700MS | | | 24.30 | 2.00 | 37,278,388 | 20.00 | 29,822,710 | 2.00 | 29,220,000 | 58.59 | 35.13 | 31.33 | 42.65 | | | |
| Sandilands 708MS | | | 29.94 | 2.00 | 113,577,952 | 20.00 | 90,862,362 | 2.00 | 89,040,000 | 70.76 | 34.97 | 36.91 | 40.46 | | | |
| Sterkstroom 689MS | | | 34.11 | 2.00 | 202,578,880 | 20.00 | 162,063,104 | 2.00 | 158,820,000 | 69.57 | 35.01 | 39.07 | 40.21 | | | |
| Sutherland 693MS | | | 22.31 | 2.00 | 69,689,344 | 20.00 | 55,751,475 | 2.00 | 54,630,000 | 55.35 | 35.14 | 32.23 | 40.93 | | | |
| Woodlands 701MS | | | 28.65 | 2.00 | 175,242,480 | 20.00 | 140,193,984 | 2.00 | 137,390,000 | 68.20 | 35.23 | 38.04 | 41.27 | | | |
| **TOTAL/ AVERAGE CHAPUDI** | | | **30.20** | **2.00** | **1,681,735,982** | **20.00** | **1,345,388,786** | **2.00** | **1,318,420,000** | **67.22** | **35.18** | **37.52** | **40.72** | | | |

**Notes:**

Minimum seam thickness of 0.5 applied to GTIS.

Maximum seam depth of 200m for opencast mining.

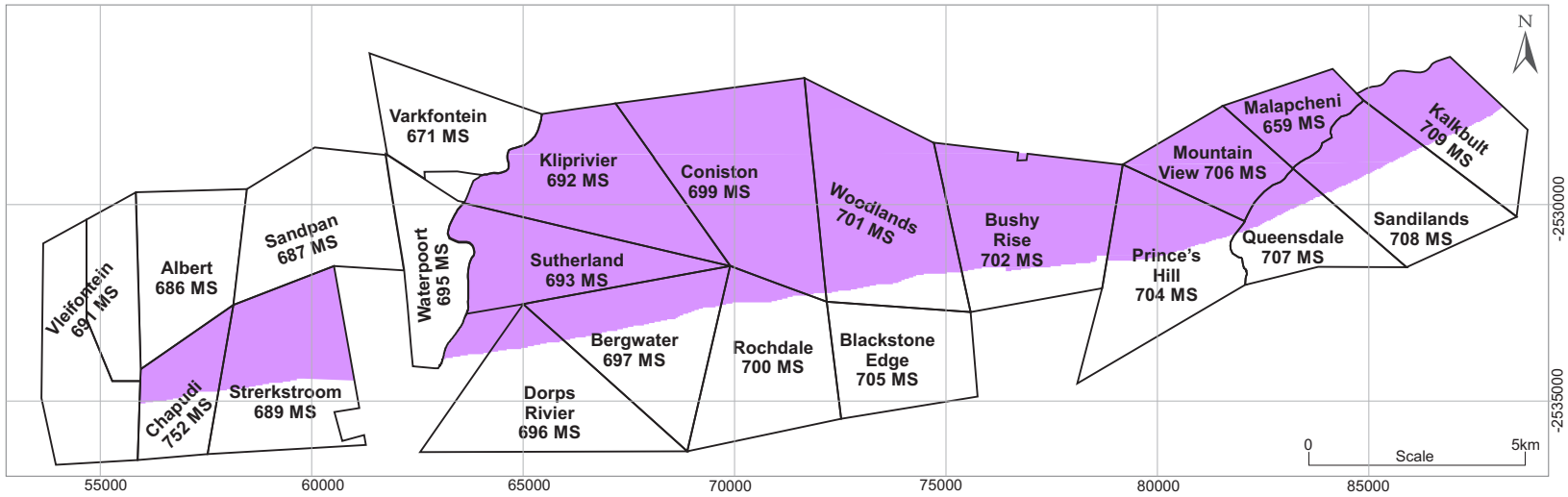
No underground mining.

Qualities reported as -63mm+0.075mm fraction.

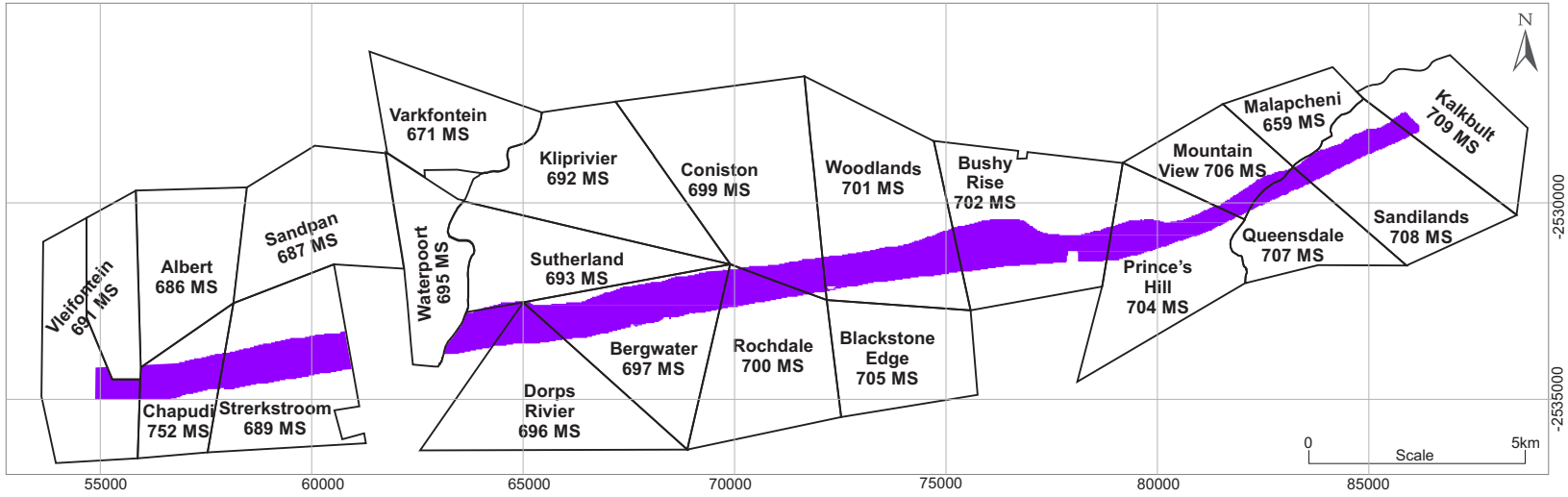
Rounding down of tonnages to 100t; 1,000t and 10,000t for Measured, Indicated and Inferred, respectively.

## CHAPUDI SECTION - LOCATION OF RESOURCES AT 0.5M (TTIS) CUTOFF SEAM THICKNESSES

### SEAM 6 GTIS RESOURCE




### SEAM 6 MTIS RESOURCE

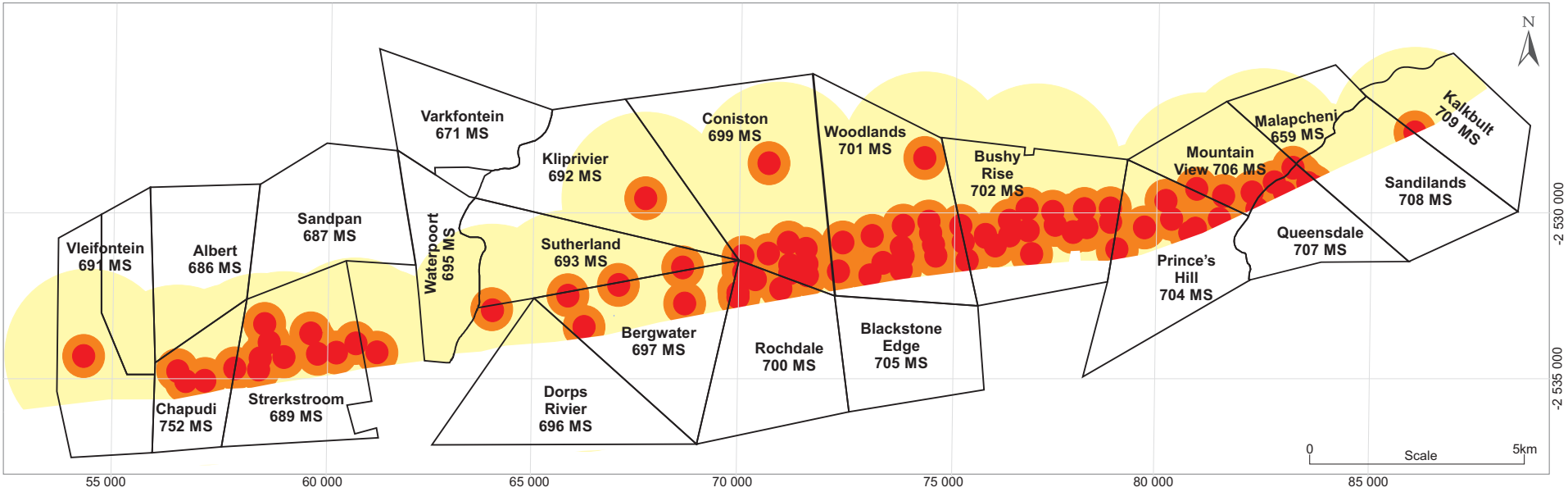



**Mineral Resource**

- Prospecting Rights Boundary
- Seam 6 GTIS Resource
- Seam 6 MTIS Resource

Source: Coal of Africa
VMD1971_CoAL GSP CPR_2015

## CHAPUDI SECTION – OBSERVATION POINT HALOS IN ACCORDANCE WITH JORC REPORTING STANDARDS




**Mineral Resource**

- Measured (250m radius from borehole with quality data)
- Indicated (500m radius from borehole with quality data)
- Inferred (2,000m radius from borehole with quality data)
- Prospecting Rights Boundary

*Note: All resources downgraded to Inferred*

Source: Coal of Africa
VMD1971_CoAL GSP CPR_2015

Figure 74

- mining limit is set from the level of oxidation (at approximately 18m from surface) to a maximum depth of 200m;
- opencast mining methods only are considered; and
- mining layout losses of 2% were applied prior to the calculation of MTIS.

### 13.17.3. Differences Between Resource Statements

No Differences occur between the February 2012 Coal Resource statement and the current Coal Resource statement.

## 13.18. Ore Reserve Statement

As a result of the current stage of development of the Chapudi Section, no reserves have yet been declared. Reserves can only be declared once a mining plan has been prepared by CoAL.

# 14. Chapudi West

The Chapudi West Section is at an early stage of exploration, with potential for coking coal and possibly a middlings fraction for power generation. Chapudi West Section was acquired by CoAL pursuant to the Soutpansberg Properties Acquisition with Rio Tinto. It is comprised of nine farms situated adjacent and to the west of the Chapudi.

## 14.1. Location

The Chapudi West Section is situated in the magisterial district of Vhembe, in the Limpopo Province of South Africa and extends over a total strike length of approximately 10km. The location of the Chapudi West Section area in relation to regional infrastructure and the mineral tenure in the greater Soutpansberg Project area is illustrated in Figure 63. The Chapudi West Section lies adjacent to and along strike to the west of the Chapudi Section.

The nearest town is Louis Trichardt, situated approximately 70km to the south of the easternmost extent of the Chapudi Section area (Figure 63). The town of Musina is located approximately 85km north of the Chapudi Section area.

## 14.2. Access

Access to the Chapudi West Section area is via the tarred national N1 road from Louis Trichardt to Musina, located immediately east of the project area. The N1 road is in excellent condition. The project area is easily accessed via the R523 off the N1 (Figure 63). This well maintained tarred road runs along the entire length of the Chapudi and Chapudi West section areas roughly bisecting the project area through its centre. The project area is approximately 400km, by road from the capital, Pretoria. Further access on the various properties within the project area is via by a network of gravel farm roads that branch off the R523.

## 14.3. Climate and Topography

Chapudi West experiences a warm, semi-arid climate. The area has an average maximum summer temperature of 32°C and an average maximum temperature of 26°C. The region receives an average annual rainfall of 356mm in the form of summer thunderstorms. The average evaporation rate is between 1,700mm and 2,000mm per annum.

Operations can occur all year round and the climatic conditions generally do not prevent exploration or mining operations. However, during times of heavy downpours, temporary delays may be experienced.

The topography of the majority of the Chapudi West Section area is relatively flat and lies at an average elevation of about 750mamsl. The Soutpansberg Mountain Range runs along the southern edge of the project area, as indicated on Figure 2, which reaches a maximum elevation of 1,747mamsl in the south of the project.

## 14.4. Fauna & Flora

The Chapudi West Section area falls within the North Eastern Mountain Sour Veld and the Soutpansberg Arid Mountain Bushveld biomes, characterised predominantly by a grassy ground layer and an upper layer of woody plants, dominated by sweet thorn and mopane.

The land is mainly given over to commercial crop and cattle farming as well as game ranching in less arable areas.

## 14.5. Legal Aspects

### 14.5.1. Ownership by CoAL

The Chapudi West Section comprises nine farms, or portions thereof, held an accepted application for a NOMR by CoAL's wholly owned subsidiary Chapudi Coal (Pty) Ltd (subsequent to Section 11 transer and Section 102 approval). CoAL's interest in the mineral rights within the Chapudi West Section is a consequence of the Soutpansberg Properties Acquisition Agreement.

The ownership and the NOMRs relevant to the Chapudi West Section are graphically represented in Figure 64.

### 14.5.2. Mineral Tenure

All of the three NOPRs held by CoAL for the farms that make up the Chapudi West Section expired by June 2014. In May 2013 CoAL applied for a NOMR under its wholly owned subsidiary Chapudi Coal (Pty) Ltd for all of the Chapudi Section. The DMR issued an acceptance letter for the NOMR application in July 2013. Venmyn Deloitte has viewed the acceptance letters and confirms the security of the mineral tenure.

The rights relating to the Chapudi West Section is summarised in Table 45.

### 14.5.3. Surface Rights

CoAL will re-negotiate access to all Chapudi West Section properties.

### 14.5.4. Royalties

There are no private royalties payable for the Chapudi West Section. State royalties, as per the MPRRA will be payable, however, on any future production.

### 14.5.5. Material Contracts

Currently there are no offtake agreements, operational contracts or contract mining agreements that are relevant to the Chapudi West Section, as it is still in the early stages of development.

### 14.5.6. Other Legal Issues

CoAL has informed Venmyn Deloitte of land claims on 21 the farms that form part of the Chapudi West Section. A summary of the land claims on the Chapudi West Section are listed in Table 44.

The land claims on the various properties have been gazetted by the Department of Rural Development and Land Reform (DRDLR). CoAL recognises land claimants as key stakeholders, and the company's engagement is governed by the company's stakeholder engagegemt strategy that ensures regular, meaningful and transparent engagement.

CoAL recognises the legislative framework of the land claims process and will work within that framework.

Venmyn Deloitte has not been made aware of any litigation or competing rights associated with the Chapudi West Section.

## 14.6. Infrastructure

The project is well situated with respect to the major infrastructural aspects of rail, road and power.

**Table 44: Summary of Land Claims on the Chapudi West Section**

| SECTION | FARM NAME & NO. | PORTION NO. | LAND OWNER | LAND CLAIMANT | OFFICIAL |
|---|---|---|---|---|---|
| Chapudi West | Albert 686MS | Whole farm | Andre Francois Pauer | Tshivhula / Leshiba | Cate Mashaphu |
| | Enfield 521MS (Incorporates Enfield 474MS & Bosdoorn 682MS) | Portion 1 | Grootboomen Eiendomme (Pty) Ltd | Neighbour 100mm Zone (But not identified) | |
| | Middelfontein 683MS | Whole farm | JG du Preez Trust | No land claimant | Not stated |
| | Vleifontein 691MS | RE | Martha Louisa Susanna Pauer | Not stated | |
| | | Portion 1 | Amelia Elizabeth Pauer | No land claimant | |
| | Bluebell 480MS | RE | EMW Lewende Trust | | |
| | | Portion 1 | Jannie & Annette Moolman | | |
| | Grootboomen 476MS | Whole farm | Grootboomen Eiendomme (Pty) Ltd | Tshivhula | |
| | Melrose 469MS | Whole farm | Michael Albertus Otto | No land claimant | |
| | Vastval 477MS | RE | Manupont 124 (Pty) Ltd | Tshivhula | |
| | | RE of portion 1 | Lambert Hendrik Fick | | |
| | | Portion 2 | Hector Kincaid-Smith | | |
| | Grootvlei 684MS | Whole farm | Not stated | Mulambwane | Cate Mashaphu |

The railway linking Gauteng (in South Africa) and Zimbabwe is situated approximately 5km east of the Chapudi West area with the nearest rail siding, Waterpoort, being located on the farm Dorpsrivier 696MS in the Chapudi Section (Figure 63).

Eskom grid powerlines are located parallel to the N1 and are situated approximately 35km west of the Chapudi West Section at their closest point.

Water for drilling and potable requirements is currently available from the local surface owner's farm dams.

### 14.6.1. Local Resources

Louis Trichardt and Musina are regional centres and provide modern conveniences, including accommodation and services. The towns are also sources of fuel and labour. A small village exists at Waterpoort.

## 14.7. Regional Geological Setting

The Chapudi West Section is situated within an extension of the Tshipise Coalfield, a subdivision of the Soutpansberg Coalfield (Figure 11). This extension is referred to as the Waterpoort Coalfield in some of the literature. The reader is referred to Section 7.2 on the regional geology of the Tshipise Coalfield, as described for the Makhado Project. As stated in this earlier section, the Tshipise Coalfield comprises a number of east-west trending half-graben structures in which Upper Ecca Group are preserved. The geology is generally broken up into fault blocks by a number of parallel strike faults.

## 14.8. Local Geological Setting

Within the Chapudi West Section area, seven coal zones (or seams) are recognised, three of which occur in the Lower Ecca Group with the remaining four occurring in the Upper Ecca Group. The reader is referred to Section 13.8 for a description of the local geology of the Chapudi Section which is applicable to Chapudi West.

## 14.9. Historical Ownership

The historical ownership and associated activities with respect to the Chapudi Section is summarised in Table 40. No specific information was available for the Chapudi West Section as it has formed part of the Chapudi Section during Rio Tinto's activities.

**Table 45 : Summary of the Chapudi West Section Mineral Tenure**

| SECTION | FARM NAME & NO. | PORTION NO. | AREA (ha) | APPLYING ENTITY | NEW ORDER LICENCE TYPE | LICENCE NO. | SUBMISSION DATE OF MINING RIGHT APPLICATION | DATE OF MINING RIGHT APPLICATION ACCEPTANCE LETTER | SURFACE RIGHTS |
|---|---|---|---|---|---|---|---|---|---|
| Chapudi West | Albert 686MS | Whole farm | 898.84 | Kwezi Mining Exploration (Pty) Ltd | Mining | LP 30/5/1/2/2/51 PR/ 10056 MR | 10/05/2013 | 09/07/2013 | No |
| | Enfield 521MS (Incorporates Enfield 474MS & Bosdoorn 682MS) | Portion 1 | 173.02 | | | | | | No |
| | Middelfontein 683MS | Whole farm | 869.53 | | Mining | LP 30/5/1/2/2/676 PR/ 10043 MR | 10/05/2013 | 09/07/2013 | No |
| | Vleifontein 691MS | Portion 1 & RE | 1,410.17 | | | | | | No |
| | Bluebell 480MS | Portion 1 & RE | 1,549.62 | | Mining | LP 30/5/1/2/2/10039 PR/ 10049 MR | 10/05/2013 | 15/07/2013 | No |
| | Grootboomen 476MS | Whole farm | 530.77 | | | | | | No |
| | Melrose 469MS | Whole farm | 724 .42 | | | | | | No |
| | Vastval 477MS | Portion 2, RE of portion 1 & RE | 1,998.9 | | | | | | No |
| | Grootvlei 684MS | Whole farm | 847 | | Mining | LP 30/5/1/2/2/51 PR/ 10056 MR | 10/05/2013 | 09/07/2013 | No |
| **TOTAL CHAPUDI WEST** | | | **6,867.68** | | | | | | |

## 14.10. Historical Exploration and Mining

19 historical boreholes have been drilled on the Chapudi West Section five by Trans Natal Coal Mining Company and 11 by Iscor from 1973 to 1974. The boreholes were included in the geological model of the Chapudi Section. However, due to the paucity of points of information, no resources have been declared for the Chapudi West Section, although the presence of coal is known.

## 14.11. Recent Exploration Trans Natal Coal Mining Company

The Chapudi West Section was only the subject of the reconnaissance drilling programme by Rio Tinto between 2003 and 2005, during which three boreholes were drilled on the farm Grootvlei 684 MS and Grootboomen 476 MS (Table 46). The location of these two boreholes is presented in Figure 66. The boreholes on the Chapudi West were sampled for petrographical analysis only.

CoAL has not drilled any confirmatory boreholes into this section. This is now a priority for CoAL, especially in light of the change of product direction which CoAL would take for the project.

#### 14.11.1.1. Surveying Methods

During the Reconnaissance Stage, the borehole collar coordinates were measured with a handheld GPS. The reader is referred to Section 13.11.2 for a description of Rio Tinto's survey methods.

### 14.11.2. Diamond Drilling

All the exploration drilling was undertaken by Earth Resources. All drilling has been managed by Rio Tinto, with Mr. D. Hristov as the geologist responsible for the drilling and sampling.

Neither CoAL nor Venmyn Deloitte have independently witnessed the drilling and sampling protocols as no exploration drilling is currently taking place. However, Venmyn Deloitte is confident that the drilling was carried out to the required standard as these programmes were undertaken by a large international and reputable company utilising best practise standards. The details on the drilling, sampling and analytical methods and protocols are very well documented in reports prepared by Rio Tinto, as summarised in this section, and this adds to the confidence which CoAL and Venmyn Deloitte have in the integrity of the data and accuracy of the results.

The reader is referred to Section 13.11.3 for a detailed description of the diamond drilling practises carried out by Rio Tinto.

#### 14.11.2.1. Logging

Geotechnical and initial lithological logging was carried out whilst the core was in the split inner tube. Core was then transferred into numbered core trays. Core was not split prior to logging in order to minimise the effects of oxidation. The core boxes were then transported to a refrigerated container for storage.

#### 14.11.2.2. Sampling Method

Two types of samples were collected from the Rio Tinto drilling. These included samples for coal quality and washability testing and samples for petrographical analysis. The two boreholes on Chapudi West were only sampled for petrographical analysis.

### 14.11.3. Down the Hole Geophysics / Wireline Logging

No downhole geophysical surveys were conducted on two boreholes drilled in the Chapudi West Section.

### 14.11.4. Bulk Sampling

No bulk sampling has been carried out on the Chapudi West Section.

### 14.11.5. Laboratory Analyses

Only a petrographical analysis was undertaken on the Chapudi West boreholes.

**Table 46 : Chapudi West Section – Summary of Historic and Recent Drilling**

| DATE | COMPANY | LOCATION | PURPOSE | SURVEYOR | DRILLING COMPANY | TYPE OF DRILLING | SIZE | RESPONSIBLE GEOLOGIST | TOTAL NO. B/H | WIRELINE LOGGING | SEAMS SAMPLED | QUALITY RESULTS | LABORATORY FOR QUALITY | USED IN MODEL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1968 - 1975 | Trans Natal Coal Mining Company | Grootvlei 684MS, Vastval 477MS | Early exploration and resource estimation. | Unknown. | Unknown. | Diamond core | NQ | J. Raubenheimer, J Liebenberg | 5 | No | All | Yes | Fuels Research Institute of South Africa | No |
| 1975 - 1982 | Iscor | Vleifontein 691MS | Early exploration and resource estimation. | Unknown. | Unknown. | Diamond core | NQ | H. Van den Berg | 11 | No | All | Yes | Iscor | No |
| 2003 - 2005 | Rio Tinto | Vleifontein 691MS, Grootvlei 684MS, Grootboomen 476MS | Reconnaissance Drilling | Unknown. | Unknown. | Reverse Circulation | 8 inch | D. Hirstov | 3 | Yes | Unknown | No | - | Yes |
| | | | | | | | | **TOTAL** | **14** | | | | | |

### 14.11.6. Data Management

#### 14.11.6.1. Data Acquisition and Validation

The data acquisition protocols utilised for Chapudi West are the same as those for the Chapudi Section, as described in Section 13.11.8.1.

#### 14.11.6.2. Database Management

Similarly Rio Tinto data management systems utilised for Chapudi West are the same as those for the Chapudi Section, as described in Section 13.11.8.2.

## 14.12. Orebody Modelling and Results

The two boreholes situated in the Chapudi West Section were included in the orebody model prepared by Rio Tinto, which was used to generate the resource statement issued in 2008. This resource statement was prepared at the conclusion of the OMS study and included the reconnaissance and OMS drilling. The resource was estimated for the coal horizons within Seam 6 and extended to a maximum depth of 200m.

The latest model for the Chapudi West Section, was prepared by Mr. J. Sparrow (Pr.Sci.Nat), CoAL's Competent Person, as at 29 February 2012. The model was prepared in Minex Software. The model takes into account all available recent drilling and other geological information as of the 29 February 2012.

The reader is referred to Section 13.12 for a detailed description of the orebody modelling process. The results of the orebody modelling are illustrated in the Chapudi Section diagrams (Figure 70 to Figure 74) and discussed in Section 13.12.1 to Section 13.12.2.

## 14.13. Coal Mining

No mine planning has been undertaken specifically on the Chapudi West Section. However, an Options Study was conducted by Snowden, in June 2009, on the mining of the Chapudi Section. The reader is referred to Section 13.13 for a description of the results of this study.

## 14.14. Coal Processing

Extensive and highly detailed testwork has been carried out on the samples derived from the various exploration campaigns carried out at the Chapudi Section. However, no studies have been carried out at Chapudi West Section due to its early stage of development.

## 14.15. Coal Market

No coal market has yet been identified for the Chapudi West Section. However, synergies may exist to market the coal in a similar manner to that of CoAL's Makhado Project.

## 14.16. Previous Resource Statement

The previous Mineral Resource Statement for the Chapudi Section was prepared and signed off by Rio Tinto in February 2008. However, no resources were declared, by CoAL for Chapudi West due to the paucity of boreholes.

## 14.17. Current Resource Statement

No resources have been declared for the Chapudi West Section, although the presence of coal has been demonstrated.

## 14.18. Ore Reserve Statement

As a result of the early stage of development of the Chapudi West Section and current lack of resources, no reserves can be declared.

# 15. Wildebeesthoek

The Wildebeesthoek Section, located within the Soutpansberg Coalfield, is an early-stage exploration project. It represents the least developed section of the Chapudi Project. There are currently no coal resources associated with the project, but the presence of coal is known. CoAL acquired the Wildebeesthoek Section from Rio Tinto as part of the Soutpansberg Properties Acquisition Agreement.

## 15.1. Location

The Wildebeesthoek Section is situated in the magisterial district of Vhembe, in the Limpopo Province of South Africa. The location of the Wildebeesthoek Section area in relation to regional infrastructure and the mineral tenure in the greater Soutpansberg Project area is illustrated in Figure 75.

The nearest town is Louis Trichardt, situated approximately 25km to the southeast of the Wildebeesthoek Section area. Musina is located approximately 50km to the northeast of the project area.

## 15.2. Access

Access to the Wildebeesthoek Section area is via the tarred national N1 road (which passes immediately to the east of the project area) from Louis Trichardt to Musina. The various properties can be accessed by a network of gravel roads that branch off the N1 and R523. The gravel roads are in a good condition, whilst the N1 road is in an excellent condition. The project area is approximately 400km, by road from the capital, Pretoria.

## 15.3. Climate and Topography

Wildebeesthoek experiences a warm, semi-arid climate as described in Section 10.3. Operations can occur all year round and the climatic conditions generally do not prevent exploration operations. However, during times of heavy downpours, temporary delays may be experienced.

The topography of the Wildebeesthoek Section area is relatively flat and lies at an average elevation of about 750mamsl. The area is drained by the non-perennial Mutamba River which flows in an easterly direction across project area.

## 15.4. Fauna & Flora

The Wildebeesthoek Section area falls within the North Eastern Mountain Sour Veld and the Soutpansberg Arid Mountain Bushveld biomes, characterised predominantly by a grassy ground layer and an upper layer of woody plants, dominated by sweet thorn and mopane.

The land is mainly given over to cattle and game ranching with localised arable farming.

## 15.5. Legal Aspects

### 15.5.1. Ownership by CoAL

The 11 farms that constitute the Wildebeesthoek Section are held by an accepted application for a NOMR under CoAL's wholly owned subsidiary Chapudi Coal (Pty) Ltd (subsequent to Section 11 transfer and Section 102 approval). CoAL's interest in the mineral rights within the Wildebeesthoek Section is a consequence of the Soutpansberg Properties Acquisition Agreement.

Figure 75 graphically represents the ownership and the NOMRs relevant to the Wildebeesthoek Section.

### 15.5.2. Mineral Tenure

All of the three NOPRs held by CoAL for the farms that make up the Chapudi West Section expired by June 2013. In May 2013 CoAL applied for a NOMR under its wholly owned subsidiary Chapudi Coal (Pty) Ltd for all of the Chapudi Section. The DMR issued an acceptance letter for the NOMR application in July 2013. Venmyn Deloitte has viewed the acceptance letters and confirms the security of the mineral tenure.

The rights relating to the Wildebeesthoek Section are summarised in Table 47 and their locations are graphically presented in Figure 77. CoAL's interest in the mineral rights within the Wildebeesthoek Section is a consequence of the acquisition agreement discussed in Section 6.3.

### 15.5.3. Surface Rights

There are currently agreements with the surface rights owners to access the properties for exploration purposes and access is sufficient for most of their prospecting requirements.

### 15.5.4. Royalties

There are no private royalties payable for the Wildebeesthoek Section. State royalties, as per the MPRRA will be payable on any future production, however.

### 15.5.5. Material Contracts

Venmyn Deloitte is not aware of any material contracts in place for the Wildebeesthoek Section, other than the recent acquisition agreement between Coal and Rio Tinto.

### 15.5.6. Other Legal Issues

CoAL has informed Venmyn Deloitte of land claims on 5 the farms that form part of the Chapudi West Section. A summary of the land claims on the Wildebeesthoek Section are listed in Table 48.

The land claims on the various properties have been gazetted by the Department of Rural Development and Land Reform (DRDLR). CoAL recognises land claimants as key stakeholders, and the company's engagement is governed by the company's stakeholder engagegemt strategy that ensures regular, meaningful and transparent engagement.

CoAL recognises the legislative framework of the land claims process and will work within that framework.

Venmyn Deloitte is not aware of any land claims associated with the Wildebeesthoek Section area. Venmyn Deloitte is not aware of any litigation or competing rights associated with the Wildebeesthoek Section area.

## 15.6. Infrastructure

The project is well situated with respect to the major infrastructural aspects of rail, road and power.

The railway linking Gauteng (in South Africa) and Zimbabwe traverses the western most corner of the project area (Figure 77). CoAL has negotiated the rights to the Huntleigh Siding, located approximately 15km to the north of the project area.

Eskom grid powerlines run parallel to the N1 and are located 3km from the easternmost boundary of the project area (Figure 77).

Water for drilling can be sourced from farmers' dams or from boreholes.

Due to the fact that the Wildebeesthoek Section is still at an exploration stage, details on the availability and requirements of power, water, tailings disposal and other infrastructural items have not been investigated in detail and are therefore not reported upon in this document.

### 15.6.1. Local Resources

The nearest towns of Louis Trichardt and Musina are regional centres and provide modern conveniences, including accommodation and services. The towns are also sources of fuel and labour.

## 15.7. Regional Geological Setting

The Wildebeesthoek Section is situated within the Waterpoort Coalfield subdivision of the greater Soutpansberg Coalfield (Figure 11). The reader is referred to Section 0 on the regional geology of this coalfield.

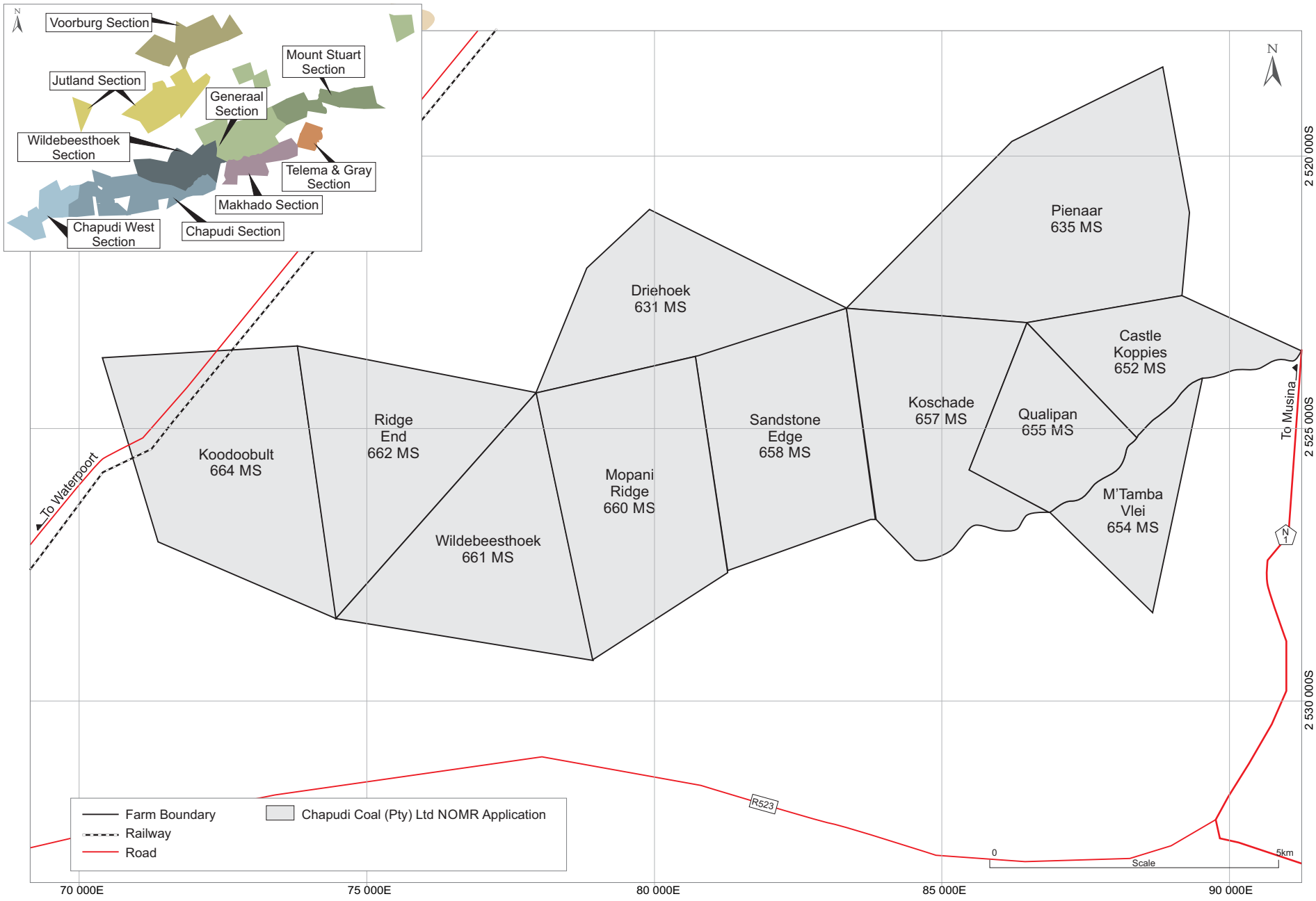
## 15.8. Local Geological Setting

The Wildebeesthoek Section represents an isolated and upfaulted block of Karoo age sediments, which lies adjacent to the Chapudi Section (Figure 76). The area is interpreted as representing an up-faulted extension of the coal seams from down dip of the main Chapudi Section.

**Table 47 : Summary of the Wildebeesthoek Section Mineral Tenure**

| SECTION | FARM NAME & NO. | PORTION NO. | AREA (ha) | APPLYING ENTITY | NEW ORDER LICENCE TYPE | LICENCE NO. | SUBMISSION DATE OF MINING RIGHT APPLICATION | DATE OF MINING RIGHT APPLICATION ACCEPTANCE LETTER | SURFACE RIGHTS |
|---|---|---|---|---|---|---|---|---|---|
| Wildebeesthoek | Castle koppies 652MS | Whole farm | 554.04 | Kwezi Mining Exploration (Pty) Ltd | Mining | LP 30/5/1/2/2/51PR/ 10056 MR | 10/05/2013 | 09/07/2013 | No |
| | Mapani Ridge 660MS | Whole farm | 1,193.2 | | Mining | LP 30/51/2/2/676 PR/ 10043 MR | 10/05/2013 | 09/07/2013 | No |
| | M'Tamba Vlei 654MS | Whole farm | 523.51 | | | | | | No |
| | Qualipan 655MS | Whole farm | 523.51 | | | | | | No |
| | Wildebeesthoek 661MS | Whole farm | 1,033.93 | | | | | | No |
| | Driehoek 631MS | Whole farm | 873.73 | | Mining | LP 30/5/1/2/2/45 PR/ 10055 MR | 10/05/2013 | 03/07/2013 | No |
| | Pienaar 635MS | Portion 1 & RE | 1,590 | | | | | | No |
| | Koodoobult 664MS | RE | 1,337.6 | | Mining | LP 30/5/1/2/2//1/170PR/ 10052 MR | 10/05/2013 | 23/07/2013 | No |
| | Koschade 657MS (formerly Mapani Kop 656MS) | Whole farm | 981.46 | | | | | | No |
| | Ridge End 662MS | Portion 1 & RE | 1,037.08 | | | | | | No |
| | Sandstone Edge 658MS | Whole farm | 1,076.97 | | | | | | No |
| **TOTAL WILDEBEESTHOEK** | | | **10,725.03** | | | | | | |

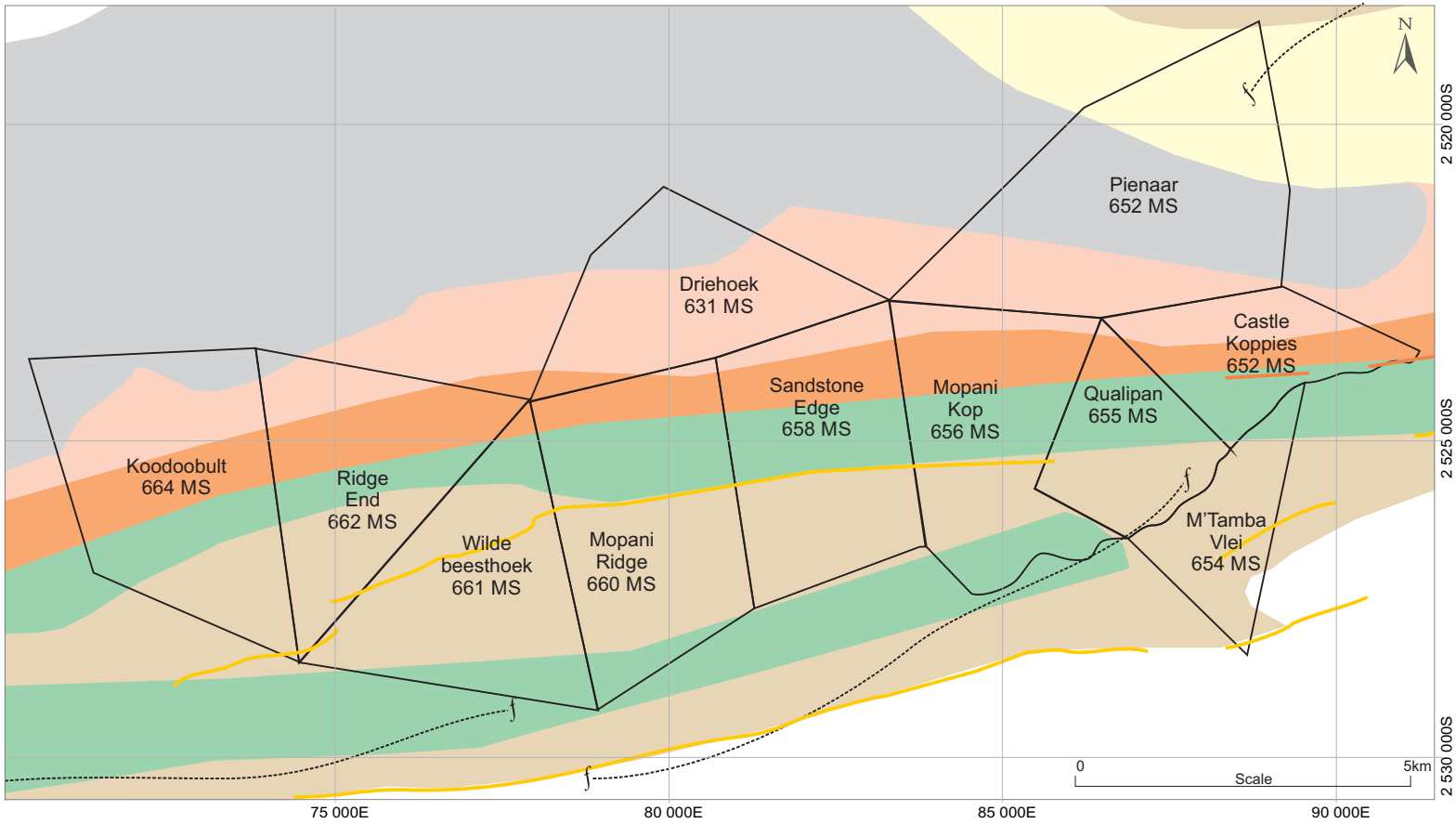
## LOCATION OF THE WILDEBEESTHOEK SECTION IN RELATION TO LOCAL INFRASTRUCTURE AND MINERAL TENURE

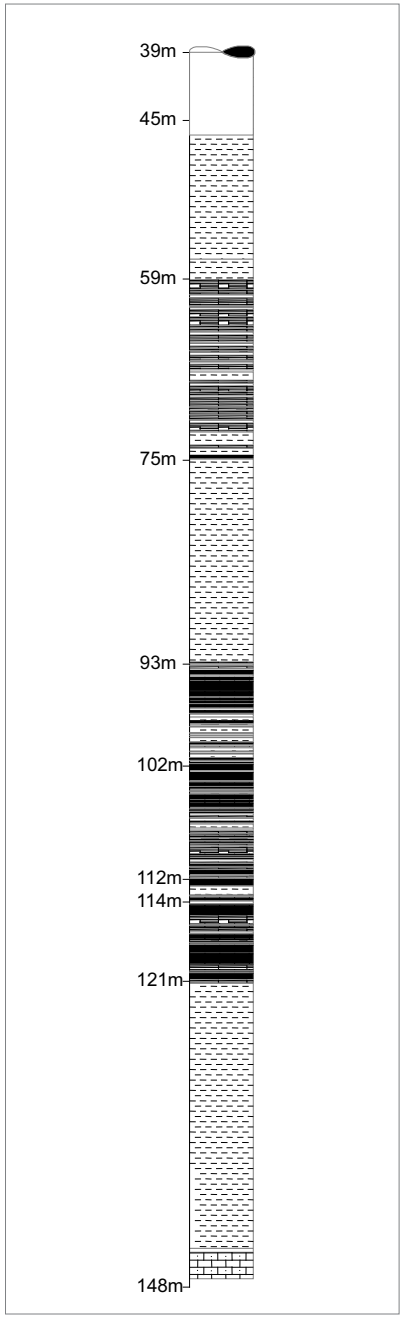



Source: Coal of Africa
VMD1971_CoAL GSP CPR_2015

Figure 75

## LOCAL GEOLOGICAL MAP AND TYPICAL STRATIGRAPHIC COLUMN FOR THE WILDEBEESTHOEK SECTION




Faults
Farm Boundary
Quartenary
Letaba
Clarens
Elliot
Molteno
Beaufort
Fripp Formation
Ecca

Shale
Mudstone
Carbonaceous Shale
Coal
Dwyka

Source: Coal of Africa
VMD1971_CoAL GSP CPR_2015

Coal of Africa

Figure 76

**Table 48: Summary of Land Claims for the Wildebeesthoek Section**

| SECTION | FARM NAME & NO. | PORTION NO. | LAND OWNER | LAND CLAIMANT | OFFICIAL |
|---|---|---|---|---|---|
| Wildebeesthoek | Castle koppies 652MS | Whole farm | Not stated | Ramalamula MJ, Musekwa & Mulambwane | Cate Mashaphu |
| | Mapani Ridge 660MS | | Berta Trust | No land claimant | Not stated |
| | M'Tamba Vlei 654MS | | Manupont 124 (Pty) Ltd | | |
| | Qualipan 655MS | | Manupont 124 (Pty) Ltd | Mulambwane | |
| | Wildebeesthoek 661MS | | Pieter Willem Adriaan Espach | No land claimant | |
| | Driehoek 631MS | | Berta Trust | Mulambwane | Mpoi Charles Hamese |
| | Pienaar 635MS | Portion 1 & RE | Not stated | | |
| | Koodoobult 664MS | RE | Lambert Hendrik Fick | | Degrecia Tshibudzi |
| | Koschade 657MS (formerly Mapani Kop 656MS) | Whole farm | Manupont 124 (Pty) Ltd | No land claimant | |
| | Ridge End 662MS | Portion 1 | Lambert Hendrik Fick | | |
| | | RE | Johannes Adolf Hartzenberg | | |
| | Sandstone Edge 658MS | Whole farm | Berta Trust | Tshivhula | |

The project area comprises the typical local Karoo strata as elsewhere within the basin, and most similar to that of the Chapudi Section (Section 13.8). The coal bearing strata sub-crops and is again, very similar to that of the adjacent Chapudi Section (Section 13.8).

Airborne geophysics and limited exploration drilling, within the project area, suggest the presence of numerous dolerite dykes. These dykes, together with the up-faulted nature of the coal, while disrupting the coal sequence, have contributed to the increase in rank observed within the coal locally. This introduces the possibility that, at least locally, the coal from this project could have better coal qualities than that encountered at the Chapudi Section, especially down dip, due to the increase in rank observed with depth.

## 15.9. Historical Ownership

The historical ownership and associated activities with respect to the Wildebeesthoek Section is summarised in Table 49.

**Table 49 : Wildebeesthoek Section – Summary of Historical Ownership and Activities**

| DATE | COMPANY | ACTIVITY |
|---|---|---|
| 1975 - 1978 | Iscor Ltd (now Exxaro Resources Ltd) | Drilled 69 boreholes over the Wildebeesthoek Section area. |
| 2004 - 2009 | Rio Tinto Mining & Exploration Ltd. (Rio Tinto) | Four diamond core holes drilled on the farms Wildebeesthoek 661MS and Mapani Ridge 660MS. |
| 2009 | | Farm Swap Agreement finalised and executed. |
| 2011 | CoAL | Concluded transaction with Rio Tinto & Kwezi Mining to acquire rights to their farms, and submitted Section 11 transfer application. |
| 2012 | | Section 11 approval for properties subject to the Soutpansberg Properties Acquisition Agreement |

## 15.10. Historical Exploration

Between 1975 and 1978, Iscor drilled a total of 94 boreholes over the Wildebeesthoek Section area. The location of the boreholes is shown on Figure 77. The Iscor boreholes are believed to have been drilled vertically.

The drilling and sampling protocols used by Iscor are unknown. However, it is assumed that the drilling methods were conventional and pre-date the more efficient triple-tube wireline techniques that are commonly employed today.

It is not known whether the Iscor borehole collars were professionally surveyed.

The Iscor boreholes were sampled and sent to their in-house laboratory for analysis. Typically 13 samples were taken from the top to the base of the coal bearing strata, and numbered consecutively in this order. Raw analyses were carried out on the coal samples. Washed analyses were only undertaken at an RD=1.40. Proximate, CV, Roga and Swell Index testwork was carried out.

The Iscor borehole database was acquired in 2007 by CoAL; however, quality data is only available for two boreholes.

## 15.11. Recent Exploration

Rio Tinto drilled 4 boreholes within the Wildebeesthoek Section area on the farms Wildebeesthoek 661MS and Mapani Ridge 660MS. No specific details are available regarding Rio Tinto's drilling and sampling protocols, but it is assumed that they implemented the same protocols as discussed for the Chapudi Section (Section 13.11).

The location of these boreholes is indicated on Figure 79.

Seam 6 was sampled on a ply-by-ply basis.

In 2013 CoAL drilled ten diamond core and ten RC boreholes over the Wildebeesthoek Section to assist with structural interpretation. The new boreholes were used to update the geological model but not the Coal Resource estimation as no sampling was conducted.

### 15.11.1. Bulk Sampling

No bulk sampling has been carried out on the Wildebeesthoek Section.

### 15.11.2. Laboratory Analyses

Samples from the Rio Tinto drilling campaign were analysed at ALS Brisbane (ISO 17025 accredited). Products were returned to South Africa for petrographic analysis.

Coking quality analysis was not undertaken, however a sample taken from Seam 6 (6A) did produce an $R_oV_{max}$ of 1.74%, which is considered by Venmyn Deloitte as encouraging.

No specific details are available regarding Rio Tinto's analytical, QA/QC and security protocols for the Wildebeesthoek Section, but it is assumed that they implemented the same protocols as discussed for the Chapudi Section (Section 13.11.7).

### 15.11.3. Data Management

#### 15.11.3.1. Data Acquisition and Validation

CoAL purchased both hard and electronic data copies of the original Iscor database from Exxaro in 2007; however, quality data is only available from two boreholes. CoAL acquired the data from the four Rio Tinto boreholes from Rio Tinto in 2011. This data is stored in an Access database.

No data verification has yet been conducted.

#### 15.11.3.2. Database Management

The Access database for the Wildebeesthoek Section area currently contains data from Iscor and Rio Tinto boreholes. The Access database is managed and maintained by CoAL's Competent Person, Mr. J. Sparrow (Pr.Sci.Nat). Backups are stored at CoAL's head office in Johannesburg.

## 15.12. Orebody Modelling and Results

No orebody modelling has been undertaken on the Wildebeesthoek Section.

## 15.13. Coal Mining

Due to the stage of development of the Wildebeesthoek Section, no detailed investigations have been carried out on the potential mining of the deposit.

## 15.14. Coal Processing

Due to the stage of development of the Wildebeesthoek Section, no detailed investigations have been carried out on the potential processing of the coal.

## 15.15. Coal Market

Due to the stage of development of the Wildebeesthoek Section, no detailed investigations have been carried out on the potential coal market. Initial indications are that the Wildebeesthoek product will be a coking coal, based on current geological data.

## 15.16. Previous Resource Statement

There are no known previous resource estimates for the Wildebeesthoek Section.

## 15.17. Current Resource Statement

There is no current resource estimate for the Wildebeesthoek Section.

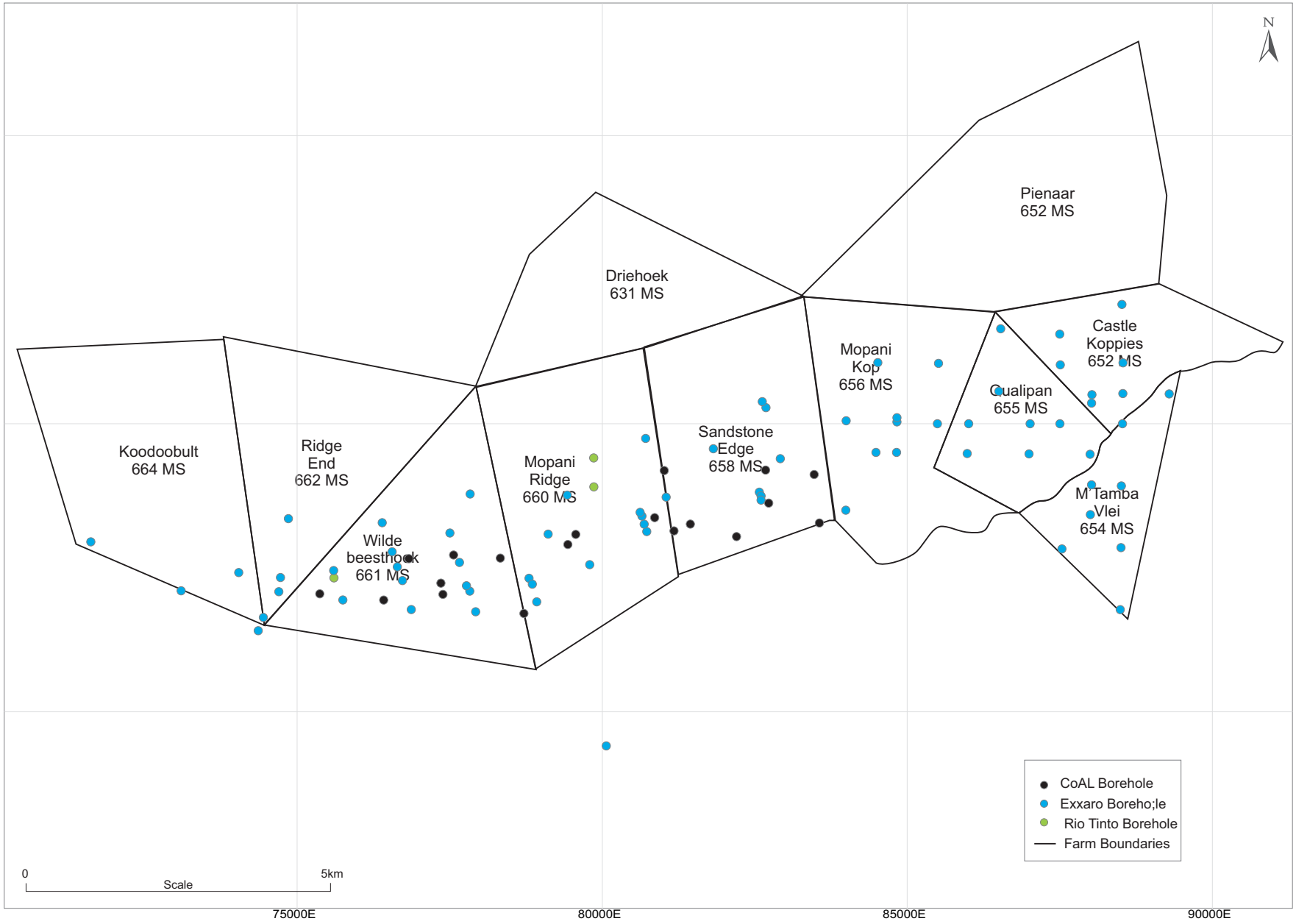
## 15.18. Ore Reserve Statement

As a result of the current stage of development of the Wildebeesthoek Section, no reserves have yet been declared.

**Table 50 : Wildebeesthoek - Summary of Historical and Recent Drilling**

| DATE | COMPANY | LOCATION | PURPOSE | SURVEYOR | DRILLING COMPANY | TYPE OF DRILLING | SIZE | RESPONSIBLE GEOLOGIST | TOTAL NO. B/H | WIRELINE LOGGING | SEAMS SAMPLED | QUALITY RESULTS | LABORATORY FOR QUALITY | USED IN MODEL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1975 - 1982 | Iscor | Koodoobult 664MS, Ridge End 662MS, Wildebeesthoek 661MS, Mapani Ridge 660MS, Sandstone Edge 658MS, Koschade 657MS, Qualipan 655MS, Castle Koppies 652MS, M'Tamba Vlei 654MS | Early exploration and resource estimation. | Unknown. | Unknown. | Diamond core | NQ | H. Van den Berg | 94 | No | All | Yes | Iscor | No |
| 2006 - 2007 | Rio Tinto | Wildebeesthoek 661MS, Mapani Ridge 660MS | Reconnaissance Drilling | Unknown. | Unknown. | Reverse Circulation | 8 inch | D. Hirstov | 4 | Yes | Unknown | No | - | No |
| | | | | | | | | **TOTAL** | **74** | | | | | |

## WILDEBEESTHOEK SECTION – LOCATION OF BOREHOLES




Source: Coal of Africa
VMD1971_CoAL GSP CPR_2015

Figure 77

# 16. Environmental Compliance Social Requirements

Various environmental authorisations are required from governmental departments for the CoAL Projects to operate lawfully. These include:-

- a Record of Decision (RoD) from the DMR in terms of the MPRDA;
- an Environmental Authorisation in terms of NEMA; and
- an approved Integrated Water Use Licence (IWUL) from the Department of Water and Sanitation (DWS) in terms of Section 40 of the NWA.

It is important to note that no authorisation in terms of the above is currently in place for CoAL, however, the process of obtaining these has been instigated.

New Order Mining Right (NOMR) applications in terms of the MPRDA were submitted to the Department of Mineral Resources (DMR) during the course of 2013 and 2014. These applications were submitted for the Chapudi Project, Generaal Project and Mopane Project. At this stage of the process, authorisation is still pending from the DMR.

Subsequent to the award of these NOMR, CoAL has highlighted that it will then instigate the process of applying for the overall Environmental Authorisation.

## 16.1. Chapudi Project Area

The environmental and social compliance status in relation to the South African legislative requirements for the Chapudi Project are summarised in Table 1.

A number of environmental and social studies were previously conducted by Rio Tinto on the Chapudi Section. These studies formed the basis for the EIA/EMP and included the following:-

- an environmental baseline study;
- an environmental sensitivity report;
- a social and community baseline study; and
- a cultural heritage management programme.

### 16.1.1. Social Aspects and Management

CoAL's SLP for the Chapudi Project was developed in December 2013 in terms of Sections 40 to 46 of the MPRDA. The development and submission of an SLP is a requirement of the MPRDA and sets out the social and labour programmes that need to be in place for the life of mine.

CoAL intends on providing the necessary training and exposure to HDSAs and in alignment with the mapped career paths. In this regard CoAL will:-

- identify critical positions;
- establish role descriptions for all critical positions;
- identify all the requirements of the role descriptions;
- implement HDSA training;
- formulate career paths to critical positions where shortages are anticipated; and
- implement formal career planning for potential candidates.

CoAL's project plans committed in the SLP for the Chapudi Project are summarised in the sections below.

#### 16.1.1.1. Upgrade of Sewer and Construction of Classrooms

Presently the sewer is overloaded, but still functional, due to the increase in hostel learners and is in need of urgent attention. The school needs to rapidly extend the existing curing ponds from which the sewer water is released into a dam. The school has developed a project proposal in which the treated sewer water can be utilized to irrigate Lucerne on a piece of land that has already been cleared. Presently the school is looking for a partner to engage in this project which will benefit both parties financially.

Mopane Intermediate School is in need of six (6) classrooms that can accommodate 40-50 learners per classroom. Presently the school hall is being utilized by the Grade nine (9) learners due to a shortage of classrooms. The seating and levels of audible teaching is not meeting a good standard and the school hopes to rectify this situation as soon as the opportunity arises. The school is therefore primarily focusing on ways in which to expand the school buildings by means of donations.

#### 16.1.1.2. Maintenance of the Makhado Waste Water Treatment Plant (WWTP)

Makhado Municipality made ZAR11.5 million available in 2010 for the upgrading of Makhado's existing sewage treatment plant. The envisaged refurbishment entailed a new screen, renovation of primary settling tank, new chlorination system, and distributor arm of biological filter. It is possible for CoAL to assist with the refurbishment and upgrade of the Makhado WWTW. The envisaged refurbishment entailed a new screen, renovation of primary settling tank, new chlorination system, and distributor arm of biological filter.

In June 2011, the municipality also announced the building of an additional sewerage treatment plant for Makhado at a cost of ZAR46,3 million. Construction for a new WWTW commenced in 2011/2012 in Makhado Town. The project was commissioned by Vhembe District Municipality (VDM) as the Water Services Authority (WSA/WSP) who also appointed the consulting engineers and contractors for this purpose. The total capacity of this new wastewater treatment plant will be 10 mega litres per day.

#### 16.1.1.3. Establishment of the Mining School of Excellence

CoAL will establish a Mining School of Excellence to provide the required human capacity to service the mining industry on a provincial, district and/or local level.

### 16.1.2. Material Environmental Factors

The most important environmental issues identified during the EIA/EMP phase include the following:-

- the Chapudi Section lies in a sparsely populated and disturbed rural area;
- the Soutpansberg Mountain Range, located along the southern boundary of the project hosts special and rare ecosystems and as a result, all infrastructure will need to be located further north and away from these sensitive areas;
- water is a critical issue in the area due to the low rainfall and high evaporation rates. Mining and processing requires significant amounts of water. The potential sources within the areas are limited and sensitive due to the existing farming in the area. However studies have identified potential regional water sources;
- the EIA/EMP report highlights that a number of heritage sites located along the mining belt will be directly affected by the mining operations. These include, Later Iron Age ruins, graves and stands of Marula Trees, requiring Phase II assessment;

**Table 51: Chapudi Project – Environmental and Social Compliance Status**

| ACT, REGULATION OR BY-LAW | REQUIREMENTS | SECTIONAL REQUIREMENTS | PERMITTING REQUIREMENTS | CURRENT COMPLIANCE STATUS |
|---|---|---|---|---|
| MPRDA, 2002 (Act 28 of 2002) | An EMP must be approved in terms of Section 39(4) of the MPRDA as a perquisite to the commencement of the mining / exploration permit. | The MPRDA require that all applicants for a reconnaissance permissions, prospecting rights or mining permits must conduct an EIA and submit an EMP. | Approval of submissions subject to the conditions stipulated in Section 39(4) of the MPRDA. | In December 2013, Jacana Environmentals cc compiled and submitted an EIA/EMP in support of a NOMR application. It is important to note that this was an integrated application including Wildebeesthoek and Chapudi sections.<br><br>A decision from the DMR is still pending. |
| | Financial provision must be made to allow for closure and rehabilitation must be annually adjusted. | The financial provisions have, until recently, been regulated under the MPRDA. Sections 41 to 47 of the MPRDA addressed legislative closure requirements. GNR 527 of the MPRDA addressed the financial provision for mine rehabilitation and closure and required that the quantum of financial provision, to be approved by the Minister, be based on the requirements of the approved EMP and include a detailed itemisation of all actual costs required for:-<br>• premature closure regarding:-<br>  • the rehabilitation of the surface of the area;<br>  • the prevention and management of pollution of the atmosphere;<br>  • the prevention and management of pollution of water and the soil; and<br>  • the prevention of leakage of water and minerals between subsurface formations and the surface.<br>• decommissioning and final closure of the operation; and<br>• post closure management of residual and latent environmental impacts. Regulation 54(2) requires annual financial closure estimation and associated financial adjustment.<br>For the Purposes of this report, the financial rehabilitation provision requirements are regulated by GNR 527. | Annual closure and rehabilitation estimation and associated financial provision | As at 30 September 2014, an estimated environmental liability of **ZAR3,408,097.10** was calculated by CoAL for the Chapudi Project, the Generaal Project and the Mopane Project. Noting that the mine is still in the application phase, the DMR will require that the financial provision be updated on an annual basis once the mining right has been accepted. |

| ACT, REGULATION OR BY-LAW | REQUIREMENTS | SECTIONAL REQUIREMENTS | PERMITTING REQUIREMENTS | CURRENT COMPLIANCE STATUS |
|---|---|---|---|---|
| MPRDA, 2002 (Act 28 of 2002) | An approved Social and Labour Plan (SLP) is required for permitting approval, with annual compliance reporting submission. | Sections 40 - 46 of GNR 527 of 2004 and 39(1) and (2) of the MPRDA dictate the requirements of submission, approval and reporting of the SLP | Approval and annual reporting to the regional DMR office on compliance in compliance with S, 200445 of GNR 527 | Chapudi Project has an SLP compiled in December 2013. |
| NEMA, 1998 (Act No. 107 of 1998) | EIAs and EMPs are required as defined by listed activities set out under Section 24 of NEMA, 1998. | The NEMA regulations establishes the processes to be followed to obtain an environmental authorisation and the listed activities requiring authorisation. | | In the 2013 EIA/EMP report, CoAL has highlighted that as soon as the NOMR process is complete and further detail in respect of its planned development has been received, an environmental authorisation process in terms of NEMA will be undertaken. |
| | Section 28 addresses the duty of care and remediation of environmental damage. | Section 28 details that all persons who cause, have caused or may cause significant pollution or degradation of the environment must take reasonable measures to prevent such pollution or degradation from occurring, continuing or recurring, or, in so far as such harm to the environment is authorised by law or cannot reasonably be avoided or stopped, to minimise and rectify such pollution or degradation of the environment. | | To Venmyn Deloitte's knowledge, no directives have been issued in this regard to CoAL for the Chapudi Project. |
| NEM:AQA, 2004 (Act 39 of 2004) | No listed activity in terms of the Act can take place without a licence. | GN 1210 establishes national Ambient Air Quality Standards, and provides limits for $SO_2$, $NO_2$, $PM_{10}$, ozone, benzene, lead and CO. | Atmospheric Emission Licence (AEL) | Identified as Not Applicable for the Chapudi Project at the time of this report. However, as changes to legislation occur frequently, Venmyn Deloitte would recommend regular review of the proposed Chapudi Project activities to identify the requirements of an AEL. |

| ACT, REGULATION OR BY-LAW | REQUIREMENTS | SECTIONAL REQUIREMENTS | PERMITTING REQUIREMENTS | CURRENT COMPLIANCE STATUS |
|---|---|---|---|---|
| NEM: WA Act, 2008 (Act 59 of 2008) | A licence is required to establish and operate a waste disposal site, as defined by the listed activities within the Act. | Chapter 5 of the Act provides for the licensing of waste management activities, which include storage, transfer, recycling, treatment and/or disposal of waste. Radioactive waste and mine residues have been excluded from the Act. | Waste Management Licence (WML) | At the time of compiling this reports, a WML was identified as Not Applicable for the Chapudi Project as all General/Hazardous waste will be sent to a licensed waste management facility. In addition, there are no on-site waste disposal facilities and none are planned for the mine. Venmyn Deloitte recommends that the waste management activities be reviewed and assessed during the environmental authorization phase, to identify if authorization is still not required. |
| National Heritage Resources Act (Act No. 25 of 1999) | Permission from SAHRA is required for the removal of graves. | Section 5 of NHRA outlines general principles for heritage resources management.<br><br>Section 38 provides the process and minimum requirements that need to be complied with. | Permission from SAHRA | The EIA/EMP report highlights that a number of heritage sites located along the mining belt will be directly affected by the mining operations. These include, Later Iron Age ruins, graves and stands of Marula Trees, requiring Phase II assessment. As such, permission from SAHRA has not yet been obtained. |
| NWA, 1998 (Act 36 of 1998) as amended | A licence is required for the abstraction, storage, use, diversion, flow reduction and disposal of water and effluent. | The NWA stipulates that a WUL is required for the abstraction, storage, use, diversion, flow reduction and disposal of water and effluent in terms of Section 21 of the Act. | Water Use Licence | An Integrated Water Use Licence Application (IWULA) will be undertaken as soon as the NOMR process has been completed. As such, the mine does not yet have an approved Integrated Water Use Licence (IWUL) The anticipated water use activities include the following:-<br>• Section 21 (a) – Abstraction of water from a water resource;<br>• Section 21 (b) – Storage of water;<br>• Section 21 (c) – Impeding or diverting the flow of water in a watercourse;<br>• Section 21 (g) – Disposing of waste in a manner which may detrimentally impact on a water resource; and<br>• Section 21 (i) – Altering the bed, banks, course or characteristics of a watercourse. |
| | | Section 19 of the NWA addresses pollution prevention and, in particular, the situation where pollution of a water resource occurs or might occur as a result of activities on land. Any person who owns, controls, occupies or uses the land in question is responsible for taking measures to prevent pollution of water resources. | | To Venmyn Deloitte's knowledge, no directives have been issued to CoAL for the Chapudi Project. |
| | | GN704, established in terms of Section 26(1) (b), (g) and (i) of the NWA, regulates the use of water for mining and related activities aimed at the protection of water resources of the Act. | | |

- international tourism occurs in the area in the form of trophy hunting. Mining could have a negative visual and noise impact on this activity; and
- the project area shares a border with the Bergtop Private Nature Reserve and is a neighbour to the Western Soutpansberg Conservancy, both of which could be negatively impacted upon as a results of coal mining and processing.

### 16.1.3. Environmental Liability

CoAL has calculated a financial provision of **ZAR3,408,097.10** combined for the Chapudi Project, the Generaal Project and the Mopane Project. The exact allowance for each project is not yet confirmed. This quantum includes demolition of infrastructure, rehabilitation activities, river diversion, water management, aftercare maintenance and specialist studies.

## 16.2. Generaal Project Area

The environmental and social compliance status in relation to the South African legislative requirements for the Generaal Project are summarised in Table 2.

### 16.2.1. Social Aspects and Management Practices

An SLP for the Generaal Project was developed in December 2013. As mentioned in the previous section, an SLP is a requirement of the MPRDA and sets out the social and labour programmes that need to be in place for the life of mine.

CoAL has committed to the whole school transformation project for Mudimeli Senior Secondary School. The school is located on the Fripp Village, within the village of Mudimeli and is in serious disrepair, walls of the classrooms are cracking, and classes are overcrowded.

Another initiative includes the implementation of learnership programmes that will enable the learners to progress in their relevant areas of responsibility within the workplace and in this way develop specialists and technical skills. Critical focus will be given to the transfer of skills and experience through broad-based mentorship.

These learnerships will also aim to facilitate the entry of HDSA's into the minerals and mining industry.

### 16.2.2. Material Environmental Factors

The most important environmental issues identified during the EIA/EMP phase include the following:-

- according to the ecological importance classification for the A80 quaternary catchments, the system can be classified as a Sensitive system which, in its present state, can be considered a Class D (largely modified) stream. The most significant riverine resource within the Generaal Project area within the A80F quaternary catchment is the Mutamba River, a major tributary of the Nzhelele River and the Nzhelele River itself. The Dolidoli River was the only other system observed with surface water at the time of the EIA assessment. These systems all form part of the Sand River catchment which in turn is a large tributary of the Limpopo River;
- based on the findings of the aquatic assessments and ecological sensitivity of the wetland systems, it was recommended in the EIA/EMP studies that that the project should be designed and operated on the basis that no mining activities should take place within 100m from the edge of the 1:100 year flood-line of the major drainage lines, i.e. Mutamba and Nzhelele Rivers;

**Table 52: Generaal Project – Environmental and Social Compliance Status**

| ACT, REGULATION OR BY-LAW | REQUIREMENTS | SECTIONAL REQUIREMENTS | PERMITTING REQUIREMENTS | CURRENT COMPLIANCE STATUS |
|---|---|---|---|---|
| MPRDA, 2002 (Act 28 of 2002) | An EMP must be approved in terms of Section 39(4) of the MPRDA as a perquisite to the commencement of the mining / exploration permit. | The MPRDA requires that all applicants for a reconnaissance permissions, prospecting rights or mining permits must conduct an EIA and submit an EMP. | Approval of submissions subject to the conditions stipulated in Section 39(4) of the MPRDA. | In January 2014, Jacana Environmentals cc submitted an EIA/EMP in support of a NOMR. It is important to note that this was an integrated application including Generaal and Mount Stuart sections.<br><br>A decision from the DMR is still pending. |
| | Financial provision must be made to allow for closure and rehabilitation must be annually adjusted. | The financial provisions have, until recently, been regulated under the MPRDA. Sections 41 to 47 of the MPRDA addressed legislative closure requirements. GNR 527 of the MPRDA addressed the financial provision for mine rehabilitation and closure and required that the quantum of financial provision, to be approved by the Minister, be based on the requirements of the approved EMP and include a detailed itemisation of all actual costs required for:-<br>• premature closure regarding:-<br>  • the rehabilitation of the surface of the area;<br>  • the prevention and management of pollution of the atmosphere;<br>  • the prevention and management of pollution of water and the soil; and<br>  • the prevention of leakage of water and minerals between subsurface formations and the surface.<br>• decommissioning and final closure of the operation; and<br>• post closure management of residual and latent environmental impacts. Regulation 54(2) requires annual financial closure estimation and associated financial adjustment.<br>For the Purposes of this report, the financial rehabilitation provision requirements are regulated by GNR 527. | Annual closure and rehabilitation estimation and associated financial provision | As at 30 September 2014, an estimated environmental liability of **ZAR3,408,097.10** was calculated by CoAL for the Chapudi Project, the Generaal Project and the Mopane Project. Noting that the mine is still in the application phase, the DMR will require that the financial provision be updated on an annual basis once the mining right has been accepted. |

| ACT, REGULATION OR BY-LAW | REQUIREMENTS | SECTIONAL REQUIREMENTS | PERMITTING REQUIREMENTS | CURRENT COMPLIANCE STATUS |
|---|---|---|---|---|
| MPRDA, 2002 (Act 28 of 2002) | An approved SLP is required for permitting approval, with annual compliance reporting submission. | Sections 40 - 46 of GNR 527 of 2004 and 39(1) and (2) of the MPRDA dictate the requirements of submission, approval and reporting of the SLP | Approval and annual reporting to the regional DMR office on compliance in compliance with S, 200445 of GNR 527 | The Generaal Project has an SLP compiled in December 2013. |
| NEMA, 1998 (Act No. 107 of 1998) | EIAs and EMPs are required as defined by listed activities set out under Section 24 of NEMA, 1998. | The NEMA regulations establishes the processes to be followed to obtain an environmental authorisation and the listed activities requiring authorisation. | | The NEMA environmental authorisation process has not yet been instigated by CoAL. This process will commence as soon as the NOMR process has been completed. |
| | Section 28 addresses the duty of care and remediation of environmental damage. | Section 28 details that all persons who cause, have caused or may cause significant pollution or degradation of the environment must take reasonable measures to prevent such pollution or degradation from occurring, continuing or recurring, or, in so far as such harm to the environment is authorised by law or cannot reasonably be avoided or stopped, to minimise and rectify such pollution or degradation of the environment. | | To Venmyn Deloitte's knowledge, no directives have been issued in this regard to CoAL for the Generaal Project. |
| NEM:AQA, 2004 (Act 39 of 2004) | No listed activity in terms of the Act can take place without a licence. | GN 1210 establishes national Ambient Air Quality Standards, and provides limits for $SO_2$, $NO_2$, $PM_{10}$, ozone, benzene, lead and CO. | Atmospheric Emission Licence | Identified as Not Applicable for the Generaal Project at the time of this report. However, as changes to legislation occur frequently, Venmyn Deloitte would recommend regular review of the proposed Generaal Project activities to identify if there are any requirements for an AEL. |

| ACT, REGULATION OR BY-LAW | REQUIREMENTS | SECTIONAL REQUIREMENTS | PERMITTING REQUIREMENTS | CURRENT COMPLIANCE STATUS |
|---|---|---|---|---|
| NEM: WA Act, 2008 (Act 59 of 2008) | A licence is required to establish and operate a waste disposal site, as defined by the listed activities within the Act. | Chapter 5 of the Act provides for the licensing of waste management activities, which include storage, transfer, recycling, treatment and/or disposal of waste. Radioactive waste and mine residues have been excluded from the Act. | WML | A WML application process has not yet been instigated. Venmyn Deloitte would recommend that the requirements of a WML be determined in detail during the environmental authorization process. Venmyn Deloitte recommends that the waste management activities be reviewed and assessed during the environmental authorization phase, to identify if authorization is still not required. |
| National Heritage Resources Act (Act No. 25 of 1999) | Permission from SAHRA is required for the removal of graves. | Section 5 of NHRA outlines general principles for heritage resources management.<br><br>Section 38 provides the process and minimum requirements that need to be complied with. | Permission from SAHRA | A Heritage Impact Assessment was conducted by MBOFHO Consulting and Projects in December 2013 and a total 48 heritage sites were identified. These sites include Burial Sites, Stone Age Archaeological Sites, Later Iron Age Sites, Later Iron Age Stonewalled Sites, Buildings of more than 60 years, Sites of Commercial Farming Periods and Cultural Landscapes.<br><br>Permission from SAHRA has not yet been obtained. |
| NWA, 1998 (Act 36 of 1998) as amended | A licence is required for the abstraction, storage, use, diversion, flow reduction and disposal of water and effluent. | The NWA stipulates that a WUL is required for the abstraction, storage, use, diversion, flow reduction and disposal of water and effluent in terms of Section 21 of the Act. | Water Use Licence | An IWULA process will be undertaken as soon as the NOMR process has been completed. As such, the mine does not yet an approved IWUL. The anticipated water use activities include the following:-<br>• Section 21 (a) – Abstraction of water from a water resource;<br>• Section 21 (b) – Storage of water;<br>• Section 21 (c) – Impeding or diverting the flow of water in a watercourse;<br>• Section 21 (g) – Disposing of waste in a manner which may detrimentally impact on a water resource; and<br>• Section 21 (i) – Altering the bed, banks, course or characteristics of a watercourse. |
| | | Section 19 of the NWA addresses pollution prevention and, in particular, the situation where pollution of a water resource occurs or might occur as a result of activities on land. Any person who owns, controls, occupies or uses the land in question is responsible for taking measures to prevent pollution of water resources. | | To Venmyn Deloitte's knowledge, no directives have been issued to CoAL for the Generaal Project. |
| | | GN704, established in terms of Section 26(1) (b), (g) and (i) of the NWA, regulates the use of water for mining and related activities aimed at the protection of water resources of the Act. | | |

- a Heritage Impact Assessment was conducted by MBOFHO Consulting and Projects in December 2013 and a total 48 heritage sites were identified. These sites include Burial Sites, Stone Age Archaeological Sites, Later Iron Age Sites, Later Iron Age Stonewalled Sites, Buildings of more than 60 years, Sites of Commercial Farming Periods and Cultural Landscapes;
- protected areas that will be affected or that are directly adjacent to the site include Honnet Nature Reserve and the Greater Kuduland Conservancy (Mount Stuart Section). The Generaal Project area falls outside the Priority Area 1 {North Eastern Escarpment} for conservation as determined by the National Biodiversity Assessment (NBA) as contemplated in the National Protected Area Expansion Strategy (LEDET, 2008); and
- the area is known locally to be water scarce, therefore livelihoods in the project area largely rely on water sources to be able to sustain their socio-economic activities.

### 16.2.3. Environmental Liability

CoAL has calculated a financial provision of **ZAR3,408,097.10** combined for the Chapudi Project, the Generaal Project and the Mopane Project. The exact allowance for each project is not yet confirmed. This quantum includes demolition of infrastructure, rehabilitation activities, river diversion, water management, aftercare maintenance and specialist studies.

## 16.3. Mopane Project

The environmental and social compliance status in relation to the South African legislative requirements for the Mopane Project are summarised in Table 3.

### 16.3.1. Social Aspects and Management Practices

An SLP was compiled for the Mopane Project in December 2013 and the following project commitments were made by CoAL:-

#### 16.3.1.1. Informal Sector Support

Musina local municipality has a large number of street traders who eke out an existence under very trying conditions. The objective of the project is to provide dignified trading facilities and entrepreneurial training so as to incorporate street traders into the mainstream of the local economy.

#### 16.3.1.2. Labour Intensive Road Construction

Road surface conditions in Musina town have deteriorated rapidly over the past ten years. This situation has been exacerbated by the extraordinary rate of densification in the Musina-Nancefield urban complex during this period. A Roads Master Plan was recently completed.

#### 16.3.1.3. Adopt a School: Ramaano High and Nngweni High School

The Dinaledi Schools programme was birthed in 2001 as a result of the Government's launching of the National Mathematics, Science and Technology Education (NMSTE) Strategy. The project addresses and improves the quality of teaching, learning and performance in Mathematics and Science outputs increasing the number and quality of learner passes in Mathematics and Science at Grade 12 level. The company intends to contribute to community development by supporting Ramaano and Nngweni High School via the Adopt a Dinaledi School Project, thus enabling it to become one of the Best Performing Schools in the province. The focus is the sustained achievement and improvement of results in Higher Grade (HG) Maths and Science. The first project in this process in the construction of laboratory facilities.

#### 16.3.1.4. Water Conservation and Water Demand Management and Strategy

The Water Service Development Plans of Vhembe District Municipality as Water Service Authority (WSA) in the area as well Makhado Local Municipality as Water Service Provider (WSP) states that no Water Conservation and Demand Management Programmes are in place in Makhado, this despite a dire need for water in the area.

### 16.3.2. Material Environmental Factors

The most important environmental issues identified during the EIA/EMP phase include the following:-

- the Mopane Project area falls outside Priority Area 1 {North Eastern Escarpment} for conservation as determined by the National Biodiversity Assessment (NBA) as contemplated in the National Protected Area Expansion Strategy (LEDET, 2008), and no NBA Endangered or Critically Endangered Ecosystems (2011) are affected by the proposed development;
- a Heritage Impact Assessment was conducted by MBOFHO Consulting and Projects in October 2013 and a total 177 heritage sites were identified. These sites include Provincial Sites, Grace Sites, Stone Age Archaeological Sites, Later Iron Age Sites, Later Iron Age Stonewalled Sites, Buildings of more than 60 years, Sites of Commercial Farming Periods and Cultural Landscapes.
- the area is known locally to be water scarce therefore livelihoods in the project area largely rely on water sources to be able to sustain their socio-economic activities and
- The EIA/EMP report has identified impacts on a water stressed catchment.

### 16.3.3. Environmental Liability

CoAL has calculated a financial provision of ZAR3,408,097.10 combined for the Chapudi Project, the Generaal Project and the Mopane Project. The exact allowance for each project is not yet confirmed. This quantum includes demolition of infrastructure, rehabilitation activities, river diversion, water management, aftercare maintenance and specialist studies.

## 16.4. Telema and Gray

A reapplication of a prospecting right EMP was submitted for the Telema and Gray Project, which has not yet been approved. At this stage of the process, there would be no SLP and financial provision. Future activities, includes submission of a Mining Right Application (MRA). Upon acceptance of a MRA, the DMR will require the compilation and submission of an EIA/EMP in support of a MRA.

The detailed assessments will require an undertaking of a Scoping and EIA process. An independent environmental consultant must be appointed by CoAL in this regard to undertake broad scale assessments of the entire application areas with the intent of providing generic impacts and areas of sensitivity where detailed site specific studies would be required. The scope of the specialist studies must include:-

- the production of a Scoping Report that provides a desktop description of the baseline environment, potential impacts that may result from the activity.; and
- a plan of study for the EIA phase, and sensitivity mapping of the area. This supplements the EIA assessment and includes an impact assessment, recommendations, suggested mitigation measures, site sensitivities and constraints, and a framework for future site selection. Public Participation Process (PPP) is a key element of the EIA process. The PPP for the EIA must be an extension of the process carried out during Scoping. All registered I&APs must be notified of the outcome of the Scoping decision-making process.

**Table 53: Mopane Project – Environmental and Social Compliance Status**

| ACT, REGULATION OR BY-LAW | REQUIREMENTS | SECTIONAL REQUIREMENTS | PERMITTING REQUIREMENTS | CURRENT COMPLIANCE STATUS |
|---|---|---|---|---|
| MPRDA, 2002 (Act 28 of 2002) | An EMP must be approved in terms of Section 39(4) of the MPRDA as a perquisite to the commencement of the mining / exploration permit. | The MPRDA require that all applicants for a reconnaissance permissions, prospecting rights or mining permits must conduct an EIA and submit an EMP. Prescriptive details are provided in Section 39(3) a-d. Regulations 49, 50, 51 and 52 detail the requirements for the contents and processes for scoping, EIA, EMP and EMPRs. | Approval of submissions subject to the conditions stipulated in Section 39(4) of the MPRDA. | In November 2013, Jacana Environmentals cc submitted an EIA/EMP in support of a NOMR. It is important to note that this was an integrated application including Voorburg and Jutland sections.<br><br>A decision from the DMR is still pending. |
| | Financial provision must be made to allow for closure and rehabilitation must be annually adjusted. | The financial provisions have, until recently, been regulated under the MPRDA. Sections 41 to 47 of the MPRDA addressed legislative closure requirements. GNR 527 of the MPRDA addressed the financial provision for mine rehabilitation and closure and required that the quantum of financial provision, to be approved by the Minister, be based on the requirements of the approved EMP and include a detailed itemisation of all actual costs required for:-<br>• premature closure regarding:-<br>  • the rehabilitation of the surface of the area;<br>  • the prevention and management of pollution of the atmosphere;<br>  • the prevention and management of pollution of water and the soil; and<br>  • the prevention of leakage of water and minerals between subsurface formations and the surface.<br>• decommissioning and final closure of the operation; and<br>• post closure management of residual and latent environmental impacts. Regulation 54(2) requires annual financial closure estimation and associated financial adjustment.<br>For the Purposes of this report, the financial rehabilitation provision requirements are regulated by GNR 527. | Annual closure and rehabilitation estimation and associated financial provision | As at 30 September 2014, an estimated environmental liability of **ZAR3,408,097.10** was calculated by CoAL for the Chapudi Project, the Generaal Project and the Mopane Project. Noting that the mine is still in the application phase, the DMR will require that the financial provision be updated on an annual basis once the mining right has been accepted. |

| ACT, REGULATION OR BY-LAW | REQUIREMENTS | SECTIONAL REQUIREMENTS | PERMITTING REQUIREMENTS | CURRENT COMPLIANCE STATUS |
|---|---|---|---|---|
| MPRDA, 2002 (Act 28 of 2002) | An approved SLP is required for permitting approval, with annual compliance reporting submission. | Sections 40 - 46 of GNR 527 of 2004 and 39(1) and (2) of the MPRDA dictate the requirements of submission, approval and reporting of the SLP | Approval and annual reporting to the regional DMR office on compliance in compliance with S, 200445 of GNR 527 | The Mopane Project has an SLP compiled in December 2013. |
| NEMA, 1998 (Act No. 107 of 1998) | EIAs and EMPs are required as defined by listed activities set out under Section 24 of NEMA, 1998. | The NEMA Regulations establishes the processes to be followed to obtain an environmental authorisation and the listed activities requiring authorisation. | | The NEMA environmental authorisation process has not yet been instigated by CoAL. This process will commence as soon as the NOMR process has been completed. |
| | Section 28 addresses the duty of care and remediation of environmental damage. | Section 28 details that all persons who cause, have caused or may cause significant pollution or degradation of the environment must take reasonable measures to prevent such pollution or degradation from occurring, continuing or recurring, or, in so far as such harm to the environment is authorised by law or cannot reasonably be avoided or stopped, to minimise and rectify such pollution or degradation of the environment. | | To Venmyn Deloitte's knowledge, no directives have been issued in this regard to CoAL for the Mopane Project. |
| NEM:AQA, 2004 (Act 39 of 2004) | No listed activity in terms of the Act can take place without a licence. | GN 1210 establishes national Ambient Air Quality Standards, and provides limits for $SO_2$, $NO_2$, $PM_{10}$, ozone, benzene, lead and CO. | Atmospheric Emission Licence | Identified as Not Applicable for the Mopane Project at the time of this report. However, as changes to legislation occur frequently, Venmyn Deloitte would recommend regular review of the proposed Mopane Project's activities to identify if there are any requirements for an AEL. |

| ACT, REGULATION OR BY-LAW | REQUIREMENTS | SECTIONAL REQUIREMENTS | PERMITTING REQUIREMENTS | CURRENT COMPLIANCE STATUS |
|---|---|---|---|---|
| NEM: WA Act, 2008 (Act 59 of 2008) | A licence is required to establish and operate a waste disposal site, as defined by the listed activities within the Act. | Chapter 5 of the Act provides for the licensing of waste management activities, which include storage, transfer, recycling, treatment and/or disposal of waste. Radioactive waste and mine residues have been excluded from the Act. | WML | A WML application process has not yet been instigated. Venmyn Deloitte would recommend that the requirements of a WML be determined in detail during the environmental authorization process. Venmyn Deloitte recommends that the waste management activities be reviewed and assessed during the environmental authorization phase, to identify if authorization is still not required. |
| National Heritage Resources Act (Act No. 25 of 1999) | Permission from SAHRA is required for the removal of graves. | Section 5 of NHRA outlines general principles for heritage resources management.<br><br>Section 38 provides the process and minimum requirements that need to be complied with. | Permission from SAHRA | A Heritage Impact Assessment was conducted by MBOFHO Consulting and Projects in October 2013 and a total 177 heritage sites were identified. These sites include Provincial Sites, Grace Sites, Stone Age Archaeological Sites, Later Iron Age Sites, Later Iron Age Stonewalled Sites, Buildings of more than 60 years, Sites of Commercial Farming Periods and Cultural Landscapes.<br><br>Permission from SAHRA has not yet been obtained. |
| NWA, 1998 (Act 36 of 1998) as amended | A licence is required for the abstraction, storage, use, diversion, flow reduction and disposal of water and effluent. | The NWA stipulates that a WUL is required for the abstraction, storage, use, diversion, flow reduction and disposal of water and effluent in terms of Section 21 of the Act. | Water Use Licence | An IWULA process will be undertaken as soon as the NOMR process has been completed. As such, the mine does not have an approved IWUL. The anticipated water use activities include the following:-<br>• Section 21 (a) – Abstraction of water from a water resource;<br>• Section 21 (b) – Storage of water;<br>• Section 21 (c) – Impeding or diverting the flow of water in a watercourse;<br>• Section 21 (g) – Disposing of waste in a manner which may detrimentally impact on a water resource; and<br>• Section 21 (i) – Altering the bed, banks, course or characteristics of a watercourse. |
| | | Section 19 of the NWA addresses pollution prevention and, in particular, the situation where pollution of a water resource occurs or might occur as a result of activities on land. Any person who owns, controls, occupies or uses the land in question is responsible for taking measures to prevent pollution of water resources. | | To Venmyn Deloitte's knowledge, no directives have been issued to CoAL for the Mopane Project. |
| | | GN704, established in terms of Section 26(1) (b), (g) and (i) of the NWA, regulates the use of water for mining and related activities aimed at the protection of water resources of the Act. | | |

## 16.5. Environmental Aspects and Management Practices

All potential environmental impacts have been identified as part of the NOMR process in consultation with Interested and Affected Parties (IAPs), regulatory authorities, specialist consultants and CoAL. A range of environmental issues were considered and are reported in the EIA/EMP reports compiled by Jacana Environmentals cc.

Aspects which require monitoring and monitoring programs include:-

- climate;
- surface water;
- groundwater;
- mine water balance;
- land use management;
- biodiversity;
- air quality;
- environmental noise;
- blasting;
- waste; and
- heritage.

In the various EIA/EMP reports compiled for the Chapudi Project, Generaal Project and Mopane Project, CoAL has committed to the following in terms of auditing:-

- ensuring consistent auditing and reporting protocols;
- conduct an annual vegetation audit to determine the effectiveness of land use management plan and long term sustainability;
- conduct bi-annual Environmental Legal Compliance Audit; and
- monitoring, auditing and regular review (if required) of the Mine Rehabilitation and Reclamation Plan.

## 16.6. Recommendations

Recent amendments made to the NEM:WA, NEMA and MPRDA on closure and rehabilitation will apply to CoAL once the environmental authorisation process is initiated.

Amendments to NEMA have resulted in a change in the prescribed methodology for the calculation of closure liability (both scheduled and unscheduled).

A summary of the amendments to the financial provision is provided in the sections which follow. This section has been compiled to assist CoAL in understanding what effects the amended legislation will have on the process to determine CoAL's closure and rehabilitation liability.

The financial provisions have been, until recently, regulated under the MPRDA.

- Section 41 of the MPRDA requires an application for a prospecting right, mining right or mining permit to make a prescribed financial provision for the rehabilitation or management of negative environmental impacts before the Minister approves the EMP; and
- Regulations 53 & 54 of the MPRDA regulations of 2004 regulate the making of financial provisions and have their own way of payment method.

For effective implementation of the 'One Environmental System', the Ministers responsible for the DEA, DWS and the DMR have agreed that the requirements for making of financial provision for the management, rehabilitation and remediation of environmental impacts from mining operations will be regulated under NEMA and no longer under the MPRDA. This agreement has been formalized through the amendment of the various relevant environmental, water and mining legislation.

Section 44 of the NEMA has been amended to empower the Minister of Environmental Affairs to promulgate regulations with respect to:-

- the assessment and determination of environmental liability;
- auditing and reporting of environmental liability; and
- any other matter necessary to facilitate the implementation of the financial provision.

As a result, new closure and rehabilitation financial regulations have been promulgated in accordance with the mandate of NEMA Section 44.

An applicant or holder of a right or permit must now make financial provision for:-

- rehabilitation and remediation;
- decommissioning and closure activities at the end of prospecting, exploration, mining or production operations; and
- remediation and management of latent or residual environmental impacts which may become known in the future, including the pumping and treatment if polluted or extraneous water.

An applicant, or Right Holder must determine the financial provision through a detailed itemisation of all activities and costs, calculated based on the actual costs of implementation of the measures required for:-

- annual rehabilitation;
- final rehabilitation, decommissioning and closure; and
- remediation of latent or residual environmental impacts which may become known in the future, including pumping and treatment of polluted or extraneous water, as reflected in the environmental risk assessment report.

In the determination of the closure and rehabilitation liability and associated requirements for financial provision, the holder of a mining or prospecting right must:-

- make the determination of the financial provision and submit the plans contemplated in regulation 6 prior to the consideration by the Minister responsible for mineral resources of an application for environmental authorisation, the associated environmental management programme and the associated right or permit in terms of the MPRDA, 2002; and
- provide proof of payment or arrangements to provide the financial provision prior to commencing with any prospecting, exploration, mining or production operations.

When performing an assessment, review and adjustment of financial provision, the holder of a mining or prospecting right must assess and review the adequacy of the financial provision by reviewing the:-

- annual rehabilitation, as reflected in an annual rehabilitation plan;
- final rehabilitation, decommissioning and closure of the prospecting, exploration, mining or production operations at the end of the life of mine, as reflected in a final rehabilitation, decommissioning and mine closure plan; and
- remediation of latent or residual environmental impacts which may become known in the future, including the pumping and treatment of polluted or extraneous water, as reflected in an environmental risk assessment report.

Annually, the holder of a mining or prospecting right must submit a revised plan, environmental risk assessment report, audit report or financial provision must be resubmitted for approval.

Where prevailing economic conditions cause a substantive decrease in the profitability for a continuous period of 12 months or more or where there is a substantive curtailment in mining operations affecting employment, a holder of a right or permit may apply at any time to the Minister, on an application form provided by the competent authority, to be placed under care and maintenance.

When applying for an operation to be placed under care and maintenance, the holder of a mining or prospecting right must include in the application:-

- a detailed explanation by the holder of a right or permit of the merits to be placed under care and maintenance; and
- a care and maintenance plan.

# 17. Interpretation and Conclusions

Venmyn Deloitte has reviewed the technical merits of each GSP project area and provided a detailed description of each asset (including reference to its tenure, status of development, recent exploration and production, resources, review of technical input parameters, where appropriate). Venmyn Deloitte has also included a review of the global and South African coal industry.

Venmyn Deloitte has independently reviewed CoAL's resource statements for each of the GSP coal assets, as at 30 September 2012, and has concluded that they are reasonable and have been correctly classified, by CoAL, according to the JORC Code and stated as at 31 December 2015.

Venmyn Deloitte confirms that the Coal Resources have been based upon reliable exploration and mining results (where appropriate) and accurately estimated, by CoAL, using industry best practise standards of modelling.

In general, Venmyn Deloitte has concluded that the technical input assumptions are reasonable as at the effective date of this report.

# 18. Effective Date and Signatures

CPR Compiled and reviewed by:

**E. de Klerk**
B. Sc. (Geol.), M.Sc. (Exploration Geol.)
**Pr.Sci.Nat., FGSSA**
**Competent Person**
**Manager, Venmyn Deloitte**

**T.C. ORFORD**
B.Sc. Hons (Geol.), GDE (Min. Eng.),
Pr.Sci.Nat., MGSSA, MSAIMM, MSPE.
Competent Person
**Manager, Venmyn Deloitte**

Reviewed by:

**F.J. HARPER**
B.Sc. Hons (Geol.),
Pr.Sci.Nat., MGSSA.
**Associate Director**

**N. McKENNA**
M.Sc. (Geol), B.Sc. Hons. (Geol), Pr.Sci.Nat.
MAusIMM, MSAIMM, MGSSA,MIASSA, M.Inst.D.
**Associate Director, Venmyn Deloitte**

CPR Compiled by:

**N. MOEKETSI**
BTech. (Env. Sci.)
IAIASA
**Environmental Industry Analyst, Venmyn Deloitte**

**C. JACOBS**
B.Com (Hons). (Investment Management).
SAIMM
**Mineral Project Analyst**

Coal Resources Estimate prepared by:

**J. SPARROW**
B.Sc. Hons (Geol.), COMcert. Rock Mechanics,
Pr.Sci.Nat.,
Competent Person
**Group Geologist, CoAL**

**Reference No.:- VMD1971**
**Effective Date:- 31 December 2015**
**Final Report Date: 28 January 2016**

# Appendix 1: JORC Code 2012 Edition Table 1

| JORC (TABLE 1) | DESCRIPTION | VOORBURG | JUTLAND | TELEMA & GRAY | MOUNT STUART | GENERAAL | CHAPUDI | CHAPUDI WEST | WILDEBEESTHOEK |
|---|---|---|---|---|---|---|---|---|---|
| | **SECTION 1: SAMPLING TECHNIQUE AND DATA** | | | | | | | | |
| **1.1** | **SAMPLING TECHNIQUES** | | | | | | | | |
| **i** | Nature and quality of sampling (e.g. cut channels, random chips, or specific specialised industry standard measurement tools appropriate to the mineral under investigation, such as downhole gamma sondes, or handheld XRF instruments, etc). These examples should not be taken as limiting the broad meaning of sampling. | Section 9.11.3.3 and 9.11.6 | Section 10.11.3 and 10.11.6 | Section 11.11.3 and 11.11.6 | Section 12.11.3.3 and 12.11.6 | Section 13.11.3 and 13.11.6 | Section 14.11.3.3 and 14.11.6 | Section 15.11.2.2 and 15.11.4 | Section 16.11.1 |
| **ii** | Include reference to measures taken to ensure sample representivity and the appropriate calibration of any measurement tools or systems used. | | | | | | | | |
| **iii** | Aspects of the determination of mineralisation that are Material to the Public Report. In cases where 'industry standard' work has been done this would be relatively simple (e.g. 'reverse circulation drilling was used to obtain 1m samples from which 3kg was pulverised to produce a 30g charge for fire assay'). In other cases more explanation may be required, such as where there is coarse gold that has inherent sampling problems. unusual commodities or mineralisation types (e.g. submarine nodules) may warrant disclosure of detailed information. | | | | | | | | |
| **1.2** | **DRILLING TECHNIQUES** | | | | | | | | |
| **i** | Drill type and details. | Section 9.11.3.1 and 9.11.4 | Section 10.11.3 and 10.11.4 | Section 11.11.3 and 11.11.4 | Section 12.11.3.1 and 12.11.4 | Section 13.11.3 and 13.11.4 | Section 14.11.3.1 and 14.11.4.1 | Section 15.11.2 | Section 16.11 |
| **1.3** | **DRILL SAMPLE RECOVERY** | | | | | | | | |
| i | Methods of recording and assessing core and chip sample recoveries and results assessed. | Section 9.11.3.1 and 9.11.4 | Section 10.11.3 and 10.11.4 | Section 11.11.3 and 11.11.4 | Section 12.11.3.1 and 12.11.4 | Section 31.11.3 and 13.11.4 | Section 14.11.3.1 and 14.11.4 | Section 15.11.2 | N/A |
| **ii** | Measures taken to maximise sample recovery and ensure representative nature of the samples. | | | | | | | | |
| **iii** | Whether a relationship exists between sample recovery and grade and whether sample bias may have occurred due to preferential loss/gain of fine/coarse material. | | | | | | | | |
| **1.4** | **LOGGING** | | | | | | | | |
| **i** | Whether core and chip samples have been geologically and geotechnically logged to a level of detail to support appropriate Mineral Resource estimation, mining studies and metallurgical studies. | Section 9.11.3.2 and 9.11.5 | Section 10.11.3, 10.11.4 and 10.11.5 | Section 10.11.3, 11.11.4 and 11.11.5 | Section 12.11.3.2 and 12.11.5 | Section 13.11.3, 13.11.4 and 13.11.5 | Section 14.11.3.2 and 14.11.5 | Section 15.11.2.1 and 15.11.3 | N/A |
| **ii** | Whether logging is qualitative or quantitative in nature. Core photography. | | | | | | | | |
| **iii** | The total length and percentage of the relevant intersections logged. | | | | | | | | |
| **1.5** | **SUB-SAMPLING TECHNIQUES AND SAMPLE PREPARATION** | | | | | | | | |
| **i** | If core: whether cut or sawn and whether quarter, half or all cores taken. | Section 9.11.3.2 | Section 10.11.7 | Section 11.11.7 | Section 12.11.3.3 | Section 13.11.7 | Section 14.11.3.2 | Section 15.11.5 | Section 16.11.2 |
| **ii** | If non-core, whether riffled, tube sampled, rotary split etc and whether sampled wet or dry. | Section 9.11.7.1 | | | Section 12.11.7.1 | | Section 14.11.7.1 | | |
| **iii** | For all sample types, the nature, quality and appropriateness of the sample preparation technique. | | | | | | | | |
| **iv** | Quality control procedures adopted for all sub-sampling stages to maximise representivity of samples. | Section 9.11.7.3 | | | Section 12.11.7.3 | | Section 14.11.7.3 | | |

| JORC (TABLE 1) | DESCRIPTION | VOORBURG | JUTLAND | TELEMA & GRAY | MOUNT STUART | GENERAAL | CHAPUDI | CHAPUDI WEST | WILDEBEESTHOEK |
|---|---|---|---|---|---|---|---|---|---|
| v | Measures taken to ensure that the sampling is representative of the in situ material collected, including for instance results for field duplicate/second-half sampling. | | | | | | | | |
| vi | Whether sample sizes are appropriate to the grain size of the material being sampled. | Section 9.11.7.1 | | | Section 12.11.7.1 | | Section 14.11.7.1 | | |
| **1.6** | **QUALITY OF ASSAY DATA AND LABORATORY TESTS** | | | | | | | | |
| i | The nature, quality and appropriateness of the assaying and laboratory procedures used and whether the technique is considered partial or total | Section 9.11.7.1 | Section 10.11.7 | Section 11.11.7 | Section 12.11.7 | Section 13.11.7 | Section 14.11.7.1 | Section 15.11.5 | Section 16.11.2 |
| ii | For geophysical tools, spectrometers, handheld XRF instruments, etc, the parameters used in determining the analysis including instrument make and model, reading times, calibrations factors applied and their derivation | | | | | | | | |
| iii | Nature of quality control procedures adopted (e.g. standards, blanks, duplicates, external laboratory checks) and whether acceptable levels of accuracy (i.e. lack of bias) and precision have been established. | Section 9.11.7.1 and 9.11.7.3 | | | Section 12.11.7.1 and 12.11.7.3 | | Section 14.11.7.1 and 14.11.7.3 | | |
| **1.7** | **VERIFICATION OF SAMPLING AND ASSAYING** | | | | | | | | |
| i | The verification of significant intersections by either independent or alternative company personnel. | Section 9.11.7.3 | Section 10.11.7 | Section 11.11.7 | Section 12.11.7.3 | Section 13.11.7 | Section 14.11.7.3 | Section 15.11.5 | Section 16.11.2 |
| ii | The use of twinned holes | Section 9.11.3.1 and 9.11.4 | Section 10.11.3 and 10.11.4 | Section 11.11.3 and 11.11.4 | Section 12.11.3.1 and 12.11.4 | Section 13.11.3 and 13.11.4 | Section 14.11.3.1 and 14.11.4 | Section 15.11.2 | N/A |
| iii | Documentation of primary data, data entry procedures, data verification, data storage (physical and electronic) protocols. | Section 9.11.8 | Section 10.11.8 | Section 10.11.8 | Section 12.11.8 | Section 13.11.8 | Section 14.11.8 | Section 15.11.6 | Section 16.11.3.1 |
| iv | Discuss any adjustments to assay data. | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| **1.8** | **LOCATION OF DATA POINTS** | | | | | | | | |
| i | Accuracy and quality of surveys used to locate drill holes (collar and down-hole survey), trenches, mine workings and other locations used in Mineral Resource estimation. | Section 9.11.2 | Section 10.11.2 | Section 11.11.2 | Section 12.11.2 | Section 13.11.2 | Section 14.11.2 | Section 15.11.1 | N/A |
| ii | Specification of the grid system used. | Section 9.12 | Section 10.12 | Section 11.12 | Section 12.12 | Section 13.12 | Section 14.12 | Section 15.12 | Section 16.12 |
| iii | Quality and adequacy of topographic control. | Section 9.11.2 | Section 10.11.2 | Section 11.11.2 | Section 12.11.2 | Section 13.11.2 | Section 14.11.2 | Section 15.11.1 | N/A |
| **1.9** | **DATA SPACING AND DISTRIBUTION** | | | | | | | | |
| i | Data spacing for reporting of Exploration Results. | Section 9.12 | Section 10.12 | Section 11.12 | Section 12.12 | Section 13.12 | Section 14.12 | Section 15.12 | Section 16.12 |
| ii | Whether the data spacing and distribution is sufficient to establish the degree of geological and grade continuity appropriate for the Mineral Resource and Ore Reserve estimation procedure(s) and classifications applied. | Section 9.12 and 9.17 | Section 10.12 and 10.17 | Section 11.12 and 11.17 | Section 12.12 and 12.17 | Section 13.12 and 13.17 | Section 14.12 and 14.17 | Section 15.12 and 15.17 | Section 16.12 and 16.17 |
| iii | Whether sample compositing has been applied. | Section 9.11.3.3 and 9.12 | Section 10.11.3 and 10.12 | Section 11.11.3 and 11.12 | Section 12.11.3.3 and 12.12 | Section 13.11.3 and 13.12 | Section 14.11.3.3 and 14.12 | Section 15.11.2 and 15.12 | Section 16.17 |
| **1.1** | **ORIENTATION OF DATA IN RELATION TO GEOLOGICAL STRUCTURE** | | | | | | | | |
| i | Whether the orientation of the sampling achieves unbiased sampling of possible structures and the extent to which this is known, considering the deposit type. | Section 9.11.3 and 9.11.4 | Section 10.11.3 and 10.11.4 | Section 11.11.3 and 11.11.4 | Section 12.11.3 and 12.11.4 | Section 13.11.3 and 13.11.4 | Section 14.11.3 and 14.11.4 | Section 15.11.2 | N/A |

| JORC (TABLE 1) | DESCRIPTION | VOORBURG | JUTLAND | TELEMA & GRAY | MOUNT STUART | GENERAAL | CHAPUDI | CHAPUDI WEST | WILDEBEESTHOEK |
|---|---|---|---|---|---|---|---|---|---|
| ii | If the relationship between the drilling orientation and the orientation of key mineralised structures is considered to have introduced a sampling bias, this should be assessed and reported if material. | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 1.11 | **SAMPLE SECURITY** | | | | | | | | |
| iii | Measures taken to ensure sample security. | Section 9.11.7.2 | Section 10.11.7 | Section 11.11.7 | Section 12.11.7.2 | Section 13.11.7 | Section 14.11.7.2 | Section 15.11.5 | Section 16.11.2 |
| | **AUDITS OR REVIEWS** | | | | | | | | |
| i | The results of any audits or reviews of sampling techniques and data. | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| | **SECTION 2: REPORTING OF EXPLORATION RESULTS** | | | | | | | | |
| 2.1 | **MINERAL TENEMENT AND LAND TENURE STATUS** | | | | | | | | |
| i | Type, reference name/number, location and ownership including agreements or material issues with third parties such as joint ventures, partnerships, overriding royalties, native title interests, historical sites, wilderness or national park and environmental settings. | Section 9.5 | Section 10.5 | Section 11.5 | Section 12.5 | Section 13.5 | Section 14.5 | Section 15.5 | Section 16.5 |
| ii | The security of the tenure held at the time of reporting along with any known impediments to obtaining a licence to operate in the area. | | | | | | | | |
| 2.2 | **EXPLORATION DONE BY OTHER PARTIES** | | | | | | | | |
| i | Acknowledgments and appraisal of exploration by other parties. | Section 9.10 | Section 10.10 | Section 11.10 | Section 12.10 | Section 13.10 | Section 14.10 | Section 15.10 | Section 16.10 |
| 2.3 | **GEOLOGY** | | | | | | | | |
| | Deposit type, geological setting and style of mineralisation. | Section 9.7 and 9.8 | Section 10.7 and 10.8 | Section 11.7 and 11.8 | Section 12.7 and 12.8 | Section 13.7 and 13.8 | Section 14.7 and 14.8 | Section 15.7 and 15.8 | Section 16.7 and 16.8 |
| | **DRILL HOLE INFORMATION** | | | | | | | | |
| i | A summary of all information material to the understanding of the exploration results including a tabulation of the following information for all Material drill holes: | Table 15 | Table 22 | Table 25 | Table 29 | Table 33 | Table 36 | Table 40 | Table 43 |
| | Easting and northing of the drill hole collar | | | | | | | | |
| | Elevation or RL (Reduced Level - elevation above sea level in metres) of the drill hole collar | | | | | | | | |
| | Dip and azimuth of the hole | | | | | | | | |
| | Down hole length and interception depth | | | | | | | | |
| | Hole length | | | | | | | | |
| ii | If the exclusion of this information is justified on the basis that the information is not Material and this exclusion does no detract from the understanding of the report, the Competent Person should clearly explain why this is the case. | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 2.4 | **DATA AGGREGATION METHODS** | | | | | | | | |
| i | In reporting Exploration Results, weighting averaging techniques, maximum and/or minimum grade truncations (e.g. cutting of high grades) and cut-off grades are usually Material and should be stated. | Section 9.12 and 9.17 | Section 10.12 and 10.17 | Section 11.12 and 11.17 | Section 12.12 and 12.17 | Section 13.12 and 13.17 | Section 14.12 and 14.17 | Section 15.12 and 15.17 | Section 16.12 and 16.17 |
| ii | Where aggregate intercepts incorporate short lengths of high grade results and longer lengths of lower grade results, the procedure used for such aggregation should be stated and some typical examples of such aggregations should be shown in detail. | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| iii | The assumptions used for any reporting of metal equivalent values should be clearly stated. | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 2.5 | **RELATIONSHIP BETWEEN MINERALISATION WIDTHS AND INTERCEPT LENGTHS** | | | | | | | | |

| JORC (TABLE 1) | DESCRIPTION | VOORBURG | JUTLAND | TELEMA & GRAY | MOUNT STUART | GENERAAL | CHAPUDI | CHAPUDI WEST | WILDEBEESTHOEK |
|---|---|---|---|---|---|---|---|---|---|
| i | These relationships are particularly important in the reporting of Exploration Results. | Section 9.11.3.3 and 9.17 | Section 10.11.3 and 10.17 | Section 11.11.3 and 10.17 | Section 12.11.3.3. and 12.17 | Section 13.11.3 and 13.17 | Section 14.11.4.3 and 14.17 | Section 15.11.2.2 and 15.17 | Section 16.17 |
| ii | If the geometry of the mineralisation with respect to the drill hole angle is known, its nature should be reported. | Section 9.12 and Figure 20 | Section 10.12 and Figure 34 | Section 11.12 and Figure 38 | Section 12.12 and Figure 52 | Section 13.12 and Figure 65 | Section 14.12 and Figure 69 | Section 15.12 | Section 16.12 and Figure 80 |
| iii | If it is not known and only the down hole lengths are reported, there should be a clear statement to this effect (e.g. 'down hole length, true width not known'). | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| 2.6 | **DIAGRAMS** | | | | | | | | |
| i | Appropriate maps and sections (with scales) and tabulations of intercepts which should be included for any significant discovery being reported. These should include, but not limited to a plan view of drill hole collar locations and appropriate sectional views. | Figure 16 and Figure 20 | Figure 16, Figure 33 and Figure 34 | Figure 16 and Figure 38 | Figure 16, Figure 51 and Figure 52 | Figure 16 and Figure 65 | Figure 16, Figure 68 and Figure 69 | Figure 16 | Figure 16, Figure 79 and Figure 80 |
| 2.7 | **BALANCED REPORTING** | | | | | | | | |
| i | Where comprehensive reporting of all Exploration Results is not practicable, representative reporting of both low and high grades and /or widths should be practiced to avoid misleading reporting of Exploration Results. | Section 6 | Section 6 | Section 6 | Section 6 | Section 6 | Section 6 | Section 6 | Section 6 |
| 2.8 | **OTHER SUBSTANTIVE EXPLORATION DATA** | | | | | | | | |
| i | Other exploration data, if meaningful and material, should be reported including (but not limited to): geological observations; geophysical survey results; geochemical survey results; bulk samples - sizes and method of treatment; metallurgical test results; bulk density; groundwater; geotechnical and rock characteristics; potential deleterious or contaminating substances. | Section 9.11.1 and 9.14 | Section 10.11.1 and 10.14 | Section 11.11.1 and 11.14 | Section 12.11.1 and 12.14 | Section 13.11.1 and 13.14 | Section 14.11.1 and 14.14 | Section 15.14 | Section 16.14 |
| 2.9 | **FURTHER WORK** | | | | | | | | |
| i | The nature and scale of planned further work (e.g. tests for lateral extensions or depth extensions or large-scale step-out drilling). | Section 9.11.1 and 9.14 | Section 10.11.1 and 10.14 | Section 11.11.1 and 11.14 | Section 12.11.1 and 12.14 | Section 13.11.1 and 13.14 | Section 14.11.1 and 14.14 | Section 15.14 | Section 16.14 |
| ii | Diagrams clearly highlighting the areas of possible extensions, including the main geological interpretations and future drilling areas, provided this information is not commercially sensitive. | Figure 16 and Figure 29 | Figure 16 | Figure 16 and Figure 47 | Figure 16 and Figure 61 | Figure 16 | Figure 16 and Figure 76 | Figure 16 | Figure 16 |
| | **SECTION 3: ESTIMATION AND REPORTING OF MINERAL RESOURCES** | | | | | | | | |
| 3.1 | **MINERAL TENEMENT AND LAND TENURE STATUS** | | | | | | | | |
| i | Measures taken to ensure that data has not been corrupted by, for example, transcription or keying errors, between its initial collection and its use for Mineral Resource estimation purposes. | Section 9.11.8.1 | Section 10.11.8.1 | Section 11.11.8.1 | Section 12.11.8.1 | Section 13.11.3.1 | Section 14.11.8.1 | Section 15.11.6.1 | Section 16.11.3.1 |
| ii | Data validation procedures used. | Section 9.11.8.1 | Section 10.11.8.1 | Section 11.11.8.1 | Section 12.11.8.1 | Section 13.11.3.1 | Section 14.11.8.1 | Section 15.11.6.1 | Section 16.11.3.1 |
| 3.2 | **SITE VISITS** | | | | | | | | |
| i | Comment on any site visits undertaken by the Competent Person and the outcome of those visits. | Section 1.6 | Section 1.6 | Section 1.6 | Section 1.6 | Section 1.6 | Section 1.6 | Section 1.6 | Section 1.6 |
| ii | If no site visits have been undertaken, indicate why this is the case. | | | | | | | | |
| 3.3 | **GEOLOGICAL INTERPRETATION** | | | | | | | | |
| i | Confidence in (or conversely, the uncertainty of) the geological interpretation of the mineral deposit. | Section 18, Section 9.17, Section 6 | Section 18, Section 10.17, Section 6 | Section 18, Section 11.17, | Section 18, Section 12.17, Section 6 | Section 18, Section 13.17, Section 6 | Section 18, Section 14.17, Section 6 | Section 18, Section 15.17, Section 6 | Section 18, Section 16.17, Section 6 |

| JORC (TABLE 1) | DESCRIPTION | VOORBURG | JUTLAND | TELEMA & GRAY | MOUNT STUART | GENERAAL | CHAPUDI | CHAPUDI WEST | WILDEBEESTHOEK |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Section 11.18 | | | | | |
| ii | Nature of the data used and any assumptions made. | Section 9.17.2 | | Section 11.17.2 | Section 12.17.2 | | Section 14.17.2 | | |
| iii | The effect, if any, of alternative interpretations on Mineral Resource estimation. | | | | | | | | |
| iv | The use of geology in guiding and controlling Mineral Resource estimation. | Section 9.7, Section 9.8 | Section 10.7, Section 10.8 | Section 11.7, Section 11.8 | Section 12.7, Section 12.8 | Section 13.7, Section 13.8 | Section 14.7, Section 14.8 | Section 15.7, Section 15.8 | Section 16.7, Section 16.8 |
| v | The factors affecting continuity both of grade and geology. | Section 9.8 | Section 10.8 | Section 11.8 | Section 12.8 | Section 13.8 | Section 14.8 | Section 15.8 | Section 16.8 |
| **3.4** | **DIMENSIONS** | | | | | | | | |
| i | The extent and variability of the Mineral Resource expressed as length (along strike or otherwise), plan width, and depth below surface to the upper and lower limits of the Mineral Resource. | Section 9.12.1, Section 9.17.2.5 | | Section 11.12.1, Section 11.17.2.5 | Section 12.12.1, Section 12.17.2.5 | | Section 14.12.1, Section 14.17.2.5 | | |
| **3.5** | **ESTIMATION AND MODELLING TECHNIQUES** | | | | | | | | |
| i | The nature and appropriateness of the estimation technique(s) and key assumptions, including treatment of extreme grade values, domaining, interpolation parameters and maximum distance of extrapolation from data points. If a computer assisted estimation method was chosen include a description of computer software and parameters used. of extrapolation from data points. | Section 9.12 | Section 10.12 | Section 11.12 | Section 12.12 | Section 13.12 | Section 14.12 | Section 15.12 | Section 16.12 |
| ii | The availability of check estimates, previous estimates and/or mine production records and whether the Mineral Resource estimate takes appropriate account of such data. | Section 9.13, Section 9.16 | Section 10.13., Section 10.16 | Section 11.13, Section 11.16 | Section 12.13, Section 12.16 | Section 13.13. Section 13.16 | Section 14.13, Section 14.16 | Section 15.13, Section 15.16 | Section 16.13, Section 16.16 |
| iii | The assumptions made regarding recovery of by-products. | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| iv | Estimation of deleterious elements or other non-grade variables of economic significance. | Table 17 | | Table 26 | Table 30 | | Table 38 | | Table 41 |
| v | In the case of block model interpolation, the block size in relation to the average sample spacing and the search employed. | Section 9.11.8 | Section 10.12 | Section 11.12 | Section 12.12 | Section 13.12 | Section 14.12 | Section 15.12 | Section 16.12 |
| vi | Any assumption behind modelling of selective mining units. | Figure 23, Section 9.12.1.2. Section 9.13 | | Figure 42, Section 11.12.1, Section 11.13 | Figure 56, Section 12.12.1, Section 12.13 | Section 13.13 | Figure 74, Section 14.12.1, Section 14.13 | Section 15.13 | Section 16.13 |
| vii | Any assumption about the correlation between variables. | | | | | | | | |
| viii | Description of how the geological interpretation was used to control the resource estimates. | Section 9.8 | Section 10.8 | Section 11.8 | Section 12.8 | Section 13.8 | Section 14.8 | Section 15.8 | Section 16.8 |
| ix | Discuss the basis for using or not using grade cutting or capping. | | | | | | | | |
| x | The process validation , the checking process used, the comparison of model data to drill hole data and use of reconciliation data if available. | Section 9.11 | Section 10.11 | Section 11.11. | Section 12.11 | Section 13.11 | Section 14.11 | Section 15.11 | Section 16.11 |
| **3.6** | **MOISTURE** | | | | | | | | |
| i | Whether the tonnages are estimated on a dry basis or with natural moisture and the method of determination of the moisture content. | Table 17 | | Table 26 | Table 30 | | Table 38 | | Table 41 |
| **3.7** | **CUT-OFF PARAMETERS** | | | | | | | | |
| i | The basis of the adopted cut-off grade(s) or quality parameters applied. | Figure 29 | | Figure 47 | Figure 61 | | | | |
| **3.8** | **MINING FACTORS OR ASSUMPTIONS** | | | | | | | | |

| JORC (TABLE 1) | DESCRIPTION | VOORBURG | JUTLAND | TELEMA & GRAY | MOUNT STUART | GENERAAL | CHAPUDI | CHAPUDI WEST | WILDEBEESTHOEK |
|---|---|---|---|---|---|---|---|---|---|
| i | Assumptions made regarding possible mining methods, minimum mining dimensions and internal (or, if applicable, external) mining dilution. It is always necessary as part of the process of determining reasonable prospects for eventual economic extraction to consider potential mining methods, but the assumptions made regarding mining methods and parameters when estimating Mineral Resources may not always be rigorous. Where this is the case, this should be reported with an explanation of the basis of the mining assumptions made. | Figure 23, Section 9.12.1.2. Section 9.13 | | Figure 42, Section 11.12.1, Section 11.13 | Figure 56, Section 12.12.1, Section 12.13 | Section 13.13 | Figure 74, Section 14.12.1, Section 14.13 | Section 15.13 | Section 16.13 |
| **3.9** | **METALLURGICAL FACTORS OR ASSUMPTIONS** | | | | | | | | |
| i | The basis for assumptions or predictions regarding metallurgical amenability. It is always necessary as part of the process of determining reasonable prospects for eventual economic extraction to consider potential metallurgical methods, but the assumptions regarding metallurgical treatment processes and parameters made when reporting Mineral Resources may not always be rigorous. Where this is the case, this should be reported with an explanation of the basis of the mining assumptions made. | Section 9.14 | Section 10.14 | Section 11.14 | Section 12.14 | Section 13.14 | Section 14.14 | Section 15.14 | Section 16.14 |
| **3.10** | **ENVIRONMENTAL FACTORS OR ASSUMPTIONS** | | | | | | | | |
| i | Assumptions made regarding possible waste and process residue disposal options. It is always necessary as part of the process of determining reasonable prospects for eventual economic extraction to consider the potential environmental impacts of the mining and processing operation. While at this stage the determination of potential environmental impacts, particularly for a greenfields project, may not always be well advanced, the status of early consideration of these potential environmental impacts should be reported. Where these aspects have not been considered this should be reported with an explanation of the environmental assumptions made. | Section 17.3.2, Section 17.5, Section 17.6 | Section 17.3.2, Section 17.5, Section 17.6 | Section 17.4, Section 17.5, Section 17.6 | Section 17.2.2, Section 17.5, Section 17.6 | Section 17.2.2, Section 17.5, Section 17.6 | Section 17.1.2, Section 17.5, Section 17.6 | Section 17.1.2, Section 17.5, Section 17.6 | Section 17.3.2, Section 17.5, Section 17.6 |
| **3.11** | **BULK DENSITY** | | | | | | | | |
| i | Whether assumed or determined. If assumed, the basis for the assumptions. If determined, the method used, whether wet or dry, the frequency of the measurements, the nature, size and representativeness of the samples. | Section 9.17.2.2 | | Section 11.17.2.2 | Section 12.17.2.2 | | Section 14.7.2.2 | | |
| ii | The bulk density for bulk material must have been measured by methods that adequately account for void spaces (vugs, porosity, etc.), moisture and differences between rock and alteration zones within the deposit. | Section 9.17.2.2 | | Section 11.17.2.2 | Section 12.17.2.2 | | Section 14.7.2.2 | | |
| iii | Discuss assumptions for bulk density estimates used in the evaluation process for different materials. | Section 9.17.2.2 | | Section 11.17.2.2 | Section 12.17.2.2 | | Section 14.7.2.2 | | |
| **3.12** | **CLASSIFICATION** | | | | | | | | |
| i | The basis for the classification of the Mineral Resources into varying confidence categories. | Section 6 | Section 6 | Section 6 | Section 6 | Section 6 | Section 6 | Section 6 | Section 6 |
| ii | Whether appropriate account has been taken of all relevant factors (i.e. relative confidence in tonnage/grade estimations, reliability of input data, confidence in continuity of geology and metal values, quality, quantity and distribution of the data). | Section 6 | Section 6 | Section 6 | Section 6 | Section 6 | Section 6 | Section 6 | Section 6 |
| iii | Whether the result appropriately reflects the Competent Person's view of the deposit. | Section 6 | Section 6 | Section 6 | Section 6 | Section 6 | Section 6 | Section 6 | Section 6 |
| **3.13** | **AUDITS OR REVIEWS** | | | | | | | | |
| i | The results of any audits or reviews of Mineral Resource estimates. | Section 18 | Section 18 | Section 18 | Section 18 | Section 18 | Section 18 | Section 18 | Section 18 |
| **3.14** | **DISCUSSION OF RELATIVE ACCURACY/CONFIDENCE** | | | | | | | | |

| JORC (TABLE 1) | DESCRIPTION | VOORBURG | JUTLAND | TELEMA & GRAY | MOUNT STUART | GENERAAL | CHAPUDI | CHAPUDI WEST | WILDEBEESTHOEK |
|---|---|---|---|---|---|---|---|---|---|
| i | Where appropriate a statement of the relative accuracy and confidence level in the Mineral Resource estimate using an approach or procedure deemed appropriate by the Competent Person. For example, the application of statistical or geostatistical procedures to quantify the relative accuracy of the resource within stated confidence limits, or, if such an approach is not deemed appropriate , a qualitative discussion of the factors that could affect the relative accuracy and confidence of the estimate. | Section 6 | Section 6 | Section 6 | Section 6 | Section 6 | Section 6 | Section 6 | Section 6 |
| ii | The statement should specify whether it relates to global or local estimates, and if local, state the relevant tonnages, which should be relevant to technical and economic evaluation. Documentation should include assumptions made and the procedures used. | Section 6 | Section 6 | Section 6 | Section 6 | Section 6 | Section 6 | Section 6 | Section 6 |
| iii | These statements of relative accuracy and confidence of the estimate should be compared with production data, where available. | Section 6 | Section 6 | Section 6 | Section 6 | Section 6 | Section 6 | Section 6 | Section 6 |
| | **SECTION 4: ESTIMATION AND REPORTING OF ORE RESERVES** | | | | | | | | |
| **4.1** | **MINERAL RESOURCE ESTIMATE FOR CONVERSION TO ORE RESERVES** | | | | | | | | |
| i | Description of the Mineral Resource estimate used as a basis for the conversion to an Ore Reserve. | N/A | | | | | | | |
| ii | Clear statement as to whether the Mineral Resources are reported additional to, or inclusive of, the Ore Reserves. | | | | | | | | |
| **4.2** | **SITE VISITS** | | | | | | | | |
| i | Comment on any site visits undertaken by the Competent Person and the outcome of those visits. | N/A | | | | | | | |
| ii | If no site visits have been undertaken, indicate why this is the case. | | | | | | | | |
| **4.3** | **STUDY STATUS** | | | | | | | | |
| i | The type and level of study undertaken to enable Mineral Resources to be converted to Ore Reserves. | N/A | | | | | | | |
| ii | The Code requires that a study to at least a Pre-Feasibility Study level has been undertaken to convert Mineral Resources to Ore Reserves. Such studies will have been carried out and will have determined a mine plan that is technically achievable and economically viable, and that material Modifying Factors have been considered. | | | | | | | | |
| **4.4** | **CUT-OFF PARAMETERS** | | | | | | | | |
| i | The basis of the cut-off grade(s) or quality parameters applied. | N/A | | | | | | | |
| **4.5** | **MINING FACTORS OR ASSUMPTIONS** | | | | | | | | |
| i | The method and assumptions used as reported in the Pre-Feasibility or Feasibility Study to convert the Mineral Resource to an Ore Reserve (i.e. either by application of appropriate factors by optimisation or by preliminary or detailed design). | N/A | | | | | | | |
| ii | The choice, nature and appropriateness of the selected mining method(s) and other mining parameters including associated design issues such as pre-strip, access, etc. | | | | | | | | |
| iii | The assumptions made regarding geotechnical parameters (e.g. pit slopes, stope sizes, etc.), grade control and pre-production drilling. | | | | | | | | |
| iv | The major assumptions made and Mineral Resource model used for pit and stope optimisation (if appropriate). | | | | | | | | |

| JORC (TABLE 1) | DESCRIPTION | VOORBURG | JUTLAND | TELEMA & GRAY | MOUNT STUART | GENERAAL | CHAPUDI | CHAPUDI WEST | WILDEBEESTHOEK |
|---|---|---|---|---|---|---|---|---|---|
| v | The mining dilution factors used. | | | | | | | | |
| vi | The mining recovery factors used. | | | | | | | | |
| vii | Any minimum mining widths used. | | | | | | | | |
| viii | The manner in which Inferred Mineral Resources are utilised in mining studies and the sensitivity of the the outcome to their inclusion. | | | | | | | | |
| ix | The infrastructure requirements of the selected mining methods. | | | | | | | | |
| **4.6** | **METALLURGICAL FACTORS OR ASSUMPTIONS** | | | | | | | | |
| i | The metallurgical process proposed and the appropriateness of that process to the style of mineralisation. | | | | | | | | |
| ii | Whether the metallurgical process is well-tested technology or novel in nature. | | | | | | | | |
| iii | The nature, amount and representativeness of metallurgical test work undertaken, the nature of the metallurgical domaining applied and the corresponding metallurgical recovery factors applied. | | | | | N/A | | | |
| iv | Any assumptions or allowances made for deleterious elements. | | | | | | | | |
| v | The existence of any bulk sample or pilot scale test work and the degree to which such samples are considered representative of the orebody as a whole. | | | | | | | | |
| vi | For minerals that are defined by a specification, has the ore reserve estimation been based on the appropriate mineralogy to meet the specifications? | | | | | | | | |
| **4.7** | **ENVIRONMENTAL** | | | | | | | | |
| i | The status of studies of potential environmental impacts of the mining and processing operation. Details of waste rock characterisation and the consideration of potential sites, status of design options considered and, where applicable, the status of approvals for process residue storage and waste dumps should be reported. | | | | | N/A | | | |
| **4.8** | **INFRASTRUCTURE** | | | | | | | | |
| i | The existence of appropriate infrastructure:<br>-availability of land for plant development,<br>-power,<br>-water,<br>-transportation (particularly for bulk commodities),<br>-labour,<br>-accommodation or;<br>-the ease with which the infrastructure can be provided, or accessed. | | | | | N/A | | | |
| **4.9** | **COSTS** | | | | | | | | |
| i | The derivation of, or assumptions made, regarding projected capital costs in the study. | | | | | | | | |
| ii | The methodology used to estimate operating costs. | | | | | | | | |
| iii | Allowances made for the content of deleterious elements. | | | | | | | | |
| iv | The derivation of assumptions made of metal or commodity price(s), for the principle minerals and co-products. | | | | | N/A | | | |
| v | The source of exchange rates used in the study. | | | | | | | | |
| vi | Derivation of transportation charges. | | | | | | | | |

| JORC (TABLE 1) | DESCRIPTION | VOORBURG | JUTLAND | TELEMA & GRAY | MOUNT STUART | GENERAAL | CHAPUDI | CHAPUDI WEST | WILDEBEESTHOEK |
|---|---|---|---|---|---|---|---|---|---|
| vii | The basis for forecasting or source of treatment and refining charges, penalties for failure to meet the specifications, etc. | | | | | | | | |
| viii | The allowances made for royalties payable, both Government and private. | | | | | | | | |
| **4.1** | **REVENUE FACTORS** | | | | | | | | |
| i | The derivation of, or assumptions made regarding revenue factors including:<br>-head grade,<br>-metal or commodity price(s) exchange rates,<br>-transportation and treatment charges,<br>-penalties,<br>-net smelter returns, etc. | | | | | N/A | | | |
| ii | The derivation of assumptions made of metal or commodity price(s), for the principle minerals and co-products. | | | | | | | | |
| **4.11** | **MARKET ASSESSMENT** | | | | | | | | |
| i | The demand, supply and stock situation for the particular commodity, consumption trends and factors likely to affect supply and demand into the future. | | | | | | | | |
| ii | A customer and competitor analysis along with the identification of likely market windows for the product. | | | | | N/A | | | |
| iii | Prices and volume forecasts and the basis for these forecasts. | | | | | | | | |
| iv | For industrial minerals, the customer specification, testing and acceptance requirements prior to a supply contract. | | | | | | | | |
| **4.12** | **ECONOMIC** | | | | | | | | |
| i | The inputs to the economic analysis to produce the net present value (NPV) in the study, the source and confidence of these economic inputs including;<br>-estimated inflation,<br>-discount rate, etc. | | | | | N/A | | | |
| ii | NPV ranges and sensitivity to variations in the significant assumptions and inputs. | | | | | | | | |
| **4.13** | **SOCIAL** | | | | | | | | |
| i | The status of agreements with key stakeholders and matters leading to social licence to operate. | | | | | N/A | | | |
| **4.15** | **OTHER** | | | | | | | | |
| i | To the extent relevant, the impact of the following on the project and/or on the estimation and classification of the Ore Reserves:<br>-Any identified material naturally occurring risks.<br>-The status of material legal agreements and marketing arrangements.<br>-The status of governmental agreements and approvals critical to the viability of the projects such as mineral tenement status and government and statutory approvals. There must be reasonable grounds to expect that all necessary Government approvals will be received within the timeframes anticipated in the Pre-Feasibility study. Highlight and discuss the materiality of any unresolved matter that is dependent on a third party on which extraction of the reserve is contingent. | | | | | N/A | | | |
| **4.16** | **CLASSIFICATION** | | | | | | | | |
| i | The basis for the classification of the Ore Reserves into varying confidence categories. | | | | | N/A | | | |

| JORC (TABLE 1) | DESCRIPTION | VOORBURG | JUTLAND | TELEMA & GRAY | MOUNT STUART | GENERAAL | CHAPUDI | CHAPUDI WEST | WILDEBEESTHOEK |
|---|---|---|---|---|---|---|---|---|---|
| ii | Whether the result appropriately reflects the Competent Person's view of the deposit. | | | | | | | | |
| iii | The proportion of Probable Ore Reserves that have been derived from Measured Mineral Resources (if any). | | | | | | | | |
| **4.17** | **AUDITS OR REVIEWS** | | | | | | | | |
| i | The results of any audits or reviews of Ore Reserve estimates. | | | | | N/A | | | |
| **4.18** | **DISCUSSION OF RELATIVE ACCURACY/CONFIDENCE** | | | | | | | | |
| i | Where appropriate a statement of the relative accuracy and confidence level in the Ore Reserve estimate using an approach or procedure deemed appropriate by the Competent Person (where appropriate). the application of statistical or geostatistical procedures to quantify the relative accuracy of the resource within stated confidence limits, or, if such an approach is not deemed appropriate , a qualitative discussion of the factors that could affect the relative accuracy and confidence of the estimate. | | | | | | | | |
| ii | The statement should specify whether it relates to global or local estimates, and if local, state the relevant tonnages, which should be relevant to technical and economic evaluation. Documentation should include assumptions made and the procedures used. | | | | | N/A | | | |
| iii | Accuracy and confidence discussions should extend to specific discussions of any applied Modifying factors that may have material impact on Ore Reserve viability, or for which there are remaining areas of uncertainty at the current study stage. | | | | | | | | |
| iv | It is recognised that this may not be possible or appropriate in all circumstances. These statements of relative accuracy and confidence of the estimate should be compared with production data, where available. | | | | | | | | |
| | | | | | | | | | |

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# Appendix 3: Glossary

| TERM | DEFINITION |
|---|---|
| Abrasion index | Calculated from the mass loss of four standard steel plates attached to a stirrer rotating under controlled conditions in a certain mass of coal. |
| Ash (%) | The solid residue that remains after the complete combustion of coal. |
| Assay laboratory | A facility in which the quality of the ores are determined using analytical techniques. |
| Audit | Checking mechanisms to verify the veracity of results. |
| Basic | Of igneous rocks having a relatively low silica content |
| Block model | Technique of modelling which divides the resources into a number of mineable blocks. |
| Boxcut | Open cut made through the overburden to expose a portion of the coal seam that provides portal access to a decline to an underground mine. |
| Bulk sample | Large sample which is processed through a small-scale plant, not a laboratory |
| Burnt coal | Coal in contact or close proximity with dolerite intrusions that undergoes chemical change, particularly the loss of volatiles due to heating. |
| Calorific Value (CV) | The heat liberated by the coal's complete combustion with oxygen. |
| Coal | Carbonaceous sedimentary rock with an ash content of less than 50%. |
| Coal Rank | The degree of 'metamorphism' undergone by a coal. Higher rank, harder coals are defined by a higher carbon/energy content and lower inherent moisture. |
| Coking coal properties | When vitrinite –rich coals of suitable rank are heated in the absence of air, they become plastic, swell due to devolatilisation and reconsolidate to form a porous, coherent, carbon-rich residue called coke. A good coking coal has good thermoplasticity, a high dilation and a high caking or agglutinating power. Four indices are normally used to assess the coking properties of coal: the crucible swelling index/number (or free swelling index), the Roga index, the dilation and the plasticity. |
| CRI | When coke is preheated and cooled under nitrogen, the weight loss during reaction is measured. The percentage weight loss is known as the reactivity or CRI. |
| Cross section | A diagram or drawing that shows features transected by a vertical plane drawn at right angles to the longer axis of a geologic feature. |
| Defunct Property | a Mineral Asset on which the Mineral Resources and Mineral Reserves have been exhausted and exploitation has ceased and which may or may not have residual assets and liabilities. |
| Density | Measure of the relative "heaviness" of objects with a constant volume, density = mass/volume |
| Deposit | Any sort of earth material that has accumulated through the action of wind, water, ice or other agents |
| Development Property | a Mineral Property that is being prepared for mineral production and for which economic viability has been demonstrated. |
| Diamond drilling | A drilling method, where the rock is cut with a diamond bit, to extract cores. |
| Dilation (%) | The change in volume observed when pulverized coal, pressed into a pencil shape, is heated slowly. The temperatures of softening, maximum shrinkage, and maximum dilation of the coal are noted, as the plastic range from softening temp. to max. dilation of individual coals in a coking coal blend should overlap to achieve the best results. Good coking coals should have dilations of 50% to 150%. |
| Dilution | Waste which is mixed with ore in the mining process. |
| Dip | The angle that a structural surface, i.e. a bedding or fault plane, makes with the horizontal measured perpendicular to the strike of the structure. |
| Dolerite | A medium grained igneous rock which is emplaced within the earth's crust in the form of dykes and sills. |
| Dormant Property | A Mineral Asset which is not currently being actively explored or exploited, where the Mineral Resources and Mineral Reserves have not been exhausted, and which may or may not be economically viable. |
| Dyke | Intrusive igneous rock vertically or subvertically emplaced. |
| Estimation | The quantitative judgement of a variable. |
| Exploration | Prospecting, sampling, mapping, diamond drilling and other work involved in the search for mineralization. |
| Exploration Property | A Mineral Asset which is being actively explored for Mineral deposits or petroleum fields, but for which economic viability has not been demonstrated |
| Fault | A fracture in earth materials, along which the opposite sides have been displaced parallel to then plane of the movement |
| Feasibility study | A definitive engineering estimate of all costs, revenues, equipment requirements and production levels likely to be achieved if a mine is developed. The study is used to define the economic viability of a project and to support the search for project financing. |

| TERM | DEFINITION |
|---|---|
| Fixed Carbon (%) | The organic residue remaining after the volatile matter has been liberated. The % fixed carbon is obtained when the sum of the moisture, ash and volatile matter percentages is subtracted from100%. |
| Footwall | The underlying side of a fault, orebody or stope. |
| Gravity survey | A geophysical study undertaken from the surface or from the air which identifies variations in the density of the earth from surface to depth. |
| Groundwater | Water found beneath the surface of the land. |
| Hardgrove grindability index | The ease with which coal can be pulverized, the higher the index the softer the coal. |
| Hydrological | Pertaining to water either above or below the surface |
| Igneous | Rocks resulting from the crystallization of a molten magma, either intrusive or volcanic. |
| In situ | In its original place, most often used to refer to the location of the mineral resources. |
| Indicated Coal Resource | That part of a coal resource for which tonnage, densities, shape, physical characteristics, grade and coal quality can be estimated with a moderate level of confidence. It is based on exploration sampling and testing information gathered through appropriate techniques from locations such as outcrops, trenches, pits, workings and drill holes. The locations are appropriate to confirm physical continuity, while the locations are too widely or inappropriately spaced to confirm coal quality continuity. However, such locations are spaced closely enough for coal quality continuity to be assumed. |
| Inferred Coal Resource | That part of a coal resource for which tonnage, grade and coal quality can be estimated with a low level of confidence. It is inferred from geological evidence and assumed but not verified physical continuity with or without coal quality continuity. It is based on exploration, sampling and testing information gathered through appropriate techniques from locations such as outcrops, trenches, pits, workings and drill holes which is limited or of uncertain quality or reliability. |
| Laser survey | Airborne survey which accurately measures the height of the surface of the earth to produce a detailed digital topographic plan. |
| Lava | Molten silicate material extruded by a volcano. |
| Licence, Permit, Lease or other similar entitlement | Any form of licence, permit, lease or other entitlement granted by the relevant Government department in accordance with its mining legislation that confers on the holder certain rights to explore for and/or extract minerals that might be contained in the land, or ownership title that may prove ownership of the minerals |
| Life of Mine - LoM | Expected duration of time that it will take to extract accessible material |
| Mineable | That portion of a resource for which extraction is technically and economically feasible. |
| Mineral Asset(s) | Any right to explore and / or mine which has been granted (“property”), or entity holding such property or the securities of such an entity, including but not limited to all corporeal and incorporeal property, mineral rights, mining titles, mining leases, intellectual property, personal property (including plant equipment and infrastructure), mining and exploration tenures and titles or any other right held or acquired in connection with the finding and removing of minerals and petroleum located in, on or near the earth’s crust. Mineral Assets can be classified as Dormant Properties, Exploration Properties, Development Properties, Mining Properties or Defunct Properties. |
| Mineral Resource | A concentration of material of economic interest in or on Earth’s crust in such form, quality and quantity that there are reasonable and realistic prospects for eventual economic extraction. The location, quantity, grade, continuity an other geological characteristics of a Mineral Resource are known, estimated from specific geological evidence and knowledge, or interpreted from a well constrained and portrayed geological model. Mineral Resources are subdivided, in order of increasing confidence in respect of geoscientific evidence, into Inferred, Indicated and Measured categories.<br>A deposit is a concentration of material of possible economic interest in, on or near the Earth’s crust. Portions of a deposit that do not have reasonable and realistic prospects for eventual economic extraction must not be included in a Mineral resource.<br>JORC prefers the term ‘Mineral Resource’, although it may be reported as ‘Coal Resource’ if preferred by the reporting company. |
| Mineralisation | The presence of a target mineral in a mass of host rock. |
| Mining Property | a Mineral Asset which is in production. |
| Moisture Content (Inherent moisture) | Moisture content for purposes of a proximate analysis is derived from the mass loss of air-dried coal when heated to between 105°C and 110°C. |

| TERM | DEFINITION |
|---|---|
| NPV | Net present value. The NPV is the present value of future cash flows calculated from an escalated and inflated free cash flow of the operations. This is discounted back at inflation and then further discounted at a project risk rate. The NPV can be of cash flows before or after tax, or based upon full shareholders returns. |
| Olivine | A silicate mineral commonly found in igneous rocks |
| Opencast / Open pit | Surface mining in which the ore is extracted from a pit. The geometry of the pit may vary with the characteristics of the ore body. |
| Orebody | A continuous well defined mass of material of sufficient ore content to make extraction economically feasible. |
| Ore Reserve | Is the economically mineable material derived from a Measured and /or Indicated Mineral Resource, It is inclusive of diluting materials and allows for losses that Reserves to denote progressively increasing uncertainty in their recoverability. Proved Reserve can be categorised as Developed or Undeveloped. JORC prefers the term 'Ore Reserve', although it may be reported as 'Coal Reserve' if preferred by the reporting company, or as 'Mineral Reserve' when reporting to SAMREC standards. |
| Overburden | The alluvium and rock that must be removed in order to expose an ore deposit. |
| Payability | Economic viability of a mineral deposit. |
| Petrographic Analysis | A representative sample of coal is embedded in epoxy resin, and one side ground and polished for microscopic examination in reflected light under oil immersion. The maceral composition is determined by means of point counting. Generally only the group macerals vitrinite (V), exinite (E) and inertinite (I), and in some case reactive semifusinite (RSF), are counted. |
| Plasticity (d.p.m.) | The Gieseler plasticity is given by the angular velocity of a shaft with rabble arms, which is rotated in powdered coal by the action of a constant driving torque, while the temperature is raised slowly. The temperatures of softening (Ts), maximum plasticity (Tp) and resolidification (Tr) are recorded. These characteristic temperatures should overlap in the case of coal blends in order to obtain an optimum coke fabric and coke strength. The maximum plasticity for good coking coals should be above 100 angular degrees per minute (d.p.m.). |
| Prefeasibility Study | Referring to a study of a Mineral asset, in which appropriate assessments have been made of realistically estimated mining, metallurgical, economic, marketing legal, environmental, social, governmental, geological, engineering, operational and all other modifying factors are considered in sufficient detail to demonstrate at the time of reporting that extraction is reasonably justified and the factors are considered in sufficient detail to serve as a reasonable basis for a decision to proceed or not to proceed to a Feasibility Study. |
| Primary deposit | With reference to the deposition of diamonds, these deposits include kimberlite pipes, dykes, blows and fissures as well as lamproites. Contrasted with alluvial. |
| Probable mineral reserve | Is the economically mineable material derived from a Measured and/or Indicated Coal Resource. It is estimated with a lower level of confidence than a Proved Reserve. It is inclusive of diluting materials and allows for losses that may occur when the material is mined. Appropriate assessments, which may include feasibility studies, have been carried out, including consideration of, and modification by, realistically assumed mining, metallurgical, economic, marketing, legal, environmental, social and governmental factors. These assessments demonstrate at the time of reporting that extraction is reasonably justified. |
| Prospect | A deposit with the potential for economic extraction |
| Proximate analysis | The determination, by prescribed methods, of moisture, ash, volatile matter and fixed carbon (by difference) contents of air-dried coal. |
| Rehabilitation | The process of restoring mined land to a condition approximating to a greater or lesser degree its original state. Reclamation standards are determined by the South African Department of Mineral and Energy Affairs and address ground and surface water, topsoil, final slope gradients, waste handling and re-vegetation issues. |
| ROGA Index | Gives an indication of the caking power of coal and is calculated from the resistance to abrasion, determined under standard conditions, of a coke button made from a mixture of coal and a standard anthracite. |
| RoVmax (%) | Maximum vitrinite reflectance. |
| Sample | The removal of a small amount of rock pertaining to the deposit which is used to estimate the grade of the deposit and other geological parameters. |
| Sampling | Taking small pieces of rock at intervals along exposed mineralization for analysis (to determine the mineral content). |
| Sandstone | A fine to very coarse grained arenaceous sedimentary rock consisting of silicate group minerals e.g. Sand |
| Seam | An economically viable stratum of coal or mineral |

| TERM | DEFINITION |
|---|---|
| Sedimentary | Formed by the deposition of solid fragmental or chemical material that originates from weathering of rocks and is transported from a source to a site of deposition. |
| Shale | A fine grained argillaceous sedimentary rock consisting of clays. |
| Silt | A detrital particle, smaller than sand and coarser than clay, in the range 0.004 to 0.062mm |
| Specific gravity | Measure of quantity of mass per unit of volume, density. |
| Stockpile | A store of unprocessed ore or marginal grade material. |
| Stratigraphic | A term describing the sequence in time of bedded rocks which can be correlated between different localities. |
| Strike | The direction taken by a structural surface such as a fault plane as it intersects the horizontal. |
| Stripping | Removal of waste overburden covering the mineral deposit. |
| Stripping ratio | Ratio of ore rock to waste rock. |
| Swelling Index | Determined by rapidly heating one gram of a pulverized coal in a closed crucible at 820°C. The ratio of volume of coke button obtained to the original volume is assigned a value between 0 and 9 (in half steps). |
| Tailings | The waste products of the processing circuit. These may still contain very small quantities of the economic mineral. |
| Tailings dam | Dams or dumps created from waste material from processed ore after the economically recoverable metal or mineral has been extracted. |
| Tertiary period | A period of time spanning between 2.0 Ma and 65 Ma. |
| Tonnage | Quantities where the tonne is an appropriate unit of measure. Typically used to measure quantities of in-situ material or quantities of ore and waste material mined, transported or milled. |
| Thermal Coal | All non-coking coal. |
| Tonne | Metric Ton |
| Trenching | Making elongated open-air excavations for the purposed of mapping and sampling. |
| Ultimate Analysis | Analysis of air-dried coal in terms of its carbon, oxygen, nitrogen, and organic sulphur contents. |
| Volatile Matter (%) | The material, other than inherent moisture, which is driven off when air-dried coal is heated at 900°C for seven (7) minutes under standard conditions, in the absence of air. |
| Volcanic | Igneous rocks that have reached or nearly reached the earth's surface before solidifying, for example lavas. |
| Vitrinite | One of the primary components of coal, derived from the cell-wall material or woody tissue of the plants from which coal was formed. Chemically, it is composed of polymers, cellulose and lignin. |
| Waste rock | Rock with an insufficient diamond content to justify processing. |
| Weathered rock | Rock which has been broken down by the influences of water and air and which becomes softened and partially decomposed. |
| Yield | The actual quantity of ore (coal) realised after the mining and treatment process. |

# Appendix 4: Acronyms and Abbreviations

| ABBREVIATION OR UNIT OF MEASUREMENT | EXPLANATION |
|---|---|
| ACT | Advanced Coal Technologies (Pty) Limited |
| AIM | Alternative Investment Market |
| AEL | Atmospheric Emission Licence |
| amsl | Above mean sea level |
| ANC | African National Congress |
| Anglo American | Anglo American plc |
| Anglo Coal | Anglo Coal SA Limited, Anglo American plc's Coal Division |
| Anker | Anker Coal and Mineral Resources (Pty) Ltd |
| ArcelorMittal | ArcelorMittal South Africa Ltd |
| ARD | Apparent Relative Density |
| ASX | Australian Stock Exchange |
| AusIMM | Australian Institute of Mining & Metallurgy |
| B.Sc. | Bachelor of Science degree |
| B.Sc. (Hons) | Bachelor of Science Honours degree |
| Badger Mining | Badger Mining (Pty) Ltd |
| BBBEE | Broad-based black economic empowerment |
| BEE | Black economic empowerment |
| BHPB | BHP Billiton plc |
| BOD | Biochemical Oxygen Demand |
| BP | British Petroleum |
| BRSW | BRSW Mining Consulting Services (Pty) Ltd |
| Bt | Billion tonnes |
| Capex | Capital Expenditure |
| CBM | Coal Bed Methane |
| CGS | Council for Geoscience |
| Chapudi Coal | Chapudi Coal (Pty) Ltd |
| CIF | Cost, insurance and freight |
| CM | Continuous Miner |
| CoAL | Coal of Africa Limited |
| COD | Chemical Oxygen Demand |
| CPR | Competent Persons' Report |
| CSR | Coke Strength After Reaction |
| CTL | Coal to Liquids |
| CV | Calorific Value |
| DAF | Dry Ash Free |
| DCF | Discounted cash flow |
| DEA | Department of Environmental Affairs |
| DFS | Definitive Feasibility Study |
| Dip | Diploma |
| DME | Department of Minerals and Energy |
| DMR | Department of Mineral Resources |
| DWA | Department of Water Affairs |
| DWS | Department of Water and Sanitation |
| EA | Environmental Authorisation |
| EBIT | Earnings before interest and tax |
| ECA | Environmental Conservation Act |
| EIA | Environmental Impact Assessment/ Energy Information Administration |
| EIMS | Environmental Impact Management Services(Pty) Ltd |
| EMP | Environmental Management Plan |
| EOH | End of hole |
| Eskom | Eskom Holdings Limited, South Africa's State power utility |
| EU | European Union |
| Exxaro | Exxaro Resources Limited |
| FGSSA | Fellow of the Geological Society of South Africa |

| ABBREVIATION OR UNIT OF MEASUREMENT | EXPLANATION |
|---|---|
| FOB | Free on board |
| FSA | United Kingdom Financial Services Authority |
| FSAIMM | Fellow of the South African Institute for Mining & Metallurgy |
| GDP | Gross domestic product |
| GeoCoal | GeoCoal Services |
| Goldfields | Goldfields Mining and Development |
| Govt Cert | Government Certificate |
| Grindrod | Grindrod Trading and Shipping Ltd |
| GTIS | Gross Tons In situ |
| GW | GigaWatt |
| ha | Hectare |
| HDSAs | Historically disadvantaged South Africans |
| I&APs | Interested and Affected Parties |
| IEM | Integrated Environmental Management |
| Ingwe | Ingwe Coal Corporation |
| Inspectorate | Inspectorate M & L (Pty) Ltd |
| Iscor | Iscor Ltd |
| ISO | International Organization for Standardization |
| IWUL | Integrated Water Use Licence |
| IWULA | Integrated Water Use Licence Application |
| JORC | Joint Ore Reserves Committee |
| JPMC | JP Morgan Casenove |
| JSE | Johannesburg Stock Exchange Limited |
| kg | Kilogram |
| km | Kilometre |
| KME | Kwezi Mining Exploration (Pty) Ltd |
| Kwena | Kwena Mining Projects cc |
| Kwezi | Kwezi Mining (Pty) Ltd |
| Langcarel | Langcarel (Pty) Ltd |
| LDD | Large Diameter Drilling |
| LHD | Load Haul Dumper |
| LIDAR | Light Detection and Ranging |
| Limpopo Coal | Limpopo Coal Company (Pty) Ltd |
| LIMS | Laboratory Integrated Management System |
| LOM | Life of mine |
| LSE | London Stock Exchange |
| LVR | LVR Plant (Pty) Ltd |
| m | Metre / million |
| m2 | Square metres |
| m3 | Cubic metre |
| M.Sc. | Masters degree in Science |
| Mapungubwe | Mapungubwe National Park and World Heritage Site |
| MAusIMM | Member of the Australian Institute of Mining & Metallurgy |
| MDEDET | Mpumalanga Department of Economic Development, Environment and Tourism |
| MEC | Member of the Executive Council |
| MGSSA | Member of the Geological Society of South Africa |
| MIA | Mine Infrastructure Area |
| Midlabs | Midlab cc |
| Min.Eng | Mining Engineer |
| Mining Charter | Broad-based Socio-Economic Charter for the South African Mining Industry |
| MJ/kg | MegaJoule per kilogram |
| mm | Millimetre |
| Mm3 | Million cubic metres |

| ABBREVIATION OR UNIT OF MEASUREMENT | EXPLANATION |
|---|---|
| MOA | Memorandum of Understanding |
| MOF | Maputo Option Fee |
| Mooiplaats Mining | Mooiplaats Mining (Pty) Ltd |
| Morgan Stanley | Morgan Stanley & Co International plc |
| Motjoli | Motjoli Resources (Pty) Ltd |
| MPRDA | South African Minerals and Petroleum Resources Development Act |
| MPRRA | Minerals and Petroleum Resources Royalty Act |
| MR | Mining Right |
| MRA | Mining Right Application |
| MSA | MSA GeoServices (Pty) Ltd |
| MSAIMM | Member of the South African Institute for Mining & Metallurgy |
| Mt | Million tonnes |
| MTIS | Mineable Tons In Situ |
| Mtoe | Million tonnes oil equivalent |
| Mtpa | Million tons per annum |
| MW | Mega Watt |
| N/A | Not applicable |
| NEM:AQA | National Environmental Management: Air Quality Act |
| NEM:PAA | National Environmental Management: Protected Areas Act |
| NEM:WA | National Environmental Management : Waste Act |
| NEMA | National Environmental Management Act |
| NEMWA | National Environmental Management : Waste Act |
| NFA | National Forests Act |
| NHRA | National Heritage Resources Act |
| NMSTE | National Mathematics, Science and Technology Education |
| NOMR | New Order Mining Right |
| NOPR | New Order Prospecting Right |
| NuCoal | NuCoal Mining (Pty) Ltd |
| NWA | National Water Act |
| OECD | Organisation for Economic Co-operation and Development |
| OHSA | Occupational Health and Safety Act |
| Opex | Operating expenditure |
| OPH/ Optimum | Optimum Coal Holdings |
| PCD | Pollution Control Dam |
| PetroSA | Petroleum, Oil and Gas Corporation of South Africa (Pty) Limited |
| PPP | Public Participation Process |
| RoD | Record of Decision |
| SAHRA | South African Heritage Resource Agency |
| SLP | Social and Labour Plan |
| VBR | Vhembe Biosphere Reserve |
| WML | Waste Management Licence |
| WSA | Water Service Authority |
| WSP | Water Service Provider |
| WWTP | Waste Water Treatment Plant |

# Appendix 5: CVs of the Compilers

**Name of Staff:** Elizabeth Sarah de Klerk
**Position:** Manager
**Name of Firm:** Venmyn Deloitte, a subsidiary of Deloitte Consulting South Africa (Pty) Ltd
**Address:** Building 33, The Woodlands Office Park, 20 Woodlands Drive, Woodmead, Sandton
**Profession:** Geologist
**Date of Birth:** 11 January 1978
**Years with Firm/Entity:** Joined March 2015
**Nationality:** British

### Membership in Professional Societies:

| CLASS | PROFESSIONAL SOCIETY | YEAR OF REGISTRATION |
|---|---|---|
| Member (400090/08) | The South Africa Council for Natural Scientific Professions | 2008 |
| Member (965062) | Geological Society of South Africa | 2003 |
| Fellow | Geological Society of South Africa | 2013 |

### Detailed Tasks Assigned whilst at Venmyn Deloitte:

| YEAR | CLIENT | COMMODITY | PROJECT DESCRIPTION |
|---|---|---|---|
| 2015 | Simeka Capital Holdings (Pty) Ltd | Chromium | Planning, implementation, oversight and audit of a chromium exploration programme on the Memor Mining (Pty) Ltd Langpan Chromium mine on the western limb of the Bushveld Complex, Limpopo Province, South Africa. |
| | Jay and Jayendra (Pty) Ltd | Coal | Mmamabula Energy Project, Bankable Feasability requirements gap analysis |
| | Mindset Mining Consultants (Pty) Ltd | Coal | SAMREC compliant due diligence on the Braakfontein Project Coal Resources owned by Keaton Energy Holdings Ltd located in the Kilprivier Coalfield, KwaZulu-Natal South Africa. The review was used as part of a Feasibility Study for the project. |
| | African Specialty Metals 1 | Lead/Zinc | Independent mineral asset valuation and resource review for the Bushy Park, Mississippi Valley-type lead/zince deposit, Northern Cape, South Africa |
| | Samancor Chrome Limited | Chromium | Full evaluation of the Mineral Resource and Reserve estimation and underlying exploration information of Samancor's chromite projects across South Africa. |
| | EMCO Coal Zambia Ltd | Coal | Independent mineral asset valuation for the EMCO Coal Project, Siankondobo Coalfield, Zambia |
| | Assmang (Pty) Ltd | Iron Ore | MRM recovery programme at Khumani Iron Ore Mine, Northern Cape, South Africa, focussing on assistance with mine resource to production cycle |
| | Delta Mining Consolidated | Coal | Short form and valuation report on the Rietkuil Coal Asset, Delmas, Mpumalanga, South Africa |
| | Xtract Resources PLC | Copper | Provide independent exploration review services and QA/QC procedures and protocols, together with a Mineral Resource estimate, for the O'Kiep Copper Company Carolusberg and O'Kiep copper tailings storage facilities in the Northern Cape Province of South Africa. |

### Key Qualifications:

Liz de Klerk has been actively involved in the mining industry since 2003, having moved to South Africa in 2001 and graduated from Rhodes University in 2002 with an MSc. Since that time Liz has worked on a number of exploration, due diligence and modelling projects covering a range of commodities, including coal, platinum, chrome, alluvial diamonds, base metals and manganese. She has written and contributed to a number of compliant documents applicable to the Australian, South African, London and Canadian stock exchanges. Her specific area of expertise is coal exploration, resource modelling, reporting and compliance. In addition Liz has a wide amount of knowledge and experience in QA/QC, database management and auditing across many commodities. Liz is on the council of the Geological Society of South Africa and in this capacity is involved in development of courses and conferences.

**Education:**

| DEGREE/DIPLOMA | FIELD | INSTITUTION | YEAR |
|---|---|---|---|
| B.Sc (Hons) | Geology | Leicester University | 2000 |
| MSc | Exploration Geology | Rhodes University | 2002 |
| Certified Short Course | Project Management | University of Witwatersrand | 2007 |

## Employment Record:

| POSITION | COMPANY | JOB DESCRIPTION | DURATION |
|---|---|---|---|
| Manager | Venmyn Deloitte (Pty) Ltd | · Orebody modelling and interpretation in Micromine, Datamine and GeoSoft Target<br>· Resource estimation specializing in coal and stratiform orebodies<br>· Geostatisical evaluation of mineral deposits<br>· Independent Competent Persons Reports for listings on London, Johannesburg and Australian Stock Exchanges<br>· Advising clients on compliance documentation<br>· Due diligence technical assessments & prospectivity reviews<br>· Public reporting to the stock exchange standards and client liasing<br>· Advising clients on exploration programme development and implementation<br>· Market studies | Mar 2015 - present |
| Director | DK Exploration cc | Owner of an independent consulting company specializing in coal exploration, resource modelling and compliance, including:<br>· Orebody modelling in Micromine and GeoSoft Target<br>· Resource estimation and reporting<br>· Involvement in a variaty of reporting documents such as CPRs, Feasability Studies, Bankable Feasbility Studies, NI-43 101, due diligence and technical reports<br>· Creation, implementation and management of exploration programmes in South Africa, Southern Africa and Russia<br>· Associations with a number of leading consulting firms in South Africa and the UK<br>· Competent person in coal<br>· Advice and due diligence for project and resource compliance with the JSE, ASX and LSE<br>· Technical assessments and project viability<br>· Investor presentations | Sept 2010 - Mar 2015 |
| Co-founder and Managing Partner | CCIC Coal (Pty) Ltd | · Manager and mentor to graduate geologists<br>· Marketing and sourcing new clients and projects<br>· Billing, sub-contractor management and payroll<br>· Lead exploration geologist managing all coal-related prospectivity programmes<br>· Target identification and interpretation using GeoSoft Target<br>· Client and investor presentations | Oct 2008 - Sept 2010 |
| Senior Exploration Geologist | Caracle Creek International Consulting Inc. (CCIC) | · Planning, execution and management of various exploration programs for a variety of commodities around South Africa.<br>· Mine exploration geologist (consulting) at Anglo Platinum's PPL operating mine on the Platreef<br>· Project reporting adhering to various requirements. | Feb 2006 - Oct 2008 |
| Project Geologist | Eersteling Gold Mining Company | · Planning, execution and field management of two dual running exploration programs PGM's and Au.<br>· Involved in all such phases setting up stake holder relations, managing QA/QC, various contractors, geological logging, sampling etc.<br>· Database management and geological interpretation.<br>· Project reporting.<br>· Guided GSSA and university field trips through project areas. | Mar 2004 – Jan 2006 |
| Field Geologist | Tawana Resources NL | · Drill rig management of a diamond exploration program.<br>· Geological logging and management of bulk sample collection<br>· Running of Flow Sort machine<br>· Data collection, management and interp<br>· Hand picking diamonds from final concentrates<br>· Project reporting | Oct 2003 – Mar 2004 |
| Field Surveyor | Longdin & Browning | · Sent around the United Kingdom using a range of surveying equipment to correct/confirm the previous topographic contouring of the countryside and cities of Wales and England. | Feb 2003 – Jun 2003 |

**Languages:**

English: Excellent (written and verbal)

Certification:

I, the undersigned, certify that to the best of my knowledge and belief, these data correctly describe me, my qualifications, and my experience.

_____Date: January 2016
Full name of staff member: Elizabeth Sarah de Klerk

**Name of Staff Member:** Tarryn Claire Orford
**Position:** Mineral Project Analyst
**Name of Firm:** Venmyn Deloitte, a subsidiary of Deloitte Consulting South Africa (Pty) Ltd
**Address:** 1st Floor, Building 33, the Woodlands Office Park, 20 Woodlands Drive, Woodmead
**Profession:** Geologist
**Date of Birth:** 26 March 1987
**Years with Firm/Entity:** Joined March 2010
**Nationality:** South African

## Membership in Professional Societies:-

| CLASS | PROFESSIONAL SOCIETY | YEAR OF REGISTRATION |
|---|---|---|
| Member | Geological Society of South Africa | 2010 |
| Member | Geostatistical Association of South Africa | 2011 |
| Member | South African Institute for Mining and Metallurgy | 2014 |
| Member | Society for Petroleum Engineers | 2015 |
| Professional Natural Scientist | South African Council for Natural Scientific Professions | 2015 |

## Fair and Reasonable Opinions:-

| YEAR | CLIENT | SECURITIES EXCHANGE JURISDICTION | TRANSACTION TYPE | IMPLIED VALUE (USDm) | DESCRIPTION |
|---|---|---|---|---|---|
| 2012 | Chrometco | JSE | Purchase of assets for shares. | 21.6 | Independent Professional Expert Report. |
| 2014 | Village Main Reef | TRP | Cash for shares | | Independent Professional Expert Report. |

## Detailed Tasks Assigned:-

| YEAR | CLIENT | COMMODITY | PROJECT DESCRIPTION |
|---|---|---|---|
| 2015 | Chrometco | Chrome & PGEs | Provided strategic advice on the relevant properties, company strategy and transaction value to Chrometco to use for use as part of a potential transaction on assets in South Africa. |
| | Molopo | Gas | Exploration guideline which provides a best practice company document to ensure exploration going forward is compliant with the relevant reporting codes in South Africa. |
| | Kemin | Molybdenum/Tungsten | Two JORC Compliant Technical Reports on two molybdenum and tungsten projects in Kazakhstan, for listing on the LSE. |
| | Deloitte Audit South Africa | Coal | Review of technical inputs, Resources and Reserves, depletions and reconciliations for the audit of Glencore Coal. |
| | Deloitte Audit South Africa | Chrome, Platinum & Vanadium | Review of technical inputs, Resources and Reserves, depletions and reconciliations for the audit of Glencore Alloys. |
| | Deloitte Audit Perth | Iron Ore | Provided technical guidance to the Perth audit team as the basis for an impairment review. |
| 2014 | Greenflash Trading | Potash, REE's | Technical guidance for determining the exploration and economic potential of an offshore deposit. |
| | Sentula | Coal | Listing CPRs on Sentula's major coal assets in South Africa for the purposes of disposal. |
| | Deloitte Kyrgyztan | Uranium | Mining Specialist review of Mineral Resources for audit assist on a number of uranium projects. |
| | Deloitte Italy | Gold | Strategic Exploration Guidance on a gold asset in the DRC. |
| | Deloitte Pretoria | Gold | Mining Specialist review of a CPR for audit assist on a number of gold projects in the Pilgrims Rest area. |
| | Chrometco | Chrome & PGEs | Strategic Review of the Rooderand Properties in the Bushveld Complex, South Africa. |
| | Bauba | PGEs | Completed a CPR on their South African PGE assets for updated listing on the JSE. |
| | Hambledon | Gold | Gap Analysis and CPR on the Sekisovskoya Gold Mine in Kazakhstan. |
| | Bauba | PGEs | Completed a CPR on their South African PGE assets for updated listing on the JSE. |
| 2013 | Ecobank | Gold | Completed a review of a financial model to assist a client to obtain financing for a gold asset located in the Democratic Republic of the Congo. |
| | Village Main Reef | Water | Assessment of Flooding and Pumping arrangements in the Klerskdorp Gold Basin, South Africa. |
| | Banro | Gold | Completed a Feasibility study for the Namoya Project, Democratic Republic of the Congo. |
| | Ashkari | Chrome | Fatal Flaws Analysis on 11 chrome assets in Zimbabwe. |
| | Deloitte Atlanta | Sand & Aggregate | Mining Specialist review of Mineral Resources, density calculations, QA/QC and Life of Mine for audit assist on a number of sand and aggreaagte projects in the USA. |

| YEAR | CLIENT | COMMODITY | PROJECT DESCRIPTION |
|---|---|---|---|
| 2013 | Village Main Reef | Water | Assessment of Flooding and Pumping arrangements in the Klerskdorp Gold Basin, South Africa. |
| | Banro | Gold | Completed a Feasibility study for the Namoya Project, Democratic Republic of the Congo. |
| | Ashkari | Chrome | Fatal Flaws Analysis on 11 chrome assets in Zimbabwe. |
| | Bauba | PGEs | Update of the Mineral Resource estimates for the Bauba Projects, Bushveld Complex, South Africa. |
| | African Nickel | Nickel | Completed a market review for Nickel in South Africa. |
| | Western Utilities Corporation | Intangible Assets | Independent high level evaluation of intangible Acid Mine Drainage technology assets for Financial Year end statements. |
| | Capital Works | Clay | Review of a Clay Mine, in South Africa, for Fatal Flaws to assist with an Investement Decision. |
| | Loncor | Gold | Compiling several sections for a NI 43-101 Preliminary Economic Assessment on the Makapela Prospect, Democratic Republic of the Congo. |
| | Banro | Gold | Verifying geological model and Mineral Resource estimates for the Lugushwa Project, Democratic Republic of the Congo. |
| | ZYL/Sentula Valuation | Coal | Valuation for various coal assets in the Kangwane Coalfield, South Africa, for potential merger discussions. |
| 2012 | Pinette Mining | Copper | Compilation of a exploration best practice guideline. |
| | Deloitte UK | Iron Ore | Review of Technical and Business Model on an Iranian Gold Project for guidance on an investment decision. |
| | Eureka | Gold | Short Form Technical Report and guidance on a defunct gold mine, Zimbabwe. |
| | Deloitte Canada | Iron Ore | Audit Assistance on Mont Wright Mine, Canada. |
| | SARS | Coal | Mineral Asset Valuation on various assets within South Africa held by Umthombo Resources. |
| | G&B African Resources | REE's, W, Li | Compilation of a CPR as part of listing requirements for their Zimbabwean assets. |
| | SEW Trident | Iron Ore | Technical on-site assistance in identifying mineralisation concessions in Guinea. |
| | Chrometco | Chrome | Compilation of a valuation letter for mineral assets in the Bushveld Complex, South Africa. |
| | Rukwa | Coal | Compilation of a CPR and technical documentation on their coal assets in Tanzania. |
| | Bauba | PGEs | Update of the Bauba's Mineral Resources in the Bushveld Complex, South Africa. |
| | Loncor | Gold | Verification of geological modelling and Mineral Resource estimation and parameters for the Makapela Project, Democratic Republic of the Congo. |
| | Izingwe and BRL | Magnetite | Techno-Economic Statement on the Mokopane Magnetite Project, Northern Limb, Bushveld Complex, South Africa. |
| | Razita Mining | Various | Short Form Prospectivity Reviews on various New-Order Prospecting Rights under application over South Africa. |
| 2011 | Lesego | PGEs | Strategic Assistance during exploration, project development and resource estimation for an Bushveld Project, South Africa. |
| | Evraz Highveld Steel and Vanadium | Magnetite and Iron Ore | Update of Annual Resource Statement for Mapochs Mine and technical assistance for future development of the asset in the Bushveld Complex, South Africa. |
| | Sable Platinum | Platinum and Vanadium | Strategic Technical Assistance on geology and exploration on some Bushveld Complex platinum projects, South Africa. |
| | Sylvania | Chrome | Techno-Economic Statements on chrome dump projects, South Africa. |
| | PSIL | Uranium | Techno-Economic Statement on a uranium deposit in Kazakhstan. |
| | African Consolidated Resources | Gold | Review and geostatistical analysis on some greenstone belt gold projects located in Zimbabwe. |
| | Realm Resources | PGEs | Techno-Evaluation Statement on some Bushveld Complex platinum assets, South Africa. |
| | Lesego | PGEs | Mineral Resource Update for their Bushveld Complex project, South Africa. |
| | Boynton | PGEs | Pre-Feasibility Study on the Western Bushveld Complex Magazynskraal Project, South Africa. |
| | Aura | Coal | A prospectivity Review on a coal Project in Nigeria. |
| | Pan African Resources | Gold | A Fatal Flaws Review of a gold tailings retreatment project near Barberton, South Africa. |
| | National Mining Corporation | Gold And Base Metals | A Scoping Study on gold and base metal projects in Ethiopia. |
| 2010 | Central African Gold | Gold | Technical Statement and Update of Resource Statement on a greenstone gold deposit in Zimbabwe. |
| | JCI Exploration | Uranium | Technical Review document on a Greenfields uranium project in the Northern Cape, South Africa. |
| | Absolute Holdings | PGEs | Compilation and research on three Bushveld Complex platinum projects for three Techno-Economic Valuations and a CPR. |
| | AfriSam | Cement | Data collection, research and proofreading for a Technical Review of numerous limestone, aggregate, sandstone, and dolomite assets, South Africa. |
| | Keldoron Coal Mining | Coal | Independent Valuation on coal assets in the Klipriver Coalfield, KwaZulu Natal, South Africa. |
| | Banro | Gold | Assistance with compilation of CPRs on a number of gold projects in the Democratic Republic of Congo. |

| YEAR | CLIENT | COMMODITY | PROJECT DESCRIPTION |
|---|---|---|---|
| 2010 | Buildmax | Sand | Short Form CPR on some sand mineral assets, South Africa. |
| | Ultratech | Coal | Technical and Valuation report on various coal projects, South Africa. |
| | Gentor | Base Metals | CPR and Technical Review of ophiolite deposits in Oman. |
| | Coal of Africa | Coal | Supporting documentation for valuation of coal assets in the Ermelo, Soutpansberg, Limpopo and Highveld Coalfields, South Africa. |
| | Bauba Platinum | PGEs | Technical assistance and Technical Statement on three Bushveld Complex platinum projects, South Africa. |

**Key Qualifications:-**

Tarryn Orford studied at the University of Pretoria where she undertook her Bachelor of Science degree in Geology and later, her Honours in Geology. As part of her honours degree, she undertook a study detailing the effect of metamorphism by the Bushveld Complex on the Transvaal Supergroup.

Tarryn joined the Venmyn team in March 2010. She brought with her experience in tutoring at University of Pretoria as well as vacation work for Digby Wells and Associates. Her current area of expertise includes preparation of SAMREC and National Instrument compliant technical documents, interpretation and analysis of mineral project data, preparation of technical diagrams and geostatistics to provide technical assistance during early stages of exploration.

In 2013, Venmyn Rand became Venmyn Deloitte, a wholly owned subsidiary of Deloitte Consulting South Africa. Since joining Venmyn, Tarryn has been involved in a number of projects including Competent Person's Reports, Technical Reports, Due Diligence Studies, Mineral Resource and Mineral Reserve Statements and Techno-Economic Valuations, Fatal Flaw Evaluations and has provided technical assistance to a number of companies over a wide range of commodities including Platinum Group Minerals, gold, coal, uranium, base metals, iron ore, manganese, magnetite, Rare Earth Elements, sand and clay. These projects included many technical field visits throughout South Africa and globally, including Ethiopia, Guinea, Botswana, Tanzania, Benin, Zimbabwe, the DRC and Kazakhstan.

Tarryn has completed her Graduate Diploma in Engineering (GDE) in Mining Engineering specialising in Mineral Resource Evaluation through the University of the Witwatersrand.

**Education:-**

| DEGREE/DIPLOMA | FIELD | INSTITUTION | YEAR |
|---|---|---|---|
| B.Sc. | Geology | University of Pretoria | 2008 |
| B.Sc. (Honours) | Geology | University of Pretoria | 2009 |
| Graduate Diploma in Engineering | Mining Engineering specialising in Mineral Resource Evaluation | University of the Witwatersrand | 2013 |

**Employment Record:-**

| POSITION | COMPANY | JOB DESCRIPTION | DURATION |
|---|---|---|---|
| Mineral Project Analyst | Venmyn Deloitte (Previously Venmyn Rand) | Venmyn Rand operates as a techno-economic consultancy for the resources industry on a worldwide basis.<br><br>Responsibilities at Venmyn include:-<br>• data processing for technical reports;<br>• compilation of due diligences, prospectivity reviews, technical reports, mineral resource and mineral reserve statements;<br>• compiling technical and geological information into reports which are compliant with the SAMREC and JSE listing rules; and<br>• high level research for multiple facets of mineral projects. | March 2010 to Present |
| Geology Tutor | University of Pretoria | Assisted students with practical tasks and assignments including identification of hand specimens and preparation for tests and exams. | January to July 2009 |
| Geography Tutor | University of Pretoria | Assisted students with practical tasks and assignments. Marking and overseeing tasks and exams. | January to July 2009 |
| Student Geologist | Digby Wells and Associates | Assistance on project specific work and a desktop study in the environmental field, secretarial work and general assistance to employers. | June 2009 to July 2009 |

**Languages:-**

English: Excellent
Afrikaans: Excellent
French: Basic

**Certification:-**

I, the undersigned, certify that to the best of my knowledge and belief, these data correctly describe me, my qualifications, and my experience.

Date: January 2016
Tarryn Claire Orford

**Name of Specialist**: Naledi Moeketsi
**Position:** Environmental Industry Specialist
**Name of Firm:** Venmyn Deloitte, a subsidiary of Deloitte Consulting South Africa (Pty) Ltd
**Address:** First Floor, Building 33, The Woodlands, 20 Woodlands Drive, Woodmead
**Profession:** Environmental Scientist
**Date of Birth**: 9 May 1989
**Years within field of Practise**: 5
**Nationality**: South African

## Education:-

| DEGREE/DIPLOMA | FIELD | INSTITUTION | YEAR |
|---|---|---|---|
| Degree | B.Tech Degree | Tshwane University of Technology | 2011 |
| Diploma | N.Dip – Environmental Sciences | Tshwane University of Technology | 2009 |

## Membership in Professional Societies:-

| CLASS | PROFESSIONAL SOCIETY | YEAR OF REGISTRATION |
|---|---|---|
| Member | International Association of Impact Assessors | 2014 |

## Detailed Tasks Assigned:-

| YEAR | CLIENT | COMMODITY | PROJECT DESCRIPTION |
|---|---|---|---|
| 2015 | Barplats | Platinum | Asset Retirement Obligation Review |
| | Continental Coal | Coal | Asset Retirement Obligation Review |
| | PIC Siyanda | Chrome | Technical Due Diligence |
| | Rand Refinery | Gold Refinery | Rand Refinery Audit Assistance |
| 2014 | Imerys South Africa | Zircon Sand | Transactional Due Diligence for Foskor Zirconia |
| | Inkomati Resources | Chrome | Environmental Legal Review |
| | Rand Bank Merchanr | Coal | Rviews on Boikarabelo Coal Mine's Environmental Compliance |
| | Ichor Coal N.V | Coal | Project Sketch - Technical and Financial Due Diligence Report |
| | Pembani Group (Pty) | Coal | Project Eagle - Technical and Financial Due Diligence Report |
| | Kumba Iron Ore | Iron Ore | Independent Review of LCosure Cost Estimates |
| | Exxaro Coal (Pty) Ltd | Coal | Compilation of an Environmental Impact Assessment and Environmental Management Program for the proposed Thabametsi Coal Mine in Lephalale. |
| | Msobo Coal (Pty) Ltd | Coal | Integrated Water Use Licence Amendment compilation for the proposed Discard Dump Extension at Spitzkop Colliery |
| | Future Coal Mining (Pty) Ltd | Coal | Gap Analysis for Chelmsford and Da-Ma Collieries in Newcastle |
| | Temo Coal Mining (Pty) Ltd | Coal | Compilation of an Environmental Impact Assessment and Environmental Management Program for the proposed Temo Coal Mine in Lephalale. |
| | Nokuhle Coal (Pty) Ltd | Coal | Compilation of a scoping report in terms of NEMA. |
| 2013 | Ledjadja Coal (Pty) Ltd | Coal | Compilation of a Water Use Licence Application for the Boikarabelo Coal Mine's proposed power station activities. |
| | Lephalale Local Municipality | - | Compilation of an Waste Licence Application |
| | Lephalale Local Municipality | - | Compilation of a Section 24 g application for the unlawful construction of a Sewage Treatment Plant in Marapong. |
| | Nokuhle Coal (Pty) Ltd | Coal | Compilation of an IWULA and IWWMP for the proposed Nokuhle Colliery. |
| | Lanxess Mine (Pty) Ltd | Chrome | Compilation of an Environmental Legal Gap Analysis Report |
| | Copper Sunset Trading | Sand | Compilation of an EMP assessment report |
| 2012 | Msobo Coal (Pty) Ltd | Coal | Compilation of an EMP Amendment for Tselentis Colliery |
| | Msobo Coal (Pty) Ltd | Coal | Compilation of a Water Use Licence Application amendment for Tselentis Colliery |
| | Matsopa Minerals (Pty) Ltd | Bentonite | Compilation of a Water Use Licence Application for Koppies Bentonite Mine |
| | Rangold Limited | Gold | Assistance with ISO 14001 certification |
| | Foskor Zirconia | Zircon | Environmental Control Officer work |
| 2011 | Various | - | Addressing comments from the Department of Water Affairs on various Water Use Licence Applications as part of the Letsema project. |

| YEAR | CLIENT | COMMODITY | PROJECT DESCRIPTION |
|---|---|---|---|
| 2011 | Copper Sunset Trading | Sand | Compilation of Water Use Licence Application for Copper Sunset Mine |
| | Xstrata Alloys | - | Compilation of a Water Use Licence Application for the proposed Lesedi Power Station |
| 2010 | Resgen | Coal | Compilation of a Water Use Licence Application and an IWWMP for the proposed Boikarabelo Coal Mine |
| | CIC | - | Compilation of a Water Use Licence Application for the Mamabula project |
| | HCI Khusela | Coal | Compilation of a Water Use Licence Application and an IWWMP for Palesa Colliery |
| | Continental Coal (Pty) Ltd | Coal | Compilation of a Water Use Licence Application for Penumbra Coal Mine |
| | Various | - | Addressing comments from the Department of Water Affairs on various Water Use Licence Applications as part of the Letsema project. |
| 2009 | Sentula Mine | Coal | Compilation of a Water Use Licence Application for Bankfontein Mine |
| | Universal Coal Kangala | Coal | Compilation of Water Use Licence Application for Kangala Coal Mine |
| | Northern Coal (Pty) Ltd | Coal | Compilation of a Water Use Licence Application for Weltevreden Mine. |
| | Volclay (Pty) Ltd | Chrome | Compilation of a Water Use Licence Application for Volclay Mine |
| | HCI Khusela | Coal | Compilation of a Water Use Licence Application for the Mbali Colliery |
| 2008 | BHP Billiton | Coal | Compilation of a Water Use Licence Application for Khuthala Southern Access |
| | Eastplats | Platinum | Compilation of a Water Use Licence for Mareesburg Joint Venture |
| | Eastplats | Platinum | Water Use Registration for Zandfontein, Crockette and Maroelabult Mines in Brits |

**Key Qualifications:-**

Naledi Moeketsi studied at the Tshwane University of Technology (TUT) where she undertook her National Diploma in Environmental Sciences and subsequently a Bachelor's Degree in Technology – Environmental Sciences.

She then started working for Digby Wells Environmental in July 2008 as an intern (while completing her studies) and became a permanent employee in January 2010. She was employed within the Surface Water division and was responsible for compiling Integrated Water Use Licence Applications (IWULAs) and the associated Integrated Water and Waste Management Plans (IWWMPs). In broadening her expertise, she moved to the Environmental Management Services (EMS) division where she was responsible for conducting Environmental Impact Assessments and Environmental Management Plans (EIA/EMP), conducting water use licence and performance assessment audits, Environmental Control Officer work, project management, proposal compilation and client liaison.

In July 2014, Naledi joined Venmyn Deloitte, a wholly owned subsidiary of Deloitte Consulting South Africa as an Environmental Industry Analyst where she is currently responsible conducting reviews on Financial Closure Provision, Environmental Compliance Reporting and Environmental Due Diligence Reporting.

**Languages:-**

English: Excellent
South Sotho: Excellent
Zulu: Good

**Certification:-**

I, the undersigned, certify that to the best of my knowledge and belief, these data correctly describe me, my qualifications, and my experience.

Date: January 2016

Naledi Moeketsi