CONFIDENTIAL AND LEGALLY PRIVILEGED REPORT

Independent Competent Person's Report on Goedehoop Colliery

Report Prepared for

South Africa Coal Operations (Pty) Ltd

Report Number 566657

Report Prepared by

SRK Consulting (South Africa) (Pty) Ltd

Report Ref: 566657_Goedehoop_CPR Final

Report Date: 25 March 2021

Effective Date: 31 December 2020 [12.10(a), SR9.1(iii), SV1.2]

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South Africa Coal Operations (Pty) Ltd

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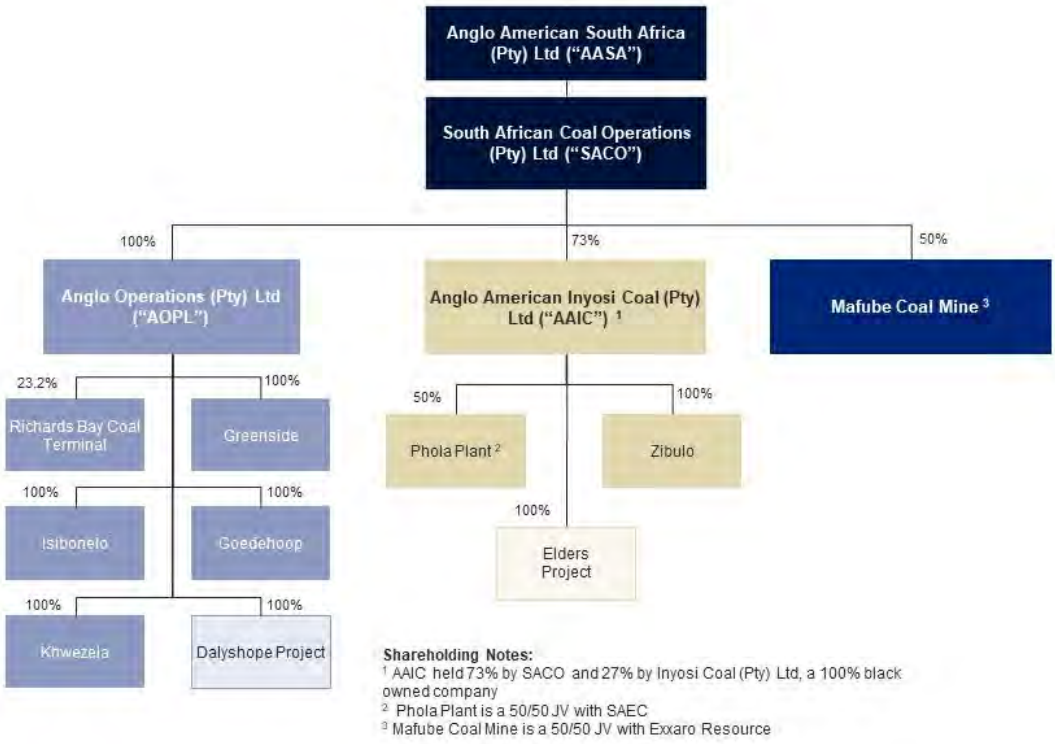
Executive Summary

ES1: Introduction

[12.10(h)(i)] [SR1.1(i), SR7.1] [SV1.2, SV1.3, SV1.4, SV1.5]

SRK Consulting (South Africa) (Pty) Ltd (**SRK**) was commissioned by South African Coal Operations (Pty) Ltd (**SACO**) (Figure ES.1) to compile a Competent Person's Report (**CPR**) on Goedehoop Colliery (**Goedehoop**) in Mpumalanga, South Africa (Figure ES.2). The Anglo American Group will be separating its South African thermal coal operations, which comprise the operations held by SACO, by way of a demerger ("**Demerger**") and the transfer of such operations to Thungela Resources Limited (the **Company**). The Company is incorporated in South Africa and all of the issued, and to be issued, Shares of the Company are expected to be admitted to the main board of the JSE Limited (**JSE**) as a primary listing and admitted to the standard listing segment of the UK Official List and to trading on the main market for listed securities on the London Stock Exchange (**LSE**). Any reference to the Company in this report should be read to also include SACO, as relevant.



srk consulting	**GOEDEHOOP COLLIERY CPR** Illustrative Existing Group Structure and Interests in Coal Assets *(Source: pers. comm. Harding, C., 2021)*	Project No. 566657

Figure ES.1: Simplified Corporate Structure and Interests in Coal Assets

This report has been prepared by SRK for inclusion in the pre-listing statement and prospectus, or similar (**Listing Documentation**) to be published by the Company in connection with the Demerger and the proposed admission of the Company's issued and to be issued ordinary shares to:

- Trading on the "Mining" sector of the JSE as a primary listing;
- The standard listing segment of the UK Official List; and
- Trading on the LSE's Main Market for listed securities (collectively the **Offer**).

This report, which summarises the findings of SRK's review, has been prepared to satisfy the requirements of:

- A Competent Person's Report as set out in Chapter 12 of the Listing Rules of the JSE (the **JSE Rules**) and follows the form and content of a Mineral Asset Valuation Report as specified by the 2016 Edition of "*The South African Code for the Reporting of Mineral Asset Valuations"* (the **SAMVAL Code**); and
- The requirements of the UK Prospectus Regulation Rules made by the Financial Conduct Authority (**FCA**) pursuant to section 73A (4) of the Financial Services and Markets Act 2000 (**FSMA**) (**UK Prospectus Regulation Rules**) and the UK version of Regulation (EU) 2017/1129) of the European Parliament and of the Council of 14 June 2017 and repealing Directive 2003/71/EC and the delegated acts, implementing acts and technical standards thereunder as such legislation forms part of retained EU law by virtue of the European Union (Withdrawal) Act 2018, in conjunction with the European Securities and Markets Authority (**ESMA**) update of the Commission of European Securities Regulators (**CESR**) recommendations for the consistent implementation of the European Commission's Regulation on Prospectuses No 809/2004 (CESR/05-054b) issued (**ESMA Recommendations**), specifically, Clauses 131 to 133 and Appendices I and II.

SRK has given and has not withdrawn its written consent to:

(i) The issue of the Listing Document with the inclusion of the references to its name; and

(ii) The inclusion of information extracted from this CPR in "Part VIII—Business Overview" of the Listing Document, and has authorised the contents of this CPR and references thereto as part of the Listing Document for the purposes of Item 1.3 of Annex 1 of Commission Delegated Regulation (EU) 2019/980 as it forms part of UK law by virtue of the European Union (Withdrawal) Act 2018.

In compliance with Item 1.2 of Annex 1 of Commission Delegated Regulation (EU) 2019/980 as it forms part of UK law by virtue of the European Union (Withdrawal) Act 2018, SRK accepts responsibility for this CPR and, to the best of SRK's knowledge, declares that the information set out in this CPR is in accordance with the facts and that this CPR makes no omission likely to affect its import.

The reporting standard adopted in this CPR for the reporting of the Coal Resources and Coal Reserves for Goedehoop is the 2016 Edition of "*The South African Code for the Reporting of Exploration Results, Mineral Resources and Mineral Reserves"* (**SAMREC Code**) as prepared by the South African Mineral Resource Committee Working Group under the auspices of the Southern African Institute for Mining and Metallurgy (**SAIMM**) and the Geological Society of South Africa (**GSSA**). The definitions of the relevant terms, methodologies and estimation processes employed and the reporting for South African Securities Exchange purposes for the Coal Resources and Coal Reserves in this CPR are according to those set out in the *"The South African -guide to the systematic evaluation of coal exploration results, coal resources and coal reserves"* (**SANS 10320:2020**) published by Standards South Africa, a division of the South African Bureau of Standards (**SABS**).

The reporting standard adopted for the reporting of the valuation for Goedehoop is the SAMVAL Code, as prepared by the South African Mineral Asset Valuation Working Group under the auspices of the SAIMM and the GSSA.

This report also satisfies the disclosure requirements of *"The South African Guideline for the Reporting of Environmental, Social and Governance Parameters within the Solid Minerals and Oil and Gas Industries"* (the **SAMESG** Guideline).

This report has been prepared under the direction of the Competent Persons (**CPs**) and Competent Valuator (**CV**[2]) in accordance with the requirements of the SAMREC (**SR**) and SAMVAL (**SV**) Codes and the SAMESG Guideline (**ESG**). Note that two "CV" abbreviations are used throughout this document:

- CV[1] refers to Calorific Value; and
- CV[2] refers to Competent Valuator.

A shorthand notation has been adopted to demonstrate compliance with the JSE Rules and disclosure requirements of the SAMREC/SAMVAL Codes, for example:

- [12.10(d)] represents Section 12.10(d) of the JSE Rules;
- [SR1.1] represents Item 1.1 - Property Description of Table 1 of the SAMREC Code;
- [SV1.4] represents Criterion T1.4 - Compliance of Table 1 in Appendix A of the SAMVAL Code; and
- [ESG2.3] relates to Item 2.3 included in the SAMESG Guideline.

ES2: Effective Date and Valuation Date

[12.10(a)] [SR9.1(iii)] [SV1.2, SV1.13]

The Effective Date for this CPR is 31 December 2020 (the **Effective Date**).

The Coal Resource and Coal Reserve statements set out in this CPR are reported as at 31 December 2020 and represent the Coal Resources and Coal Reserves at the Effective Date as estimated by SRK.

The Life-of-Mine (**LoM**) plan and associated technical and economic parameters (**TEPs**) included in the LoM plan and techno-economic model (**TEM**) all commence on 1 January 2021 and are presented in constant money terms (cost estimates are at the Effective Date and ignore inflation and any real increase due to escalation).

The financial results for Goedehoop are taken to be correct at 31 December 2020, the Effective Date of the CPR, which is also the **Valuation Date**.

ES3: Project Outline

[12.10(h)(ii)(iii)] [SR1.1(i), SR1.2(i)] [SV1.2, SV1.5] [ESG4.5]

Goedehoop Colliery is an underground coal mine located approximately 165 km east of Johannesburg and approximately 40 km southeast of eMalahleni (previously Witbank), in Mpumalanga Province, South Africa (Figure ES.2).

Goedehoop is an amalgamation of two existing Company-owned collieries, namely Bank Colliery (now known as Goedehoop North) and the original Goedehoop Colliery (now known as Goedehoop South) in 2006. Goedehoop North currently mines both the Number 2 Seam (**No 2 Seam**) and Number 4 Seam (**No 4 Seam**); Goedehoop South is closed, and no mining occurs in this area. Goedehoop North and Goedehoop South each have its own coal preparation plant and train loading facilities. The infrastructure remains and the environmental and water management at the site continues.

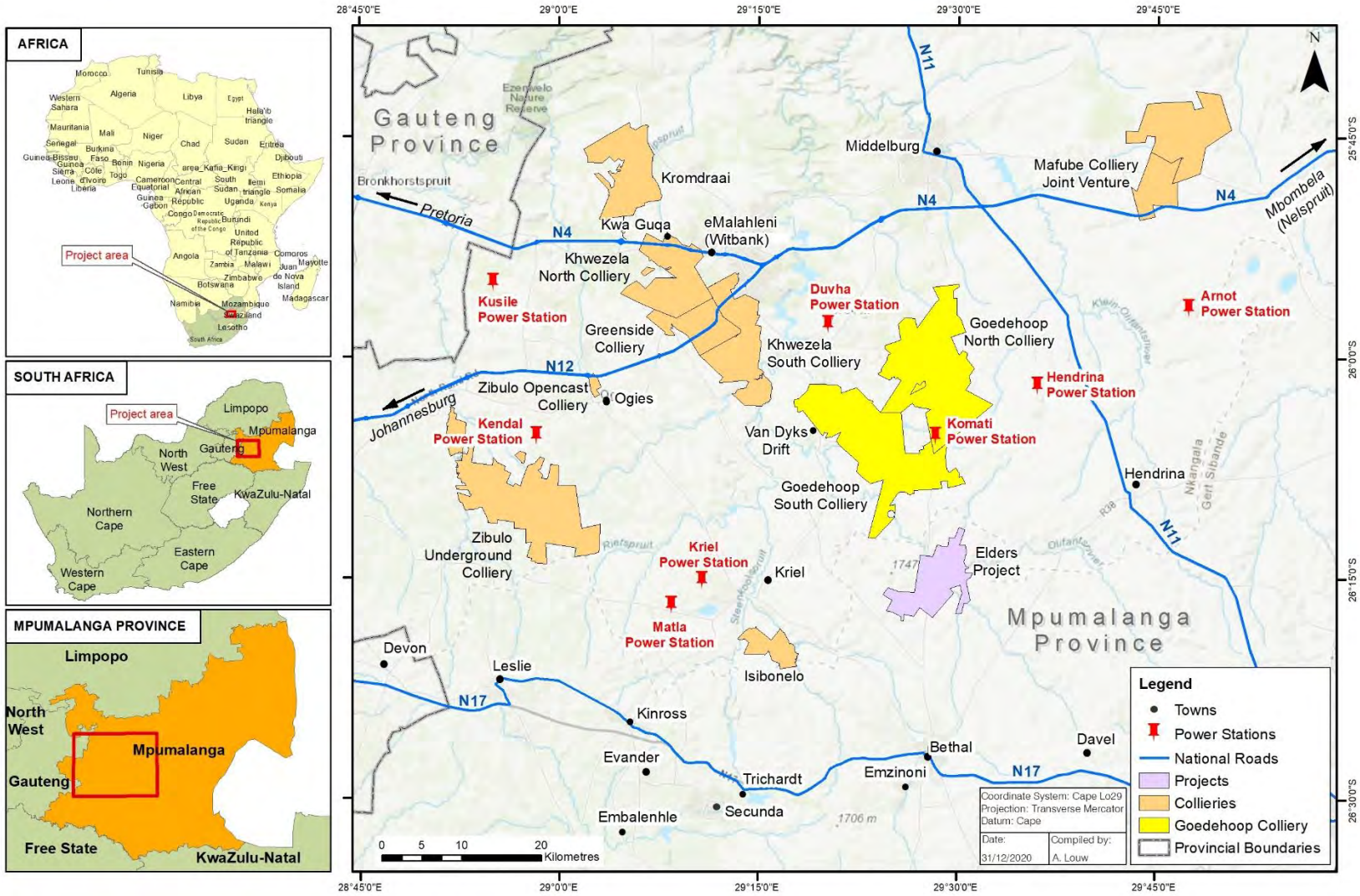
ES4: Overview of Material Assets and Legal Status

[12.10(h)(iv)] [SR1.5] [SV1.5]

A summary of the Mining Rights held by Goedehoop is given in Table ES-1 and the Water Use Licences (**WUL**s) in Table ES-2, while a summary of extant land claims is shown in Table ES-3.

Table ES-1: Summary of Mining Rights

Name	Number	Rights Type	Area (ha)	Grant Date	Expiry Date
Goedehoop North					
Bank Colliery	MP 30/2/1/2/2/143 MR	Mining	14 190.4171	05/05/2008	17/11/2038
Bank Colliery Roodepoort	MP 30/5/1/2/2/57 MR	Mining	283.2501	19/12/2009	17/11/2038
Goedehoop South:					
Goedehoop Main	MP 30/5/1/2/2/122 MR	Mining	13 676.0623	05/05/2008	25/08/2038
Bultfontein	MP 30/5/1/2/2/124 MR	Mining	482.7272	05/05/2008	25/08/2038
Van Dyksdrift	MP 30/5/1/2/2/38 MR	Mining	219.4646	05/10/2006	23/04/2038
Kleinfontein	MP 30/5/1/2/2/466 MR	Mining	64.71	20/09/2017	19/09/2042
Komati Power Station	MP 30/52/1/2/2/23 MR	Mining	145.6280	Granted; awaiting registration and execution	



srk consulting	**GOEDEHOOP COLLIERY CPR** Location of Operations highlighting Goedehoop Colliery	Project No. 566657

Figure ES.2: Location of Operations highlighting Goedehoop Colliery

Table ES-2: Summary of Water Use Licences

Licence Number	Description	Approval Date	Comments
04/B11B/ACFGIJ/1754	Amended Goedehoop South WUL	04/03/2020	Original WUL approved on 2 August 2013
03/B11B/CGI/4702	Dump expansion and Briquetting Plant WUL	08/08/2016	
06/B11B/ACGIJ/5269	Hope 4 Seam WUL	18/05/2017	
04/B11B/ACGIJ/411	Block 20 WUL	05/06/2017	Original WUL approved on 1 April 2011 but expired
27/2/2/B11G/254	Goedehoop South GNR 704 exemption	05/07/2018	
04/B11H/AFGJ/633	Goedehoop North WUL	08/07/2011	
04/B11H/ACGIJ/4329	Amended Brown Shaft 2 WUL	31/05/2019	Originally approved on 29 March 2016
27/2/2/B11G/257	Goedehoop North GNR 704 exemption	05/07/2018	
27/2/2/B811/3/3	Goedehoop Colliery General Authorisation for the proposed construction of a contractor's laydown/ camp area for section 21(c) and (i) water uses	17/01/2019	

Table ES-3: Registered Land Claims

Number	Farm and Portion	Current Owner	Description of Land Claim
3217 & 6217	Kleinfontein 49 IS (4)	Anglo Operations (Pty) Ltd (**AOPL**)	L Fulathelwa
1293	Enkeldebosch 20 IS (27)	AOPL	W Masimula
850	Enkeldebosch 20 IS (2)	Islardu Boerdery cc	Mosehla Family
2307	Enkeldebosch 20 IS (4)	Beestepan Boerdery(Pty) Ltd	Masango Family
10857	Enkeldebosch 20 IS (5)	AOPL	L Mashiloane
9915	Bankfontein 340 JS (10)	AOPL	J Mabena
10854	Hartbeestfontein 339 JS (1)	AOPL	BL Mahlangu
2096 & 1219	Koornfontein 27 IS (16, 17, 18)	AOPL	SS Mahlangu
2287	Goedehoop 46 IS (2)	AOPL	BP Masango
	Kleinfontein 49 IS (10)	AOPL	
	Kleinfontein 49 IS (5)	Ukufisa Inv Holdings (Pty) Ltd	
9901	Haasfontein 28 IS (11)	Islardu Boerdery cc	M Mushweni
1381 & 10282	Haasfontein 28 IS (11)	Islardu Boerdery cc	P Masango
9814	Welverdiend 23 IS (20)	C & J Boerdery cc	JM Mgibe
9866	Welverdiend 23 IS (21)	Rudolf Schoeman Landgoed Pty Ltd	JM Sithole

ES5: Geological Setting

[12.10(h)(v), SR2.1] [SV1.2, SV1.7]

Regional Geology

[SR2.1(i)]

Coal is found in South Africa in 19 coalfields, located mainly in KwaZulu-Natal, Mpumalanga, Limpopo, and the Free State, with lesser amounts in Gauteng, the North West Province and the Eastern Cape. All the coal deposits are found in the Karoo Supergroup, the majority in the Vryheid Formation of the Ecca Group, consisting predominantly of sedimentary rocks. Goedehoop is located near the northern extent of the Witbank Coalfield, within the Mpumalanga Province of South Africa.

The Witbank Coalfield extends for over 180 km in an west-east direction between Springs in the west to Belfast in the east and 50 km from north to south between Middelburg in the north and Rietspruit in the south, where it is separated from the Highveld Coalfield by the basement palaeohigh known as the Smithfield Ridge. The area is underlain by sedimentary rocks of the Karoo Supergroup, deposited 248 – 290 Ma during the Permian Period (Hancox & Götz, 2014). The thickness of the Karoo Supergroup varies from thin in the north to thickest the palaeovalleys and towards the south, with the variation in thickness primarily due to the uneven nature of the pre-Karoo topography. This uneven pre-Karoo topography is also responsible for the controlling the presence and thickness of the Dwyka Group sequence.

Stratigraphy

The Karoo Supergroup comprises, from oldest to youngest, the Dwyka, Ecca and Beaufort Groups, with the coal seams hosted within the Vryheid Formation of the Middle Ecca Group (270 Ma). The stratigraphy of the Witbank Coalfield is well described by Hancox & Götz, 2014. The basal Dwyka Group sequence comprises massive diamictites with lesser matrix-supported conglomerates and coarse-grained sandstones. Occasional siltstone interbedded with sandstone, pebbly mudstones and varved siltstones are also present. The diamictites are composed of sub-angular to sub-rounded clasts primarily comprising granites, quartzites, mudstones and calcareous sandstones.

The Vryheid Formation overlies the diamictites and other glacially derived sediments of the Dwyka Group. The Vryheid Formation sediments represent coal-capped upward fining cycles of clastic sediments, deposited in a fluviodeltaic/shallow marine environment. The formation is characterised by a variety of sandstones, mudstones and siltstones, with lesser amounts of coal and occasional gritstones. Five coal seams are present within the Vryheid Formation, the Number 1, 2, 3, 4 and 5 Seams, named from the base up.

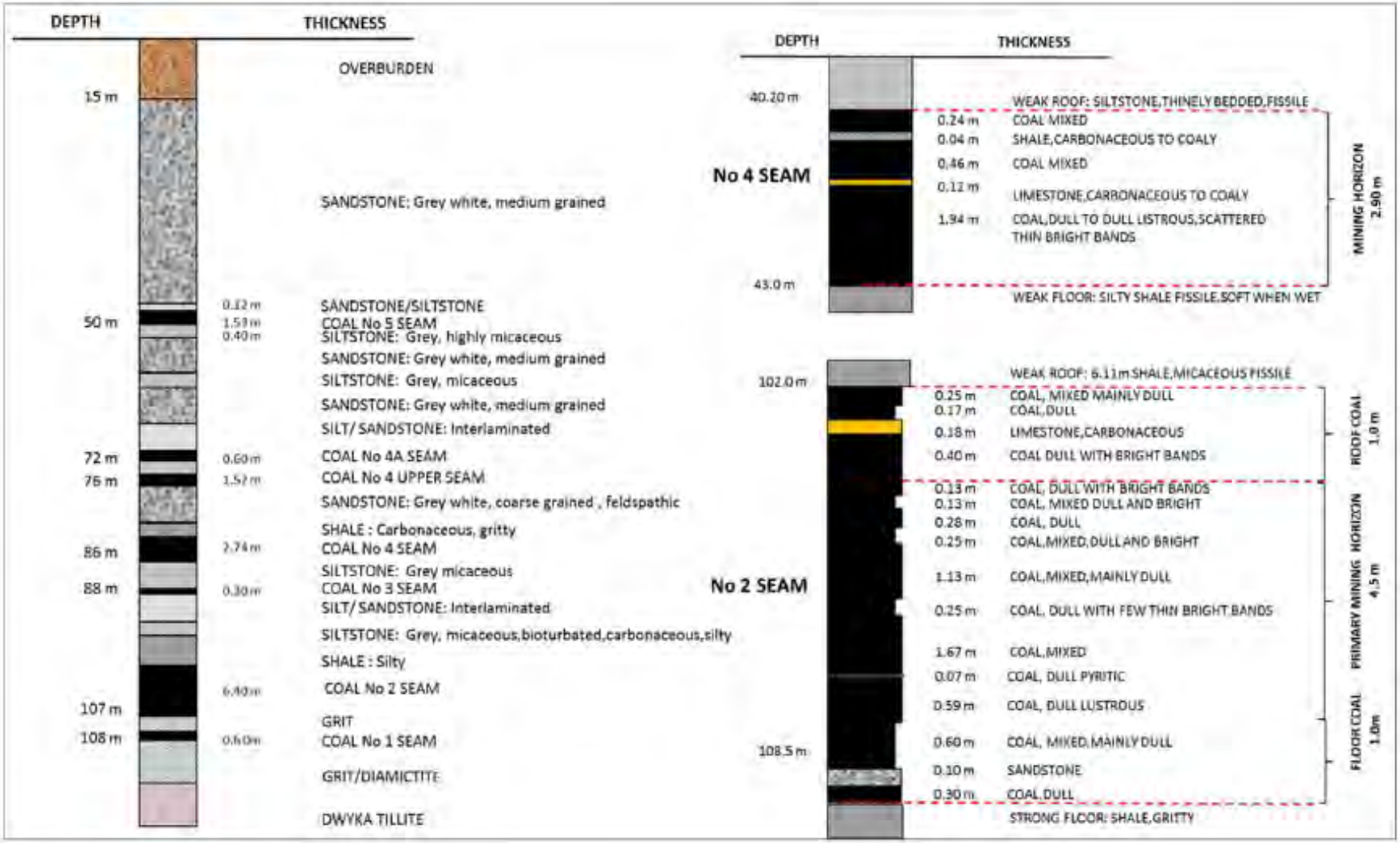
The Number 1 Seam (**No 1 Seam**) and Number 3 Seam (**No 3 Seam**) are thin and discontinuous throughout the coalfield. The No 2 Seam ranges between 1.5 and 4.0 m where it is laterally continuous, comprising mainly dull coal. The No 4 Seam averages 4.0 m and is economically the most important seam (Jeffrey, 2005). It ranges from 1 – 12 m across the coalfield, and shale intercalations are common in the upper part of the seam. The Number 5 Seam (**No 5 Seam**) is present over most of the coalfield, attaining mineable thicknesses in the northern and western portions of the field only. The No 5 Seam comprises bright to dull coal, with the presence of shale intercalations.

Local Geology

Surface material at Goedehoop consists of weathering products of the sandstones, siltstones and mudstones of the Vryheid Formation, with isolated patches of dolerite. The top layer consists of reddish-brown sandy soil, with clayey-sandy subsoil below.

Weathering generally does not extend deeper than approximately 10 m at Goedehoop, although isolated areas display weathering to depths of around 40 m. Weathering negatively affects the mineable Coal Resource, but rarely has an impact of the physical mining operation in terms of mining method and design.

Strata at Goedehoop are typical of the Witbank Coalfield, with all five coal seams being present on both properties (Figure ES.3). Underlying the coal sequence of the Vryheid Formation are glacial deposits of the Dwyka Group, which accumulated on the erosional pre-Karoo basement surface. The distribution of the lower seams (No 1 and No 2 Seams) is controlled by the underlying palaeotopography while that of the uppermost No 5 Seam is controlled by the level of the present-day erosion. The seams are generally flat lying and gently undulating.



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GOEDEHOOP COLLIERY CPR
Typical Stratigraphy at Goedehoop Colliery
(Source: Goedehoop South Resources CPR – AAC,2019l)

Project No.
566657

Figure ES.3: Typical Stratigraphy at Goedehoop Colliery

The structural interpretation for Goedehoop North is shown in Figure ES.4 and for Goedehoop South in Figure ES.5. There are no reported faults in Goedehoop North, while minor small-scale (1.5 m throw) faulting has been reported in the No 4 Seam in the Block 14 area of Goedehoop South. Seam dislocations occur along some dykes or where sills transgress the coal seams, but these are not interpreted as true faulting. The Goedehoop area has been intruded by transgressive Karoo dolerite sills, resulting in displacement of the seams. Large areas of coal have been devolatilised where a sill is in close proximity to the seam. Dolerite dykes and stringers are commonly encountered. The average dyke spacing is 200 to 500 m with a preferred orientation of northwest-southeast and northeast-southwest.

ES6: Exploration and Drilling

[12.10(h)(vi)] [SR3.1, SR3.2(i)-(v)] [SV1.8]

Historical exploration activities included vertical surface drill holes, underground in-seam drilling from within the working areas and geophysical surveys. The surface drilling has employed cored drill holes to gather information regarding horizon and strata depths and thicknesses and to recover samples for laboratory analysis. The underground drilling has employed non-cored drill holes to gather structural data ahead of mining from focused directional drilling; the data from these drill holes is not incorporated into the geological model but assist with long- and short-term planning.

Data gathered from aeromagnetic surveys has been used to provide additional structural information and to identify areas that require additional drilling. Ground magnetic and resistivity surveys have been trialled to estimate the depth of weathering. Some of the more recent drill holes have been geophysically surveyed using specialist downhole tools. This assists with depths of intersections, correlation of coal seams and provides quality control of the drilling operation.

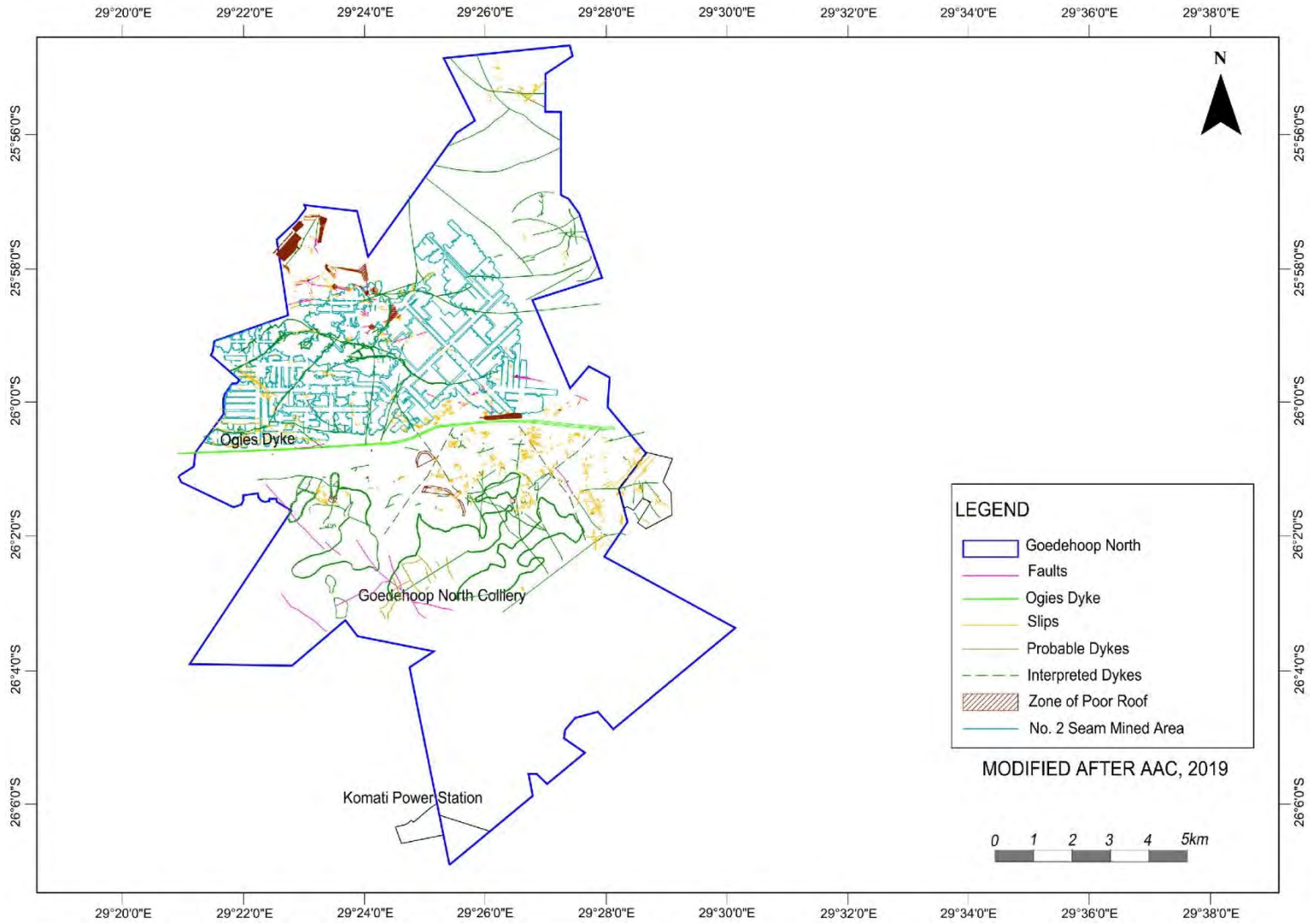
Current exploration drilling is governed by the relevant sections of Anglo American Coal Standard(s).

Future Planned Exploration

A summary of the planned exploration expenditure is given in Table ES-4.

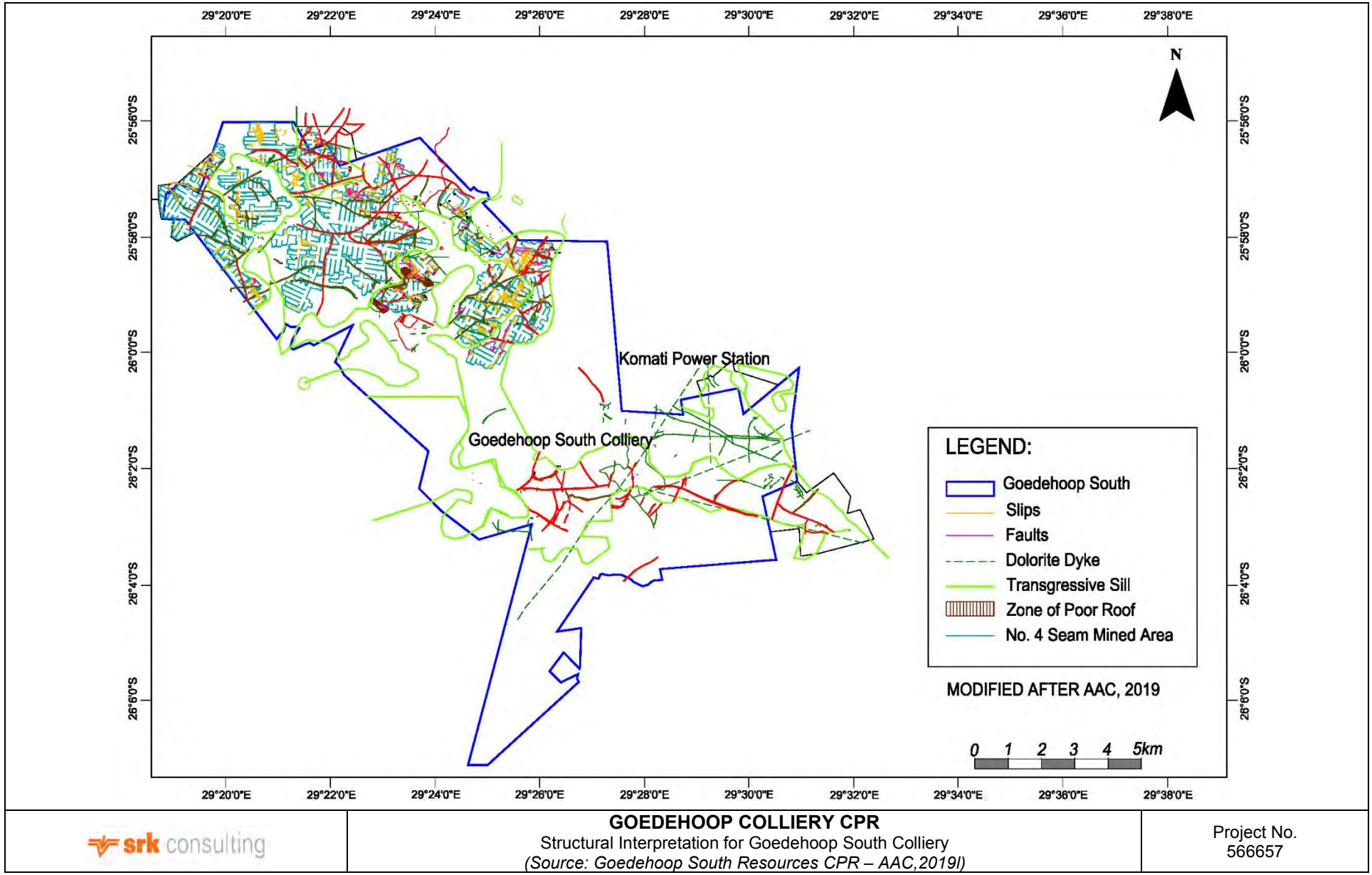
Table ES-4: Goedehoop Exploration Drilling Budget

Region	Core Drill Holes	Total Length (m)	Cost Estimate (ZAR)	Samples Planned	Cost Estimate (ZAR)	Indirect Costs (ZAR)	Labour Costs (ZAR)	Total Cost Estimate (ZAR)
Goedehoop North	20	1 200	3 569 240	26	271 200	781 038	1 037 235	5 658 713
Total	**20**	**1 200**	3 569 240	**26**	**271 200**	**781 038**	**1 037 235**	5 658 713



srk consulting	**GOEDEHOOP COLLIERY CPR** Structural Interpretation for Goedehoop North Colliery *(Source: Goedehoop North Resource CPR 2019 – AAC, 2019m)*	Project No. 566657

Figure ES.4: Structural Interpretation for Goedehoop North Colliery



srk consulting	**GOEDEHOOP COLLIERY CPR** Structural Interpretation for Goedehoop South Colliery *(Source: Goedehoop South Resources CPR – AAC,2019l)*	Project No. 566657

Figure ES.5: Structural Interpretation for Goedehoop South Colliery

ES7: Geological Model Review

[SR2.1(vii), SR4.1(ii)(iv)(v)]

The geological models (one each for Goedehoop North and Goedehoop South) under review were created by Adri Opperman, then Resource Geology Specialist at the Company, using Datamine's StratModel™ Software version 6.1.2 and reviewed by SRK using StratModel™ version 7. The Goedehoop North model is dated 19 March 2019, with a data cut-off date of 15 March 2019. The Goedehoop South model is dated 29 June 2019, with a data cut-off date of 17 May 2019.

The Goedehoop models were evaluated to assess:

- How the physical and quality drill hole data were loaded and evaluated;
- That the modelled data accurately reflected the original drill hole data;
- The interpolation parameters used to create the model;
- The interpretation of the data to ensure that the final structural model is a true reflection of the coal in the ground; and
- That the Coal Resource estimation methodologies were correct and appropriate.

Model and data validations included the following:

- Topographic surface generation and evaluation – evaluating whether surveyed collar coordinates fall within 2 m of the topographic surface and understanding any discrepancies;
- Evaluating any differences between the drill hole data and the model interpretation;
- Structural interpretation of dolerite intrusions, faulting, seam pinch out and subcrop etc.;
- Quality checks and evaluation - checking that the data load tables contain no sampling gaps, that all standardised coal quality values for unsampled material have been included where necessary; the sample compositing rationale (the correct method is to only composite data for which there are no missing samples or depth overlaps) and examining quality plots for "bull's eyes" which require corroboration;
- The correct application of Coal Resource cut-off limits; for example, minimum seam thickness, crop lines and mined out areas; and
- The resource block classification was in accordance with the SANS13020:2020 guidelines.

The Goedehoop models are established models that are well understood and managed. The supporting Anglo Standards and Procedure Documents ensure that there is a high level of confidence regarding the model. However, it is suggested that the models are re-run using the different interpolators available in Stratmodel to assess which interpolator is the best fit for the current data distribution as some model interpretations do not honour the data as well as is desired.

ES8: Coal Resources Summary

[12.10(a)] [SR1.4(iii), SR4.1(iv), SR4.5(ii)(iv)(v)(vii), SR6.1(i), SR6.3(vi)] [SV1.9]

The Coal Resource estimates were conducted in accordance with the SAMREC Code, as well as SANS10320:2020.

The Coal Resource estimates have been independently estimated by Ms K. Black of KJB GeoServices and signed off by Ms L. Jeffrey on behalf of SRK, based on the model supplied by the Company and verified by SRK. The Coal Resource estimate is declared as at 31 December 2020.

During the resource verification process carried out by SRK, certain coal measures, either excluded totally by the Company, or included as 'Low Potential' Coal Resources in the Company's internal coal inventory, were deemed by SRK as meeting the necessary requirements (RPEEE) to be included in the SRK Coal Resource Estimate for

both Goedehoop North and Goedehoop South. These Coal Resources were excluded by the Company predominantly on the basis of access (current mining had ceased in the immediate vicinity), as well as challenging mining conditions, while some of the coal measures were excluded on the basis of poor quality (did not meet the current strategy of an underground export product). However, these Coal Resources could meet the quality requirements of a local steam coal.

After careful consideration, SRK took the decision to include some of these coal measures as reportable Coal Resources, because different mining methodologies and markets could result in this coal becoming economically viable.

There are no Inferred Coal Resources at either Goedehoop North or Goedehoop South.

Goedehoop North Coal Resource Estimates

The Goedehoop North Coal Resource estimate has been subdivided as follows:

- Resources within the current Mine Plan (underground coal only);
- Resources outside of the current Mine Plan, further subdivided as follows:
    - Underground coal north of the Ogies Dyke;
    - Opencast coal north of the Ogies Dyke, including the Mineral Residue Deposit (**MRD**); and
    - Underground coal south of the Ogies Dyke (there is no opencast coal south of the Ogies Dyke.

Note that the *in situ* opencast Coal Resources will only be available for mining provided the MRD has been completely removed.

Provision has been made for a geological loss factor (discount). Losses may occur mainly as a result of intersection of dolerite dykes, faulting and other unforeseen geological losses.

The Company has applied geological losses of between 10 to 15% for the Measured Coal Resources and between 15 and 20% for the Indicated Coal Resources. However, SRK is of the opinion that lower geological losses are warranted, based on the redefined resource polygons. SRK has thus applied geological losses of between 5.0 and 15% for the Measured Resources and 15% for the Indicated Coal Resources; this translates to an average geological loss of 9.3%.

The Coal Resources for Goedehoop North inside the Mine Plan on a total basis[1] (100% attributable to Goedehoop) at 31 December 2020 are summarised in Table ES-5; the average raw coal qualities on an air-dried basis are shown in Table ES-6. Note that these Coal Resources are all north of the Ogies Dyke.

The Coal Resources have been subdivided into those inside and outside the Life of Mine Plan, which has been determined using the specified mine design parameters within the economic footprint (SANS 10320:2020, Clauses 3.2.5, 8.1.1.1, 8.1.2.3 and Table F1).

Coal Resources inside the Mine Plan are reported inclusive of the Coal Reserves.

The Goedehoop North Coal Resource within the current Mine Plan on an MTIS air-dried basis amounts to 38.07 Mt. This estimate consists of Measured and Indicated Coal Resources only; there are no Inferred Coal Resources within the current Mine Plan. 31.47 Mt of the Coal Resources are derived from the *in situ* coal with an average moisture content of 2.5%. The Measured Coal Resources account for 95.1% (29.93 Mt) of the *in situ* Coal Resources, while the Indicated Coal Resources account for 4.9% (1.54 Mt). The MRD contributes 6.6 Mt with an average moisture content of 2.3%.

[1] Note that "total basis" refers to 100% of the Coal Resources and/or Coal Reserves attributable to Goedehoop North and South and are equivalent to the term "gross" used in the AIM Mining Guidance.

Table ES-5: Goedehoop North: MTIS Coal Resource Statement at 31 December 2020 (Inside the Mine Plan)

Block	Resource Classification Category	Mining Method	Seam	Area (ha)	Seam Thickness (m)	Raw ARD	Geo. Loss (%)	MTIS (Mt)
Simunye	Measured	UG+BP	No 4	399.38	2.67	1.57	10.0	15.05
	Indicated	UG+BP	No 4	47.91	2.42	1.56	15.0	1.54
Brown 2	Measured	UG+BP	No 2	236.95	4.37	1.56	8.0	14.88
MRD	*Measured*	*OC*	*Discard*	*-*	*-*	*-*	*-*	*6.6*
Total Inside the Mine Plan		**UG+BP**	**No 4, 2**	**684.23**	**3.46**	**1.56**	**9.3**	**38.07**

Note:
1. Note that "total basis" refers to 100% of the Coal Resources and/or Coal Reserves within the Goedehoop Mining Rights and is not necessarily the percentage attributable to the holder of the Mining Rights.
2. Coal within Mining Right boundary.
3. UG+BP = Underground Bord and Pillar; OC = Opencast.
4. MRD = Mineral Residue Dump (derived from the No 4 and No 2 Seam discard material).
5. Minimum UG seam thickness cut-off: No 4 Seam = 1.5 m; No 2 Seam = 2.0 m (the same as the minimum mining height).
6. Maximum UG seam thickness cut-off of 4.5 m (the same as the maximum mining height).
7. Minimum UG depth = 20 m.
8. Ash < 50% cut-off applied.
9. DAFV > 24% cut-off applied.
10. ARD – Apparent Relative Density.
11. The bulk density for the MRD is not stated in the Company's estimate.
12. All seam thicknesses used are true thicknesses.

Table ES-6: Goedehoop North: Average Raw Coal Qualities (adb) (Inside the Mine Plan)

Block	Resource Classification Category	Seam	Ash (%)	CV[1] (MJ/kg)	FC (%)	IM (%)	TS (%)	VM (%)	DAFV (%)
Simunye	Measured	No 4	25.7	22.93	49.2	2.6	1.39	22.6	31.6
	Indicated	No 4	24.8	23.26	50.0	2.6	1.66	22.6	31.2
Brown 2	Measured	No 2	28.4	22.38	49.3	2.4	1.04	19.9	29.4
MRD	*Measured*	*Discard*	*-*	*12.64*	*-*	*2.3*	*-*	*-*	*-*
Average		**All**	**26.9**	**22.69**	**49.3**	**2.5**	**1.24**	**21.3**	**30.5**

Note:
1. Weighted average qualities estimated on MTIS.
2. adb = air-dried basis.
3. CV[1] - Calorific Value, VM – Volatile Matter Content, FC - Fixed Carbon, TS - Total Sulphur, IM - Inherent Moisture, DAFV – Dry Ash Free Volatile Matter Content.
4. MRD = Mineral Residue Deposit (derived from No 4, No 2 and No 1 Seam discard material).
5. The CV[1] for the MRD has been converted by SRK from kcal/kg to MJ/kg (kcal/kg * 0.004187 = MJ/kg).
6. Note that the MRD CV[1] and IM have not been considered in the average values.

The Goedehoop North Coal Resource outside of the current Mine Plan on an MTIS air-dried basis amounts to 121.91 Mt at an average IM of 2.5%. The estimate consists of:

- 90.48 Mt of Measured underground Coal Resources (74%);
- 2.90 Mt of Indicated underground Coal Resources (2%);
- 25.51 Mt Measured opencast Coal Resources (21%); and
- 3.02 Mt of Indicated opencast Coal Resources (3%).

The Coal Resources for Goedehoop North outside the Mine Plan on a total basis[2] (100% attributable to Goedehoop) at 31 December 2020 are summarised in Table ES-7. The average raw coal qualities on an air-dried basis are shown in Table ES-8.

Table ES-7: Goedehoop North: MTIS Coal Resource Statement at 31 December 2020 (Outside the Mine Plan)

Block	Resource Classification Category	Mining Method	Seam	Area (ha)	Seam Thickness (m)	Raw ARD	Geo. Loss (%)	MTIS (Mt)
North of the Ogies Dyke								
Simunye + Brown 1+ Brown 2	Measured	UG+BP	No 4	289.64	2.82	1.60	10.0	11.75
	Indicated	UG+BP	No 4	99.22	2.22	1.55	15.0	2.90
	Total No 4 Seam	***UG+BP***	***No 4***	***388.86***	***2.70***	***1.59***	***11.0***	***14.65***
	Measured	UG+BP	No 2	327.84	4.46	1.59	15.0	19.74
	Total No 2 Seam	***UG+BP***	***No 2***	***327.84***	***4.46***	***1.59***	***15.0***	***19.74***
	Measured	UG+BP	No 1	247.76	3.00	1.58	10.0	10.57
	Total No 1 Seam	***UG+BP***	***No 1***	***247.76***	***3.00***	***1.58***	***10.0***	***10.57***
Subtotal Simunye, Brown 1+2		**UG+BP**	**No 4, 2, 1**	**964.46**	**3.54**	**1.59**	**12.5**	**44.96**
Simunye	Measured	OC	No 4	215.13	2.48	1.53	10.0	7.36
	Indicated	OC	No 4	91.88	2.53	1.53	15.0	3.02
	Total No 4 Seam	***OC***	***No 4***	***307.01***	***2.49***	***1.53***	***11.5***	***10.38***
	Measured	OC	No 2	255.62	2.91	1.67	10.0	11.18
	Total No 2 Seam	***OC***	***No 2***	***255.62***	***2.91***	***1.67***	***10.0***	***11.18***
	Measured	OC	No 1	171.51	2.84	1.59	10.0	6.97
	Total No 1 Seam	***OC***	***No 1***	***171.51***	***2.84***	***1.59***	***10.0***	***6.97***
Subtotal Simunye		**OC**	**No 4, 2, 1**	**734.14**	**2.74**	**1.60**	**10.5**	**28.53**
Total North of the Ogies Dyke		**UG + OC**	**No 4, 2, 1**	**1 698.60**	**3.23**	**1.59**	**11.7**	**73.49**
<u>South of the Ogies Dyke</u>								
South	Measured	UG+BP	No 4	1 204.76	2.96	1.60	15.0	48.42
Total South of the Ogies Dyke		**UG+BP**	**No 4**	**1 204.76**	**2.96**	**1.60**	**15.0**	**48.42**
TOTAL		**UG+OC**	**No 4**	**2 903.36**	**3.12**	**1.59**	**13.0**	**121.91**

Note:
1. Note that "total basis" refers to 100% of the Coal Resources and/or Coal Reserves within the Goedehoop Mining Rights and is not necessarily the percentage attributable to the holder of the Mining Rights.
2. Coal within Mining Right boundary.
3. UG+BP = Underground Bord and Pillar; OC = Opencast.
4. Minimum UG seam thickness cut-off: No 4 Seam north of the Ogies Dyke = 1.5 m and 2.0 m south of the Ogies Dyke; No 2 Seam = 2.0 m, No 1 Seam = 1.5 m (the same as the minimum mining height).
5. Maximum UG seam thickness cut-off of 4.5 m (the same as the maximum mining height).
6. Minimum UG depth = 20 m.
7. Minimum OC seam thickness cut-off of 0.5 m.
8. Strip ratio < 6.5.
9. Ash < 50% cut-off applied.
10. DAFV > 24% cut-off applied.
11. ARD – Apparent Relative Density.
12. All seam thicknesses used are true thicknesses.

[2] Note that "total basis" refers to 100% of the Coal Resources and/or Coal Reserves attributable to Goedehoop North and South and are equivalent to the term "gross" used in the AIM Mining Guidance.

Table ES-8: Goedehoop North: Average Raw Coal Qualities (adb) (Outside the Mine Plan)

Block	Resource Classification Category	Seam	Ash (%)	CV[1] (MJ/kg)	FC (%)	IM (%)	TS (%)	VM (%)	DAFV (%)
North of the Ogies Dyke									
Simunye + Brown 1+ Brown 2	Measured	No 4	28.3	21.80	47.3	2.6	1.29	21.7	31.6
	Indicated	No 4	23.7	23.80	51.4	2.8	1.40	22.1	30.1
	Average No 4 Seam	***No 4***	***27.4***	***22.19***	***48.19***	***2.6***	***1.31***	***21.8***	***31.3***
	Measured	No 2	27.9	22.27	48.9	2.4	1.18	20.7	30.1
	Average No 2 Seam	**No 2**	**27.9**	**22.27**	**48.9**	**2.4**	**1.18**	**20.7**	**30.1**
	Measured	No 1	27.8	22.82	47.5	2.1	1.14	22.6	32.9
	Average No 1 Seam	**No 1**	**27.7**	**22.82**	**47.5**	**2.1**	**1.14**	**22.6**	**32.9**
Average Simunye, Brown 1+2		**No 4, 2, 1**	**27.7**	**22.3**	**48.3**	**2.4**	**1.22**	**21.5**	**31.1**
Simunye	Measured	No 4	23.0	23.94	52.3	2.9	1.14	21.8	29.4
	Indicated	No 4	23.0	24.18	52.6	2.7	1.44	21.7	29.3
	Average No 4 Seam	***No 4***	**23.0**	**24.01**	**52.4**	**2.9**	**1.23**	**21.8**	**29.4**
	Measured	No 2	35.3	19.19	42.2	2.3	0.83	20.2	33.2
	Average No 2 Seam	**No 2**	**35.3**	**19.19**	**42.2**	**2.3**	**0.83**	**20.2**	**33.2**
	Measured	No 1	30.2	22.36	45.6	2.0	1.01	22.2	32.8
	Average No 1 Seam	**No 1**	**30.2**	**22.36**	**45.6**	**2.0**	**1.01**	**22.2**	**32.8**
Average Simunye		**No 4, 2, 1**	**29.6**	**21.72**	**46.8**	**2.4**	**1.02**	**21.3**	**31.7**
Average North of the Ogies Dyke		**No 4, 2, 1**	**28.4**	**22.12**	**47.7**	**2.4**	**1.14**	**21.4**	**31.4**
South of the Ogies Dyke									
South	Measured	No 4	28.3	21.83	47.4	2.7	1.30	21.5	31.6
Average South of the Ogies Dyke		**No 4**	**28.3**	**21.83**	**47.4**	**2.7**	**1.30**	**21.5**	**31.6**
Average		**No 4, 2, 1**	**28.4**	**22.00**	**47.6**	**2.5**	**1.20**	**21.5**	**31.4**

Note:
1. Weighted average qualities estimated on MTIS.
2. adb = air-dried basis.
3. CV[1] - Calorific Value, VM – Volatile Matter Content, FC - Fixed Carbon, TS - Total Sulphur, IM - Inherent Moisture, DAFV – Dry Ash Free Volatile Matter Content.

Goedehoop South Coal Resource Estimates

The Goedehoop South Coal Resource on an MTIS air-dried basis amounts to 98.94 Mt. This estimate is made up of Measured, Indicated and Inferred Coal Resources, all of which are outside any Mine Plan.

Coal Resources contributing to the *in situ* estimate include 93.47 Mt of Measured Coal Resources (94.5%), 2.57 Mt of Indicated Coal Resources (2.6%) and 2.90 Mt of Inferred Coal Resources (2.9%). The average IM is 2.8%.

The Coal Resources for Goedehoop South on a total basis[3] (100% attributable to Goedehoop) at 31 December 2020 are summarised in Table ES-9; the average raw coal qualities pertained to the Coal Resources are shown in Table ES-10.

Provision has been made for a geological loss factor (discount). Losses may occur mainly as a result of intersection of dolerite sills and dykes, faulting and other unforeseen geological losses. SRK believes the

[3] Note that "total basis" refers to 100% of the Coal Resources and/or Coal Reserves attributable to Goedehoop North and South and are equivalent to the term "gross" used in the AIM Mining Guidance.

geological losses indicated in Table ES-9 are appropriate considering the dolerite intrusions prevalent in the area. The geological losses applied by the Company are similar to those applied by SRK.

Table ES-9: Goedehoop South: MTIS Coal Resource Statement at 31 December 2020 (Outside a Mine Plan)

Block	Resource Classification Category	Mining Method	Seam	Area (ha)	Thickness (m)	Raw ARD	Geological Loss (%)	MTIS (Mt)
GHS	Measured	UG+BP	No 5	277.25	1.66	1.47	15.0	5.77
	Inferred	UG+BP	No 5	90.16	1.76	1.52	20.0	1.90
	Subtotal No 5 Seam	***UG+BP***	***No 5***	***367.42***	***1.69***	***1.48***	***16.24***	***7.67***
	Measured	UG+BP	No 4	2 171.86	2.90	1.61	13.5	87.70
	Indicated	UG+BP	No 4	67.18	2.90	1.55	15.0	2.57
	Inferred	UG+BP	No 4	31.63	2.61	1.57	20.0	1.00
	Subtotal No 4 Seam	***UG+BP***	***No 4***	***2 270.67***	***2.90***	***1.61***	***13.6***	***91.27***
GRAND TOTAL		**UG+BP**	**No 5, 4**	**2 638.09**	**2.81**	**1.60**	**13.8**	**98.94**

Note:
1. Note that "total basis" refers to 100% of the Coal Resources and/or Coal Reserves within the Goedehoop Mining Rights and is not necessarily the percentage attributable to the holder of the Mining Rights.
2. Coal within Mining Right boundary.
3. UG + BP = Underground Bord and Pillar
4. OC = Opencast
5. GHS = Goedehoop South
6. Minimum No 5 Seam thickness cut-off of 1.5 m; minimum No 4 Seam thickness cut-off of 2.0 m (the same as the minimum mining height).
7. Maximum seam thickness cut-off of 4.5 m (both seams) (the same as the maximum mining height).
8. Ash < 50% cut-off applied.
9. DAFV > 24% cut-off applied.
10. ARD – Apparent Relative Density.
11. All seam thicknesses used are true thicknesses.

Table ES-10: Goedehoop South: Average Raw Coal Qualities (All Seams) (adb) (Outside a Mine Plan)

Block	Resource Classification Category	Seam	ASH (%)	CV[1] (MJ/kg)	FC (%)	IM (%)	TS (%)	VM (%)	DAFV (%)
GHS	Measured	No 5	18.1	26.59	49.9	2.8	2.08	29.3	36.7
	Indicated	No 5	-	-	-	-	-	-	-
	Inferred	No 5	21.7	25.20	48.9	2.7	2.27	26.7	35.4
	Average No 5 Seam	***No 5***	***19.0***	***26.25***	***49.6***	***2.7***	***2.1***	***28.6***	***36.4***
GHS	Measured	No 4	29.8	21.41	48.2	2.8	1.18	19.9	29.2
	Indicated	No 4	24.7	23.02	50.9	3.0	1.23	21.4	29.6
	Inferred	No 4	25.9	22.72	50.8	2.8	1.17	20.6	28.7
	Average No 4 Seam	***No 4***	***29.6***	***21.24***	***47.9***	***2.8***	***1.18***	***19.8***	***29.3***
AVERAGE		**No 5, 4**	**28.2**	**21.84**	**48.4**	**2.8**	**1.25**	**20.6**	**29.8**

Note:
1. Weighted average qualities estimated on MTIS.
2. adb = air-dried basis.
3. CV[1] - Calorific Value, VM – Volatile Matter Content, FC - Fixed Carbon, TS - Total Sulphur, IM - Inherent Moisture, DAFV – Dry Ash Free Volatile Matter Content.
4. GHS = Goedehoop South

ES9: Reconciliation with the Previous Coal Resource Estimate

[SR1.4(iii), SR4.2(v), SR4.5(vi), SR6.1(iii)]

Goedehoop North

Table ES-11 shows the reconciliation between the 2020 and 2019 Coal Resource estimates for the No 4, No 2 and No 1 Seams. The 2020 estimate was done by SRK as at 31 December 2020, while the 2019 estimate was done by the Company as at 31 December 2019 (AAC, 2019m).

Table ES-11: Reconciliation between the Goedehoop North 2020 and 2019 Coal Resource Estimates

Block	Resource Classification Category	MTIS Coal Resources			
		Mass (Mt)		CV[1] (MJ/kg)	
		2020	2019	2020	2019[1]
GHN	Measured	145.92	107.5	22.07	22.82
	Indicated	7.46	7.2	23.84	21.27
	Inferred	-	1.1	-	19.01
MRD	*Measured*	*6.6*	*4.5*	*12.63*	*12.64*
GRAND TOTAL		**159.98**	**120.3**	**21.76**	**22.69**

Note:
1. GHN = Goedehoop North
2. MRD = Mineral Residue Deposit (derived from the No 5, No 4, No 2 and No 1 Seam discard material).
3. CV[1] converted by SRK from kcal/kg to MJ/kg (kcal/kg * 0.004187 = MJ/kg)
4. Note that the MRD CV[1] has not been considered in the average CV[1].

The differences between the SRK Coal Resource estimates and those of the Company amount to 39.68 Mt (approximately 25%) and are explained by the following:

- No 4 Seam:
  - SRK included opencast resources of 10.38 Mt based on a favourable stripping ratio of less than 6:1 bcm/t when considering all seams (No 4, No 2 and No 1 Seams); this coal was classified by the Company as “Low Potential”;
  - SRK has included 15.01 Mt of Measured No 4 Seam “Low Potential” south of the Ogies Dyke; SRK is of the opinion that these could be economically extractable and have thus included them in the estimate;
  - SRK has included 8.28 Mt of No 4 Seam “Low Potential” (Measured, Indicated and Inferred) as the same category of Coal Resources; SRK is of the opinion that these could be economically extractable and have thus included them in the estimate;
  - SRK has excluded 1.94 Mt of Indicated “Additional” Coal Resources as there are insufficient appropriate PoOs to categorize this coal according to SANS 10320:2020. Note that as with the Company “Low Potential” category, “Additional” is not a recognised SAMREC category;
  - SRK has relaxed the minimum mining height cut-off from 2.0 m as applied by the Company to 1.5 m. The relaxation in the minimum mining height was guided by the SRK Mining Team, who are of the opinion that as seam heights of close to 1.5 m are already being successfully mined elsewhere in the mine, the same cut-off could be applied to the No 4 Seam; SRK has thus allowed for the inclusion of an additional 0.6 Mt of No 4 Seam coal;
  - Mining that took place between December 2019 and December 2020; this is forecast to be 4.8 Mt; and
  - There is an overall difference of 0.54 Mt (0.3%) between the SRK Coal Resource Estimates and those of the Company, which is potentially explained by a minor difference in the way the geological losses are applied. SRK is of the opinion that this difference is not material.

- No 2 Seam:
  - SRK has included an additional 7.25 Mt of opencast Coal Resources not included by the Company. SRK is of the opinion that these Coal Resources could be economically extractable (based on favourable depths to the coal seam roof, as well as a favourable stripping ratio) and have thus included them in the estimate;
  - SRK has included an additional 1.36 Mt in the Brown 2 area and 1.94 Mt in the Simunye UG area by consistently applying the theoretical mining height of 4.5 m over the entire area;
  - SRK has excluded 1.1 Mt of Inferred Coal Resources as reported by the Company due to unfavourable coal qualities, as well as excluding 1.28 Mt of Indicated Coal Resources during the reclassification of Coal Resources from underground to opencast; and
  - Mining that took place between December 2019 and December 2020; this is forecast to be 0.48 Mt.
- No 1 Seam:
  - SRK has included an extra 1.78 Mt of Coal Resources not included by the Company. This was achieved by revising the categorization of the No 1 Seam Coal Resources as follows:
    - 6.97 Mt of opencast Coal Resources, categorized by the Company as underground Coal Resources;
    - The remaining underground Coal Resources (10.57 Mt) were subdivided into separate polygons (Figure 6-3) based on different mining horizons dictated by the thickness of the clastic parting:
      - Parting < 0.3 m – the S1UM mining horizon is defined as the uppermost coal sub-seam (S1U) plus the P1M parting plus the middle coal sub-seam (S1M) with a thickness ≤ 4.5 m; and
      - Parting > 0.3 m – the mining horizon is defined as either the S1U or the S1M, whichever is the thicker, with a minimum thickness of 1.5 m and a maximum mining height of 4.5.
- MRD:
  - Production during 2020, which amounted to 3.6 Mt; and an update to the MRD estimate by the Company (not validated by SRK), resulting in an updated estimate of 6.6 Mt (January 2021 – June 2023).

Comparison of the SRK and Company estimates on an approximate like-for-like basis reveals that the difference between the estimates is not material.

However, it is suggested that there is potential for revisiting the current Company rationale behind the Goedehoop North extraction plan and resultant resource classification. This will enable the additional 38.8 Mt derived from the potential OC area and south of the Ogies Dyke as per SRK's estimate to be exploited.

Goedehoop South

Table ES-12 shows the reconciliation between the 2020 and 2019 Coal Resource estimates for the No 5 and No 4 Seams. The 2020 estimate was done by SRK as at 31 December 2020, while the 2019 estimate was done by the Company as at 31 December 2019 (AAC, 2019m).

Table ES-12: Reconciliation between the Goedehoop South 2020 and 2019 Coal Resource Estimates

Block	Resource Classification Category	Seam	MTIS Coal Resources			
			Mass (Mt)		CV[1] (MJ/kg)	
			2020	2019	2020	2019[1]
GHS	Measured	No 5	5.77	-	26.59	-
	Indicated	No 5	-	-	-	-
	Inferred	No 5	1.90	-	25.20	-
	Subtotal No 5 Seam	**No 5**	**7.67**	**-**	**26.25**	**-**
	Measured	No 4	87.70	80.6	21.18	22.86
	Indicated	No 4	2.57	4.3	23.02	22.69
	Inferred	No 4	1.00	-	22.72	-
	Subtotal No 4 Seam	**No 4**	**91.27**	**84.9**	**21.24**	**22.86**
GRAND TOTAL			**98.94**	**84.9**	**21.61**	**22.86**

Note:
1. GHS = Goedehoop South.
2. CV[1] converted by SRK from kcal/kg to MJ/kg (kcal/kg * 0.004187 = MJ/kg).

The differences between the SRK Coal Resource estimates and those of the Company amount to 14.04 Mt (approximately 17%) and are explained by the following:

- No 5 Seam:
  - The Company categorized all No 5 Seam Coal Resources as “Low Potential” (a category not recognised by SAMREC); SRK is of the opinion that some these Coal Resources could be economically extractable and have thus included them in the estimate (7.67 Mt);
- No 4 Seam:
  - SRK has included 37.74 Mt of No 4 Seam “Low Potential”; again, SRK is of the opinion that these could be economically extractable and have thus included them in the estimate;

    Note that both the No 5 Seam tonnage and this tonnage is not included in the 84.90 Mt in the Company’s estimate.
  - SRK has included 0.36 Mt of Indicated No 4 Seam “Low Potential” to Inferred Coal Resources; SRK is of the opinion that these could be economically extractable and have thus included them in the estimate;
  - SRK excluded 30.42 Mt contained in coal remnants in the northern part of Goedehoop South as SRK is of the opinion that these could not be economically extractable; Note that these Coal Resources are included in the Company’s estimate. According to SANS 10320:2020 Clause 3.18, coal in remnants or pillars may not be included in public reporting until such time as an extraction and coal processing plan has been defined;
  - SRK further excluded 0.65 Mt based on the DAFV quality cut-off of 24%; and
  - SRK downgraded 0.06 Mt of Indicated Coal Resources to the Inferred category.

Comparison of the SRK and Company estimates on a like-for-like basis reveals that the difference between the estimates amounts to only 1.31 Mt; the difference is thus not material. However, it is suggested that there is potential for revisiting the current Company rationale behind the Goedehoop South extraction plan and resultant resource classification. This will enable the additional 14.04 Mt as per SRK’s estimate to be exploited.

ES10: Rock Engineering

[12.10(h) (vii)] [SR3.1(i), SR4.1(ii), SR4.3(ii), SR5.2(ii) (viii)]

Goedehoop has comprehensive procedures in place for managing rock engineering risks. The roof conditions are generally fairly good. The Trigger Action Response Plan system is generally effective and hazardous conditions appear to be identified and addressed. There are a few exceptions, but these are addressed through the systems.

The pillar design is reasonably conservative and the surveyed pillars and bord widths are reconciled each month to ensure compliance. Subsidence protection and undermining of surface structures appears to be well managed.

ES11: Mining

[12.9(h)(vii)] [SR4.2(ii), SR4.3(ii), SR5.2(i)(iv), SR6.1(ii)] [SV1.10]

The mine is designed to maximise volume throughput at 5.5 Mtpa to maintain economic viability. The LoM plan is geared to achieve that target for approximately the next five years, where after the current available Coal Reserves become depleted. The mine has limited flexibility to respond to increases in coal price or exchange rate but must continue to manage towards a low working cost environment to protect against reducing prices. There are other Coal Resources at Goedehoop and ongoing investigation should continue to potentially extend the mine life.

Ventilation and Cooling

[SR5.2(vii)(viii)]

Flammable gas (methane) and coal dust explosions are one of the principle hazards in underground coal mines. In order to prevent an accumulation of flammable gas, sufficient ventilation has to be provided in the last through roads to maintain air speeds above the critical velocity of 1.0 m/s. The ventilation quantity of 450 m³/s provided by the main fans is more than sufficient to maintain air speeds above the minimum velocity. However, although the main fans provide a ventilation quantity of 450 m³/s, the following inefficiencies were identified in 2020:

- The No 4 Seam surface fans are operating at high pressure. This is an indication of excessive resistance within the workings; and
- Ventilation leakage is excessive within the workings of this mine, partially due to the pressure of the surface fans. Total air utilisation is in the order of 52% (48% leakage).

Although the mine only utilizes 52% of the available ventilation quantity, current air speeds in through roads at all the mining sections were above the minimum requirement of 1.0 m/s.

The following corrective action has been taken:

- A thorough assessment is to be conducted on the No 4 Seam fans by a fan engineer;
- Two priority areas of the mine have been identified for sealing to reduce the leakage;
- The up- and downcast shafts planned for the Brown 2 Seam should reduce the overall mine resistance; and
- The LoM plans show the workings can be adequately ventilated.

ES12: Historical Production

[SR1.4(iii)] [SV1.6]

Historical production per mining section for the past four years is shown in Table ES-13.

Table ES-13: Historical Production

Item/Description	2017 (Mt)	2018 (Mt)	2019 (Mt)	2020 (Mt)
Run-of-Mine	7.27	6.51	5.91	4.31
Export Sales	4.46	4.37	3.92	2.19
Domestic Sales	-	1.15	2.12	3.93

Production from Goedehoop South ceased in December 2019. Goedehoop North contributed 4.41 Mt Run-of-Mine (**RoM**) to the total in 2019.

ES13: Key Modifying Factors

[12.10(h) (vii)] [SR5.1(i)(ii), SR6.1(iii), SR6.2(i)] [SV1.10]

The following Modifying Factors were applied in Gradecon when converting Coal Resources to Saleable Coal Reserves (Table ES-14).

Table ES-14: Modifying Factors

Modifying Factor	Reporting Basis	No 4 Seam Value (%)	No 2 Seam Value (%)
Geological loss	MTIS	10.0	10.0
Mining loss	aduc	3.0	3.0
Mining extraction	aduc	74.0	73.8
Mining recovery	aduc	71.8	71.6
Contamination	ROM_{adc}	13.2	7.6
Surface moisture	ROM_{ar}	3.5	3.5

Note:
1. aduc = air-dried uncontaminated basis
2. RoM_{adc} = Run-of-Mine air-dried contaminated basis
3. RoM_{ar} = Run-of-Mine as received basis

ES14: Coal Reserves Summary

[12.10(h) (ix)] [SR4.2(ii), SR4.5(i), SR5.1(i), SR5.2(ix), SR5.6(v), SR6.3(i) (ii)] [SV1.2, SV1.9]

The Coal Reserve estimate has been independently estimated by and signed off by Mr N McGeorge on behalf of SRK, based on the mining model supplied by the Company and verified by SRK. The Coal Reserve estimate is declared as at 31 December 2020.

The Coal Reserves for Goedehoop North on a total basis[4] (100% attributable to Goedehoop) at 31 December 2020 are summarised in Table ES-15.

The RoM Goedehoop North Coal Reserves on an as received basis amount to 19.3 Mt; these consist of 18.0 Mt of Proved Coal Reserves (93.3%) and 1.3 Mt of Probable Coal Reserves (6.7%). The average Total Moisture is 5.7%. The Saleable Coal Reserves on an air-dried contaminated basis total 11.5 Mt; these consist of 10.80 Mt of Proved Coal Reserves (93.9%) and 0.7 Mt of Probable Coal Reserves (6.1%). The average Total Moisture is 8%.

[4] Note that "total basis" refers to 100% of the Coal Resources and/or Coal Reserves within the Goedehoop Mining Rights and is not necessarily the percentage attributable to the holder of the Mining Rights.

Table ES-15: Goedehoop Coal Reserve Statement at 31 December 2020

Reserve Classification Category	RoM Coal Reserves			Saleable Coal Reserves (adc)			
	RoM_{ar} (Mt)	Total Moisture (%)	CV^1_{adc} (kcal/kg)	Sales (Mt)	Practical Yield (%)	Total Moisture (%)	CV^1_{adc} (kcal/kg)
Proved	20.0	5.7	4 996	10.8	54.0%	8	6 310
Probable	1.3	5.7	4 897	0.7	53.6%	8	6 310
Total	**21.3**	**5.7**	**4 990**	**11.5**	**54.0%**	**8**	**6 310**

Note:
1. Source: Goedehoop North Resource CPR 2019 – AAC, 2019m
2. Note that "total basis" refers to 100% of the Coal Resources and/or Coal Reserves within the Goedehoop Mining Rights and is not necessarily the percentage attributable to the holder of the Mining Rights.
3. Assumes coal supply until mid-2025.
4. RoM_{ar} = Run of Mine on an as received basis
5. CV^1_{adc} = Calorific Value on an air-dried contaminated basis

The Coal Reserves are extracted from the mining schedule model and are from the Effective Date to the last period scheduled (mid-2025). All the Coal Reserves are from the No 4 Seam and the No 2 Seam (Brown 2 area). The Saleable coal quality is quoted on an air-dried contaminated basis, which translates to a 5 700 kcal/kg product, to match the way coal prices are quoted in the financial evaluation.

ES15: Reconciliation to Historical Coal Reserve Estimates

[SR1.4(iv), SR4.2(v), SR4.5(vi), SR6.1(iii)]

The previous estimate of Coal Reserves was conducted in 2019 with an effective date of 31 December 2019. The comparison between the Coal Reserves of 31 December 2019 and 31 December 2020 are illustrated in Table ES-16.

Table ES-16: Comparison of Coal Reserves at 31 December 2020 and 31 December 2019

Coal Reserve Classification	RoM Coal Reserves				Saleable Coal Reserves			
	Mass (Mt)		CV^1_{adc} (kcal/kg)		Mass (Mt)		CV^1_{adc} (kcal/kg)	
	2020	2019[1]	2020	2019	2020	2019	2020	2019
Proved	20.0	15.4	5 539	4 590	10.8	7.7	6 310	5 970
Probable (from Measured in 2019)	0	9.0	0	5 130	0	5.4	6 310	5 970
Probable from Indicated	1.3	0	4 897	0	0.7	0	0	0
Total	**21.3**	**24.4**	**5 496**	**4 790**	**11.5**	**13.1**	**6 310**	**5 970**
Inferred in LoM Plan	0	0	0	0	0	0	0	0
Total in Mine Plan	**21.3**	**24.4**	**5 496**	**4 790**	**11.5**	**13.1**	**6 310**	**5 970**

Note:
1. Source: Goedehoop North Resource CPR 2019 – AAC, 2019m
2. CV^1_{adc} = Calorific Value on an air-dried contaminated basis
3. CV^1s for 2020 are quoted Gross adc, which equates to 5 700 kcal/kg NAR

The reconciliation to previous Coal Reserve estimates shows that the main contribution to the difference between the estimates is depletion due to mining between the effective dates (4.5 Mt) and a different end period between the life of Mine Plans.

ES16: Coal Processing

[12.10(h)(vii)] [SR4.3(ii), SR5.3(iii)]

Goedehoop North coal preparation plant is the only plant remaining in the complex since the beginning of 2020. It is one of the original plants producing Low Ash Coal for the Japanese Steel Mill contract. It has changed substantially over the years and now produces a single product, AFS, at 5 700 kcal/kg. The condition of the RoM stockpile, wash plant and the load out station is excellent. Quality is well controlled, and all systems are in place. However, the feed sampling and fines treatment is poor.

The plant does not currently operate on Sundays; if it did, it could probably run four shifts with the same number of people, resulting in more operating hours and therefore treating more coal. This would also impact positively on the weekday maintenance, incurring less overtime and possibly lower cost per tonne feed.

ES17: Coal Discard Disposal

[SR1.1(ii), SR5.4(ii)]

The current operational Goedehoop coal discard infrastructure consists of the following:

- Co-disposal Discard Facility consisting of coarse discard outer slopes that support an inner central slurry compartment;
- Penstock (original design) for decanting supernatant water from the slurry pool;
- New elevated penstock planned for operations from 2020 until the end LoM (2025);
- Both penstocks decant into dissipators, toe trenches and silt traps, with excess water overflowing into the Return Water Dam complex; and
- Bankfontein Dam - earth fill dam that caters for clean runoff from upstream of the processing plant.

Dormant and rehabilitated structures consist of the following:

- Bank 5 Discard Facility; and
- Schoongezicht Discard Facility.

The risks identified by SRK during the inspection of the Co-disposal Discard Facility are associated with the LoM deposition airspace, the requirement of a liner for the North Dam Extension, silting of toe drains, silt trap complex and Return Water Dam (**RWD**), phreatic surface monitoring, coarse discard compaction and fencing around the RWD.

As the Consequence Classification Structure ratings of the Discard Facility, RWD and Bankfontein Dam classify as Major, dam break analyses need to be conducted.

ES18: Infrastructure and Engineering

[SR4.3(ii), SR5.4(i) (ii), SR5.6(viii)]

Goedehoop is a well-developed, mature coal mining operation, with plant, equipment, machines, and infrastructure to support the operational requirements.

Goedehoop has two operations:

- Goedehoop North (GHN), which is fully operational; and
- Goedehoop South (GHS), where mining ceased at the end of 2019.

At GHS, electrical infrastructure, primarily associated with security and access control operations, remains in operation.

The total Notified Maximum Demand, from various Eskom Holdings SOC Limited (**Eskom**) Points of Delivery, is 63.270 MVA.

Goedehoop operates subject to organisational policies, procedures, codes of practice and standards.

With mining operations now scheduled to cease in mid-2025, there may be opportunities to reduce Stay In Business (**SIB**) capital by reducing scheduled replacement and/ or overhauls. There would be an increase in operating cost, associated with additional spares and maintenance, but this would be offset by the reduced SIB capital. An analysis and review are currently in progress.

No material issues were found.

ES19: Logistics

Goedehoop supplies coal to the export market through the Richards Bay Coal Terminal (**RBCT**). Coal is transported from underground to the surface RoM silo and then delivered by three conveyors to the RoM stockpile. Coal is reclaimed from the RoM stockpile by vibrating feeders and through the coal processing plant for washing and preparation. Product coal is then conveyed to either the product silos or directly to a stockpile adjacent to the silos. The product coal is reclaimed from the silos (or stockpile) using feeders, via an automatic sampler, to the load-out silo at the RLT, for direct loading onto trains for dispatch to RBCT.

ES20: Occupational Health and Safety

[SR5.2(viii)]

Occupational Health

Coal dust is the main airborne pollutant in Coal Mines and the cause of the Occupational Diseases, Coal Workers Pneumoconiosis (**CWP**) and Chronic Obstructive Airway Disease.

In terms of the occupational hygiene measurement results, approximately 32% of the coal dust measurement results between 2018 and 2019, exceeded the Occupational Exposure Limit (**OEL**). Most of the over-exposure samples were measured at the continuous miner areas. Although 26% of the dust measurements exceeded the OEL, there was a decrease in the diagnosed CWP cases from 24 in 2017 to one in 2020. Compared to gold mine dust, the silica content in coal dust can be classified as a low health risk (no silicosis cases recorded).

The diagnosed Noise Induced Hearing Loss cases also fluctuate between zero and five cases per annum.

Safety

The Company has good risk management and risk control procedures in place which are actively followed by all levels of management. The systems and procedures are commendable, with prompt investigation of lost time injuries (**LTI**s) and necessary remedial actions being implemented.

The lost time injury frequency rate (**LTIFR**) decreased from a high of 1.90 in 2016 toa consolidate 0.42 in 2020, a commendable 78% decrease in the past four years. An LTIFR of zero should be achievable. Greenside Colliery (an underground mine), achieved this milestone in 2015.

However, although there was a significant decrease in LTIs, there were three fatalities between 2017 and 2020. The causes of the fatalities were as follows:

- In 2017 the one fatality was caused by a Load Haul Dump vehicle striking an employee; and
- One fatality in 2018 was caused by a fall of ground. In the second fatality in 2018, a proto member engulfed by coal while cleaning a silo.

In the quest towards zero harm, the Company identified focal areas to further reduce work related incidents and accidents.

ES21: Environmental, Social Compliance, Sustainability

[12.10(h)(viii)] [SR4.3(ii), SR5.2(viii)], SR5.5(i)(ii)(iv)] [SV1.2] [ESG4.3, ESG4.4, ESG4.8]

GHN and GHS are operating in line with several Environmental Management Programme Reports (**EMPrs**[5]), Environmental Authorisations (**EA**s) and WULs. Over the years, Goedehoop has undertaken several EMPr and WUL amendments and has applied for various other environmental authorisations as additional activities have been triggered in terms of the Mineral and Petroleum Resources Development Act (Act No 28 of 2002) (**MPRDA**), National Environmental Management Act (Act No. 107 of 1998) (**NEMA**), National Environmental Management: Waste Act (Act No. 59 of 2008) (**NEM:WA**) and National Water Act (Act No. 36 of 1998) (**NWA**) in line with the developing mining operations.

The following EMPrs are in place at GHN and GHS:

- Goedehoop North:
  - Main Bank Colliery EMPr (Reference Number: MP 30/5/1/2/2/143MR) approved on 30 May 2001;
  - Bank Colliery Addendum for Main Shaft Access Shaft, Block 10 and Brown Shaft 2 (Reference Number: MP 30/5/1/2/2/143MR) approved on 30 April 200;
  - Bank Colliery Addendum for Roodepoort-Welverdiend (Reference Number: MP 30/5/1/2/3/2/1 (57)) approved on 24 April 2008;
  - Aligned Environmental Impact Assessment and Environmental Management Programme in respect of the farms Roodepoort 151 IS and Welvediend 23 IS - (DMR Reference No: MP 30/5/1/2/2/(57) MR) issued by the then Department of Mineral Resources (**DMR**) and now the Department of Mineral Resources and Energy (as of 29/05/2019) (**DMRE**) approved on 6 December 2016;
  - Amended Environmental Impact Report (EIR) and EMPr for the changes to Brown Shaft 2 Project (Reference Number: MP 30/5/1/2/2/ (143) MR) approved on 3 September 2019; and
- Goedehoop South:
  - Goedehoop South Bultfontein Extension Aligned EMPr (Reference Number: MP 30/5/1/2/2/(122) EM) approved on 8 September 2015;
  - Goedehoop South Amended EMPr for reclamation and expansion of residue deposit and briquetting plant (Reference Number: MP 30/5/1/2/2/(122) MR) approved on 17 December 2015;
  - Integrated Environmental Authorisation (**IEA**) issued in terms of NEMA as amended, the Environmental Impact Assessment (**EIA**) Regulations, 2014 and the National Environmental Management: Waste Act 59 of 2008 ("NEMWA") and Government Notice 921 of 2013 for proposed mining and associated infrastructure (Hope 4 Seam) (Reference Number (MP) 30/5/1/2/3/2/1/ (122) EM). The IEA was received on 2 December 2016 from the then DMR and expires on 2 December 2021; and
  - EMPr for the remaining extent of Portion 4 of the farm Kleinfontein 49 S (Reference Number: MR 30/5/1/2/3/2/1 (466) EM) approved on 16 May 2019.

The following EAs are applicable to Goedehoop Colliery:

- Goedehoop North:
  - EA in terms of the NEMA as amended and NEMWA as amended, and the EIA Regulations,

[5] Previously referred to as an Environmental Management Programme (**EMPR**) approved in terms of the Mineral and Petroleum Resources Development Act (Act 28 of 2002) before 8 December 2014. Post 8 December 2014 the EMPR is now referred to as an Environmental Management Programme Report (EMPr) approved in terms of the National Environmental Management Act (Act 107 of 1998).

2014 for the expansion of Bank 2 mine residue deposit and associated infrastructures in respect of Portion 9 of the Farm Bankfontein 340 JS, situated within the Magisterial district of Middelburg: Mpumalanga Region (Reference Number (MP) 30/5/1/2/3/2/1/ (143) EM). Received on 7 June 2018 from the then DMR and expires upon closure of Goedehoop; and

- Goedehoop South:
  - EA for the proposed construction of an upcast ventilation shaft for Goedehoop Colliery's Block 10 (Reference Number: 17/2/3N-281) received on 31 March 2014 from the Mpumalanga Department of Agricultural, Rural Development, Land and Environmental Affairs. The EA expires on closure of Goedehoop; and
  - EA for Mineral Residue Deposit Expansion and Briquetting Plant (Reference Number 17/2/3N – 23B) received on 29 January 2016 from the Mpumalanga Department of Agricultural, Rural Development, Land and Environmental Affairs. The EA expires on closure of Goedehoop.

The following WULs, General Authorisations (**GA**) and General Notice 704 (**GNR 704**) exemptions have been issued to GHN and GHS for water use related activities:

- Goedehoop North:
  - The Goedehoop North WUL issued on 8 July 2011 (Licence Number: 04/B11H/AFGJ/633) by the then DWA, now DHSWS. The date of expiry is 8 July 2031;
  - Brown Shaft 2 WUL issued on 29 March 2016 (Licence Number: 04/B11H/ACGIJ/4329) and was amended on 31 May 2019 by the then DWS, DHSWS. The date of expiry is 24 March 2026;
  - Goedehoop North GNR 704 exemption (Exemption Number: 27/2/2/B11G/257) for undermining of watercourses issued on 5 July 2018 by the then DWS, now DHSWS. Expires on closure of Goedehoop; and
  - Goedehoop Colliery General Authorisation for the proposed construction of a contractors' laydown/camp area for Section 21(c) and (i) water uses (Reference Number: 27/2/2/B811/3/3) issued on 17 January 2019 by the then DWS, now DHSWS.
- Goedehoop South:
  - The Goedehoop South WUL issued on 2 August 2013 (Licence Number: 04/B11B/ACFGIJ/1754) by the then Department of Water Affairs (**DWA**), now the Department of Human Settlements, Water and Sanitation (**DHSWS**). This licence was amended and approved on 4 March 2020. Licence expires on 2 August 2033;
  - Dump expansion and Briquetting Plant WUL issued on 8 August 2016 (Licence Number: 03/B11B/CGI/4702) by the then Department of Water and Sanitation (**DWS**), now DHSWS. Licence expires on 8 August 2033;
  - The Hope 4 Seam WUL issued on 18 May 2017 (Licence Number: 06/B11B/ACGIJ/5269) by the then DWS, now DHSWS . Licence expires on 18 May 2037;
  - Block 20 WUL issued on April 2011 (Licence Number: 04/B11B/ACGIJ/411) by the then DWA, now DHSWS, although this WUL expired on April 2016. A new WUL for Block 20 (Licence Number: 06/B11B/GICAJ/5339) was issued on 5 June 2017 by then DWS, now DHSWS, and expires on 5 June 2037; and
  - Goedehoop South GNR 704 exemption (Exemption number: 27/2/2/B11G/254) for undermining of watercourses issued on 5 July 2018 by the then DWS, now DHSWS. This exemption expires on closure of Goedehoop.

Environmental management at Goedehoop is undertaken by the environmental department, which includes an Environmental Coordinator who is assisted by an Environmental Control Officer **(ECO)**. The colliery makes use of an Environmental Management System (**EMS)** to manage environmental data, incidents and reporting, which is ISO 14001:EMS:2015 accredited. The colliery undertakes annual internal and external ISO14001 audits. External compliance audits are conducted on regular basis (mainly annually) on all existing environmental

permits. These audits have found that, while Goedehoop is compliant with a significant number of the permit conditions, there are several areas of concern relating to water management. These relate mainly to seepage at the MRDs and other surface water aspects and are addressed in Section16, Water Management.

Exceedances in monitoring parameters for surface water and groundwater parameters have been observed on an ongoing basis. Biomonitoring has also indicated that mining activities are impacting on the aquatic ecosystems being monitored. The colliery is generally compliant with the dust and $PM_{2.5}$ and PM_{10} limits. The colliery is implementing action plans to address ongoing non-compliances and avoid being issued with directives or fines by the relevant environmental authority. In addition to this, the Environmental Coordinator has indicated that various non-compliances are currently being addressed through the amendment of the operations' EMPrs and WULs.

In terms of non-compliances with EMPrs and EA obligations, Shangoni Management Services (**Shangoni**) (Shangoni, 2019a and 2019b) compiled an EA and Performance Assessment Review Report for both GHN and GHS which identifies non-compliances with the obligations of the Goedehoop EMPrs and EAs. It should be noted that more recent EA and Performance Assessment Reviews (conducted by Geovicon Environmental (Pty) Ltd) have been conducted during August 2020 but these reports are still in draft format and have not undergone legal review. Therefore the 2019 Shangoni audits reports findings have been included in this CPR.

In terms of the EA and Performance Assessment Review (**PAR**) Review Report for GHN (Dated November 2019 with Reference Nos: MP30/5/1/2/2/143MR; MP30/5/1/2/3/2/1(57); MP 30/5/1/2/2/ (124) MR; and 17/2/3N – 281) the following non-compliances were noted:

- Main Bank Colliery EMPr: Inadequate containment and other pollution intervention measures at Bank 5 Dump; seepage water from Bank 5 is not channelled to any slimes disposal boreholes as specified in the condition; seepage from Bank 5 Dump is impacting on rehabilitation efforts of the wetlands;
- Bank Colliery EMPr Addendum – Main shaft access shaft, Block 10 and Brown Shaft 2: No non-compliances were noted;
- Bank Colliery EMPr Addendum – Roodepoort-Welverdiend: No proof of investigations into exceedances of surface and groundwater monitoring targets specified in the WUL;
- Goedehoop Colliery Bultfontein Extension Aligned EIA and EMPr: No non-compliances were noted;
- EA for the up-cast ventilation shaft: No independent ECO was appointed before or during construction of the vent shaft and the department was not notified of the failure to appoint the ECO; no monthly compliance reports were submitted to the Department; no site diary was kept during the construction and rehabilitation phases of the project; no evidence of an independent environmental auditor report having been compiled following the completion of construction and rehabilitation activities; no notice was given to the Department regarding the commencement of the activity;
- Integrated EA for the expansion of Bank 2 mine residue deposit and associated infrastructure on respect of Portion 9 of the Farm Bankfontein 340 JS: no notice was given to the Department regarding the commencement of the activity; groundwater monitoring network has not been extended to cover shallow boreholes adjacent to existing boreholes at the time of the audit; and
- Integrated EA for proposed mining and associated infrastructure in respect of Portions 1, 2, 3, 4, 5, 6, 7, 8 and 9 of farm Goedehoop 46 IS; portions 7 and 26 of the farm Geluk 26 IS; portions 1, 2, 3, 6, 10, 11, 12, 13 and 14 of the farm Bultfontein 87 IS; portions 6, 7, 10 and 11 of the farm Wilmansrust 47 IS; portion 12 of the farm Koornfontein 27 IS; remaining extent of the farm Komati Power Station 56 IS and portion 27 of the farm Haasfontein 28 IS: No non-compliances were noted.

AOPL subsequently prepared a Recommendations Memorandum dated 6 December 2019, which proposes the amendments indicated below to the Goedehoop Main Bank EMPR. The Recommendation Memorandum was subjected to a 30-day public participation process.

- Detailing of the risks and significance thereof related to the wetland areas, as well as the associated management measures;

- Inclusion of further investigations and management commitments of seepage management associated with the Bank 5 MRD and ensure alignment of such with a final mine closure plan;
- Updating of risks and associated mitigation measures as applicable to the Bank 2 processing plant; specifically associated with clean and affected water management;
- Alignment of some EMPr commitments with the approved Water Use Licence(s) (WULs) conditions; and
- Updating of risks and associated mitigation associated with visual impacts.

In terms of the EA and PAR Review Report for GHS (Dated 29 November 2019 with Reference No: MP30/5/1/3/2/1/ (122) MR; and 17/2/3N-238) the following non-compliances were noted:

- Goedehoop Colliery Amended EIA and EMPr:
  - Inadequate diversion of clean runoff water from the Vlaklaagte and North East Shafts;
  - No WUL authorisation or Government Notice 704 (GN704) exemption for shafts constructed prior to 2008 within 100 m buffer proposed by the wetland specialist;
  - Conveyor at Block 7 is not completely enclosed at the bridge crossing; placement of pollution control dams (PCDs) within the 100 m buffer zone of wetlands with no evidence of a WUL or GN704 exemption;
  - No groundwater modelling plume for underground activities was available at the time of the audit;
  - Several storm water management systems were not operated to comply with the requirements of the regulations under the GN704 at the time of the audit;
  - Locality of conveyor crossings within the 100 m buffer of wetlands without evidence of a WUL or GN704 exemption;
  - Ineffective rehabilitation of the Springbok 1 and 2 and Hope Dumps due to seepage observed and recommendations from the investigation conducted at Springbok 1 and 2 and Hope Dump have not been implemented;
  - Seepage containment within the South Plant Return Water Dam is not effective;
  - No rehabilitation of wetlands has been undertaken where required or committed to do so; and
  - No sumps have been constructed to contain seepages from the dumps.
- EA for the Mineral Residue Deposit Expansion and Briquetting Plant:
  - The operation did not notify the Department of the commencement of the re-mining activities; and
  - vehicles transporting re-mined material are not covered with tarpaulins as required.

An External WUL Audit Report (Report Reference: ANG-COA-18 12 12) compiled by Shangoni and dated February 2020, notes non-compliances with conditions of the GHN and GHS WULs as indicated below:

Goedehoop North WUL (Licence Number: 04/B11H/AFGJ/633):

- Failure to submit the 2018 external audit report to the DHSWS Regional Head within one month of the finalisation of the report;
- Failure to calibrate flowmeter devices on a biennial basis;
- Exceedances of abstraction volumes of groundwater from the Simunye Shafts;
- Inadequate storage and handling of waste within the Simunye Shaft Salvage yard;

- Contamination of stormwater leaving the site originating from seepage from the Bank 5 Dump. This seepage is also not collected in a Pollution Control Dam (**PCD**) as required according to the condition;
- Quality of sewage discharged exceeds all parameters with the exception of pH and orthophosphate;
- The quality of water discharged is not recorded and the flow meters are not maintained therefore the discharge quantities are not recorded;
- Quality of waste is not being monitored weekly as required but rather on a monthly basis;
- Monthly sewage reports are not being submitted to the DHSWS as required but rather quarterly;
- Exceedances in disposal volumes authorised for disposal of water into the Erickson Reservoir and the disposal of discard and slurry onto Bank 2 co-disposal Dump;
- Exceedances in authorised water quality limits observed in seepage from Bank 2 RWD and the Bankfontein outlet and in the Goedehoop North mining area;
- Groundwater monitoring is conducted on a quarterly basis and not monthly as required. In addition, three monitoring points are not sampled;
- Lack of maintenance of the Bank 2 Plant silt trap;
- Monthly monitoring results for the Schoongezicht Dump have not been included in the quarterly water quality monitoring reports;
- Engineered mitigation measures for sources of pollution have not been put in place specifically with regard to the seepage at the discard dumps; and
- The geochemical assessment was not submitted with the Integrated Waste and Water Management Plan (**IWWMP**) as required.

Goedehoop South WUL (Licence Number: 04/B11B/ACFGIJ/1754):

- Failure to submit the 2018 external audit report to the DHSWS Regional Head within one month of the finalisation of the report;
- Failure to calibrate flowmeter devices on a biennial basis;
- Exceedances of abstraction volumes of groundwater from the Block 7 and Vlaklaagte Shaft and failure to obtain authorisation for the exceedances;
- The location of several infrastructure components within the 1:100 year floodline and within a horizontal distance of 100 m from the watercourse without a WUL or GN704 exemption. These were classified as existing lawful water uses and Goedehoop is in discussions with the DHSWS about this condition;
- As-built drawings were not re-submitted after the issuances of the licence;
- Inadequate diversion of stormwater from dirty areas due to no visible storm water channels been implemented upslope of the Vlaklaagte Shaft;
- Contamination of stormwater leaving the property as a result of raw sewage spillage from the Springbok Main Sewage Treatment Plant;
- Proof of submission of the stormwater management plan to DHSWS was not provided to the auditor;
- Construction of infrastructure within a water course prior to receiving authorisation;
- Lack of some of the required sampling parameters in soil potentially affected by pollution;
- Lack of some of the required sampling parameters in the water monitoring procedure;
- Treated effluent from the Springbok Main wastewater treatment works does not comply with the water quality limits in the WUL;
- Exceedances in some of the water quality limits authorised in the WUL;

- No definitive strategies for effectiveness of seepage prevention and/or containment have been developed or submitted to the Regional Head for approval as required;
- Water monitoring results are required to be submitted 30 days after the results of each sampling event but are rather being submitted quarterly. Some variables are also not being sampled as required by the condition;
- Annual analysis of acid base accounting and leachate information of roof, panel and floor samples is not undertaken;
- Discharge volumes exceeded the limits specified for the Hope Village Wastewater Treatment Works (**WWTW**), without prior authorisation from the DHSWS;
- Discharge volumes for Springbok Main WWTW are not monitored as required;
- Quality of waste is not being monitored weekly as required but rather on a monthly basis;
- No public participation of the conditions of the WUL has been undertaken as required;
- The quality of wastewater emanating from the coal discard facility disposed of into the return water dams has exceeded the authorised limits;
- Groundwater monitoring is conducted on a quarterly basis and not monthly as required. In addition, several monitoring points are not sampled and no written approval for this change has been submitted to the Regional Head;
- Inadequate maintenance of stormwater infrastructure was observed; and
- The conceptual groundwater model was not submitted within 6 months of issuance of the WUL.

Block 20 WUL (Licence Number: 04/B11G/CGI/3730):

- Failure to submit the 2018 external audit report to the DHSWS Regional Head within one month of the finalisation of the report;
- Evidence of erosion at Block 20 indicating non-compliance to ensuring stormwater management practices are maintained in a sustainable manner;
- Evidence of erosion at watercourses indicating non-compliance to ensuring erosion prevention mechanisms are functioning;
- Evidence of compacted and un-vegetated patches at Block 20 incline shaft indicating non-compliance to ensuring that this must be managed to ensure it does not take place;
- Lack of some of the required sampling parameters in the water monitoring reports and some of the monitoring points are not sampled;
- Evidence of alien invasive species at Block 20 and lack in management of alien invasive species;
- The internal audit did not contain records of implementation of mitigation measures and did not propose any compensation measures for damage where mitigation has failed. No reporting on the monitoring programme was included within the audit report;
- A wetland specialist has not been appointed to monitor compliance to the wetland management and rehabilitation plan and conditions in the licence pertaining to impacts on wetlands;
- No public participation of the conditions of the WUL has been undertaken as required; and
- The hydrocensus at GHC was not extended to cover a 5 km radius around the Block 20 mining activities as required.

Brown Shaft 2 WUL (Licence Number: 04/B11H/ACGIJ/4329):

- Failure to submit the 2018 external audit report to the DHSWS Regional Head within one month of the

finalisation of the report; and

- Several of the required monitoring points were not sampled as required by the WUL conditions.

Dump Expansion and Briquetting Plant WUL (Licence Number: 03/B11B/CGI/4702):

- Failure to conduct an internal audit on this WUL;
- Placement of certain wastes within dedicated areas at Goedehoop have not been specified in the Waste Management Procedure as required and this procedure was not submitted in the six months period from the issuance of the WUL;
- Some of the required sampling parameters for soil samples (for areas where dust suppression is practised) were not sampled;
- Several of the required monitoring points were not sampled as required by the WUL conditions; and
- A surface water monitoring programme was not submitted within one month of the issuance of the WUL

Hope 4 Seam WUL (Licence Number: 06/B11B/ACGIJ/5269):

- Failure to conduct an internal audit on this WUL.

Goedehoop North GN704 Exemption (Exemption Number: 27/2/2/B11G/257):

- No non-compliances noted for this exemption.

External WUL audits for 2020 have been compiled by Geovicon (dated August 2020) but are still in draft format. Since these audits have not been legally reviewed or updated, the findings contained within these 2020 WUL audits not been included in this CPR.

A Social and Labour Plan (**SLP**) was prepared as part of the Mining Right Application (**MRA**) in terms of the requirements of the MPRDA. Goedehoop has developed an SLP for the 2015 to 2019 period. The SLP for the 2020 to 2024 period (AAC, 2020h) was submitted to the Department of Mineral Resources and Energy (DMRE) in September 2020.

Goedehoop submitted its Mining Charter scorecard report in March 2020 (AAC, 2019aa) for the 2019 reporting year, against the Mining Charter III requirements.

There are high expectations from local communities to benefit from enterprise development projects. Due to unrealistic expectations from the community, this aspect may become contentious and a challenge for Goedehoop to manage. If unmanaged, there is a risk of work stoppages, property damage and loss of productivity, which could result in financial loss, reputational damage and community discontent;

There are several land claims on farm portions where GHN and GHS have an interest, either because of land use or mineral rights. Even though the Company attends the Joint Land Claims Working Committee meetings, these land claims have not been resolved (i.e. gazetted or dismissed). Should this issue remain unresolved, it could lead to a loss in surface right access;

The results of the sustainability review indicate that high risks are present in manufactured, natural, social and relational capitals; moderate risks are present in human capital, external sustainability risks and sustainability reporting practices and insignificant risks are present in intellectual capital.

ES22: Mine Closure and Liabilities

[SR1.7(i), SR5.2(ii)]

The closure liability has been assessed at ZAR586 million using the approach currently required by legislation and reported as the liability in December 2019. SRK understands that a provision of ZAR852 million has been made to the DMRE. SRK is of the opinion that Goedehoop has met its legal obligations around assessing and making provision for the liability. SRK is of the opinion that Goedehoop's assessment of liability based on

commercial costs, which indicates a liability of ZAR606 million at end December 2019 (ZAR631 million at end December 2020), is likely a more accurate reflection of liability, as a more focussed approach has been used to determine this liability. This does not include a ZAR20 - 30 million inaccuracy that SRK believes is in the calculation, which would increase liability to ZAR636 million at end December 2019 (ZAR662 at end December 2020), nor does it include any of the post-closure water treatment costs with there likely to be a 10.8 Ml/d decant within fifteen years after closure. There are potential risk items that could increase the closure liability, with these being post-closure water treatment and the requirement for complex engineered covers at closure. This could add ZAR688 to ZAR1 100 million to the liability. In addition, there is a post-closure risk of subsidence requiring remediation, potential shallow groundwater impacts on aquifers associated with discard facilities and sediment accumulation in the Bankfontein Dam, that may also increase liability. However, until further investigations have been undertaken, a quantum cannot be attached to this risk. SRK is of the opinion that Goedehoop has met statutory requirements and has a robust understanding of what the liability is, with future work required to refine the estimate as the end of the LoM approaches.

SRK understands that the Company is currently undertaking updates to the closure cost estimates in order to reflect liability as at December 2020. Once the 2020 assessments are complete and have received the necessary internal approvals, these figures will be reported to the DMRE and changes to the closure provision will be made where necessary. SRK has not interrogated the 2020 figures and has instead escalated the 2019 figures to represent a liability at the end of December 2020.

ES23: Water Management

[SR3.1(i), SR4.3(ii), SR5.2(ii) (vii) (viii)]

This section deals with the technical aspects of water management at Goedehoop, while Section ES 21 deals with the legal compliance aspects. However, this section does provide context and further information about the non-compliances, specifically related to GNR704.

Surface Water Management

The specific surface water material risks are as follows:

- Failure to intercept seepage and prevent erosion at Bank 5 Discard Dump, resulting in an impact to the riparian and in-stream habitats. Similar findings related to the Hope and Springbok Dumps occur; and
- No collection of water containing waste was contained for the polluted water at Bank 5; and
- Discharge of dirty water directly to the environment.

There has been remedial work done in the last few months to implement controls to deal with the pollution from the Bank 5 Discard Facility. A phytoremediation project for Hope Dump will also commence by the end of November 2020.

The cost for the stormwater controls will be in excess of ZAR 500 million and includes the following:

- Dealing with the excess groundwater that will discharge/seep to the water sources; and
- Construction of stormwater controls.

The cost estimate for the upgrading of the surface water aspects is based on similar costs for similar items that have been implemented and costed on other mines. The items that are included were taken from the non-compliance audits done on the mine. There has been no design or investigation work to identify the best solution so this will give an indication of costs required to make the mine compliant. The main items that were highlighted are as follows:

- Inadequate diversion of clean runoff water from the Vlaklaagte and North East Shafts. SRK has allowed for 1 000 m of canals at the shafts;
- Ineffective rehabilitation of the Springbok 1 and 2 and Hope Dumps due to seepage observed and recommendations from the investigation conducted at Springbok 1 and 2 and Hope Dump have not been implemented. We have included stormwater and seepage collection that will be required on the closed dumps;

- Seepage containment within the South Plant Return Water Dam is not effective. We have included for seepage collection facilities and reticulation the potential closure works;
- No rehabilitation of wetlands has been undertaken where required or committed to do so. We have included costs for wetland rehabilitation;
- No sumps have been constructed to contain seepages from the dumps. We have included the construction of sumps as well as the infrastructure required to pump the water to the treatment works;
- Contamination of stormwater leaving the site originating from seepage from the Bank 5 Dump. This seepage is also not collected in a PCD as required according to the condition. We have included cut off drains, sumps, reticulation, stormwater dams; and
- Contamination of stormwater leaving the property as a result of raw sewage spillage from the Springbok Main Sewage Treatment Plant. An upgrade of the sewage works is included.

There will be ongoing water treatment costs that are covered in the closure section and have been considered in the summary valuation.

Ground Water Management

The area is characterised by three key hydrostratigraphic units; a shallow weathered aquifer, a deeper fractured aquifer and the pre-Karoo aquifer. Groundwater occurrence is usually associated with faults, fractures, joints, bedding planes or other geological contacts (including coal seams), while the rock matrix itself is considered impermeable. Groundwater level monitoring data suggests there is limited hydraulic connection between the shallow-weathered and the deeper fractured aquifers.

The regional groundwater levels vary from 0.8 m below ground level (**mbgl**) to 33.9 mbgl and the groundwater flow directions mimic the topography. The groundwater discharges are to surface drainage systems and pans, as well as a few springs which occur within the area. There has been regional lowering of the groundwater level at Goedehoop South due to past mining activities, but little change is evident at Goedehoop North. An assessment of the local groundwater chemistry shows that sulphate levels are elevated in the groundwater, with a number of sites showing acid mine drainage with pH of less than four. This water quality data is consistent with pyrite oxidation being the main source of sulphate contamination.

The following facilities are potential sources of contamination into the groundwater.

- Underground workings;
- Seepage from discard dumps; and
- Seepage from backfill/overburden spoil in rehabilitated open cast pits.

It is SRK's opinion that the current groundwater management strategy (dewatering) for the underground operations is effective for the safe mining of the current No 1, 2 and 4 Seam workings. However, the water pressures in the overlying No 5 Seam and underlying and No 2 Seam workings present a risk of driving water into active working areas. There is a risk of flooding in operational areas if the dewatering system is dormant for extended periods.

Elevated concentrations of sulphate are of great concern and the water management strategy must ensure that the affected water is not released into the receiving environment through discharge, decant or even plume movement.

The main concern relates to the post-mining decant of contaminated water, which may need treatment and management into perpetuity. Decanting has been predicted to occur very soon after mining ceases and pumping of water from the workings to a treatment plant will be required after cessation of mining. Post-closure, the mine water will need to be actively managed at a safe level to prevent decanting.

ES24: Utilization and Marketing

[SR4.3(vi), SR5.6(ii)] [SV1.14]

The mine produces export-grade coal, which is a function of the existing mine infrastructure and the inherent quality of the coal. The beneficiation plant on the mine is suited to a single-stage wash product of higher-grade coal to maintain product quality control. There are some alternative domestic coal products that can be developed for domestic power stations, sourced from the mineral residue deposits. These are best marketed through third parties.

The API 4 price assessment is the benchmark price reference for coal exported from South Africa's RBCT on a free on board (**FoB**) basis which satisfies the "RB1" product specification for a 6 000 kcal/kg product (minimum of 5 850 kcal/kg). Other coals commonly exported are the RB2 specification (minimum of 5 700 kcal/kg) and the RB3 specification (5 500 kcal/kg, minimum of 5 300 kcal/kg).

India is South Africa's main export market, accounting for about 57% of 2019 exports, with Pakistan a distant second. Exports made up 27% of South African coal sales in 2019.

Coals destined for use by Eskom made up 45% of coal sales in 2019 and generally have CV[1]s around 4 800 kcal/kg or 20 MJ/kg.

Coal is used in several different industries and applications, such as electricity generation, steel production, cement and paper production, converted into gas and liquid fuels, specialist products (e.g. activated carbon) and chemical products.

Historical export thermal coal prices FoB Richards Bay have varied since 2013 between USD50/t (Quarter 1 2016) and USD100/t (Quarter 3 2018). Domestic coal prices have varied between ZAR440/t (Quarter 2 2015, Quarter 2 2020) and ZAR620/t (Quarter 4 2018).

The ZAR:USD exchange rate and API 4 coal price forecasts used in this CPR are taken from a market report prepared for the Company by Wood Mackenzie Ltd, as set out in Table ES-17.

Table ES-17: Forecast Exchange Rate and API Export Price (Real terms)

Item	Units	2021	2022	2023	2024	2025	2026	2027	2028
Exchange Rate	(ZAR/USD)	16.24	15.58	14.99	13.75	13.75	13.75	13.75	13.75
API 4 Price	(USD/t)	85.2	82.4	80.7	79	79.3	79.4	79.5	81.1

Source: Wood Mackenzie (2021)

ES25: Material Contracts

[SR5.6(ii)(vi)] [SV1.13]

Transnet Freight Rail

The Company has a signed agreement with Transnet SOC Limited acting through its Transnet Freight Rail Division (**TFR**) for the transportation of coal to RBCT. The agreement commenced on 1 April 2014 and runs for ten years to 31 March 2024. The agreement can be extended by mutual agreement.

In terms of the contract, the contracted tonnage allocated to the Company is 19.08 Mtpa. The contract operates on a "take or pay" basis, except where the transport services offered by TFR exceed the contracted tonnage.

The annual rail tariff price escalation is based on:

- An index escalation based on a formula comprising PPI (64%), labour (22%), steel price (7%), electricity (5%) and diesel (2%); plus
- A capital related tariff adjustment (an adjustment based on the increase or decrease in actual capital expenditure estimates (**Capex**) spent relative to the projections set out in TFR's feasibility study done at the time the agreement was signed.

The Company assigns the contracted TFR allocation to the various collieries depending on their requirements. Goedehoop has historically used between 3.9 Mtpa and 4.6 Mtpa of this capacity.

The Company has leased up to 5 Mtpa of TFR entitlement to a third party.

The Company leases TFR capacity from third parties from time to time, depending on opportunities in the market.

Richards Bay Coal Terminal

The Company was one of seven coal exporting companies that were involved in Phase 1 of the development of the RBCT. The Company participated in each phase up to and including the Quattro Optimisation Project in the process securing a linked entitlement of 20.88 Mtpa. This entitlement grants the Company six allocated grades of coal it can export and 16 allocated stockpiles.

RBCT operates on a commercial breakeven basis whereby it recovers its operating costs from the shareholders based on tonnages of coal exported. In terms of the shareholders' agreement, each shareholder is required on a "use or pay" basis to export a minimum annual tonnage of coal through the terminal based on its linked entitlement and committed annual tonnage usage (**CATU**). RBCT recovers its costs via a wharfage fee, which comprises an operating charge, an interest charge, a capital charge and a usage surcharge.

A third party has leased up to 5 Mtpa of RBCT entitlement from the Company.

The Company leases RBCT capacity from third parties from time to time, to allow it to capitalise on opportunities in the market.

Coal Marketing

The Company plans to enter into an exclusive offtake agreement with a third party who will purchase all saleable export coal produced by the Company and market all domestic production.

The agreement will run for an initial term of three years, calculated with effect from the listing date of the Company.

The marketing fee payable to the third party will be a percentage of the realised price of the coal. The realised price of export coal will be the ruling price for Average Price Index (API4) coal less an adjustment for the actual calorific value (**CV[1]**) of the exported coal and a discount for the Ash content (as a USD/t).

The current marketing arrangements used by the Company are essentially the same as what are envisaged above.

Coal Supply Contracts

There is a coal supply agreement in force for the supply of unwashed, untreated Goedehoop North MRD coal to a third party, which continues to 30 June 2021. The third party has the right of first refusal post this period for an additional two years of coal supply, at prices to be re-negotiated.

The coal is loaded on to road trucks at the mine site, with ownership and risk in the coal transferring as the truck leaves the mine loading site.

Provision of Services

Goedehoop is owner-operated with use of contractors for non-core operations. The colliery is managed within a portfolio of other coal mines and obtains some services from a Central Services division such as training, medical etc. The main supply commodities are not at risk from single sourcing and are competitively priced and managed through central purchasing contracts. The largest risk item, excluding the rail logistics, is the security of electricity supply; however, these are well managed through the contract and the supplier relationship.

ES26: Valuation Methods

[12.9(a)(i), 12.10(f)] [SV1.2, SV1.12, SV1.13, SV1.14]

The valuation of Goedehoop and the contained coal deposits has been prepared in accordance with the SAMVAL Code. The three generally accepted approaches to mineral asset valuation are:

- Income Approach – The Income Approach relies on the 'value-in-use' principle and requires determination of the present value of future cash flows over the useful life of the Mineral Asset;
- Market Approach – The Market Approach relies on the 'willing buyer, willing seller' principle and requires

that the monetary value obtainable from the sale of the Mineral Asset is determined as if in an arm's-length transaction. The application of certain logic in Mineral Asset Valuation, such as 'gross in-situ value' simply determined from the product of the estimate of mineral content and commodity price(s), is considered unacceptable and inappropriate; and

- Cost Approach – The Cost Approach relies on historic and/or future amounts spent on the Mineral Asset, and is a valuation approach based on the economic principle that a buyer will pay no more for an asset than the cost to obtain an asset of equal utility, whether by purchase or by construction.

SRK has valued the Goedehoop Coal Reserves utilizing the Market Approach and Income Approach.

The preferred, minimum and maximum values per the Income and Market Valuation approaches are compared in Table ES-18. The ZAR values are converted to USD terms at the exchange rate of ZAR14.703 = USD1.00 ruling at the Valuation Date.

Table ES-18: Comparison of Income and Market Valuations for Goedehoop Coal Reserves

Valuation Approach	Units	Minimum	SRK-preferred	Maximum
Income	(ZARm)	960	1 308	1 640
Market	(ZARm)	140	350	1 597
SRK-selected	(ZARm)	960	1 308	1 640
Income	(USDm)	65.3	89.0	111.5
Market	(USDm)	9.5	23.8	108.6
SRK-selected	(USDm)	65.3	89.0	111.5

SRK considers the values derived from the Income approach to be more appropriate given that they are based on cash flows derived from a LoM production schedule and costs that are well understood.

There are some 220 Mt of Coal Resources that are outside of the LoM plan. Values for these Coal Resources outside the Mine Plan were derived using the comparable transaction metrics, as summarised in Table ES-19.

Table ES-19: Summary Value for Coal Resources Outside the Mine Plan

Deposit/Coal Seam	Values (ZARm)		
	Lower	Average	Upper
Goedehoop North No 4 Seam (N of dyke)	50	-	75
Goedehoop North No 4 Seam (S of dyke)	0		0
Goedehoop North No 2 Seam (N of dyke)	62	-	93
Goedehoop North No 2 Seam (S of dyke)	0		0
Goedehoop North No 1 Seam	35	-	52
Goedehoop South No 4 and No 5 Seams	0	-	0
Total	**147**	**183**	**220**

The SRK-selected values in Table ES-18 and Table ES-19 are adjusted for projected balance sheet items (e.g. inventories, debt and cash on hand) at 31 December 2020 in Table ES-20. Projected values for accounts receivable and accounts payable at 31 December 2020 were considered in modelling the working capital movements in the techno-economic model (TEM).

ES27: Previous Valuations

[SV1.11, SV1.13]

SRK is not aware of any independent valuations for Goedehoop that have been published in the public domain during the previous two years.

ES28: Summary Valuation

[12.10(h)(xii)] [SR5.8(i)] [SV1.12, SV1.13, SV1.14, SV1.15]

The summary valuation for Goedehoop at the Valuation Date (the same as the Effective Date) is set out in Table ES-20. The values for Goedehoop Coal Reserves were derived on a 100% basis and reflect SRK's preferred value derived from the Income and Market valuation approaches.

The effect of debt/loans and debt servicing was excluded in the compilation of the TEM used in the Income Approach valuation method, with the necessary adjustments reflected in Table ES-20. The TEM was compiled using TEPs in constant money terms.

The value for the Coal Resources outside of the Mine Plan on a 100% basis is incorporated into the summary valuation.

Adjustments have been made in Table ES-20 for balance sheet items, which include cash on hand, medium- and long-term borrowings (debt) and finished product inventories.

The Company confirmed to SRK that there are no hedge or derivative contracts in force.

The percentage of the values of the Coal Reserves and the Coal Resources outside of the Mine Plan that is attributable to the Company is then applied in the summary valuation in Table ES-20.

Entries in Table ES-20 were derived in ZAR terms and converted to USD terms at the exchange rate of ZAR14.703 = USD1.00 ruling at the Valuation Date.

Table ES-20: Goedehoop Colliery Summary Valuation as at 31 December 2020

Contract	Selected Value		Company's Interest (%)	Fair Value to the Company	
	ZARm	USDm		ZARm	USDm
Goedehoop Colliery					
Coal Reserves	1 308	89.0	100%	1 308	89.0
Coal Resources outside of the Mine Plan	183	12.4	100%	183	12.4
Sub-total				**1 491**	**101.4**
Adjustments					
Cash on hand				0	0
Medium and long-term borrowings[1]				0	0
Finished product inventories[2]				18	1.2
Exploration budget costs				Included in cash flows	
Hedge contracts – mark to market				None in force	
Environmental liabilities				Included in cash flows	
Post-closure water treatment[3]				(155)	(10.5)
Net Goedehoop Value				**1 354**	**92.1**

Note:

1 Medium and long-term borrowings are intra-company amounts that will have no cash impact on Goedehoop.

2 Finished product inventories are valued by the Company at the lower cost of net realisable value. The holding value of consumables and spares inventories has been excluded.

3 The NPV of the projected Capex and Opex cash flows for water treatment post closure.

SRK repeated the construction of Table ES-20 using the selected minimum and maximum values derived from the Income and Market valuation approaches and the Coal Resources outside of the Mine Plan minimum and maximum values.

SRK considers that the fair value for Goedehoop attributable to the Company at the Valuation Date after adjustment for balance sheet items and post-closure water treatment costs is ZAR1 354 million (USD92.1 million), in the range of ZAR988 million (USD67.2 million) to ZAR1 757 million (USD119.5 million).

The Goedehoop Colliery is sensitive to movements in the coal price. The Goedehoop operation yields a positive NPV and covers part of the Company's take or pay TFR/RBCT obligations and Company overheads/corporate costs. If Goedehoop was to cease operations, these obligations and corporate overheads would have to be re-allocated to the other collieries which may in turn affect their viability.

SRK is satisfied that Coal Reserves can be declared for Goedehoop.

ES29: Material Change

[12.10(b)] [SR4.1(iv), SR4.3(viii), SR5.3(iii), SR5.5(iii) (v)] [SV1.13]

The Company has observed a pronounced COVID-19-related impact on production at Goedehoop Colliery at the start of 2021. The Company has put in place several mitigation measures to claw back some of the production losses during 2021. However, due to ongoing concerns and uncertainties around the future impact of COVID-19, SRK has reduced the RoM and saleable production forecasts in 2021 by 5%. SRK views the downward revision for the purposes of this CPR is an appropriate measure to address the current uncertainty.

Should there be further COVID-19 infection peaks and associated lockdowns with a delayed vaccination roll-out, a similar 5% impact on 2022 forecast volumes may become necessary.

SRK has not taken into consideration the potential further impact of TFR shutdowns and/or rail constraints on sales.

Based on the information provided by the Company, no material changes are expected in the Coal Resource and Coal Reserve statements. Changes resulting from the COVID-19-related impacts are not expected to be material regarding the overall Coal Resource and Coal Reserve or the remaining LoM.

ES30: Risks

[12.10(h)(x)] [SR5.7(i)]

An iterative, integrated and collaborative risk assessment was carried out as part of the study to identify existing and potential vulnerabilities that could affect the project, using inputs from each of the project disciplines.

A total of 58 risks were evaluated across the disciplines, of those:

- 24 have a low residual rating;
- 23 have a medium residual rating;
- 11 have a high residual risk rating and
- 0 have an extreme residual risk rating.

The 11 risks that retained a high residual rating are:

- Closure liability is underestimated;
- Insufficient coal into plant;
- External sustainability factors; for example, COVID-19 and the global macro-economic environment;
- RoM Production targets are not met;
- Operating costs are understated;
- Capital budgets are understated;
- Projected plant yields are not achieved;

- Projected saleable product mix not achieved;
- Projected coal selling prices not achieved;
- Unable to manage portfolio costs; and
- There is a delay in establishing the ventilation for Brown 2.

Mitigation measures have been identified, as far as possible, and are considered essential in successfully managing the risk profile. A small number of risks are, however, are external and limited control can be applied to these (COVID-19 and the global macro-economic environment, for example). In this view, of the 69 risks:

- 11 residual risks are considered to be **resilient;**
- 32 residual risks are considered to be **robust;**
- 13 residual risks are considered to be **temperate;** and
- 2 residual risks are considered to be **weak.**

ES31: Opportunities

[SR7.1(ii)]

The opportunities identified within Goedehoop mining operation include improving the profitably through review of the SIB budget; streamlining the EMPr in order to achieve legislative compliance; increasing exploration close to geological structures, resulting in additional Coal Resources; investigating whether the Bank 5, Hope and Springbok Dumps can be remined and determining whether the coal discards at Goedehoop South could be recovered.

ES32: Concluding Remarks

[SR7.1(ii)] [SV1.0, SV1.10, SV1.13]

SRK has conducted a comprehensive review and assessment of all material issues likely to influence the future operations of Goedehoop based on information available up to 31 December 2020, which is the Effective Date and Valuation Date for this CPR. The CPR and Market Valuation of Goedehoop have been done according to the requirements of the SAMREC and SAMVAL Codes.

As far as SRK has been able to ascertain, the information provided by Goedehoop is complete and not incorrect, misleading or irrelevant in any material aspect. SRK has no reason to believe that any material facts have been withheld.

SRK has reviewed the information provided by Goedehoop and is satisfied that the extent of the descriptions of various rights is consistent with the maps and diagrams received from the Company. Nevertheless, this does not constitute a legal due diligence and SRK does not make any claim or state any opinion as to the validity of the Company's title to the Mining Rights held or purported to be held over the Material Asset.

This report contains statements of a forward-looking nature which are subject to a number of known and unknown risks, uncertainties and other factors that may cause the results to differ materially from those anticipated in this CPR.

The achievability of LoM plans, budgets and forecasts is neither assured nor guaranteed by SRK. The forecasts as presented and discussed herein have been proposed by the Company's management and staff and have been reviewed and adjusted where appropriate by SRK.

The projections cannot be assured as they are based on economic assumptions, many of which are beyond the control of the Company. Future cashflows and profits derived from such forecasts are inherently uncertain and actual results may be significantly more or less favourable.

Nevertheless, SRK believes that the projections set out in this CPR should be achievable, provided that the required management resources and adequate capital necessary to achieve the projections are sustained.

The trend towards decarbonisation is relatively recent and it remains unclear how this will impact on the value of the coal assets. SRK considers the valuation to be aligned with the SAMREC and SAMVAL Codes and to represent a reasonable interpretation of value and the associated risks. Current sentiment towards coal assets is not adequately reflected in the transactional analysis. The possible gap between the price that can be realised and the valuation is exacerbated by the recent increase in the coal price.

SRK considers that the fair value for Goedehoop attributable to the Company at the Valuation Date after adjustment for balance sheet items and post-closure water treatment costs is ZAR1 354 million (USD92.1 million), in the range of ZAR988 million (USD67.2 million) to ZAR1 757 million (USD119.5 million).

This Executive Summary is a true reflection of the full Competent Person's Report.

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Lesley Jeffrey Pr.Sci.Nat. FGSSA
Principal Geologist & Competent Person (SACNASP) (Coal Resources)
(SACNASP) (Lead Competent Person)

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Andrew McDonald CEng MIoM3 FSAIMM
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Disclaimer

The opinions expressed in this Report have been based on the information supplied to SRK Consulting (South Africa) (Pty) Ltd (**SRK**) by South African Coal Operations (Pty) Ltd (**SACO**). The opinions in this Report are provided in response to a specific request from SACO to do so. SRK has exercised all due care in reviewing the supplied information. Whilst SRK has compared key supplied data with expected values, the accuracy of the results and conclusions from the review are entirely reliant on the accuracy and completeness of the supplied data. SRK does not accept responsibility for any errors or omissions in the supplied information and does not accept any consequential liability arising from commercial decisions or actions resulting from them. Opinions presented in this report apply to the site conditions and features as they existed at the time of SRK's investigations, and those reasonably foreseeable. These opinions do not necessarily apply to conditions and features that may arise after the date of this Report, about which SRK had no prior knowledge nor had the opportunity to evaluate.

Glossary of Terms, Abbreviations and Units

Term	Description
anthracite	a high rank coal with high carbon content and low volatile matter content
API4	API 4 price assessment is the benchmark price reference for coal exported from South Africa's Richards Bay Terminal and is used in physical and over-the-counter contracts
back bye area	a generic term for the area behind the mining panel that is not directly associated with the production of coal but provides the infrastructure for the servicing of the production units such as conveyors, maintenance, bunkers, etc
Beaufort Group	the uppermost division of the Karoo Supergroup consisting predominantly of mudstones
bituminous coal	a relatively soft coal containing a tarlike substance, bitumen, that is the most abundant type of coal
bord and pillar	a mining method to extract the coal by excavating roadways (bords) in a checkerboard fashion through a block of coal and leaving pillars of coal behind to support the overlying strata
borehole	a term used exclusively to describe a deep, narrow hole drilled to access subterranean water
calorific value	calorific value is the amount of chemical energy stored in a coal that is released as thermal energy upon combustion
capacity building	activities and initiatives that enhance the knowledge and skills of people, improve the structure and processes so that communities could constantly grow and develop
carbonaceous	containing carbon
clastic	rock or sediment composed of clasts which have been transported from their place of origin, e.g. sandstone and shale
clean water	water that does not contain waste, e.g. natural catchment runoff, as per the definitions in GNR704
cumulative impact	the cumulative impact of the project is the incremental impact of the project when added to impacts from other relevant past, present and reasonably foreseeable developments, as well as unplanned but predictable activities enabled by the project that may occur later or at a different location Cumulative impacts can result from individually minor but collectively significant activities taking place over a period of time The environmental and social assessment will consider cumulative impacts that are recognized as important on the basis of scientific concerns and/or reflect the concerns of project-affected parties The potential cumulative impacts will be determined as early as possible, ideally as part of project scoping
decline	the main tunnel from surface down into the mine, which normally supports the coal clearance conveyor, men and material access and ventilation
diamictite	type of lithified sedimentary rock that consists of non-sorted to poorly sorted terrigenous sediment containing particles that range in size from clay to boulders, suspended in a matrix of mudstone or sandstone
dip	the inclination of a planar surface, measured in the vertical plane perpendicular to its strike
dirty water	water containing waste, e.g. runoff from mining plant areas, as per the definitions in GNR704
discard	the coal remaining after beneficiation that cannot be sold
dolerite	igneous rock formed below the Earth's surface, a form of basalt, containing relatively little silica (mafic in composition)
drill hole	method of sampling rock that has not been exposed
Dwyka Group	glacial Permian deposit that is widespread in South Africa
dyke	thin, tabular, vertical or near vertical body of igneous rock formed by the injection of magma into planar zones of weakness
Ecca Group	the Ecca Group is divided into three groups: the Lower Ecca (containing almost 300 metres of shales), the Middle Ecca (some 500 metres of sandstone, seams of coal, and fossilized plants), and the Upper Ecca (about 200 metres of shales)
fluvial	refers to the processes associated with rivers and streams and the deposits and landforms created by them
fluviodeltaic	sediment transported and deposited by rivers, coupled to a subaqueous delta, where transport and deposition occur via slope failure (avalanching), settling of fine-grained sediments from suspension in the water column and deposition of sediment by wind and tide generated currents
geophysical	quantitative observation of the physical properties of the deposit
geotechnical	geotechnical engineering is the branch of civil engineering concerned with the engineering behaviour of earth materials
Gondwana	a previous southern super-continent, comprising Africa, Madagascar, India, Sri Lanka, Australia, Antarctica and South America, which split about 180 million years ago
gritstone	a hard, coarse-grained sandstone
Karoo Supergroup	a sequence of mostly nonmarine units deposited between the Late Carboniferous and Early Jurassic periods
lithological	the gross physical character of a rock or rock formation

Term	Description
livelihood	a livelihood encompasses the capabilities, assets and activities accessed by an individual or household in order to support their means of making a living Livelihoods are considered sustainable when they can cope and recover from shocks or stresses, whilst maintaining or enhancing their capabilities and assets
matrix	the fine-grained material separating the clasts in a sedimentary rock
Mining Charter	a Charter to facilitate the sustainable transformation and development of the South African mining industry
mudstone	a clastic sedimentary rock with particles of mud size
Permian period	the geologic period from about 299 to 252 million years ago
pre-Karoo	igneous, sedimentary or metamorphic rocks predating Dwyka glaciation and forming the basement underlying the Karoo Supergroup
rank	the degree of coalification of a coal
RB1	the Richards Bay free-on-board price for a 6 000 kcal/kg product (minimum of 5 850 kcal/kg)
RB2	the Richards Bay free-on-board price for a minimum of 5 700 kcal/kg
RB3	the Richards Bay free-on-board price for a 5 500 kcal/kg product (minimum of 5 300 kcal/kg)
resettlement	the overarching process that describes physical and economic displacement, but also the subsequent relocation, compensation and livelihood restoration activities, through which the welfare of affected people is improved, or at least restored, to pre-Project levels
roof	the strata immediately above a coal seam
sandstone	a clastic sedimentary rock with >25% of clasts of sand by volume
seam	defined layers of coal
sedimentary	pertaining to rocks formed by the accumulation of sediments, formed by the erosion of other rocks
shale	fine-grained sedimentary rock whose original constituents were clay minerals or muds
sill	a thin, tabular, horizontal to sub-horizontal body of igneous rock
silt	a sediment whose particles have a size range of 4 – 625 microns
siltstone	a clastic sedimentary rock with particles of silt size
stakeholder/s	a person or group of people who may be exposed to positive or negative impact of financial, safety, environmental and social aspects of company operation as well as those who show interest in the company or influence it
stakeholder engagement	Communication / exchange of information with interested parties (using various means) to identify priorities in social and environmental issues in order to improve the decision-making process and implementation of these decisions in the company
strata	a layer of material, naturally or artificially formed, often one of a number of parallel layers one upon another
stratigraphy	study of stratified rocks in terms of time and space
strip ratio	the measure of waste material moved in bank cubic metres in order to expose one tonne of coal in an open pit
tectonic	relating to a major Earth structure and its formation, usually by deformation
true thickness	the thickness of a layer measured perpendicular to the strike of the layer
UK Prospectus Regulation Rules	UK Prospectus Regulation Rules made by the FCA, pursuant to Section 73A (4) of the FSMA
varve	a sedimentary bed, layer, or sequence of layers deposited in a body of still water within a year or season Also known as glacial varve
volatile matter	the components of coal (except for moisture) which are liberated at high temperature in the absence of air, consisting predominantly of hydrocarbons and some sulphur
Vryheid Formation	the main coal-bearing unit of the Karoo Supergroup, consisting mostly of interbedded sandstones, shales, mudstones and coal seams
wash densities	the different densities of the water-based medium in which coal is immersed to separate the coal according to the density of the coal particles
Witbank Coalfield	a coalfield in Mpumalanga east of Pretoria

Abbreviation	Description
2015 Provisioning Regulations	Section 24P of NEMA and the Financial Provisioning Regulations, 2015
2019 Provisioning Regulations	Section 24P of NEMA and the Financial Provisioning Regulations, 2019
AAC	Anglo American Coal
AAC SRD	Anglo American Coal Standard(s) and Requirements Document
AAIC	Anglo American Inyosi Coal (Pty) Ltd
AAML	Anglo American Marketing Ltd
AASW	Anglo American Social Way
ad	air-dried
adb	air-dried basis
adc	air-dried contaminated basis
aduc	air-dried uncontaminated basis
AEL	Atmospheric Emission Licence
AIDS	Acquired immunodeficiency syndrome
AOPL	Anglo Operations (Pty) Ltd
ar	As received
ARDML	Acid Rock Drainage and Metal Leaching
BAP	Biodiversity Action Plan
B-BBEE	Broad-Based Black Economic Empowerment
BEE	Black Economic Empowerment
BV	Bureau Veritas (Pty) Ltd
CAGR	compound annual growth rate
Capex	capital expenditure estimates
CAT	Caterpillar, an Operational Equipment Manufacturer
CATU	Committed Annual Tonnage Usage
CBF	condition-based factor
CCR	Central Control Room
CCS	Consequence Classification Structure
CDP	Carbon Disclosure Project
CESR	Committee of European Securities Regulators
CHPP	Coal Handling Preparation Plant
CIT	Corporate Income Tax
CM	Continuous Miner
COAD	Chronic Obstructive Airway Disease
CoP	Code of Practice
CP	Competent Person
CPR	Competent Person's Report
CTA	Carbon Tax Act (2019)
CV[1]	calorific value
CV[2]	Competent Valuator
CWP	Coal Workers Pneumoconiosis
DAFV	dry ash-free volatiles
DARDLEA	Department of Agriculture, Rural Development, Land and Environmental Affairs
DCF	Discounted Cash Flow
DEA	Department of Environmental Affairs
DEFF	Department of Environment, Forestry and Fisheries (as of 29/05/2019)
DHSWS	Department of Human Settlements, Water and Sanitation (as of 29/05/2019)
DMC	Dense Medium Cyclone
DMR	Department of Mineral Resources (now called DMRE)
DMRE	Department of Mineral Resources and Energy (as of 29/05/2019)
DOH	Direct Operating Hours
DPM	Diesel Particulate Matter
DTI	Department of Trade and Industry
DTM	Data Terrain Model
DWA	Department of Water Affairs (now called DHSWS)
DWS	Department of Water and Sanitation (now called DHSWS)

Abbreviation	Description
EA	Environmental Authorisation
EAP	Environmental Assessment Practitioner
ECA	Environmental Conservation Act (Act 73 of 1989)
ECO	Environmental Control Officer
ECSA	Engineering Council of South Africa
EE	Economic Empowerment
EIA	Environmental Impact Assessment
EMP	Environmental Management Plan
EMPr	Environmental Management Programme Report (after 8/12/2014, under NEMA)
EMPR	Environmental Management Programme Report (before 8/12/2014, under the MPRDA; now called EMPr)
EMS	Environmental Management System
EoR	Engineer of Record
EO	Environmental Officer
ESD	Enterprise and Supplier Development
ESG	Environmental and Social Governance
Eskom	Eskom Holdings SOC Limited
ESMA	European Securities and Markets Authority
ESOP	Employee Share Ownership Plan
EY	Ernst & Young
FC	fixed carbon
FCA	Financial Conduct Authority
FoB	Free on Board (on ship)
FoG	Fall of Ground
FoR	Free on Rail
FSMA	Financial Services and Markets Act (2000) (UK)
GA	General Authorisation
GCHP	Ground Control Hazard Plan
GHG	Greenhouse Gas
GIMS	Geological Information Management System
Glencore	Glencore Operations SA
GN	Government Notice
GN1147	Financial Provisioning Regulations, 2015 GNR.1147
GNR	Government Notice Regulation
Golder	Golder Associates Africa (formerly Golder Associates)
GSSA	Geological Society of South Africa
HDP	Historically Disadvantaged Persons
HDPE	High-density polyethylene
HDSA	Historically Disadvantaged South African
HR	Human Resources
HSE	Health, Safety and Environment
ICMM	International Council on Mining and Metals
IEA	Integrated Environmental Authorisation
IIRF	International Integrated Reporting Framework
IM	inherent moisture
IoM	Institution of Materials, Minerals and Mining
IRP	Integrated Resource Plan
IRR	Internal Rate of Return
ISO	International Organization for Standardization (ISO/IEC 17025:2017)
IWUL	Integrated Water Use Licence
IWWMP	Integrated Waste and Water Management Plan
JSE	JSE Ltd
LED	Local Economic Development
LHD	Load Haul Dump
LIMS	Laboratory Information Management System

Abbreviation	Description
LoM	Life-of-Mine
LRA	Labour Relations Act (Act 66 of 1995)
LSE	London Stock Exchange
LTI	Lost Time Injury
LTIFR	Lost Time Injury Frequency Rate
mamsl	metres above mean sea level
mbgl	Metres below ground level
MCI	Mining Charter (1st iteration, 2004)
MCII	Mining Charter (2nd iteration, 2010)
MCIII	Mining Charter (3rd iteration, 2018)
MHSA	Mine Health and Safety Act, (Act 29 of 1996) and amendments
MOU	Memorandum of Understanding
MPRDA	Mineral and Petroleum Resources Development Act (Act 28 of 2002)
MPTRO	Mineral and Petroleum Titles Registration Office
MQA	Mining Qualifications Authority
MR	Mining Right
MRA	Mining Right Application
MRD	Mineral Residue Deposit
MS	Microsoft
MTIS	Mineable Tonnes In Situ
MWP	Mine Works Programme
NAR	Nett as Received
NCVAR	Net As Received Calorific Value
NEM:AQA	National Environmental Management: Air Quality Act (Act 39 of 2004)
NEM:BA	National Environmental Management: Biodiversity Act (Act 10 of 2004)
NEM:PAA	National Environmental Management: Protected Areas Act (Act 57 of 2003)
NEM:WA	National Environmental Management: Waste Act (Act 59 of 2008)
NEM:WAA	National Environmental Management: Waste Amendment Act (Act 26 of 2014)
NEMA	National Environmental Management Act (Act 107 of 1998)
NEMLAA4	National Environmental Management Laws Amendment (Act 4) Bill
NFA	National Forests Act (Act 84 of 1998)
NGER	National Greenhouse Gas Emission Reporting Regulations
NHRA	National Heritage Resources Act (Act 25 of 1999)
NIHL	Noise-Induced Hearing Loss
NMD	Notified Maximum Demand
No 1 Seam	Number 1 Seam
No 2 Seam	Number 2 Seam
No 3 Seam	Number 3 Seam
No 4 Seam	Number 4 Seam
No 5 Seam	Number 5 Seam
NOMR	New Order Mining Right
NPV	Net Present Value
NWA	National Water Act (Act 36 of 1998)
OC	opencast
OEL	Occupational Exposure Limit
OES	One Environment System
Opex	operating expenditure estimates
P1	Number 1 Seam parting (separates S1 and S2 seams)
P2M	Number 2 Seam parting (separates S2M and S2U coal)
pa	per annum
PAR	Performance Assessment Review
PCD	Pollution Control Dam
PLC	Programmable Logic Controller
plc	Public Limited Company
PoO	Point of Observation

Abbreviation	Description
PPE	Personal Protective Equipment
QA/QC	Quality Assurance/Quality Control
R&R	Coal Resources and Coal Reserves
RBCT	Richards Bay Coal Terminal
RD	relative density
RLT	Rail Load-out Terminal
RMD	Roof Monitoring Devices
RoM	Run-of-Mine
RoM_{ar}	Run-of-Mine as received basis
Royalty Act	Mineral and Petroleum Resources Royalty Act (Act 28 of 2008)
Royalty Bill	Mineral and Petroleum Resources Royalty Bill (2008)
RPEEE	Reasonable Prospects for Eventual Economic Extraction
RRT	Red Response Team
RSRD	Residue Stockpiles and Residue Deposit
Rsv	Coal Reserves
RWD	Return Water Dam
S2	Number 2 Seam (full seam - S2S and S2T)
S2BC	Number 2 Seam Bottom Coal
S2FC	Number 2 Seam Floor Coal
S2L	Number 2 Seam Lower (low quality)
S2M	Number 2 Seam Middle
S2RC	Number 2 Seam Roof Coal
S2S	Number 2 Seam Select
S2TC	Number 2 Seam Top Coal
S2U	Number 2 Seam Upper
S4A	Number 4 Seam Upper split
S4L	Number 4 Seam Lower
S4M	Number 4 Seam Select mining height
S4S	Number 4 Seam Select
S4T	Number 4 Seam Top
S4U	Number 4 Seam Upper
SABS	South African Bureau of Standards
SACNASP	South African Council for Natural Scientific Professions
SACO	South Africa Coal Operations (Pty) Ltd
SACMH	SA Coal Mining Holdings Ltd
SAEC	South African Energy Coal Ltd
SAIMM	Southern African Institute for Mining and Metallurgy
SAMESG Guideline	South African Guideline for the Reporting of Environmental, Social and Governance Parameters within the Mining and Oil and Gas Industries (2017 Edition)
SAMREC	South African Mineral Resource Committee
SAMREC Code	The South African Code for the Reporting of Exploration Results, Mineral Resources and Mineral Reserves (The SAMREC Code), 2016 Edition
SAMVAL	South African Mineral Asset Valuation Committee
SAMVAL Code	The South African Code for the Reporting of Mineral Asset Valuation (The SAMVAL Code), 2016 Edition
SANAS	South African National Accreditation System
SANS 10320:2020	South African National Standard 10320: *"The South African guide to the systematic evaluation of coal exploration results, coal resources and coal reserves"* 2nd Edition
SCADA	Supervisory Control and Data Acquisition
SEAT	Socio-Economic Assessment Toolkit
SEP	Stakeholder Engagement Plan
Shangoni	Shangoni Management Services (Pty) Ltd.
SIB	Stay in Business
SIMMS	Structural Inspection and Maintenance Management System
SLA	Service Level Agreement
SLP	Social and Labour Plan

Abbreviation	Description
SRK	SRK Consulting (South Africa) (Proprietary) Limited
SRK Work Products	SRK work product or other deliverable (including reports, analysis, opinion or similar)
TARP	Trigger Action Response Plan
TB	Tuberculosis
TDS	Total Dissolved Solids
TEM	techno-economic model
TEPs	techno-economic parameters
TFR	Transnet Freight Rail
THT	Train handling time
TMM	Trackless Mechanised Mining
TS	total sulphur
UEA	Use of Availability
UG	underground
UKLA	UK Listing Authority
UKLA Listing Rules	Listing Rules LR13.4.6
VAT	Value Added Tax
VM	volatile matter
VoIP	Voice over Internet Protocol
WACC	Weighted Average Cost of Capital
WCS	Working Cost Suspense
WHO	World Health Organisation
WMA	Water Management Area
WML	Waste Management Licence
WRAC	Workplace Risk Assessment and Control
WUL	Water Use Licence
WW	Webber Wentzel Inc
WWTW	Wastewater Treatment Works

Unit	Description
°	a degree
'	a minute
"	a second
%	percentage
bcm/t	stripping ratio as bcm of waste per tonne of coal
cm	a centimetre
dB	a decibel
ha	a hectare (10 000 m^2)
kcal/kg	a thousand calories per kilogram
kg/t	kilograms per tonne
kg/m^3	kilograms per cubic metre
km	a kilometre (one thousand metres)
kt	a kilotonne (one thousand metric tonnes)
ktpa	a thousand metric tonnes per annum
ktpm	a thousand metric tonnes per month
kV	a thousand volts
m	a metre
m Ø	a metre diameter
m/s	metres per second
m^3	a cubic metre
m^3/d	a cubic metres per day
Ma	a million years ago
mamsl	metres above mean sea level
mbgl	metres below ground level
Mm^3	a million cubic metres
Mcm	a million cubic metres
MJ/kg	megajoules per kilogram
Ml/d	megalitres per day
mm	a millimetre
MPa	a megapascal (one million pascals)
Mt	a million metric tonnes
Mtpa	a million metric tonnes per annum
MVA	a million volt amperes
t	a metric tonne
tph	metric tonnes per hour
tpm	metric tonnes per month
TWh	A terawatt hour
USD	United States Dollar
USDm	a million United States Dollars
USD/t	United States Dollar per tonne
Y%	mineral royalty percentage rate
ZAR	South African Rand
ZARm	a million South African Rand
ZAR/t	South African Rand per tonne

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1. Introduction

1.1. Background

[12.10(h)(i)] [SR1.1(i), SR7.1(i)] [SV1.3, SV1.4, SV1.5]

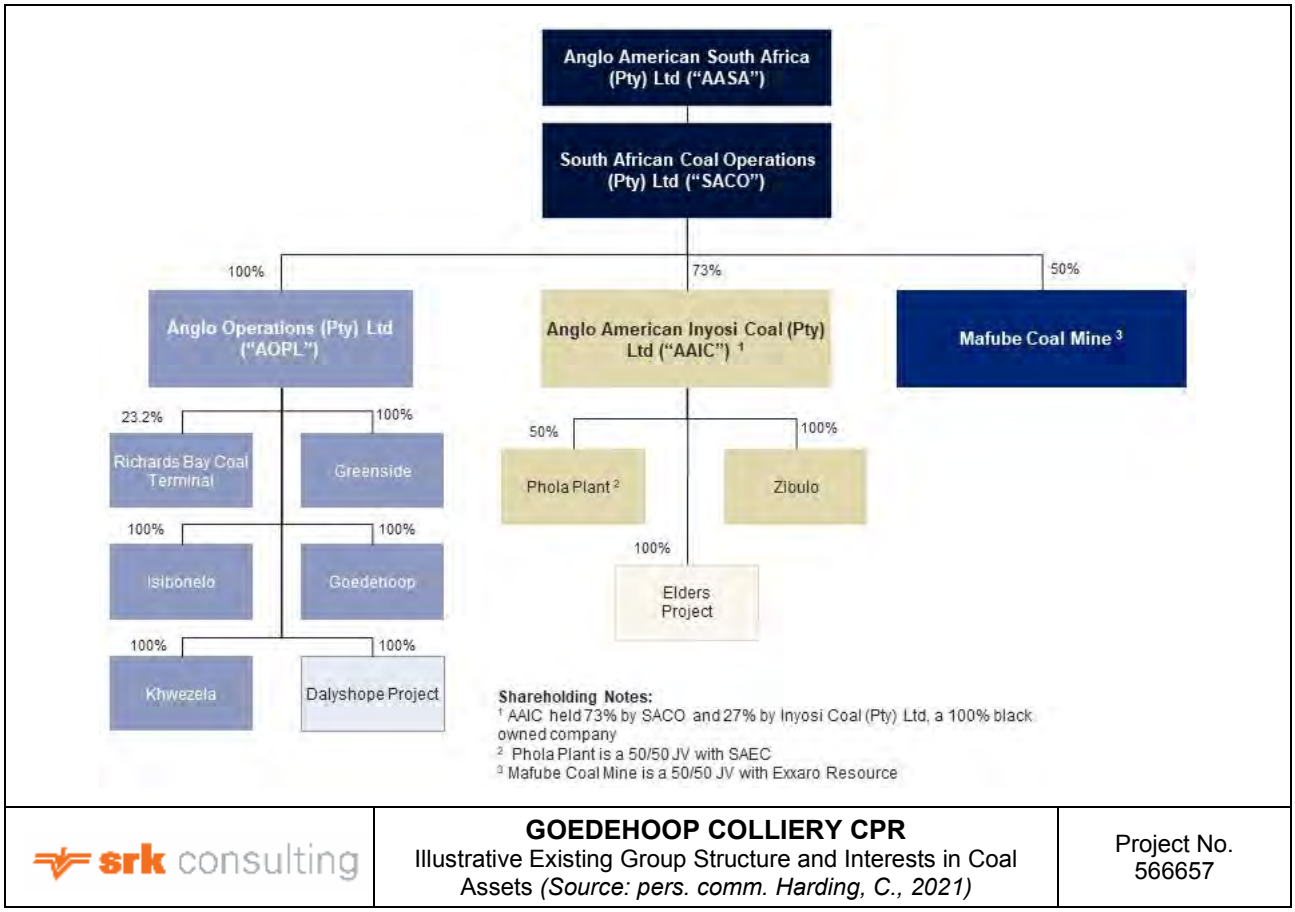
SRK Consulting (South Africa) (Pty) Ltd (**SRK**) was commissioned by South Africa Coal Operations (Pty) Ltd (**SACO**), to compile a Competent Person's Report (**CPR**) on Goedehoop Colliery (**Goedehoop**) in Mpumalanga, South Africa. The Anglo American Group will be separating its South African thermal coal operations, which comprise the operations held by SACO, by way of a demerger ("**Demerger**") and the transfer of such operations to Thungela Resources Limited (the **Company**). The Company is incorporated in South Africa and all of the issued, and to be issued, Shares of the Company are expected to be admitted to the main board of the JSE Limited (**JSE**) as a primary listing and admitted to the standard listing segment of the UK Official List and to trading on the main market for listed securities on the London Stock Exchange (**LSE**). Any reference to the Company in this report should be read to also include SACO, as relevant.

1.1.1. Ownership

[12.10(h)(iii)] [SR1.5(i)(ii)] [SV1.2] [ESG4.1]

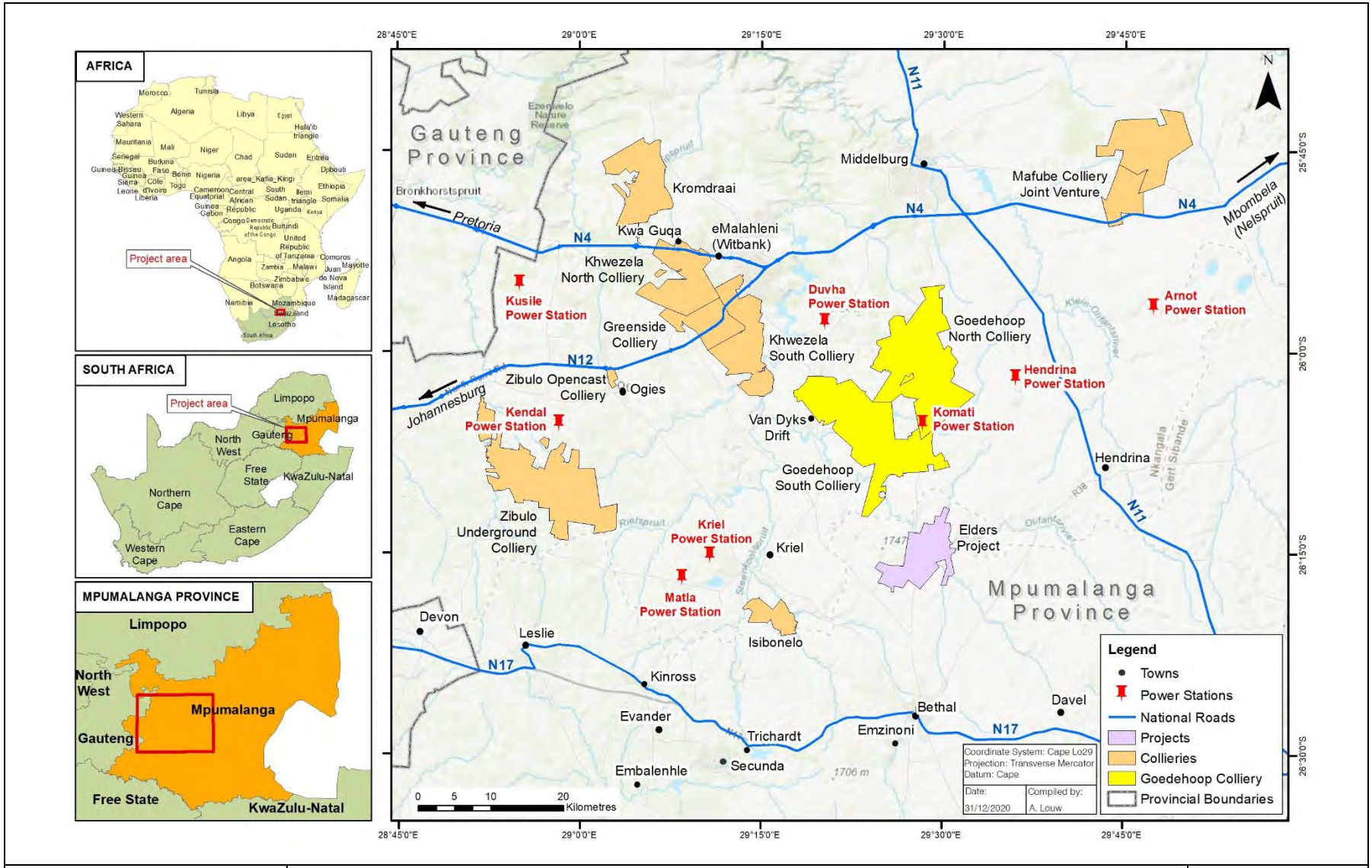
SACO holds an 100% indirect interest in the Goedehoop coal operations as shown in the proposed corporate structure in (Figure 1-1). Goedehoop is located approximately 40 km southeast of eMalahleni (previously known as Witbank) in Mpumalanga Province (Figure 1-2).

Both Goedehoop North and Goedehoop South are underground operations with coal processing facilities.



srk consulting	**GOEDEHOOP COLLIERY CPR** Illustrative Existing Group Structure and Interests in Coal Assets *(Source: pers. comm. Harding, C., 2021)*	Project No. 566657

Figure 1-1: Simplified Corporate Structure and Interests in Coal Assets



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GOEDEHOOP COLLIERY CPR
Location of Operations highlighting Goedehoop Colliery

Project No. 566657

Figure 1-2: Location of Operations highlighting Goedehoop Colliery

1.2. Terms of Reference, Reporting Compliance and Sources of Data

[12.10(h)(i)] [SV1.2, SV1.3]

1.2.1. Purpose of Report

[12.10(h)(i), SR1.1(i), SV1.2]

This report has been prepared by SRK for inclusion in the pre-listing statement and prospectus, or similar (**Listing Documentation**) to be published by the Company in connection with the Demerger and the proposed admission of the Company's issued and to be issued ordinary shares to

- Trading on the "Mining" sector of the JSE as a primary listing;
- The standard listing segment of the UK Official List; and
- Trading on the LSE's Main Market for listed securities (the **Offer**).

This report, which summarises the findings of SRK's review, has been prepared to satisfy the requirements of:

- A Competent Person's Report as set out in Chapter 12 of the Listing Rules of the JSE (the **JSE Rules**) and follows the form and content of a Mineral Asset Valuation Report as specified by the 2016 Edition of "*The South African Code for the Reporting of Mineral Asset Valuations"* (the **SAMVAL Code**); and
- The requirements of the UK Prospectus Regulation Rules made by the Financial Conduct Authority (**FCA**) pursuant to Section 73A (4) of the Financial Services and Markets Act 2000 (**FSMA**) (**UK Prospectus Regulation Rules**) and the UK version of Regulation (EU) 2017/1129) of the European Parliament and of the Council of 14 June 2017 and repealing Directive 2003/71/EC and the delegated acts, implementing acts and technical standards thereunder as such legislation forms part of retained EU law by virtue of the European Union (Withdrawal) Act 2018, in conjunction with the European Securities and Markets Authority (**ESMA**) update of the Commission of European Securities Regulators (**CESR**) recommendations for the consistent implementation of the European Commission's Regulation on Prospectuses No 809/2004 (CESR/05-054b) issued (**ESMA Recommendations**), specifically, Clauses 131 to 133 and Appendices I and II.

SRK has given and has not withdrawn its written consent to:

(i) The issue of the Listing Document with the inclusion of the references to its name; and

(ii) The inclusion of information extracted from this CPR in "Part VIII—Business Overview" of the Listing Document, and has authorised the contents of this CPR and references thereto as part of the Listing Document for the purposes of Item 1.3 of Annex 1 of Commission Delegated Regulation (EU) 2019/980 as it forms part of UK law by virtue of the European Union (Withdrawal) Act 2018.

In compliance with item 1.2 of Annex 1 of Commission Delegated Regulation (EU) 2019/980 as it forms part of UK law by virtue of the European Union (Withdrawal) Act 2018, SRK accepts responsibility for this CPR and, to the best of SRK's knowledge, declares that the information set out in this CPR is in accordance with the facts and that this CPR makes no omission likely to affect its import.

1.2.2. Reporting Compliance

[12.10(e)] [SV1.0, SV1.4]

SRK has reviewed the practice and estimation methods undertaken by the Company and is of the opinion that they are in compliance with the JSE Rules and the South African Mineral Resource Committee (**SAMREC**) and SAMVAL Codes, as well as the UKLA Listing Rules, Prospectus Rules, Prospectus Directive and ESMA update of the CESR Recommendations. In this CPR, all Coal Resources have been substantiated by evidence obtained from SRK's site visits and observation, and are supported by details of exploration results, analyses and other evidence supplied by the management of the Company and its subsidiaries.

The reporting standard adopted for the reporting of the Coal Resources and Coal Reserves for Goedehoop is the

2016 Edition of "*The South African Code for the Reporting of Exploration Results, Mineral Resources and Mineral Reserves"* (**SAMREC Code**) as prepared by the South African Mineral Resource Committee Working Group under the auspices of the Southern African Institute for Mining and Metallurgy (**SAIMM**) and the Geological Society of South Africa (**GSSA**). The definitions of the relevant terms, methodologies and estimation processes employed and the reporting for South African Securities Exchange purposes for the Coal Resources and Coal Reserves in this CPR are according to those set out in the *"The South African -guide to the systematic evaluation of coal exploration results, coal resources and coal reserves"* (**SANS 10320:2020**) published by Standards South Africa, a division of the South African Bureau of Standards (**SABS**).

The reporting standard adopted for the reporting of the valuation for Goedehoop is the SAMVAL Code, as prepared by the South African Mineral Asset Valuation Working Group under the auspices of the SAIMM and the GSSA.

This report also satisfies the disclosure requirements of *"The South African Guideline for the Reporting of Environmental, Social and Governance Parameters within the Solid Minerals and Oil and Gas Industries"* (the **SAMESG** Guideline).

SRK confirms that this CPR complies with the disclosure and reporting requirements of the JSE Rules, SAMREC and SAMVAL Codes (together the "**Codes**"), the UKLA Listing Rules as well as Clause 133 and Appendix II of the ESMA update of the CESR Recommendations.

This report has been prepared under the direction of the Competent Persons (**CP**s) and Competent Valuator (**CV^2**) in accordance with the requirements of the SAMREC and SAMVAL Codes and SAMESG, who assume overall professional responsibility for the document. SRK confirms that the staff employed to compile this CPR satisfy the requirements of the CP and CV^2 as set out by the Codes. Note that two "CV" abbreviations have been used throughout this document:

- CV^1 for "Calorific Value"; and
- CV^2 for "Competent Valuator.

A shorthand notation has been adopted to demonstrate compliance with the JSE Rules and disclosure requirements of the SAMREC (**SR**) and SAMVAL (**SV**) Codes and SAMESG Guideline (**ESG**), for example:

- [12.10(d)] represents section 12.10(d) of the JSE Rules;
- [SR1.1] represents item 1.1 - Property Description of Table 1 of the SAMREC Code;
- [SV1.4] represents criterion T1.4 - Compliance of Table 1 in Appendix A of the SAMVAL Code; and
- [ESG2.3] relates to Item 2.3 included in SAMESG.

The shorthand notation is included under all section headings, as relevant, to indicate what compliance aspects that section is addressing. Summary tables showing compliance to Chapter 12 of the JSE Listing Rules, SAMREC/SAMVAL Codes and SAMESG are included at the end of this CPR (Appendices 4 – 6).

1.2.3. Sources of Data

[SV1.19]

Details of the information used to prepare this CPR are:

- Electronic information received from the Company's Goedehoop Box (Data Room); and
- Discussion with the relevant Company staff members at the operation and at the Company's head office.

1.3. Reporting Standard, Reliance

1.3.1. Reporting Standard

[12.9(a)(i), 12.10]

The reporting standard adopted for the reporting of the Coal Resources and Coal Reserves for Goedehoop is the SAMREC Code as prepared by the South African Mineral Resource Committee Working Group under the auspices of the Southern African Institute for Mining and Metallurgy (**SAIMM**) and the Geological Society of South Africa (**GSSA**) through the SAMCODES Standard Committee (**SSC).** The SAMREC Code is an international reporting code that is acceptable to the JSE Listing Rules [Chapter 12].

The reporting standard adopted for the reporting of the value for Goedehoop is the SAMVAL Code as prepared by the South African Mineral Asset Valuation Committee Working Group under the auspices of the SAIMM and the GSSA through the SSC.

1.3.2. Reliance on SRK

[SR9.1(i)] [SV1.0]

The CPR is addressed to and may be relied upon by the Company, the Directors of the Company and the Company's various financial, legal and accounting advisors (the **Advisors**) in support of the Proposed Transaction, specifically in respect of compliance with the requirements of the Listing Rules and the Codes. SRK agrees that the CPR may be made available to and relied upon by the Advisors.

SRK is responsible for the CPR and for all the technical information contained therein. SRK declares that it has taken all reasonable care to ensure that this CPR and the technical information contained therein is, to the best of its knowledge, in accordance with the facts and makes no omission likely to affect its import.

SRK confirms that the presentation of technical information contained elsewhere in the Listing Documents released by the Company which relates to information in the CPR is accurate, balanced and not inconsistent with the CPR.

SRK believes that its opinion should be considered as a whole and selecting portions of the analysis or factors considered by it, without considering all factors and analyses together, could create a misleading view of the process underlying the opinions presented in this CPR. The preparation of a CPR is a complex process and does not lend itself to partial analysis or summary.

SRK has no obligation or undertaking to advise any person of any development in relation to Goedehoop which comes to its attention after the date of the CPR or to review, revise or update the CPR or opinion in respect of any such development occurring after the date of the CPR.

1.4. Effective Date and Valuation Date

[12.10(a)] [SR9.1(iii)] [SV1.2, SV1.13]

The Effective Date for this CPR is 31 December 2020 (the **Effective Date**).

The Coal Resource and Coal Reserve statements set out in this CPR are reported as at 31 December 2020 and represent the Coal Resources and Coal Reserves at the Effective Date as estimated by SRK.

The Life of Mine (**LoM**) plan and associated technical and economic parameters (**TEPs**) included in the LoM plan and techno-economic model (**TEM**) all commence on 1 January 2021 and are presented in constant money terms (cost estimates are at the Effective Date and ignore inflation and any real increase due to escalation).

The financial results for Goedehoop Colliery are taken to be correct at 31 December 2020, the Effective Date of the CPR, which is also the **Valuation Date**.

1.4.1. Material Change

[12.10(b)] [SR4.1(iv), SR4.3(viii), SR5.5(iii)] [SV1.13]

The valuation of Goedehoop is correct at 31 December 2020, the Valuation Date.

The Company has observed a pronounced COVID-19-related impact on production at Goedehoop Colliery at the start of 2021. The Company has put in place several mitigation measures to claw back some of the production losses during 2021. However, due to ongoing concerns and uncertainties around the future impact of COVID-19, SRK has reduced the RoM and saleable production forecasts in 2021 by 5%. SRK views the downward revision for the purposes of this CPR is an appropriate measure to address the current uncertainty.

Should there be further COVID-19 infection peaks and associated lockdowns with a delayed vaccination roll-out, a similar 5% impact on 2022 forecast volumes may become necessary.

SRK has not taken into consideration the potential further impact of TFR shutdowns and/or rail constraints on sales.

No material changes are expected in the Coal Resource and Coal Reserve statements. Changes resulting from the COVID-19-related impacts are not expected to be material regarding the overall Coal Resources and Coal Reserves or the remaining LoM.

1.4.2. Units and Currency

Throughout this CPR, SRK has used the International System of units. All units used in the CPR are defined in the glossary of terms.

All monetary values used in this CPR are expressed in 2020 constant money terms in South African Rand (**ZAR**).

1.4.3. Sufficiency of Rehabilitation Funding

[SR1.7(i)]

The closure liability has been assessed to ZAR568 million using the approach currently required by legislation as documented in the Department of Mineral Resources (**DMR)** 2005 Guideline Document. Note that the DMR is now known as the Department of Mineral Resources and Energy (as of 29/05/2019) (**DMRE**). SRK understands that a provision (based on information to end of 2019) of ZAR852 million has been made to the DMRE. SRK is of the opinion that Goedehoop has met its legal obligations around assessing and making provision for the liability. SRK considers that the Goedehoop assessment of liability based on commercial costs, which indicates a liability of ZAR606 million at end of December 2019 (ZAR631 million at end of December 2020), is likely to be a more accurate reflection of liability as a more focussed approach has been used to determine this liability. The liability of ZAR606 million does not, however, include a provision for post-closure water treatment, with there being an expected decant of 10.8 Ml/d for 15 years after closure.

In addition to there being a requirement for post-closure water treatment, there are potential risk items that could increase the closure liability. These include additional covers required on Goedehoop's discard dumps, shallow groundwater impacts associated with the discard dumps, post-closure subsidence and removal of sediments in the Bankfontein Dam. Although costs cannot be quantified for all the risks, as further study is required by Goedehoop, SRK is of the opinion that the quantifiable costs could add ZAR688 million to ZAR1 100 million to the liability.

SRK is of the opinion that Goedehoop has met statutory requirements and has a robust understanding of what the liability is, with future work required to refine the estimate as the end of LoM approaches.

SRK understands that the Company is currently undertaking updates to the closure cost estimates in order to reflect liability as at December 2020. Once the 2020 assessments are complete and have received the necessary internal approvals, these figures will be reported to the DMRE and changes to the closure provision will be made where necessary. SRK has not interrogated the 2020 figures and has instead escalated the 2019 figures to represent a liability at the end of December 2020.

1.5. Verification and Validation

[SR3.1(ii)] [SV1.0]

SRK has conducted a review and recalculation (Goedehoop Coal Resources and Coal Reserves) and assessment of all material issues likely to influence the future performance of the mine and the resulting TEPs which included the following:

- Inspection visits to Goedehoop as detailed in Table 1-2;

- A review of the Coal Resource and Coal Reserve statements for Goedehoop;
- Reporting of the Coal Resource and Coal Reserve Statements based on information provided by Goedehoop as at 31 July 2020 and depleted by planned production to 31 December 2020, the Effective Date of this CPR; and
- Measured and Indicated Coal Resources are inclusive of those Coal Resources modified to produce Coal Reserves, i.e. Coal Resources are reported on an inclusive basis of the Coal Reserves.

SRK hereby gives confirmation that it has performed all verification and validation procedures deemed necessary by SRK in order to place an appropriate level of reliance on the technical information provided by the Company and Goedehoop.

1.6. Limitations, Reliance on Information, Declaration, Consent and Cautionary Statements

1.6.1. Limitations

[SR1.7(i)] [SV1.10]

Coal Resource and Coal Reserve estimates are based on many factors, including data with respect to drilling and sampling. Coal Reserves are derived from estimates of future technical factors, operating expenditure (**Opex**) and capital expenditure estimates (**Capex**), product prices and the exchange rate between the various currencies and the United States Dollar (**USD**). The Coal Reserve estimates contained in this CPR should not be interpreted as assurances of economic life of Goedehoop. As Coal Reserves are only estimates based on the factors and assumptions described herein, future Coal Reserve estimates may need to be revised. For example, if production costs increase or product prices decrease, a portion of the current Coal Resources, from which the Coal Reserves are derived, may become uneconomical to recover and would therefore result in lower estimated Coal Reserves. Furthermore, should any of the assumed factors change adversely, the TEPs and value for Goedehoop as reported herein may need to be revised and may well result in lower estimates.

This CPR contains statements of a forward-looking nature. These forward-looking statements are estimates and involve several risks and uncertainties that may cause the actual results to differ materially from those anticipated in the CPR.

The achievability of the projections, LoM plans, budgets and forecast TEPs as included in this CPR is neither warranted nor guaranteed by SRK. The projections as presented and discussed herein have been proposed by Goedehoop management and have been adjusted where appropriate by SRK.

The projections cannot be assured as they are based on economic assumptions, many of which are beyond the control of Goedehoop and the Company. Future cash flows and profits derived from such forecasts are inherently uncertain and actual results may be significantly more or less favourable.

The trend towards decarbonisation is relatively recent and it remains unclear how this will impact on the value of the coal assets. SRK considers the valuation to be aligned with the SAMREC and SAMVAL Codes and to represent a reasonable interpretation of value and the associated risks. Current sentiment towards coal assets is not adequately reflected in the transactional analysis. The possible gap between the price that can be realised and the valuation is exacerbated by the recent increase in the coal price.

The COVID-19 pandemic has led to significant volatility and uncertainty in the global economy. The potential impact of the evolving COVID-19 situation on consumers, supply chains, commercial agreements, geopolitical outcomes, operating conditions and future decisions that the Company may have to make means that the financial forecasts may differ materially from those set out in this CPR.

Unless otherwise expressly stated, all the opinions and conclusions set out in this CPR are those of SRK.

1.6.2. Reliance on Information

[12.9(d)(e), 12.10(e), 12.10(h)(iv)]

SRK has relied upon the accuracy and completeness of technical, financial and legal information and data:

- Furnished by or through the Company or Goedehoop, including information and data originating with the Company's or Goedehoop's Advisors; and

- In respect of publicly available information published by the Company from time to time, including but not limited to any Coal Resource and Coal Reserve statements and technical studies contained in such information or data.

The Company has confirmed that, to its knowledge the information provided by it to SRK was complete and not incorrect or misleading in any material aspect. SRK has no reason to believe that any material facts have been withheld.

Whilst SRK has exercised all due care in reviewing the supplied information, SRK does not accept responsibility for finding any errors or omissions contained therein and disclaims liability for any consequences of such errors or omissions.

The technical views in this CPR are based on information provided by the Company and its advisors throughout the course of SRK investigations, which in turn reflect various technical-economic conditions prevailing at the date of this CPR. In particular, the Coal Reserves, TEPs and value of Goedehoop are based on expectations regarding commodity prices prevailing at the Effective Date of this CPR. These can change significantly over relatively short periods of time. Should these change materially, the TEPs could be materially different in these changed circumstances.

SRK has reviewed the information provided by the Company and is satisfied that the extents of the properties described in the various rights are consistent with the maps and diagrams received from the Company. SRK has placed reliance on Mr Christopher Harding, Project Manager for the Company, regarding the accuracy of all legal information in this CPR and the validity of the Company's title to the Mining Rights and surface rights held over Goedehoop.

SRK believes that its opinion must be considered as a whole and selecting portions of the analysis or factors considered by it, without considering all factors and analyses together, could create a misleading view of the process underlying the opinions presented in this CPR. The preparation of a CPR is a complex process and does not lend itself to partial analysis or summary.

SRK has no obligation or undertaking to advise any person of any development in relation to Goedehoop which comes to its attention after the date of the CPR or to review, revise or update the CPR or opinion in respect of any such development occurring after the date of the CPR.

This report includes technical information, which requires subsequent calculations to derive subtotals, totals and weighted averages. Such calculations may involve a degree of rounding and consequently introduce an error. Where such errors occur, SRK does not consider them to be material.

1.6.3. Declaration (Independence)

[12.9(b), 12.10(c), 12.12(a)] [SV1.0]

SRK will be paid a fee for this work at commercial rates in accordance with normal professional consulting practice. Payment of fees is in no way contingent upon the conclusions to be reached in the CPR.

Neither SRK nor any of its employees or associates employed in the compilation of this CPR of Goedehoop, nor any of the Competent Persons and/or Competent Valuators who are responsible for authoring this CPR, nor any directors of SRK have at the date of this CPR, nor have had within the previous two years, any material shareholding in the Company, Goedehoop, any of the Company's Advisors, or any other pecuniary, economic or beneficial interest, or the right to subscribe for such interest, whether direct or indirect, in the Company, Goedehoop, any of the Company's advisors or the outcome of the work.

Consequently, SRK, the Competent Persons and the Competent Valuator consider themselves to be independent of the Company, its directors, senior management and Advisors.

In this CPR, SRK provides assurances to the Board of Directors of the Company, in compliance with the requirements of the reporting standards, that the Coal Reserves, TEPs, including production profiles, operating expenditures and capital expenditures for Goedehoop, as provided to SRK by the Company and reviewed and where appropriate modified by SRK, are reasonable given the information currently available.

In compliance with item 1.2 of Annex 1 of Commission Delegated Regulation (EU) 2019/980 as it forms part of UK law by virtue of the European Union (Withdrawal) Act 2018, SRK accepts responsibility for this CPR and, to

the best of SRK's knowledge, declares that the information set out in this CPR is in accordance with the facts and that this CPR makes no omission likely to affect its import.

1.6.4. Consent

[12.12(a)] [SV1.0]

SRK consents to the issuing of this CPR in the form and context in which it is to be included in the Listing Documents and the registration document.

SRK has given and has not withdrawn its written consent for the inclusion of this CPR in any documentation in support of the Listing Documents of the Offer.

SRK has given and has not withdrawn its written consent to:

- The issue of the Listing Document with the inclusion of the references to its name: and
- The inclusion of information extracted from this CPR in "Part VIII – Business Overview" of the Listing Document and has authorised the contents of this CPR and references thereto as part of the Listing Document for the purposes of Item 1.3 of Annex 1 of Commission Delegated Regulation (EU) 2019/980 as it forms part of UK law by virtue of the European Union (Withdrawal) Act 2018.

1.6.5. Cautionary Statements

[SV1.15]

The reader and any potential or existing shareholder or investor is cautioned that the Company is involved in mining Goedehoop and there is no guarantee that any unmodified part of the Coal Resources will ever be converted into Coal Reserves nor ultimately extracted at a profit.

1.7. Indemnities provided by the Company

The Company has provided the following indemnities to SRK:

- In the event that the Company discloses or distributes any SRK work product or other deliverable (including reports, analysis, opinion or similar) (the "**SRK Work Products**") to any third party, the Company shall procure that such third party complies *mutatis mutandis* with various of the Company's obligations to SRK that are contained in the engagement letter between Webber Wentzel Inc (**WW**) and SRK, and, unless otherwise agreed in writing by SRK, no such third party shall be entitled to place reliance upon any information, warranties or representations which may be contained within the SRK Work Products and the Company shall indemnify SRK against all and any such claims, losses and costs which may be incurred by SRK arising from the breach by the Company of this obligation. This indemnity shall not apply in relation to the provision by the Company of drafts of this CPR to its advisors and the JSE and in relation to, or following, the public release of this CPR in the Listing Documents; and
- The Company has confirmed to SRK that, to its knowledge, the information provided by it to SRK was complete and not incorrect or misleading in any material aspect. SRK has no reason to believe that any material facts have been withheld. Whilst SRK has exercised all due care in reviewing the supplied information, SRK does not accept responsibility for finding any errors or omissions contained therein and disclaims liability for any consequences of such errors or omissions.

1.7.1. Copyright

Copyright in all text and other matter in this document, including the manner of presentation, is the exclusive property of SRK. It is a criminal offence to publish this document or any part of the document under a different cover, or to reproduce and/or use, without written consent, any technical procedure and/or technique contained in this document. The intellectual property reflected in the contents resides with SRK and shall not be used for any activity that does not involve SRK, without the written consent of SRK.

1.8. Qualifications of Consultants

[SR9.1(i)(ii)] [SV1.0]

SRK is part of an international group (the SRK Group) that comprises almost 1 400 staff, offering expertise in a wide range of resource engineering disciplines. The SRK Group's independence is ensured by the fact that it holds no equity in any project and is totally owned by its employees. This permits SRK to provide its clients with conflict-free and objective recommendations on crucial judgement issues.

SRK has a demonstrated track record in undertaking independent assessments of Resources and Reserves, project evaluations and audits, CP Reports, Resource and Reserves Compliance Audits, Independent Valuation Reports and independent feasibility evaluations to bankable standards and valuation of mineral properties on behalf of exploration and mining companies and financial institutions world-wide. The SRK Group has also worked on a large number of major international mining operations and their projects, providing mining consultancy service inputs. SRK has specific in commissions of this nature.

The following are the CPs responsible for the signing off on Goedehoop Coal Resources, Coal Reserves and Coal Asset Valuation:

- The CP with responsibility for the reporting of Coal Resources is Ms Lesley Jeffrey, PrSciNat (Reg. No. 400115/01). A Fellow of the GSSA and a Member of the Fossil Fuel Foundation of Africa, who is a Principal Geologist with SRK. Ms Jeffrey is a geologist with over 35 years' experience in coal, specializing in exploration, geological modelling and resource estimation;
- The CP assuming responsibility for the reporting of Coal Reserves is Mr Norman McGeorge, PrEng (Reg. No. 20080141). A member of the SAIMM, who is a Principal Mining Engineer at SRK. Mr McGeorge is a mining engineer with more than 34 years' experience in the mining industry. He has worked on numerous collieries in mine planning, engineering design, competent persons reporting, mine valuation and feasibility studies both locally and internationally; and
- The CV[2] with responsibility for the Goedehoop Valuation Mr Andy McDonald, CEng (Engineering Council of UK, Reg. No. 334897). A Fellow of the SAIMM and a Member of the Institution of Materials, Minerals and Mining (**IoM[3]**) in London, who is a Principal Engineer at SRK. He has 46 years of diverse experience in exploration, mining and light industrial industries, the past 20 of which have been involved in regulatory reporting for stock exchanges, valuation of mineral operations or projects, due diligence audits and engineering studies. He has more than ten years' experience in the review and valuation of coal operations.

Please refer to Appendix 3 for the Certificates of the Competent Persons and Competent Valuator.

This CPR has been prepared based on a technical and economic review by a team of consultants sourced from SRK's offices in South Africa. These consultants are specialists in the field of geology, Coal Resource and Coal Reserve estimation and classification, mining, geotechnical engineering, mineral processing, hydrology and hydrogeology, infrastructure, mine closure, environmental, social and asset valuation. The consultants who have carried out the work have extensive experience in the mining industry and are members in good standing of appropriate professional institutions. Details of their qualifications and discipline are set out in Table 1-1.

Table 1-1: Consultant Contributors

Name	Qualification	Registration	Contribution
Alan Forsyth[1]	BSc (Mechanical Engineering)	PrEng	Mechanical Infrastructure, Maintenance Management, Capex and Opex
Andrew Treadwell[1]	NDip (Mining)		Mining (Technical)
Andrew McDonald	MSc (Geophysics), MBL, MIoM[3]	CEng	Marketing and Utilisation, Material Contracts, B-BBEE Status, Asset Valuation, CV[2]
Andrew Van Zyl	BEng, MCom (Financial Economics & Econometrics)	FSAIMM	Identification and review of transactions
Ansu Louw	BA (Geography), MA (Environmental Management)		GIS and Graphics
Ashleigh Maritz	EAP, BSc, MSc (Biochemistry)	Pr.Sci.Nat.	Environmental Permitting, Compliance
Benedict Mabenge	BSc (Hons), MSc (Hydrogeology)	Pr.Sci.Nat.	Groundwater (Hydrogeology)
Carrie Zermatten	BSc (Hons), MSc	Pr.Sci.Nat.	Risk Assessment
Colin Wessels	BSc (Hons) (Engineering Geology)	Pr.Sci.Nat.	Coal Discard
Connan Hempel	BSc, MSc (Geology)	Pr.Sci.Nat.	Geology
Darryll Killian	BA, MA (Environmental and Geographical Science)		Environmental Permitting, Compliance
Ed Baldrey	BSc (Electrical Engineering)	PrEng	Electrical, Communication and Control System
James Lake	BSc (Hons), MSc	Pr.Sci.Nat.	Mine Closure and Rehabilitation Requirements
Jaques van Eyssen[1]	MEC		Occupational Health and Safety, Ventilation
Jessica Edwards	BSocSci (Hons), MA		Social permitting and stakeholder relations
Katherine Black	BSc (Hons), GDE	Pr.Sci.Nat.	Geology, Coal Resources, Exploration
Kenny Mahuma	N6 Diploma (Electrical Engineering)	PrTechEng	Electrical, Control, Communication, Maintenance Management, Project Management, Reporting
Lesley Jeffrey	BSc (Geology), MSc (Mining)	Pr.Sci.Nat.	Geology, Exploration, Coal Resources, Project Management, Reporting, Coal Resources and Lead CP
Lisl Fair	BA, MA (Communications Pathology)		Sustainability aspects
Nico Lotheringen[1]	Dip (Advanced MRM) BTech (Architectural Technology)	PrEng	Review of Life of Mine Scheduling
Norman McGeorge	BSc (Mining), MSc (Mining)	PrEng	Mining, Scheduling, Coal Reserves, Coal Reserves CP
Peter Hand	BSc (Hons)		Coal Processing
Peter Shepherd	Pr Sci Nat (400104/95), BSc (Hons) in Hydrology	Pr.Sci.Nat.	Surface Water (Hydrology)
Pierre Mans	NDip (Mining)		Mining (Technical)
Rob McNeill	NDip (Civil Eng)	Pr.Sci.Nat.	Coal Discard
Susan Benedek			Graphics
Vanessa Snyman	BCom, BCom (Hons) (CA) SA		Asset Valuation
Vassie Maharaj	BSc (Biochemistry, Physiology)		Social permitting and stakeholder relations
William Joughin	BSc Eng (Mining) MSc Eng (Management), GDE (Rock Engineering)	PrEng	Rock Engineering

Note:

1. Independent SRK Consultant

1.9. Site Visits

[SR1.1(iii)]

The COVID-19 Lockdown Regulations issued under the Disaster Management Act, 2002 have restricted and inhibited certain activities that are undertaken in the normal course with regard to compiling a CPR. These restrictions prohibited general movement of people and more stringent restrictions were applied to persons of a certain age (over 60 years old) or with pre-existing comorbidities, as suggested in the regulations and in line with the COVID-19 Risk Adjusted Strategy dated 28 May 2020, which was implemented by the National COVID-19 Command Council. In addition, the Company, out of an abundance of caution, implemented more onerous restrictions at its operations in order to ensure the safety and wellbeing of its personnel at site and to limit COVID-19 related operational disruptions.

Since the onset of the COVID-19 restrictions the following technical experts have been adversely impacted:

- The CP for Coal Resources, Ms Jeffrey, was prevented from undertaking physical site visits due to ill health, which included a prolonged stay in intensive care, coupled with two months of convalescence; and Ms Jeffrey's age is such that she is placed in the high risk category for COVID-19;
- Ms Black could not conduct the site visits on behalf of Ms Jeffrey, due to her husband's medical situation placing him in a high risk category for COVID-19, and needing to remain in an isolated situation to prevent exposure to COVID-19 and
- Mr McDonald was prevented from visiting the operations as his age places him in a high risk category for COVID-19.

As would be expected, for a person to be termed a technical expert in their field, such person requires many years of experience and, as such, can be expected to be of an age that places them in a high risk category with regards the global COVID-19 pandemic. The CPs and CVs and especially the three aforementioned technical experts, fall within the category of the persons described above and this has had a concomitant impact on the ability of these technical experts to undertake site visits to certain mining operations in order to conduct the on-site inspections, as would typically be undertaken as part of the process of compiling and verifying the information required for a CPR.

With the strong second wave of COVID-19 upon us, and the current return to Level 3 lockdown restrictions, technical experts will find the undertaking of site visits more difficult. As such, the three technical experts mentioned herein will not be able to conduct site visits in the foreseeable future, although will be able to interact with the technical teams and the mining operations through the virtual platforms available.

Thus, the COVID-19 pandemic has resulted in a change of the usual tactics regarding face-to-face meetings and site visits. Initial project initiation meetings have been held using the Microsoft Teams™ (**MS Teams™)** platform, as have meetings between SRK specialists and colliery personnel. Only where absolutely necessary, have face-to-face site visits taken place and strict adherence to COVID-19 regulations, as well as all colliery-specific COVID-19 precautions, have been maintained.

The following SRK personnel (Table 1-2) visited the Goedehoop operations, or undertook MS Teams™ meetings, as part of the inspection of surface and underground facilities and coal crushing/screening facilities. SRK personnel also met with the Company's personnel representing the relevant disciplines at Goedehoop.

The purpose of the site visit and/or MS Teams™ meetings included but was not limited to the following:

- Review of the engineering infrastructure and discussions of the maintenance management systems;
- Review and discussion of the database informing the Coal Resources;
- Review of the LoM planning process and the conversion of Coal Resources to Coal Reserves;
- Review and discussion of major contracts;
- Review of the coal plant recovery methods; and
- Review and discussion with Goedehoop personnel of the status quo involving Goedehoop permitting, key environmental and social aspects and mine closure considerations.

Table 1-2: Site Visits / MS Teams™ Meetings

Date	Meeting Location	Name	Topic
29/05/2020	**MS Teams™**	**Lesley Jeffrey (Resources CP),** Katherine Black	**Operations Overview & Familiarisation**
29/05/2020	**MS Teams™**	**Norman McGeorge (Reserves CP), Andrew MacDonald (CV)**	
29/05/2020	MS Teams™	Kenneth Mahuma	
17/06/2020	Goedehoop Colliery	William Joughin	Geotechnical Engineering (Mining)
17/06/2020	MS Teams™	Alan Forsyth	Mechanical Engineering
17/06/2020	MS Teams™	Ed Baldrey	Electrical Engineering
19/06/2020	**MS Teams™**	Katherine Black; **Lesley Jeffrey (Resources CP)**	**Exploration, Geology and Coal Resources**
23/06/2020	MS Teams™	Jessica Edwards	Social Aspects
23/06/2020	Goedehoop Colliery	Colin Wessels	Coal Discard
23/06/2020	Goedehoop Colliery	Peter Hand	Metallurgy and Coal Processing
23/06/2020	**Goedehoop Colliery**	**Norman McGeorge (Reserves CP)**	**Mining and Coal Reserves**
23/06/2020	Goedehoop Colliery	Andrew Treadwell	
25/06/2020	**MS Teams™**	**Andrew McDonald (CV)**	**B-BBEE/Mining Charter compliance**
30/06/2020	MS Teams™	Ashleigh Maritz	Environmental Aspects
30/06/2020	MS Teams™	Peter Shepherd	Surface and Groundwater
10/07/2020	**MS Teams™**	**Andrew McDonald (CV),** Andrew van Zyl, Vanessa Snyman	**WACC calculation, applicable discount rate**
12/07/2020	**MS Teams™**	**Andrew McDonald (CV)**	**Economic Evaluation**
16/07/2020	**MS Teams™**	Katherine Black; **Lesley Jeffrey (Resources CP)**	**GH model discussion**
20/07/2020	**MS Teams™**	**Andrew McDonald (CV)**	**Marketing, Contracts**
22/07/2020	MS Teams™	James Lake	Mine Closure
24/07/2020	**MS Teams™**	Katherine Black; **Lesley Jeffrey (Resources CP)**	**GHC - resource/reserve 2019 R&R general discussion**
30/07/2020	MS Teams™	Katherine Black	Risk assessment
12/08/2020	**MS Teams™**	Katherine Black; **Lesley Jeffrey (Resources CP)**	**GH Clarification**
12/08/2020	**MS Teams™**	**Andrew McDonald (CV),** Vanessa Snyman, Andrew van Zyl	**Treatment of borrowings, balance sheet items**
17/09/2020	**MS Teams™**	**Andrew McDonald (CV)**	**Marketing agreement, marketing fee, ash discount**
27/10/2020	MS Teams™	Katherine Black	GH and Navigation discussion
03/09/2020	**MS Teams™**	**Andrew McDonald (CV), Norman McGeorge (Reserves CP)**	**Valuation of Resources outside of mine plan**
15/10/2020	**MS Teams™**	**Andrew McDonald (CV)**	**Historical Operating Statistics**
18/11/2020	**MS Teams™**	**Andrew McDonald (CV),** James Lake, Vanessa Snyman	**Treatment of post-closure water treatment costs**
20/11/2020	**MS Teams™**	**Andrew McDonald (CV),** Peter Shepherd	**Cost of post-closure surface water control measures**
20/11/2020	**MS Teams™**	**Andrew McDonald (CV)**	**Economic Evaluation, Summary Valuation**

* Items in bold text are CPs/CVs

2. Description of Asset and Location

[12.10(h)(ii)(iii)] [SR1.2(i)]

2.1. Property Location

[12.10(h)(ii)(iii)] [SR1.2(i)] [SV1.5] [ESG4.5]

Goedehoop Colliery is an underground coal mine located approximately 165 km east of Johannesburg and approximately 40 km southeast of eMalahleni (previously Witbank), in Mpumalanga Province, South Africa.

The colliery is an amalgamation of two existing Company-owned collieries, namely Bank Colliery (now known as Goedehoop North) and the original Goedehoop Colliery (now known as Goedehoop South) in 2006. Goedehoop North currently mines both the Number 2 Seam (**No 2 Seam**) and Number 4 Seam (**No 4 Seam**); Goedehoop South is closed, and no mining occurs in this area. Each section has its own processing plant and train loading facilities, although the Goedehoop South plant is currently being deconstructed. The infrastructure at Goedehoop South remains and the environmental and water management at the site continues.

Historical mining at various areas at Goedehoop North has left rehabilitated dumps, including Bank 5, Schoongezicht, the Kleinshaft Dump and the Vlaklaagte mini-pit. Similarly at Goedehoop South, there is abandoned infrastructure, including the 2 Seam Hope Shaft, Hope Discard Dump, Block 20, Block 8, Blocks 11, 19 and 21 (which form a single unit), Block A, Block 3, Springbok (which is comprised of Northeast Shaft and Blocks 1C, D and 10), Springbok Dump 1, Springbok Dump 2, Block 8, Block 20 and Vlaklaagte Shaft.

Operations at the Goedehoop South opencast areas have ceased, and rehabilitation work is either complete or nearing completion. In addition, operations have ceased at Number 5 Seam (**No 5 Seam**) underground workings Central, Pioneer, Haasfontein, Johannesburg and Klein Shafts. Operations have ceased at all the No 2 and No 5 Seam workings.

2.2. Co-ordinate System

[SR1.2(i)]

All survey information is based on the LO29 trigonometrical system that has the co-ordinates of the origin as y, x = ± 0 and the constants used as Y, X = 0; the elevation is measured in metres above mean sea level (**mamsl**).

The Goedehoop North Colliery Benchmark is situated on top of a 25.4 mm diameter pipe embedded in a concrete block, identified as benchmark, situated towards the south of Simunye No 4 Seam main shaft and named Bank 4. Its co-ordinates are shown in Table 2-1.

Table 2-1: Co-ordinates of the Goedehoop North Benchmark

Projection: Gauss Conform (LO System) Ellipsoid: Clark 1880 Modified LO 29 East				Projection: Gauss Conform (WGS System) Ellipsoid: WGS 1984 LO 29 East			
LO Co-ordinates		Geographical Co-ordinates		WGS29 Co-ordinates		Geographical Co-ordinates	
Y	X	Latitude	Longitude	Y	X	Latitude	Longitude
-45 868.770	+2 874 503.460	25º58’49”S	29º27’29”E	-45 841.583	+2 874 800.125	25º58’51.28”S	29º27’28.08”E
Elevation: 1 593.764 mamsl							

The Goedehoop South Colliery Benchmark is a 1.1 m concrete beacon named BCN2 on a 1.23 m square by 1.70 m high platform, situated 423 m south of the Goedehoop South Plant. Its co-ordinates are shown in Table 2-2.

Table 2-2: Co-ordinates of the Goedehoop South Benchmark

Projection: Gauss Conform (LO System) Ellipsoid: Clark 1880 Modified LO 29 East				Projection: Gauss Conform (WGS System) Ellipsoid: WGS 1984 LO 29 East			
LO Co-ordinates		Geographical Co-ordinates		WGS29 Co-ordinates		Geographical Co-ordinates	
Y	X	Latitude	Longitude	Y	X	Latitude	Longitude
-41 634.940	+2 888 248.877	26º06'16:S	24'58"E29º	-41 607.525	+2 888 545.456	26º06'18.38"S	29º24'57.44:E
Elevation:	1588.154 mamsl						

The Company uses the Cape Datum (**LO System**) for the geological and mine models. All diagrams in this CPR have therefore also used the Cape Datum.

The GPS coordinates for Goedehoop are as follows:

- Goedehoop North Office: 25º 58' 33.86" S 29º 24' 22.14" E
- Goedehoop South Office: 26º 02' 18.62" S 29º 20' 11.97" E

2.3. Adjacent Properties

[SR1.3(i)]

Goedehoop is bordered by South African Energy Coal Ltd (**SAEC**) Ifalethu and Van Dyks Drift Collieries, Universal Coal's New Clydesdale Colliery, the Transvaal Navigation Colliery and Koornfontein Colliery (Figure 2-1). There are three instances of coal prospecting rights belonging to other companies overlap the Goedehoop Mining Rights: Black Royalty Coal, Amber Sunrise Properties (12834 PR) and PHB Holdings (14502 PR), also shown on Figure 2-1.

2.3.1. Ifalethu and Van Dyks Drift Collieries

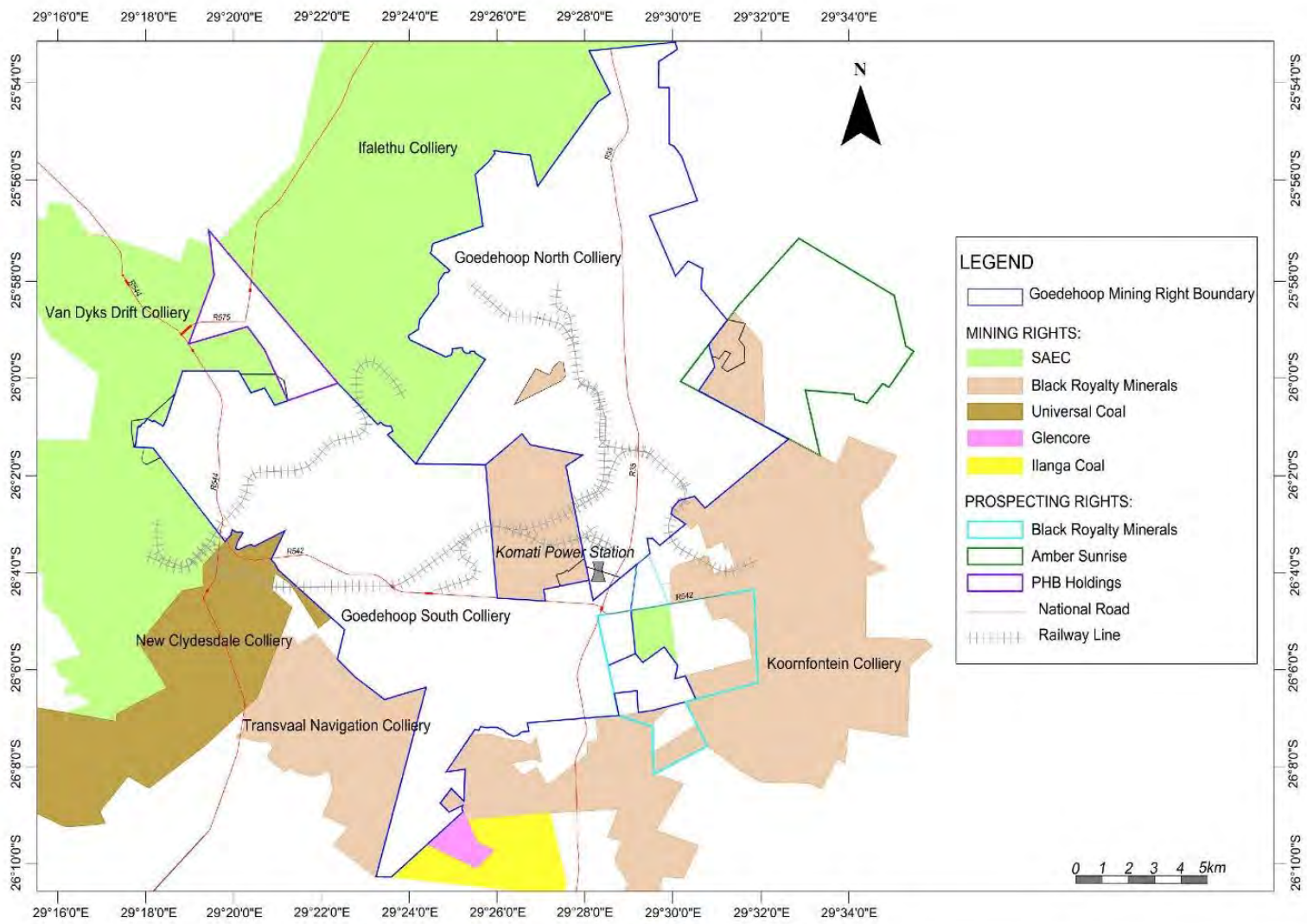
Ifalethu and Van Dyks Drift Collieries are part of what was previously known as SAEC's Wolwekrans-Middelburg Complex. Ifalethu is today an *in situ* opencast operation mining the No 2 and No 4 Seams using draglines and trucks and shovels. Van Dyks Drift (also known as Wolwekrans) mines coal pillars and remnants, also using draglines and trucks and shovels. No 1, No 2 and No 4 Seams are mined at Van Dyks Drift, with future mining planned to include the No 5 Seam in places. The coal is sold into the domestic market (including supply to the Eskom Holdings SOC Limited (**Eskom**) Duvha Power Station) along with export sales through the Richards Bay Coal Terminal (**RBCT**).

2.3.2. New Clydesdale Colliery

New Clydesdale Colliery (**NCC**) is one of the oldest collieries in South Africa, operating intermittently since the middle of the last century. It consists of the Roodekop and Diepspruit Projects and produces approximately 4 Mtpa of thermal coal for the domestic and export markets from the No 1, No 2 and No 4 Seams. It has a 1.6 Mtpa offtake agreement with Eskom and a long-term offtake agreement with a global coal trader. The mine is open pit, extended by underground workings, utilising truck and shovel and bord and pillar methods, respectively. The current life is estimated at more than ten years. Universal Coal has a 49% share in NCC, with operational control; the remaining 51% is owned by Ndalamo Resources (Pty) Ltd.

2.3.3. Transvaal Navigation Colliery

Like NCC, the Transvaal Navigation Colliery (**TNC**) is one of the oldest mines in the country. All five seams are encountered on the property and previous mining has mainly exploited the No 1 and No 2 Seams, leaving behind a multitude of coal pillars and remnants, as well as roof and floor coal. Much of the old workings are now flooded. Some unexploited No 4 and No 5 Seam is found in higher-lying areas. Parts of the original colliery are now being mined by opencast methods by the Eyethu Group.



srk consulting	**GOEDEHOOP COLLIERY CPR** Adjacent Properties	Project No. 566657

Figure 2-1: Adjacent Properties

2.3.4. Koornfontein Colliery

Koornfontein Colliery (**Koornfontein**) is an underground bord and pillar coal mine operating under various names since 1948. It is an amalgamation (in 1987) of earlier mines such as Haasfontein Colliery, Blinkpan Colliery and the Gloria block. The colliery exploited the No 2 and No 4 Seams during its long history, supplying the adjacent Komati Power Station, as well as producing a thermal product for export. It has been on care and maintenance for a number of years, although exploitable coal still remains. Koornfontein has had numerous owners throughout its history, mainly by the then-named Ingwe Collieries. It recently been purchased by Black Royalty Minerals after being put into business rescue by its previous owners, Tegeta Resources.

2.3.5. Ilanga Colliery

The Ilanga Colliery was a small opencast colliery producing coal for the export market. It formally belonged to South African Coal Mining Holdings Ltd, then to Royal Bafokeng Capital and subsequently the JSW Group. The colliery is unlikely to reopen.

2.4. Access, Infrastructure, Climate, and Physiography

[SR1.1(ii)] [SR5.4(i)(ii)]

2.4.1. Accessibility

[SR1.1(ii)]

The mine is accessible by tarred regional roads (the R35, R544 and R542) leading off the N4 national road. A railway line traverses the property, connecting the rail load-out terminal with RBCT.

The closest sizeable town to Goedehoop is eMalahleni, approximately 40 km northwest of the mine. (Figure 1-2).

Fully equipped, functional, and staffed security and access control systems are in place

2.4.2. Infrastructure

[SR1.1(ii), SR5.4(i)(ii)]

Regional infrastructure includes roads, railway lines, water and power supply. Mine-specific infrastructure includes housing, offices, storerooms, changerooms, workshops, road, conveyors, shafts that accesses the underground workings, coal preparation plant and the Mineral Residue Deposits (**MRD**s).

Bulk power to the mine is supplied by Eskom. The current agreed Notified Maximum Demand at Goedehoop North totals 24.5 MVA, 37.27 MVA at Goedehoop South and 1.5 MVA at the Company workshops. It should be noted that the peak demand at the Export substation at Goedehoop South has dropped substantially since March 2020.

2.4.3. Climate

[SR1.1(ii)] [ESG4.4]

The area lies in the summer rainfall region (Eastern Highveld) of southern Africa, with cold and dry winters, and warm and wet summers. Temperatures typically range from 9°C to 32°C in summer with maximum daily temperatures being experienced between November to March. Winter temperatures range from 6°C to 22°C with June to August being the coldest months; frost occurs frequently between May and September.

Wind in the area blows predominantly in a northerly direction during winter and spring, and mostly in a south easterly direction during summer and autumn; the strongest winds are experienced during late winter to early spring.

Rainfall is highly seasonal and, based on rainfall records kept by Goedehoop over the past 22 years, averages 672 mm per year. Most of the rainfall occurs during the summer months (October to March/April) during intense localised thunderstorms that appear from the southeast. Severe hail is not uncommon during these storms. Highest rainfall is usually experienced in January and the lowest in July.

The mine operates throughout the year (365 days) as the climate does not prevent mining from taking place.

2.4.4. Physiography

[SR1.1(ii)] [ESG4.4]

The area is typical of the Eastern Highveld with gently rolling hills and shallow valleys. The surface topography varies between 1 535 mamsl to 1 600 mamsl (Figure 2-2). A number of east-west oriented rocky ridges cross the area.

The upper Olifants River is found southwest of Goedehoop, which drains into the Witbank and Loskop Dams and thence through the Kruger National Park into the Massingir Dam in Mozambique. Thereafter, it joins the Limpopo River before flowing into the Indian Ocean south of Xai-Xai, Mozambique. The Olifants River is greatly impacted by agriculture, mining and municipal activities in its upper reaches, to the detriment of wildlife downstream. Goedehoop falls within the Olifants River Catchment Area and includes numerous smaller rivers that drain into the Oilfants River.

Non-perennial pans are found in the central and northern areas of Goedehoop.

The area falls within the Moist Sandy Grassland Biome, subdivided into the Acocks False Grassland - Turf Highveld or Themeda Highveld (52) and Bankenveld (61).

2.4.5. Current Mining and Future Mining Areas

Goedehoop South was closed at the end of 2019 and only Goedehoop North remains as an active mining area. No other areas are planned for future mining.

2.5. Mining History

[SR1.4] [SV1.6]

2.5.1. Historical Development

[SR1.4(i)(ii)] [SV1.6]

Goedehoop Colliery was formed by the amalgamation in 2005 of Goedehoop North Colliery, previously known as Bank Colliery, and Goedehoop South Colliery, the former Goedehoop Colliery. Bank Colliery itself arose from a merger of two existing collieries, the Coronation and Blesbok Collieries, in 1981 while Goedehoop South was established in 1983. After amalgamation in 2005, coal was mined underground from four shafts – the Hope, Vlaklaagte, Simunye and South shafts. Coal was also mined from the Vlaklaagte and Haasfontein mini-pits. Goedehoop South ceased operation at the end of 2019; Goedehoop North is predicted to close in approximately four years' time.

Goedehoop South traditionally mined the No 2 and No 4 Seams; Goedehoop North mined the No 1 (only in restricted areas where sufficiently close to the No 2 Seam to allow simultaneous extraction), No 2, No 4 and No 5 Seams.

2.5.2. Prior Ownership

[SR1.4(i)(ii)] [SV1.6]

The reader is referred to the discussion in **Error! Reference source not found.**.

2.5.3. Current Mining and Future Mining Areas

Goedehoop South was closed at the end of 2019 and only Goedehoop North remains as an active mining area. No other areas are planned for future mining.

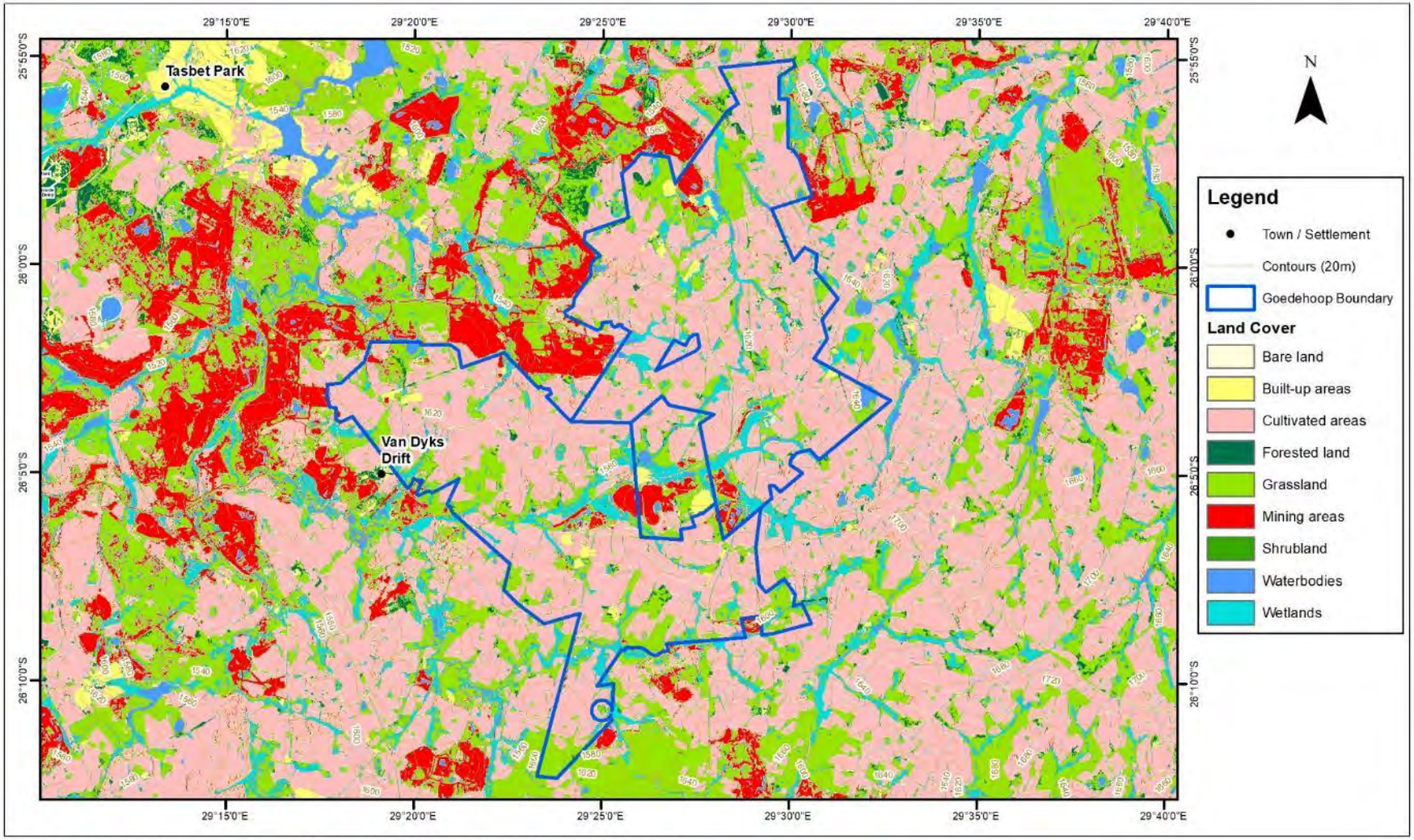


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Figure 2-2: Physiography and Land Use of the Goedehoop Area

2.5.4. Historical Operating Statistics

[12.9(c)] [SR1.4(i)(iii)(iv)] [SV1.6]

Historical production for the past four years is shown in Table 2-3.

Table 2-3: Historical Production

Item/Description	2017 (Mt)	2018 (Mt)	2019 (Mt)	2020 (Mt)
Run-of-Mine (**RoM**)	7.27	6.51	5.91	4.31
Export Sales	4.46	4.37	3.92	2.19
Domestic Sales	-	1.15	2.12	3.93

Table 2-4 shows the historical operating statistics for Goedehoop Colliery from 2017 to 2020.

Table 2-4: Historical Operating Statistics for Goedehoop Colliery (2017 to 2020)

Item/Description	Units	2017	2018	2019	2020
Production:					
RoM Coal Mined	(Mt)	7.27	6.51	5.91	4.31
Saleable Production	(Mt)	4.65	5.44	6.07	6.12
Export Coal Sales	(Mt)	4.46	4.37	3.92	2.19
Inland Coal Sales	(Mt)	-	1.15	2.12	3.93
Revenue:					
Gross Sales Revenue	(ZARm)	4 334	4 599	3 150	2 309
Logistics/Selling Expenses	(ZARm)	858	770	755	470
FoR Sales Revenue	(ZARm)	3 475	3 829	2 395	1 839
Operating Costs:					
Total Cash Cost	(ZARm)	2 329	2 489	2 596	2 273
Depreciation/Other Non-cash Costs	(ZARm)	328	407	265	306
Cost of Production	(ZARm)	2 657	2 897	2 862	2 579
Unit Costs:					
Cash Cost per Saleable Tonne	(ZAR/t saleable)	501	457	428	371
Cost of Production	(ZAR/t saleable)	571	532	472	377
FoB Cash Cost	(ZAR/t saleable)	674	638	614	1 038

Note:
1. Figures for 2020 are inclusive of the MRD.
2. FoR = Free-on-Rail
3. FoB = Free-on-Board

2.6. Regional Profile

2.6.1. Environmental Profile

[SR1.2(ii)(iii), SR1.5(i), SR5.5(i)(iii)] [SV1.2] [ESG4.2, ESG4.4]

The operations are located in the Olifants River catchment (B100) and falls within the Upper Olifants River management area (Water Management Area (**WMA**) 4), which forms part of the Witbank Dam catchment area. Several wetland types exist in the area including drainage lines, floodplains, hillslope seepage wetlands and pans.

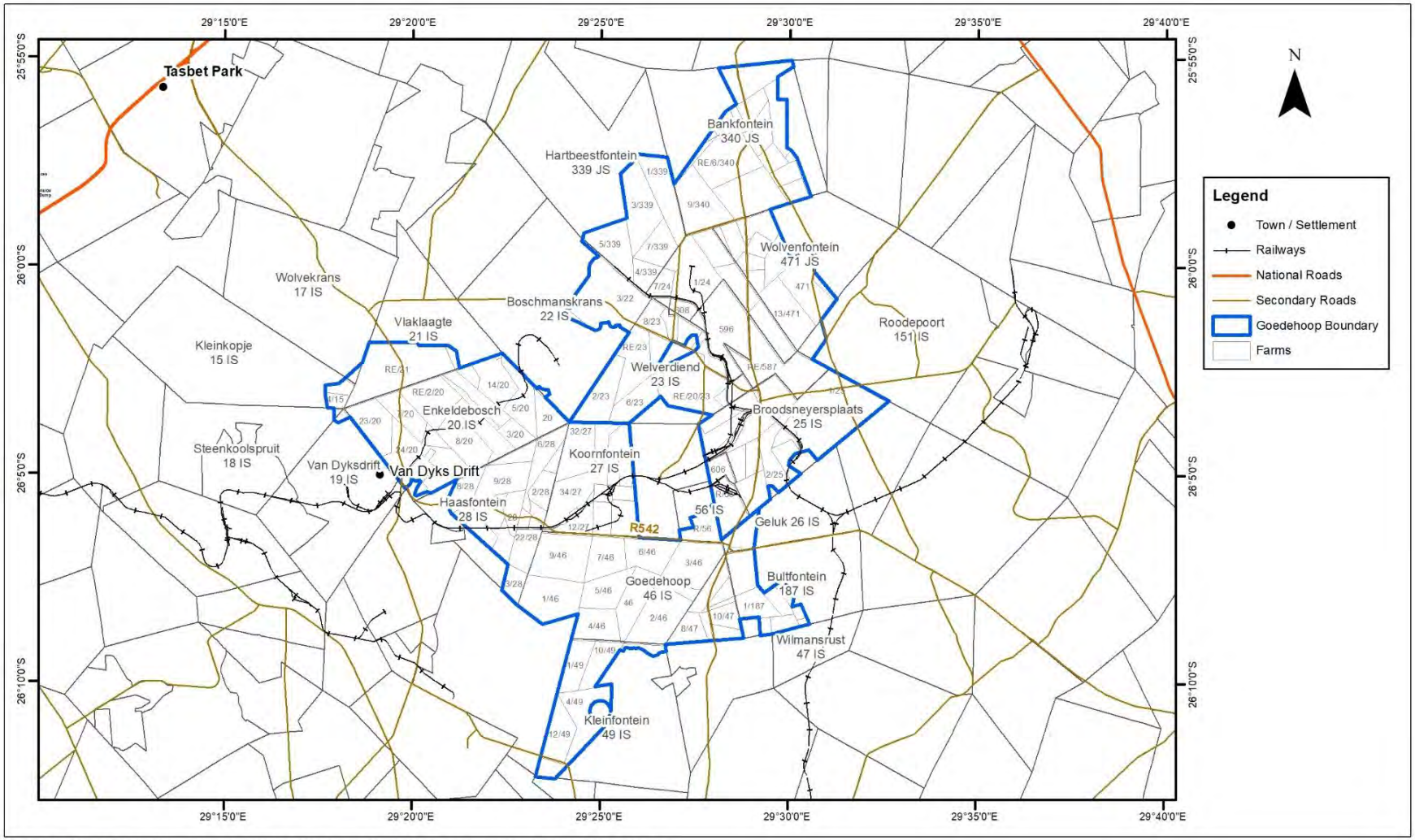
Groundwater resources in the area are poor in yield and used for stock watering or domestic use. Goedehoop is bordered by other coal mining operations and coal-fired power stations are situated within 50 km; therefore, the ambient air quality of the area is considered poor. The general noise character is rural; however, background noise levels in the area are high as a result of mining activities.

2.6.2. Social Profile

[SR1.2(ii)(iii), SR5.5(i)(iii)(v)] [SR7.1] [ESG4.1, ESG4.2, ESG4.5]

Goedehoop is situated in the Steve Tshwete Local Municipality (**STLM**). The town of eMalahleni is situated 25 km northwest of Goedehoop and acts as the service centre for the region. Limited numbers of mine village residents, farmers, farm workers and trading store complexes are present in the immediate vicinity of the site (Geovicon Environmental (Pty) Limited, 2014). The Goedehoop Stakeholder Engagement Plan (**SEP**) notes that the primary labour sending areas include those within a 50 km radius from the operation (Anglo American Coal (**AAC**), 2019a).

As confirmed during a clarification meeting on 23 July 2020, Goedehoop's workforce in 2020 comprised 815 permanent employees and approximately 500 contractors. Goedehoop draws only a small number of employees (15) from outside South Africa. The major labour sending areas include Mpumalanga followed by Limpopo. The closest community is Komati.



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srk consulting	**GOEDEHOOP COLLIERY CPR** Farms covering the Mining Rights	Project No. 566657

Figure 2-3: Farms covering the Mining Rights

3. Regulatory Environment and Tenure

[12.10(h)(iv)] [SR1.5] [SV1.5] [ESG4.1]

This section covers a brief overview of the South African regulatory environment within which the Company operates and the status of Goedehoop Colliery with respect to the requirements of the applicable laws.

3.1. South African Regulatory Environment

[12.10(h)(iv)] [SR1.5] [SV1.5]

The relevant South African regulatory framework is summarised below.

3.1.1. Constitution of the Republic of South Africa Act (Act 108 of 1996)

Section 24 of the *Constitution of the Republic of South Africa (Act 108 of 1996)* states: "everyone has the right to an environment that is not harmful to their health or well-being; and to have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures that:

- Prevent pollution and ecological degradation;
- Promote conservation; and
- Secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development.

The Constitution is the supreme law of the country, and all conduct and legislation inconsistent with its contents is unlawful and will be set aside.

3.1.2. Mineral Framework: The Minerals and Petroleum Resources Development Act (Act 28 of 2002)

The Mineral and Petroleum Resources Development Act (MPRDA) is the primary legislation used to regulate the mining industry since it came into effect on 1 May 2004. The DMRE is the national department tasked with implementing the MPRDA and regulating the mining industry. Until 30 April 2004, the right to prospect for and to mine was primarily regulated by the Minerals Act. The Minerals Act vested the right to mine a particular mineral in the holder of the mineral rights in respect of the relevant mineral in relation to the land in question.

The MPRDA extinguished private ownership of mineral rights and replaced it with a system of State grant of the right to prospect and mine. South Africa's mineral and petroleum resources were placed under the State's custodianship. A key element of the MPRDA is the change from a legal framework within which mineral rights formed an inherent element of immovable property, which encompassed the right to prospect and mine (subject to regulation by the State), to a system where the State, acting through the Minister, will grant the right to prospect and mine.

Owing to the change brought about by this new system, provision had to be made for a transition from the old regime, in which the role of the State was regulatory in nature and in which the right to prospect and mine vested in the holder of mineral rights, to the new current regime which provides for the State, acting through the Minister, to grant Prospecting Rights, mining permits and Mining Rights.

Those holding mineral rights when the MPRDA came into effect were afforded an opportunity in terms of the transitional arrangements contained in Schedule II to the MPRDA to apply to convert their old order rights into prospecting or Mining Rights, thus protecting the security of tenure of those holding rights before the MPRDA came into effect. Upon conversion, or failure to convert within the specified time periods, the old order rights ceased to exist. Such cessation to exist also terminated any contractual provisions relating to the use of the surface of the land for prospecting and/or mining activities. Upon the conversion of old order right into a Prospecting Right or Mining Right, the right to use the surface of land is primarily regulated by the MPRDA and practically by agreements between the holder and the landowner.

Under the MPRDA, applicants can apply for Prospecting Rights for the prospecting of minerals and Mining Rights for mining of minerals. Prospecting rights are granted for a period of up to five years with a right to renew the

Prospecting Right once for a period up to three years. Mining permits are granted for a period not exceeding two years for an area less than five hectares in extent. Mining permits may be renewed for three periods each not exceeding one year. Mining Rights are granted for a period up to thirty years with a right to renew the Mining Right twice, assuming that the holder can justify that it can continue mining operations.

Under the MPRDA, rights are granted to entities by the State on a "first come, first served" basis in terms of an application system. Applicants must meet certain requirements set out in the MPRDA, and on meeting such requirements, the Minister must grant the right. A failure to grant a right is an administrative action that is capable of internal appeal before the DMRE. After an internal appeal, a judicial review process is available to aggrieved applicants. The MPRDA does provide that administrative processes must be conducted, or administrative decisions must be taken within a reasonable time and in accordance with the principles of lawfulness, reasonableness and procedural fairness and that these decisions must be given in writing and accompanied by written reasons. Once rights are granted to applicants, the right must be executed in the form of a notarial deed and registered at the Mineral and Petroleum Titles Registration Office (**MPTRO**) in order for the right to be a limited real right enforceable against the third parties.

Holders of rights in terms of the MPRDA must comply with the provisions of the MPRDA and the terms and conditions on which the right was granted, as well as the provisions of the Original Mining Charter for effecting entry of Historically Disadvantaged South Africans (**HDSA**s**)** into the mining industry. Holders of Mining Rights must comply with the SLP approved in conjunction with the grant and execution of the Mining Right. The SLP relates to the obligations placed on the Mining Right holder to, amongst other things, train employees of the mine in accordance with prescribed training methodologies, achieve employment equity and human resource development in the mining company, improve housing and living conditions of employees and set up local economic development projects. A failure to implement the SLP could attract the issuing of a directive or notice by the DMRE to rectify non-implementation of the SLP. Failure to comply with the directive or notice could result in the imposition of fines and ultimately, in suspension or cancellation of the Mining Right.

Holders of Mining Rights must also comply with the Mine Works programme (**MWP**) approved as part of the Mining Right upon execution thereof. The MWP relates to the obligations in relation to mining methods, expected production and other technical aspects of the mining operations. If the plan or expected production is changed over the life of the project, then there is a provision to amend the MWP with the consent of the Minister in terms of Section 102 of the MPRDA.

Renewal of a Mining Right

Applicants for the renewal of a Mining Right must provide a report reflecting the extent of the compliance with the requirements of the approved Environmental Authorisation (**EA**) and include a detailed MWP for the renewal. In addition, the applicant in terms of Section 24(3) has to demonstrate that it, as the holder of the Mining Right, has complied with the requirements of the prescribed SLP, which does not apply to Prospecting Right renewal.

The maximum period of a renewal of a Mining Right is 30 years, but it can be renewed for further periods (each of which may not exceed 30 years at a time).

In terms of Section 25(1) of the MPRDA, the holder of a Mining Right has the exclusive right to apply for and be granted a renewal of the Mining Right in respect of the mineral and mining area in question.

The Holder of a Prospecting Right has the Exclusive Right to apply for a Mining Right

In terms of Section 19(1)(b) of the MPRDA, the holder of a Prospecting Right has the exclusive right to apply for and be granted a Mining Right in respect of the mineral and prospecting area in question. Therefore, up until the expiry of the Prospecting Right (including the rights conferred in terms of Section 18(5) and the renewal period), the holder has the exclusive right to apply for a Mining Right and no third party may lodge a valid application during such exclusivity period. Furthermore, once the holder of the Prospecting Right has lodged the Mining Right application, it is protected in terms of Section 9 of the MPRDA, which provides for a first-come first-served application procedure.

The holder of the Prospecting Right would still have to comply with all of the requirements for applications set out in Section 22 of the MPRDA and for the grant of a Mining Right set out in Section 23 of the MPRDA. Section 22 deals with the formalities for the lodgement of a valid application. Section 23 in turn deals with the criteria for the grant of a Mining Right. Essentially the Minister must grant a Mining Right if:

- The mineral can be mined optimally in accordance with the MWP;
- The applicant has access to financial resources and has the technical ability to conduct the proposed mining operation optimally;
- The financing plan is compatible with the intended mining operation and duration thereof;
- The mining will not result in unacceptable pollution, ecological degradation or damage to the environment;
- The applicant has provided for the prescribed SLP;
- The applicant has the ability to comply with the relevant provisions of the MHSA;
- The applicant is not in contravention of any provision of the MPRDA; and
- The grant of the right will further the objectives set out in Section 2(d) and (f) and in accordance with the charter contemplated in Section 100 of the MPRDA and the prescribed SLP.

Protection of Ownership of Mining Assets and Relevant Licences

While the MPRDA does not expressly provide for the protection of ownership of mining assets, Section 25 of the South African Constitution protects the right to property, including mine assets. To this extent, Section 25 provides that no one may be deprived of property except in terms of a law of general application, and no law may permit arbitrary deprivation of property. Property may, however, be expropriated only in terms of a law of general application for a public purpose or in the public interest; and subject to compensation. Therefore, although the South African government (including the Minister) is empowered to expropriate land and rights in land, provision is made for payment of compensation. However, in 2018 an amendment of Section 25 was proposed, this amendment would permit the expropriation of land and property without compensation, in order to address historic wrongs of land dispossession, as well as ensuring fair access to land and empowering the majority of South Africans.

Section 5 of the MPRDA states that a Prospecting Right or a Mining Right which has been registered at the MPTRO is considered to be a limited real right in respect of the mineral and land to which such right relates. The holder of a Mining Right has ownership of the mineral resources once the minerals have been severed from the land, which is enforceable against all third parties.

Security and continuity of tenure are listed in Section 2(g) as among the objects of the MPRDA. Continuity is preserved from prospecting to mining in that the holder of a Prospecting Right has the exclusive right to apply for and be granted a Mining Right. Continuity is further achieved during applications for renewals in that a Prospecting Right or Mining Right in respect of which an application for renewal has been lodged remains in force until the application has been granted or refused. Furthermore, security of tenure and continuity is assured by provisions in the MPRDA to the effect that an application for a right will not be accepted if another person holds a Prospecting Right, Mining Right, mining permit or retention permit for the same mineral and land in respect which such application is made.

3.1.3. Mineral Framework: The Mining Charter

Mining Right holders were initially required to comply with the Original Mining Charter for effecting entry of HDSAs into the mining industry. Among other things, the Original Mining Charter required:

- Each mining company to achieve a 15% HDSA ownership of mining assets within five years of the Mining Charter coming into effect and a 26% HDSA ownership of mining assets within ten years of the Mining Charter coming into effect;
- The mining industry as a whole to agree to assist HDSA companies in securing finance to fund participation in an amount of R100 billion over the first five years; and
- Mining companies to spell out plans for achieving employment equity at management level with a view to achieving a baseline of 40% HDSA participation in management and 10% participation by women in the mining industry, in each case within five years.

Following a review, the DMRE released the 2010 Mining Charter. The requirement under the 2010 Mining Charter for mining entities to achieve a 26% HDSA ownership of mining assets by the year 2014 was retained. The 2010 Mining Charter included the requirements, inter alia, that mining companies:

- Facilitate local beneficiation of mineral commodities;
- Procure a minimum of 40% of capital goods, 70% of services and 50% of consumer goods from HDSA suppliers (i.e. suppliers in which a minimum of 25% + 1 vote of their share capital must be owned by HDSAs) by 2014 (exclusive of non-discretionary procurement expenditure);
- Ensure that multinational suppliers of capital goods contribute a minimum of 0.5% of their annual income generated from South African mining companies into a social development fund from 2010 towards the socio-economic development of South African communities;
- Achieve a minimum of 40% HDSA demographic representation by 2014 at executive management (board) level, senior management (executive committee) level, core and critical skills, middle management level and junior management level;
- Invest up to 5% of annual payroll in essential skills development activities; and
- Implement measures to improve the standards of housing and living conditions for mineworkers by converting or upgrading mineworkers' hostels into family units, attaining an occupancy rate of one person per room and facilitating home ownership options for all mineworkers in consultation with organised labour, all of which must be achieved by 2014.

In addition, mining companies were required to monitor and evaluate their compliance with the 2010 Mining Charter and must submit annual compliance reports to the DMRE. The Scorecard for the Broad-Based Socio-Economic Empowerment Charter for the South African Mining Industry, attached to the 2010 Mining Charter, made provision for a phased-in approach for compliance with the above targets over the period ending in 2014. For measurement purposes, the Scorecard allocated various weightings to the different elements of the 2010 Mining Charter.

On 27 September 2018, the 2018 Mining Charter came into effect. The content of the 2018 Mining Charter is similar to the 2010 Mining Charter in terms of targets and requirements in relation to ownership, procurement and employment equity. Importantly, the 2018 Mining Charter has given recognition, although to a limited extent, to the concept of "once-empowered always-empowered" by providing that an existing Mining Right holder who has achieved a minimum of 26% HDSA shareholding shall be recognised as compliant for the duration of the Mining Right. However, this does not apply to renewals and to transfers of such a right. For renewals and transfers, the new requirements for new Mining Rights have to be satisfied, namely that there must be a minimum of 30% HDSA shareholding distributed as to a 5% non-transferrable carried interest to qualifying employees, a 5% to non-transferrable carried interest to host communities and a 20% effective ownership for a HDSA entrepreneur. Disposals of HDSA shareholding after 27 September 2018 will be subject to certain restrictions set out in paragraph 2.1.6 of the 2018 Mining Charter in order for the Mining Right holder to maintain its empowerment credentials.

There are certain procurement targets set out in the 2018 Mining Charter such that in relation to mining goods a minimum of 70% of mining goods procurement spend (excluding non-discretionary spend) must be on South African manufactured goods, with a percentage allocation to 21% to be spent on South African manufactured goods produced by an HDSA, 5% on manufactured goods produced by women or youth owned and controlled companies and 44% to be spent on South African manufactured goods produced by a HDSA compliant company.

In relation to services, 80% of the total spend on services must be sourced from South African based companies. The 80% of the total spend on services must be allocated in the following percentages; 50%, must be spent on services supplied by HDSAs and controlled companies, 15% is to be spent on services supplied by women owned and controlled companies, 5% must be spent on services supplied by youth, and 10% must be spent on services supplied by Broad-Based Black Economic Empowerment (**B-BBEE**) compliant companies. The procurement targets must be progressively complied with, within five years from the date of the granting of the right. In relation to employment equity, a Mining Right holder must within five years, progressively implement the targets set out in the 2018 Mining Charter in relation to board composition, executive management, senior management, middle

management, junior management and employees with disabilities. There are also obligations in relation to core and critical skills and career progression plans.

Furthermore, the 2018 Mining Charter deals with obligations in relation to mine community development, housing and living conditions and reporting by Mining Right holders. There is a scorecard for the Broad-Based Socio-Economic Empowerment Charter attached to the 2018 Mining Charter and for measurement purposes the scorecard allocates various weightings to the different elements of the 2018 Mining Charter.

3.1.4. Mineral and Petroleum Resources Royalty Act

[SR1.6(i)]

On 3 June 2008, the fourth and final Mineral and Petroleum Resources Royalty Bill (**2008 Royalty Bill**) was released, for technical comment only. It was enacted as the Mineral and Petroleum Resources Royalty Act on 1 May 2009 (**Royalty Act**).

The Royalty Act imposes a royalty on mining companies in favour of the National Revenue Fund on the transfer of Mineral Resources with effect from 1 March 2010.

Any person holding a Prospecting Right or Mining Right; retention permit; exploration right; mining permit or production permit; or a lease or sublease in respect of such a right; or any person who has recovered a mineral or petroleum resource in South Africa is subject to a levy in terms of the Mineral Royalty Act.

The Royalty Act embodies a formula-derived royalty rate regime since it provides necessary relief for mines during times of difficulties (low commodity prices or marginal mines) and allows the fiscus to share in the benefits during time of higher commodity prices. As the final product can be either refined or unrefined, two separate formulae are given.

Royalties imposed differ between refined and unrefined Mineral Resources but in both instances are based on a percentage of gross sales, derived from a pre-determined formula measuring the ratio of earnings before interest and tax and the gross revenue realised. The Royalty Act allows the holder of a Mining Right to enter into an agreement with the tax authorities to fix the percentage royalty that will be payable in respect of all mining operations carried out in respect of that resource for the life of the mine. The holder may withdraw from such agreement at any time.

The royalty in respect of unrefined minerals is calculated by dividing earnings before interest and taxes ("**EBIT**") by the product of nine times gross revenue of refined mineral resources calculated as a percentage, plus an additional 0.5%. EBIT refers to taxable mining income (with certain exceptions, such as no deduction for interest payable and foreign exchange losses) before assessed losses, but after capital expenditure. A maximum royalty limit of 5% of revenue applies to unrefined minerals.

Both formulae calculate the royalty rate based on a company's earnings before interest and taxes and its aggregate gross sales for the assessment period. The Royalty Act prescribes what EBIT may include and what EBIT must exclude, when applying the formula. For example, capital is considered an allowable deduction for the calculation of EBIT for purposes of the calculation. While the gross sales figure used in the formulae excludes transportation and handling costs, these are considered in the determination of the EBIT figure. The mineral royalty percentage rate (Y%) is based on the following formulae:

- **Refined Minerals:**

$$Y(\%) = 0.5 + \frac{EBIT}{Gross\ Sales \times 12.5} \times \frac{100\%}{1}$$

- **Unrefined Minerals:**

$$Y(\%) = 0.5 + \frac{EBIT}{Gross\ Sales \times 9.0} \times \frac{100\%}{1}$$

The maximum percentage rates for refined and unrefined minerals are 5.0% and 7.0% respectively. According to Schedule 2 of the Royalty Act, all grades of coal are deemed unrefined minerals.

The implementation of the Royalty Act commenced on 1 May 2010.

3.1.5. Taxes

[SR1.6(i), SR5.6(vii)]

Corporate Income Tax

Corporate Income Tax (**CIT**) is a tax imposed on companies' resident in the Republic of South Africa, that is those companies that are incorporated under the laws of, or which are effectively managed in the Republic, and which derive income from within or outside the Republic. Non-resident companies which operate through a branch or which have a permanent establishment within the Republic are subject to tax on all income from a source within the Republic. CIT is payable at a rate of 28%.

For the purposes of this CPR, the income taxation determined has been undertaken at the asset level and does not take into consideration any benefits that may or may not accrue from a corporate overlay with regards Corporate Income Tax.

Carbon Tax

The Carbon Tax Act of 2019 (**CTA**) came into effect on 1 June 2019. The carbon tax is imposed on entities in the country that operate emissions generation facilities at a combined installed capacity equal to or above the carbon tax threshold.

In terms of Section 3 of the CTA, a person is liable to pay carbon tax if that person conducts an activity in South Africa resulting in GHG emissions above the defined threshold. A detailed list of activities and sectors, as well as their capacity thresholds and applicable allowances are provided in Schedule 2 to the CTA. Activities carried out at the Group's operations may fall within a number of these categories.

The carbon tax is being introduced in a phased manner, with the first phase running until 31 December 2022. The CTA imposes a carbon tax of ZAR120 per tonne CO_2 equivalent, which will increase annually at a rate of inflation plus 2% until 31 December 2022, and in line with inflation thereafter. The carbon tax liability is calculated as the tax base (sum of GHG emissions from combustion, industrial processes and fugitive emissions in accordance with a reporting methodology approved by the Department of Environment, Forestry and Fisheries, proportionately reduced by certain tax-free allowances) multiplied by the rate of the carbon tax.

A number of transitional tax-free allowances are, however, applicable during the first phase of implementation of the CTA, which aim to ensure a smooth transition to a low carbon economy. Schedule 2 of the CTA sets out the first phase maximum percentages of each permissible allowance for each listed activity conducted.

On 29 November 2019, the Minister of Finance ("**Finance Minister**") gazetted the Regulations on Carbon Offsets under Section 19 of the CTA (Carbon Offsets Regulations). This sees the first material mechanism which allows companies the discretion to reduce their carbon tax liability between 5 to 10 % of their total GHG emissions through investment in a carbon offset programme and has retrospective effect to 1 June 2019. On 19 June 2020, the Finance Minister finalised the next set of regulatory mechanisms applicable to the CTA which included regulations in relation to trade exposure allowance, regulations stipulating greenhouse gas emissions intensity benchmarks for purposes of the performance allowance, and a notice regarding renewable energy premium.

The carbon tax must be levied in respect of the sum of the greenhouse gas (**GHG**) emissions of a taxpayer in respect of a tax period expressed as the carbon dioxide (CO_2) equivalent of those GHG emissions resulting from fuel combustion, industrial processes and fugitive emissions in accordance with the emission factors determined in accordance with a reporting methodology approved by the Department of Environment, Forestry and Fisheries (**DEFF**) (previously known as Department of Environmental Affairs (**DEA**).

Significant industry specific tax-free emissions ranging from 60% to 95% will result in a modest net carbon tax rate ranging from ZAR6 to ZAR48/t of CO_2. It is thus crucial for current emitters to transition their operations to cleaner technologies through investments in energy efficiency, renewables and other low carbon measures.

The calculation of amount of the tax payable is as follows:

$$X = < \{[(E - S) \times (1 - C)] - [D \times (1-M)]\} + \{P \times (1 - J)\} + \{F \times (1 - K)\} > \times R$$

Where:
E = number in respect of the total fuel combustion related greenhouse gas emissions expressed as a CO_2 equivalent;
S = greenhouse gas emissions, expressed in terms of CO_2 equivalent that were sequestrated as verified and certified by the Department of Environmental Affairs;
C = sum of the percentages of allowances determined under sections 7, 10, 11, 12, and 13;
D = petrol and diesel related greenhouse gas emissions expressed as a CO_2 equivalent;
M = sum of the percentages of the allowances under sections 7, 12 and 13;
P = total industrial process related greenhouse gas emissions expressed as a CO_2 equivalent;
J = sum of the percentages of the allowances determined under sections 8, 10, 11, 12 and 13;
F = total fugitive greenhouse gas emissions expressed as a CO_2 equivalent;
K = sum of the percentages of the allowances determined in terms of sections 7, 9, 10, 11, 12 and 13; and
R = represents the rate of tax prescribed (The first phase has a carbon tax rate of ZAR120/t of CO_2 equivalent emissions. This rate will increase annually by inflation plus two per cent until 2022, and annually by inflation thereafter. This was however amended in the 2020 Budget Speech where Carbon tax will increase by 5.6% for the rest of the 2020 calendar year. The carbon tax rate will increase to ZAR127/t of CO_2).

Transaction Taxes

Value Added Tax

Value Added Tax (**VAT**) is levied on "taxable supplies", which are supplies of goods or services made by a "vendor" in the course or furtherance of an enterprise wholly or partially owned by the vendor in South Africa.

The supply of Mining Right by a vendor is subject to VAT at a rate of 15%. Approval should be sought from the DMRE where Mining Rights are ceded, supplied or transferred to persons.

3.1.6. Mining Legislative Risk

Mining companies in South Africa are exposed to typical mining industry risks associated with rising costs, labour wage demands, resource and social licence to operate. The other risk that has been experienced recently is the reliability of bulk power supply and the power tariff increases which are above the Consumer Price Index (**CPI**). Additional country risk is raised through legislative uncertainty, political interference and bureaucratic ineptitude.

3.1.7. South African Environmental Legislation

This section provides a brief, high-level summary of selected aspects of environmental legislation applicable to the mining industry in South Africa. Colliery-specific information can be found in Section 15.

Environmental Regulations

The following legislation is (among others) relevant in an environmental and heritage context to the operations of a mining company in South Africa:

- The Constitution;
- The MPRDA and the regulations promulgated thereunder;
- The National Water Act No 36 of 1998 (**NWA**);
- The National Environmental Management Act No 107 of 1998 (**NEMA**);
- The National Environmental Management: Air Quality Act No 39 of 2004 (**NEM:AQA**);
- The National Environmental Management: Waste Act No 59 of 2008 (**NEM:WA**);
- The National Heritage Resources Act No 25 of 1999 (**NHRA**), and
- The National Nuclear Regulator Act No 47 of 1999 (**NNRA)**.

All environmental statutes and the common law principles must be viewed within the constitutional framework. The Constitution is the supreme law of South Africa and any law that is inconsistent with its provisions may be declared to be invalid. Section 24 of the Constitution compels the South African government to make legislation and to take other measures to protect the environment, prevent pollution and ecological degradation, promote

conservation and secure sustainable development in South Africa.

On 8 December 2014, the 'One Environment System' (**OES**) was implemented in South Africa. The OES introduced a shift in the regulation of environmental matters in the mining and petroleum industries from the MPRDA to NEMA and other environmental statutes. The legislative changes that have been associated with this shift have streamlined the licensing processes for Mining Rights, EAs and Integrated Water Use Licences (**IWUL**). Under the OES, it is clear that an EA is required for the commencement of any activity which requires a Mining Right or Prospecting Right, among others.

Environmental Authorisations

NEMA is the overarching legislation that gives effect to the environmental right protected in Section 24 of the Constitution of South Africa, and which provides the underlying framework and principles underpinning the coordinated and integrated management of environmental activities. In terms of NEMA, an EA is required in order to commence a listed activity. Listed activities in terms of NEMA include, among others, undertaking an activity which requires a Prospecting Right in terms of Section 16 of the MPRDA and any activity including the operation of that activity which requires a mining permit in terms of Section 27 of the MPRDA. These activities are currently listed in GNR 983-985 of 8 December 2014, (as amended) ("**NEMA Listed Activities**"). The commencement of a NEMA Listed Activity without an EA is an offence under NEMA.

Under the OES, the requirement to obtain an Environmental Management Programme or Environmental Management Plan (**EMP**), as the case may be, in terms of the MPRDA has been removed. Prospective rights holders are now required to apply for and obtain an EA under NEMA instead. The Minister of Mineral and Petroleum Resources Development (**Resources Minister**) is the competent authority for issuing EAs and waste management licences (**WML**) in terms of NEMA and NEM:WA, respectively, for prospecting and mining related activities, as well as activities in respect of the primary processing of minerals. The Minister for Environment, Forestry and Fisheries (**Environmental Minister**) remains the appeal authority in respect of any appeals against the issue of an EA or WML. The Environmental Minister is the competent authority for issuing EAs in respect of any non-mining related listed activities. Applicants are also required to follow stringent requirements in the public participation process to enable consultation with all interested and affected parties.

Under the OES, applicants for EAs in terms of NEMA are required to submit an Environmental Management Programme Report (**EMPr**) containing, among others, information on the pre-mining environment; identification and quantification of any potential environmental, economic and social impacts and providing appropriate mitigating measures to minimise any negative impacts caused by the mining operations and enhance any positive impacts.

Water Use Licences

South Africa's water resources are regulated by the NWA. A Water Use Licence (**WUL**) is required in order to undertake any of the water uses which are specified under Section 21 of the NWA; provided that:

- The water use is not generally authorised in terms of the NWA; or
- Is a Schedule 1 use6; or
- Constitutes an existing lawful water use in terms of the NWA.

Water uses include, among others: the taking of water from a water resource, the diversion of water courses, mine dewatering, discharge of wastewater and the disposal of waste on land. Most mining operations require a WUL in order to conduct their operations, particularly for activities relating to water abstraction, storage, effluent discharge, diversions, and facilities which have the potential to pollute groundwater resources. WULs are difficult to obtain and usually involve a lengthy and delayed application process.

The Minister of Water, Human Settlements and Sanitation (**Water Minister**) is the competent authority in respect of the issuing of WULs. Regulations in relation to the procedural requirements for WULs and appeals were

[6] Schedule 1 water uses are generally low-volume, low-impact activities that are consistent with domestic use, livestock watering, recreational use and the use of water for emergencies. This water use is permissible and does not require licensing or registration.

published by the Water Minister in 2017. For the first time since the NWA came into force, these regulations provide for specific timeframes and steps to be taken in the processing of a WUL application. Furthermore, the regulations provide for security that may be required to be provided by the applicant to the Department of Water, Human Settlements and Sanitation in relation to a WUL application. Where such security is required, it will be valid for a period of at least five years after the WUL activities have lapsed.

Mines are also required to comply with the regulations which were specifically published for the use of water for mining and related activities in the Government Gazette GNR 704 on 4 June 1999. The regulations provide for limitations on the location of mining infrastructure, requirements for separation of dirty and clean water systems and the design of certain water management infrastructure.

Waste Management Licences

A WML is required in terms of NEM:WA in order to undertake certain waste management activities that are listed in regulations Gazetted by the Environmental Minister. The Environmental Minister may, by notice, in the Gazette, prohibit or restrict the granting of a WML by the licencing authority for a listed activity in a specified geographical area if deemed necessary to ensure the protection of the environment, conservation of resources, sustainable development or human health and well-being.

As a result of the implementation of the OES, mine waste is currently managed in terms of NEM:WA in South Africa. Under NEM:WA, a WML is required for the establishment or reclamation of residue stockpiles or residue deposits resulting from activities which require a Prospecting Right, mining permit, Mining Right, exploration right or production right. This requirement does not apply retrospectively to existing stockpiles and deposits as the relevant transitional provisions appear to suggest that if they were authorised in an EMPr or EMP, as the case may be, in terms of the MPRDA, they will be considered lawful or authorised for the purposes of the Waste Act. In addition to licensing, mines must also comply with the management measures prescribed for residue stockpiles and deposits in the Regulations for Residue Stockpiles and Residue Deposits from a Prospecting, Mining, Exploration or Production Operation in the Government Gazette GNR 632 of 24 July 2015, which impose certain liner/barrier requirements.

This position is anticipated to change once the National Environmental Management Laws Amendment Act Bill (**NEMLAA4**) is enacted as law. One of the main objectives of NEMLAA4 is to address the incongruous treatment of residue stockpiles and residue deposits under the waste and landfill provisions by removing their regulation from the ambit of NEM:WA and placing them under the regulation of NEMA. *Note: as at July 2020, the Select Committee considering the Bill was still to schedule further meetings on this Bill. Bill Progress to be monitored and information to be updated accordingly.*

As of May 2014, NEM:WA also regulates contaminated land, whether or not the contamination occurred before the commencement of NEM:WA or at a different time from the actual activity that caused the contamination. Consequently, historic, as well as present or future arising, contaminated land which is identified as an investigation area by the environmental authorities, or which is notified as being contaminated by the landowner must be assessed and reported on. A directive requiring site remediation may follow depending on the level of risk associated with the contamination.

Atmospheric Emissions Licences

NEM:AQA requires the Environmental Minister to establish a national framework for achieving the objectives of NEM:AQA, which must include, among others, minimum emission standards and norms and standards. An Atmospheric Emissions Licence (**AEL)** is required in terms of NEM:AQA to undertake certain listed activities which are published in terms of NEM:AQA, including, among others, certain mining related and processing activities. Local government is entrusted with the competence to manage air pollution, with municipalities being the licensing authority for purposes of issuing AELs.

The measurement and monitoring of atmospheric emissions is regulated through various tools, such as the air dispersion modelling framework, the declaration of priority pollutants and pollutant areas and the mandatory reporting of data and information from identified point, non-point and mobile sources of atmospheric emissions to the National Air Emission Inventory System. The Department of Environment, Forestry and Fisheries' declaration of greenhouse gases as priority air pollutants in 2017 has been followed by the imposition of a regulatory framework for greenhouse gas emission reporting, which forms the basis and input for imposition of the carbon tax which commenced on 1 June 2019.

Historic and Cultural Heritage

Pursuant to the promulgation of the NHRA, the removal or demolition of any articles of historic or cultural importance requires a permit from the South Africa Heritage Resources Agency or relevant provincial authority, as the case may be. Burial grounds and graves are also protected under the NHRA and a permit is required to destroy, alter or remove such articles.

The National Nuclear Regulator

The NNRA requires that a nuclear authorisation be acquired from the National Nuclear Regulator for certain activities which involve radioactive materials. The authorisation issued can be in the form of either, a nuclear installation licence, nuclear vessel licence, certificate or registration or certificate of exemption. In the case of mining, the duty to obtain a certificate or registration can be triggered when there are trace amounts of radioactive materials in mineral waste, particularly where the reef that is mined contains uranium. The certificate of registration would govern the handling, storage, transportation and disposal of these materials.

Financial Provisioning

Companies undertaking mining activities must make financial provision for rehabilitation liabilities to the satisfaction of the DMRE. This means that the holder must set aside provisioning for rehabilitation of the mining activities for concurrent rehabilitation, rehabilitation upon closure and the costs of managing latent and residual post closure impacts. Financial provisioning for the remediation of environmental damage is regulated in terms of Section 24P of NEMA and the Financial Provisioning Regulations, 2015 (**2015 Provisioning Regulations**).

Section 24P of NEMA provides that an applicant for an EA relating to prospecting, exploration, mining or production must, before the Environmental Minister issues the EA; comply with the prescribed financial provision for the rehabilitation, closure and on-going post decommissioning management of negative environmental impacts.

The 2015 Provisioning Regulations have resulted in significantly increased closure costs compared with the financial provisioning requirements that were previously included in the MPRDA. This is due, in part, to the qualification that latent or residual environmental impacts which may become known in the future now include the pumping and treatment of polluted or extraneous water. The regulation of financial provision is currently in a state of flux and the 2015 Financial Provisioning Regulations are expected to be replaced by a new set of regulations in the near future. A revised draft set of Financial Provisioning Regulations was published in November 2017 and in 2019 (**2019 Provisioning Regulations**), which are yet to be finalised.

Existing rights holders have until June 2021 to ensure that the amount of financial provisioning that is required to be set aside in terms of the 2015 Financial Provisioning Regulations is put forward. Some of the fundamental changes proposed by the 2019 Provisioning Regulations include the imposition of criminal sanctions for financial institutions which fail to notify the various South African government ministries (being the Departments of Environment, Forestry and Fisheries; Mineral Resources and Energy as well as National Treasury) and the holder of a Mining Right, of an intention to cancel or withdraw financial guarantees provided, thus introducing strict liability, and a penalty of up to ZAR10 million and that costs for annual rehabilitation be provided for in the operation budget of applicants and holders of Mining Rights, rather than having to be included in the separate financial provision vehicles provided for.

In relation to mine closures and the issuance of closure certificates, mines will have to comply with the requirements set out in Section 43 of the MPRDA and its corresponding regulations, NEMA and the 2015 Provisioning Regulations. The 2019 Financial Provisioning Regulations will, in relation to mine closures, require the use of financial guarantees for post-closure obligations to remediate and manage residual and latent impacts with a provision for an automatic call up of such guarantees on the issuing of a closure certificate;

Environmental Liability

Mining companies operating in South Africa are subject to extensive environmental laws and regulations with respect to environmental matters. These environmental laws and regulations change frequently and are generally becoming more stringent, and the costs associated with compliance with the laws and regulations are substantial.

The requirements of NEMA are far reaching, particularly Section 28 thereof (commonly referred to as "the duty of care provision"), which provides that every person who causes, has caused or may cause significant pollution or degradation of the environment must take reasonable steps to prevent such pollution or degradation from

occurring, continuing or recurring, or insofar 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. It is arguable that Section 28 of NEMA may have introduced the principle of strict liability with respect to the causation of environmental impacts.

A similar duty of care exists under the NWA, in terms of which the owner of land and controllers or occupiers of land on which any activity or process is or was performed that causes, has caused or is likely to cause the pollution of a water resource, must take all reasonable measures to prevent such pollution from occurring, continuing or recurring. The Department of Water, Human Settlements and Sanitation may issue administrative directives to the abovementioned persons to take reasonable measures to prevent pollution from occurring, continuing or recurring where such measures have not been taken. The Department of Environment, Forestry and Fisheries may similarly issue directives against persons who fail to comply with the Section 28 duty of care under NEMA. In addition to this, these authorities can order the suspension of part or all of a company's operations for non-compliance. Contravention of NEMA and the NWA is an offence and an offender may be liable for significant penalties in the form of a fine and/or imprisonment.

A person may also be held liable for pollution and/or environmental harm caused by it during mining operations notwithstanding the cessation of mining activities, the issuance of a closure certificate and or the sale or transfer of the mining operation. This liability arises in terms of the duty of care provisions under NEMA and the NWA.

Furthermore, Section 24R of NEMA provides that every holder, holder of an old order right and owner of works remains responsible for any environmental liability, pollution or ecological degradation, the pumping and treatment of polluted or extraneous water, the management and unsustainable closure thereof notwithstanding the issuing of a closure certificate by the Resources Minister in terms of the MPRDA to the holder or owner concerned. This position also applies where an asset has been sold or otherwise transferred to a third party. The previous owner/operator will remain liable for any remediation or avoidance of further pollution as a result of pollution caused by it during its operations. This liability also arises from the duty of care to avoid, mitigate and rehabilitate pollution or environmental degradation established in terms of Section 28 of NEMA and Section 19 of the NWA.

The National Environmental Management Act (Act No 107 of 1998)

NEMA is regulated by the DEFF (previously known as the DEA). Responsibility for the implementation of NEMA is generally delegated to the relevant provincial environmental departments. This Act over-arches South African environmental legislation and lays down basic environmental principles including duty of care, polluter pays and sustainability.

NEMA provides for co-operative environmental governance based on the principles that everyone has the right to an environment that is not harmful to one’s health or well-being and enabling the administration and enforcement of other environmental management laws. Sections 28 (1) and (3) of NEMA set out the duty of care principle, which is applicable to all types of pollution and must be considered in considering any aspects of potential environmental degradation.

Every person who causes, has 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. A series of regulations have been promulgated in terms of NEMA including:

- NEMA EIA Regulations, 2014: These regulations were developed for the preparation, evaluation, submission, processing and consideration of, and decision on, applications for environmental authorisations; and
- NEMA Regulations pertaining to the Financial Provision for Prospecting, Exploration, Mining or Production Operations, 2015: The purpose of these regulations 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. The regulations also include detailed descriptions of the wording required in the documentation to support the provisioning for liability using Bank Guarantees and Trust Funds. It also provides detailed on the information to be contained in the

following plans: annual rehabilitation plan; final rehabilitation, decommissioning and mine closure plan; environmental risk assessment report; and care and maintenance plan.

National Environmental Management: Waste Act (Act No 59 of 2008)

The National Environmental Management: Waste Act (**NEM:WA**) came into effect on 1 July 2009 and seeks to encourage the prevention and minimization of waste generation, whilst promoting reuse and recycling of the waste and only consider disposal of waste as a last resort. It provides for the licensing of waste management activities. A series of regulations have been promulgated in terms of NEM:WA including:

- NEM:WA Regulations regarding the Planning and Management of Residue Stockpiles and Residue Deposits (2015): These regulations specify the design approach and considerations for Residue Stockpiles and Residue Deposit (RSRD). They also specify that these facilities must comply with the Norms and Standards;
- NEM:WA Waste Classification and Management Regulations: These regulations require that waste generators must ensure that the waste they generate be classified in accordance with SANS 10234 within 180 days of generation (Chapter 2, 4(2)). If the waste is to be disposed of to landfill, the waste must be assessed in accordance with the Norms and Standards for Assessment of Waste for Landfill Disposal (Chapter 2 (8)1) (a); and
- NEM:WA National Norms and Standards for the Remediation of Contaminated Land and Soil Quality (2014): The purpose of these norms and standards is to: provide a uniform national approach to determine the contamination status of an investigation area; limit uncertainties about the most appropriate criteria and method to apply in the assessment of contaminated land; and provide minimum standards for assessing necessary environmental protection measures for remediation activities.

The National Environmental Management: Waste Amendment Act (Act No 26 of 2014)

The National Environmental Management: Waste Amendment Act (**NEM:WAA**) came into effect on 2nd September 2014. In terms of this Act, Schedule 3 was amended to include mining residue deposits and stockpiles as hazardous waste. The intention of the amendment is that residue deposits and stockpiles will now be regulated in terms of NEM:WA. For new waste facilities a Waste Management Licence (**WML**) may be required under NEM:WAA. Mine residues are excluded from the Act, but the disposal of other wastes on a mine, for example general wastes, would need to be licensed if no Section 20 permit is in place. If a mine subcontracts waste disposal, the subcontractor must be in possession of the appropriate permit/licence.

National Environmental Management: Air Quality Act (Act No 39 of 2004)

NEM:AQA regulates atmospheric pollution and repealed the Atmospheric Pollution Prevention Act. The Act came into full effect on 1 April 2010 and entrusts the DEFF with the task of preventing pollution and ecological degradation, while at the same time promoting justifiable economic and social development. Metropolitan and District Municipalities are charged with issuing atmospheric emission licenses for certain listed activities. It must be shown that the best practical means are being employed to limit air pollution before these certificates will be issued. Penalties and criminal sanctions are imposed for non-compliance with NEM:AQA. On 1 April 2010, the DEFF established a list of activities, which require atmospheric emission licenses. The Department has published the minimum emission standards resulting from these listed activities. These include the permissible amount, volume, emission rate or concentration of that substance or mixture of substances that may be emitted into the atmosphere and the manner in which measurements of such emissions must be carried out. The consequences of the listing of these activities is that no person may, without a provisional atmospheric emission licence or an atmospheric emission license, conduct an activity listed on the list anywhere in the Republic or listed on the list applicable in a province anywhere in that province. The National Greenhouse Gas Emission Reporting Regulations (**NGER**), under section 53(A), (o) and (p) of NEM:AQA, were instituted in 2017 (General Notice Regulation (**GNR**) 275 of 2017). The regulations provide a list in Annexure 1 of activities and operations that are required to report their GHG emissions through a national system. NGER classifies data providers as follows:

- Category A: any person in control of or conducting an activity marked in the Category A column above the capacity given in the threshold column of the table in Annexure 1 to these Regulations; and
- Category B: any organ of state, research institution or academic institution, which holds GHG emission

data or activity data relevant for calculating GHG emissions relating to a category identified in the table in Annexure 1 to these Regulations.

If the Colliery conducts any activity equal to or above the thresholds specified in Annexure 1 of NGER, it will be considered as a Category A data provider and hence will have to register as a data provider and report to the Competent Authority by 31 March every year. Monitoring and reporting should cover all process, fugitive and combustion emissions from all greenhouse gas emission sources and source streams belonging to activities listed in Annexure 1 of NGER. It is recommended that the Colliery reviews their current operations to ensure they are below the specified thresholds relating to stationary combustion, fugitive emissions from fuel, incineration of waste, and wastewater treatment and discharge.

National Water Act (Act No 36 of 1998)

The NWA is regulated by the Department of Human Settlements, Water and Sanitation (**DHSWS**, previously known as the DWS). Chapter 4 of the NWA stipulates that water uses (abstraction, storage, waste disposal, discharge, removal of underground water and alteration to watercourses) must be licensed. There are transitional arrangements to enable permits under the former 1956 Water Act to be converted into water use licences (**WULs**). The Act also has requirements relating to pollution control, protection of water resources (Regulation 704 relates to mines), dam safety (for dams with a capacity greater than 50 000 m^3 and a dam wall higher than 5 m) and water-use tariffs.

National Heritage Resources Act (Act No 25 of 1999)

This Act is regulated by South African Heritage Resource Agency or relevant Provincial departments where these have been established. This Act controls sites of archaeological or cultural significance. Such sites must be investigated and, where necessary, protected for the nation. Procedures for the relocation of graves are also given.

National Environmental Management: Biodiversity Act (Act No 10 of 2004)

The National Environmental Management: Biodiversity Act (**NEM:BA**) seeks, amongst other things, to manage and conserve biological diversity, to protect certain species and ecosystems, to ensure the sustainable use of biological resources and to promote the fair and equitable sharing of benefits arising from bio-prospecting involving those resources. The NEM:BA includes a regulation related to the management of threatened and protected species. A similar regulation is applied to Threatened Ecosystems. NEM:BA has a set of norms and standards for the development of management plans for both species (e.g. Threatened or Migratory Species) and ecosystems (Endangered or Critically Endangered).

National Environmental Management: Protected Areas Act (Act No 57 of 2003)

Protected areas such as nature reserves and special nature reserves are declared and managed in terms of the National Environmental Management: Protected Areas Act (**NEM:PAA**). Depending on the nature of the protected area, certain activities (such as mining) may require Ministerial consent or be prohibited outright. The Act also aims to promote the sustainable use of protected areas and the participation of local communities in such areas. In addition, it provides for the continued existence of the South African National Parks.

National Forests Act (Act No 84 of 1998)

The National Forests Act (**NFA**) is enforced by DAFF. The NFA supports sustainable forest management and the restructuring of the forestry sector, as well as protection of indigenous trees in general.

Environmental Conservation Act (Act No 73 of 1989)

The Environmental Conservation Act (**ECA**) is regulated by DEFF and DHSWS. The waste sections of this Act (Section 20) were repealed and replaced by the NEM: WA, which came into effect on 1 July 2009.

Hazardous Substances Act (Act No 15 of 1973)

This Act is regulated by the Department of Health and controls the declaration of hazardous substances and control of declared substances. It allows for regulations relating to the manufacturing, modification, importation, storage, transportation and disposal of any grouped hazardous substance.

Mine Health and Safety Act (Act No 29 of 1996)

The Mine Health and Safety Act (**MHSA**) and amendments are regulated by the DMRE. This Act deals with the protection of the health and safety of persons in the mining industry but has some implications for environmental issues due to the need for environmental-health monitoring within mine operations.

3.2. Broad-Based Black Economic Empowerment

3.2.1. B-BBEE/Historically Disadvantaged South Africans Ownership of Rights

The Company's BEE/Historically Disadvantaged South African (HDSA) ownership calculation methodology is derived from Code 100 Statement 102 of the B-BBEE Codes issued under the Broad-Based Black Economic Empowerment Act No 53 of 2003 read together with the Mining Charters of 2004, 2010 and 2018. In accordance with that methodology, it is possible for the value of assets disposed of into black ownership to exceed the value of the selling company, thereby producing a recognisable ownership equivalency in excess of 100%.

The MPRDA seeks to facilitate participation by HDSAs in the mining industry. Complying with the B-BBEE requirements and HDSA regime set by the South African government is a prerequisite for the grant of Prospecting and Mining Rights. Every application for a Mining Right under the MPRDA must demonstrate that the granting of such right will:

- Substantially and meaningfully expand opportunities for HDSAs, including women, to enter the mineral and petroleum industry in order to benefit from the exploitation of South Africa's mineral and petroleum resources; and
- Promote employment and advance the social and economic welfare of all South Africans.

Pursuant to the MPRDA, the Resources Minister developed Mining Charter I (**MCI**). MCI required that mining companies achieve 15% HDSA ownership of mining assets by 2009 and required that mining companies achieve a minimum target of 26% HDSA ownership of mining assets by 2014. MCI and its scorecard were amended by the Resources Minister on 13 September 2010 - Mining Charter II (**MCII**).

On 4 April 2018, the High Court of South Africa, Gauteng Division, Pretoria handed down a landmark judgment in the matter between the *Chamber of Mines of South Africa versus the Minister of Mineral Resources and Another* (case number 41661/2015), in which it was found as follows:

- Once the Resources Minister or his/her delegate is satisfied in terms of Section 23(1)(h) of the MPRDA that the grant of a Mining Right applied for in Section 22 will further the objects of the MPRDA referred to in Section 2(d) and (f) in accordance with the applicable Charter, the holder thereof is not legally obliged to restore the percentage ownership, however measured, controlled by HDSAs to the 26% target referred to in MCI and MCII where such percentage falls below 26%, unless such obligation is specified as an obligation in terms of the conditions stated in the right;
- A failure by a holder of a Mining Right or converted Mining Right to meet the requirements of MCI and MCII does not constitute a breach of a material term or condition of the Mining Right for the purposes of Section 47(1)(a) of the MPRDA, and further does not constitute an offence, for purposes of Section 98(a)(viii), read with Section 99, unless an obligation to meet such a requirement is specified as an obligation in the terms and conditions; and
- Neither MCI nor MCII require the holder of a Mining Right to enter into further HDSA empowerment transactions to address losses in participation ownership once it has been achieved, unless otherwise specified.

Although the High Court's decision in this matter remains unchallenged, it may still be taken on appeal or review and thus subject to change.

The Broad-Based Socio-Economic Charter for the Mining and Minerals Industry, 2018 was published on 27 September 2018 - Mining Charter III (**MCIII**). MCIII regulates six elements, namely:

- Ownership;

- Mine community development;
- Employment equity;
- Procurement, supplier and enterprise development; and
- Housing and living conditions and human resource development.

On 27 March 2019, the Minerals Council South Africa applied for a judicial review of certain elements of the Mining Charter III, primarily citing challenges to provisions relating to continuing consequences of previous empowerment transactions. This review is still pending.

An existing Mining Right holder who achieved a minimum of 26% B-BBEE shareholding shall be recognised as compliant for the duration of the Mining Right. This recognition is not applicable upon renewal of the right and is not transferrable to a new owner in the case of a transfer or sale of a Mining Right. The renewal of an existing Mining Right will be subject to the MCIII requirements which are applicable at the time that the Mining Right renewal application is lodged.

In the event that a Black Economic Empowerment (**BEE**) Entrepreneur's shareholding is disposed of, a Mining Right holder's empowerment credentials will be recognised for the duration of the Mining Right where:

- The holder has complied with the requirements of MCIII at the time of such disposal;
- The BEE Entrepreneur has held empowerment shares for at least a third of the duration of the Mining Right;
- The recognition of the empowerment credentials will only be applicable to measured effective ownership which vested in the BEE shareholder; and
- An agreement detailing exit mechanisms and the BEE shareholders' remaining financial obligations constituting a contract between the Mining Right holder and BEE shareholders is submitted to the DMRE.

The recognition of consequences of previous transactions shall not be claimed against future Mining Rights or Mining Right renewal applications.

The Company is able to claim the equivalent of an 109.9% BEE/HDSA shareholding in it by virtue of prior empowerment deals, as summarised in Table 3-1. The equivalent BEE/HDSA shareholding in the empowerment deals is premised on the percentage of production tonnes transferred relative to the Company's remaining production tonnes or the percentage of resource tonnes transferred relative to the remaining resource tonnes held by the Company. The formula for the claim is:

$$A / (A + B),$$

Where:
A = production/resources transferred; and
B = the Company's remaining production/resources.

Table 3-1: Prior BB-BEE/HDSA Empowerment Deals

Transaction	Date	Metric	Asset Units (Mt)	Units Transferred (Mt)	Equivalent Ownership Claimed (%)	Source Documents/ Comments
Leeuw Mining	May 2003	Resource	145.7	145.7	3.6%	Webber Wentzel
Phembani	2003	Resource	1.9	1.9	0.0%	Webber Wentzel
Mafube	2006	Production	1.1	0.5	0.9%	AA AFS 2005 (p117)
AAIC – Kriel	2010	Production	11.2	3.0	5.1%	AA AFS 2009 (p174)
AAIC – Elders	2010	Resource	293.0	79.1	3.3%	AA AFS 2009 (p168)
AAIC – Zibulo	2010	Resource	372.9	100.7	4.1%	AA AFS 2009 (p167)
AAIC – New Largo	2010	Resource	675.6	182.4	7.5%	AA AFS 2009 (p168)
AAIC – Heidelberg	2010	Resource	338.6	91.4	3.8%	AA AFS 2009 (p168)
Wonderfontein	2012	Resource	75.0	75.0	2.8%	AA AFS 2011 (p188)
Panfontein	2013	Resource	281.0	281.0	10.1%	AA Transformation
Rietvlei	Jan 2015	Resource	42.0	42.0	1.5%	Report 2012 (p54)
Siyaphambili ESOP	2008	Free Shares	-	-	0.1%	Of AAC PLC capitalisation
Seriti – Kriel	Mar 2018	Production	5.4	3.9	7.9%	AA AFS 2017 (p200)
Seriti – New Vaal	Mar 2018	Production	15.1	15.1	30.3%	
Seriti – New Denmark	Mar 2018	Production	3.4	3.4	6.7%	
New Largo	Aug 2018	Resource	571.6	417.3	16.3%	Ore & Res 2017 (p37)
PIC investment	2019	Shares	-	-	6.1%	In: Anglo PLC (Letter MCIII 2019 Ed)
Total					**109.9%**	

Note:
1. AAIC = Anglo American Inyosi Coal (Pty) Ltd
2. ESOP = Employee Share Ownership Plan

Apart from Exxaro's 50% shareholding held in the Mafube Colliery and Anglo American Inyosi Coal (Pty) Ltd's (**AAIC**) 27% shareholding in the Zibulo Colliery, the Company far exceeds the BEE/HDSA ownership requirements of the MPRDA and MCIII. The DMRE has confirmed that the equivalent BEE shareholding as calculated per Table 3-1 is acceptable and fully satisfies the required BEE/HDSA ownership requirements.

3.2.2. B-BBEE Scorecard

All mining companies in South Africa are required to report their mining scorecard against the B-BBEE requirements set out in the MCIII. Goedehoop's MCIII compliance is between 70 - 80%, which is equivalent to Level 3 of the DTI codes. The snapshot of Goedehoop's performance against the B-BBEE scorecard is summarized in Table 3-2.

Table 3-2 shows that Goedehoop fully complies with the MCIII requirements for mine community development and housing and living conditions. Goedehoop's performance for employment equity and procurement ESD meets 50% to 100% and 100% of the MCIII requirements respectively.

Table 3-2: Goedehoop Colliery – B-BBEE Scorecard Performance

MCIII Pillars	Weighting	Score	Results (Shortfall against Target)
Ownership			
Existing rights	Yes/No	Not Applicable	OK
New rights	Yes/No	Not Applicable	OK
Pending applications	Yes/No	Not Applicable	OK
Mine Community Development	Yes/No	Yes[1,2]	OK
Housing and Living Conditions	Yes/No	Yes[1,2]	OK
Employment Equity	30%	20.7%[3]	(9.3%)
Procurement Supplier and Enterprise Development	40%	40%[2]	0
Human Resource Development	30%	12.3%[4]	(17.7%)
Total	**100%**	**72.9%[3]**	**(27.1%)**
Meet all ring-fenced elements		Yes	
MCIII Level (DMRE Scorecard)		3	
Final Result		Compliant	

Note:
1. Meets ring-fenced MCIII pillar requirements
2. Complies 100% with MCIII pillar requirement
3. Between 50% and 100% MCIII requirement met
4. Less than 50% MCIII requirements met

Source: *Anglo American Group (undated) Mining Charter Reporting 2020 March.pptx*

Goedehoop's performance regarding human resource development falls below the 50% target of the MCIII requirements. Nevertheless, Goedehoop satisfies Level 3 on the DMRE Scorecard, i.e. ring-fenced elements + 70 - 80%, and is therefore compliant with the B-BBEE requirements of the MCIII.

3.3. Goedehoop Colliery Title and Rights

[12.10(h)(iv)] [SR1.5] [SV1.5] [ESG4.1]

3.3.1. Mining and Prospecting Rights

Four granted and executed New Order Mining Rights (**NOMRs**) and one Mining Right (**MR**) that is awaiting conversion (Komati Power Station Mining Right) cover the operation (Table 3-3, Figure 3-1 and Figure 3-2), giving the Company the exclusive right to mine and recover coal in, on or under the mining areas listed below:

- Goedehoop North:
  - Bank Colliery Mining Right MP 30/5/1/1/2/143 MR
  - Bank Colliery Roodepoort Mining Right MP 30/5/1/2/2/57 MR
- Goedehoop South:
  - Goedehoop Main Mining Right MP 30/5/1/2/2/122 MR
  - Bultfontein Mining Right MP 30/5/1/1/2/124 MR
  - Komati Power Station Mining Right MP 30/52/1/2/2/23 MR
  - Van Dyksdrift Mining Right MP 30/5/1/2/2/38 MR
  - Kleinfontein Mining Right MP 30/5/1/2/2/466 MR

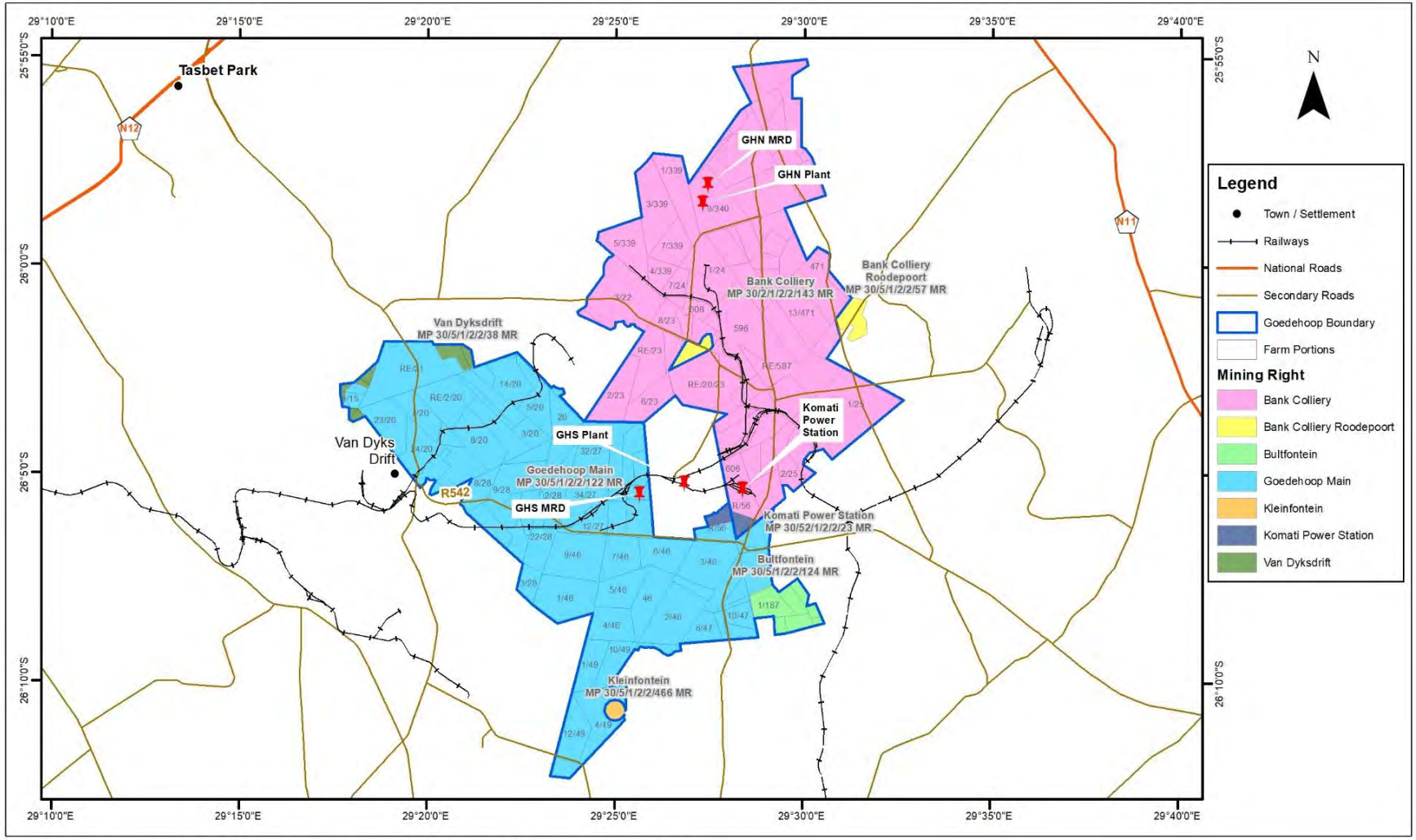
The Company owns 100% of the Mining Rights. These NOMRs may be renewed, provided application is lodged timeously with the correct authority and in compliance with the terms and conditions of the existing Mining Right. The application should not be in contravention of any relevant provision of the MPRDA or any other law, the MWP,

requirements of the SLP and conditions of the environmental authorisation. Such a NOMR will remain in force until the application has been granted or rejected. Periods of renewal may not exceed 30 years at a time.

SRK is not aware of any Prospecting Rights pertaining to Goedehoop.

Table 3-3: Mining and Prospecting Rights covering Goedehoop

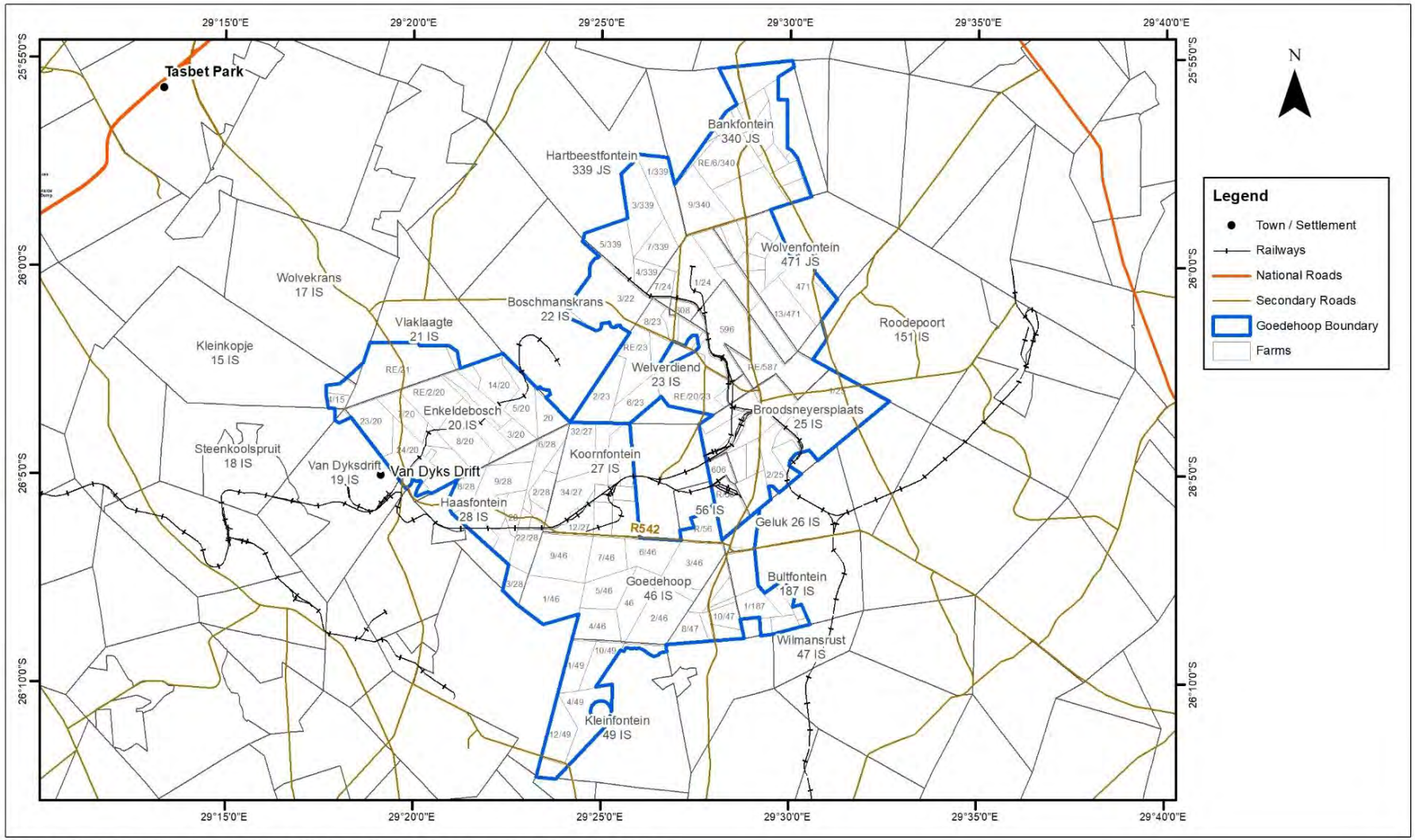
Name	Number	Rights Type	Area (ha)	Grant Date	Expiry Date
Goedehoop North:					
Bank Colliery	MP 30/5/1/1/2/143 MR	Mining	14 190.4171	05/05/2008	17/11/2038
Bank Colliery Roodepoort	MP 30/5/1/2/2/57 MR	Mining	283.2501	19/12/2009	17/11/2038
Goedehoop South:					
Goedehoop Main	MP 30/5/1/2/2/122 MR	Mining	13 676.0623	05/05/2008	25/08/2038
Bultfontein	MP 30/5/1/1/2/124 MR	Mining	482.7272	05/05/2008	25/08/2038
Van Dyksdrift	MP 30/5/1/2/2/38 MR	Mining	219.4646	05/10/2006	23/04/2038
Kleinfontein	MP 30/5/1/2/2/466 MR	Mining	64.71	20/09/2017	19/09/2042
Komati Power Station	MP 30/52/1/2/2/23 MR	Mining	145.6280	Awaiting conversion	



Path: J:\Proj\555880_Goedehoop CPR\8GIS\GISPROJ\MXD\Report\555880_A4_Goedehoop_MR_Boundaries_202000827.mxd

srk consulting	**GOEDEHOOP COLLIERY CPR** Mining Rights covering Goedehoop	Project No. 566657

Figure 3-1: Mining Rights covering Goedehoop



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srk consulting	**GOEDEHOOP COLLIERY CPR** Farms covering the Mining Rights	Project No. 566657

Figure 3-2: Farms covering the Mining Rights

3.3.2. Surface Rights

The Surface Rights are currently owned by numerous different entities, the details of which are included in Table 3-4 (Goedehoop North) and Table 3-5 (Goedehoop South). A Section 102 application is currently in progress for portion RE2 for farm Wilmansrust 47 IS in favour of the Puckree Group (Pty) Ltd.

Table 3-4: Surface Rights – Goedehoop North

Farm Name and Number	Surface Owner	Farm Subdivision	Deed	Area (ha)
Goedehoop North: MP 30/5/1/2/2/143 MR				
Bank Colliery 608 IS	Anglo Operations (Pty) Ltd (**AOPL**)	Farm	T115595/2004	519.7233
Bankfontein 340 JS	AOPL	8	T55527/1992	8.5282
		9	T55527/1992	471.2011
		10	T18056/2008	473.4010
	Sancor Pty Ltd	11	T92873/1992	130.7839
		12	T92873/1992	166.3399
		20	T39152/1984	97.4553
		21	T39152/1984	97.4553
		22	T38254/1984	97.4553
		26	T139212/1999	317.3164
		RE/1	T92873/1992	88.3113
		RE/13	T39152/1984	36.4387
	Ingwe Surface Holdings Ltd	14	T76564/1999	171.7967
		25	T137060/1999	1.9644
	Bank Stene & Boerdery cc	17	T23172/1989	42.8266
	MJ Mthimunye	RE/3	T97168/2006	25.6403
	DS van Wyk	RE/6	T16027/2008	460.6329
Blesbokvlakte 24 IS	Sancor Pty Ltd	2	T150457/2004	228.2301
	AOPL	7	T55527/1992	37.5338
	Bleswolf Boerdery Pty Ltd	9	T42564/1981	195.2964
		10	T29908/1978	160.6069
	Transnet Ltd	11	T46320/1988	4.3669
		12	T52841/1988	5.1781
		13	T97579/1994	5.0147
	JM de Beer	RE/6	T8999/2013	130.2840
Blesbokvlakte 596 IS	Sancor Pty Ltd	RE	T72666/2006	609.8295
Boschmanskrans 22 IS	Ingwe Surface Holdings Ltd	8	T76573/1999	24.4875
		9	T76573/1999	10.4621
		RE/3	T76573/1999	711.8662
	Transnet Ltd	11	T4557/1993	4.5282
Broodsneyersplaats 25 IS	JM de Beer Familie Trust	11	T14967/2014	81.4878
		15	T14967/2014	102.7202
		RE	T14967/2014	151.2222
		RE/1/	T17778/2016	677.6596
	KJF Verhuring Pty Ltd	13	T26093/2004	1.7132
	Republic of South Africa	22	T20920/1982	0.2127
	Kruger Johannes Arnoldus	36	T45663/1997	0.3188
	AM Harrod	RE/16	T127092/1997	165.6770
	JM de Beer	RE/6	T91863/1997	255.9477
		RE/10	T60717/2002	169.5932
	Anwa Trust	RE/12	T108929/2001	79.7612
		RE/2	T43254/2001	244.6343
		RE/4	T108929/2001	249.0365
		RE/5	T43254/2001	107.6833
	D Lee	RE/3	T12103/2011	103.3260
	WA de Klerk	RE/7	T73792/1993	114.5816
	Koornfontein Mines Pty Ltd	RE/9	T5694/2011	116.8128
Broodsneyersplaats 25 IS	Transnet Ltd	14	T12585/1955	26.0040
		20	T27096/1985	6.1342
		2/	T27096/1985	8.5031
		23	T5370/1978	1.1494
		24	T56428/1989	2.2909

Farm Name and Number	Surface Owner	Farm Subdivision	Deed	Area (ha)
		25	T56428/1989	2.5818
		26	T56428/1989	4.7061
		27	T56428/1989	2.3215
		28	T42605/1988	4.8791
		30	T56428/1989	0.0075
		31	T56428/1989	5.5531
		32	T56428/1989	0.3393
		33	T33771/1987	3.7386
		34	T39544/1988	0.6336
		35	T36146/1987	1.6000
Broodsneyersplaats 587 IS	Rudolph Schoeman Landgoed (Pty) Ltd	Farm	T68340/1998	452.2640
Hartbeestfontein 339 JS	AOPL	7	T55527/1992	220.1798
		RE/1	T55527/1992	349.1838
	Transnet Ltd	13/	T81163/1988	10.9740
		14	T85834/1994	1.3089
	AM Harrod	RE/3	T83610/1993	459.6347
	Wilanna Property Inv cc	5	T3768/2015	331.6388
	JM de Beer	RE/4	T9000/2013	121.1240
Komati 56 IS	Bitflow Inv 403 Pty Ltd	8	T102350/2004	5.0448
	Eskom	RE	T24999/1975	268.2222
Roodepoort 151 IS	Christo Schoeman Pty Ltd	11	T64278/2001	101.8616
Welverdiend 23 IS	Christo Schoeman Pty Ltd	RE/2	T13648/2000	260.1195
	AOPL	3	T7977/1992	128.4798
		8	T55527/1992	143.0380
	G & M Farming Enterprises cc	RE/4	T12754/2012	70.6095
		6	T12754/2012	253.8790
	JM de Beer	9	T60716/2002	85.6532
		RE/11	T60717/2002	107.5504
	Sancor Pty Ltd	12	T135656/2003	80.0804
		RE/13	T43379/2003	16.1029
	Transnet Ltd	14	T24244/1987	3.3705
		15	T41370/1990	9.4249
		16	T41370/1990	3.2635
		17	T16195/1988	0.9134
	Ingwe Surface Holdings Ltd	19	T78984/1999	92.1650
	Rudolf Schoeman Landgoed Pty Ltd	21	T72665/2006	84.4026
	AM Harrod	RE	T11303/2008	350.1774
	C & J Boerdery cc	RE/20	T7430/2011	605.8410
Wolvenfontein 471 JS	AOPL	8	T26399/2003	166.7454
		11	T26399/2003	85.6532
		RE/9	T26399/2003	81.0922
	Christo Schoeman Pty Ltd	13/2	T64278/2001	187.8152
	Komatie Ontwikkelings Mpy Pty Ltd	14	T36896/1977	28.7990
	Provincial Government Of Mpumalanga	15	T5170/2016	4.0644
	Bleswolf Boerdery Pty Ltd	18	T21278/1979	195.2965
		19	T29908/1978	34.6895
	J Schoeman	21	T3171/2000	1.2827
	Sancor Pty Ltd	22	T150457/2004	187.8313
	Uniting Reformed Church in Southern Africa	23	T309/2013	3.4269
	SIS Estate Farming Pty Ltd	RE	T58439/1981	393.1696
	DS van Wyk	RE/7	T16028/2008	133.8820
Goedehoop North: MP 30/5/1/2/2/57 MR				
Roodepoort 151 IS	Sancor Pty Ltd	RE	T135575/1997	170.1280
Welverdiend 23 IS	JM de Beer	7	T60716/2002	85.6532
	Sancor Pty Ltd	12	T135656/2003	19.3093
		13	T43379/2003	8.1595

Table 3-5: Surface Rights - Goedehoop South

Farm Name and Number	Surface Owner	Farm Subdivision	Deed	Area (ha)
	Goedehoop Main: MP 30/5/1/2/2/122 MR			
Boschmanskrans 22 IS	Ingwe Surface Holdings Ltd	5	T76573/1999	11.6867
Bultfontein 187 IS	WA de Klerk Familie Trust	2	T110394/1998	215.2222
Enkeldebosch 20 IS	AOPL	24	T152269/2006	333.0004
		27	T61840/1990	146.8945
		3	T2989/2004	126.3385
		36	T64638/1998	47.6111
		9	T2989/2004	244.4257
		RE	T2991/2004	165.7295
		RE22	T163324/2006	233.0252
		RE5	T2990/2004	266.9589
	Beestepan Boerdery (Pty) Ltd	10	T14774/2016	68.5226
		13	T14774/2016	52.6714
		RE14	T14774/2016	247.3507
		RE4	T14774/2016	184.1544
	Gedeelte 22 Enkeldebosch 20 cc	33	T76672/1997	0.4203
	Ingwe Surface Holdings Ltd	32	T8205/2010	4.0090
		35	T76574/1999	23.0571
	Islardu Boerdery cc	8	T2374/2009	340.6071
		RE2	T2374/2009	352.1138
	SJ Moll	7	T7967/2012	214.3072
	Nederduitse Gereformeerde Kerk van SA	34	T112690/1998	1.0000
	Transnet Ltd	18	T28769/1955	1.2899
	Valco Boerdery (Pty) Ltd	23	T14494/2016	325.0004
Geluk 26 IS	JDM de Klerk	7	T3928/2008	169.9417
Goedehoop 46 IS	AOPL	2	T155327/2002	475.2753
		5	T66621/1992	278.7961
		8	T155327/2002	79.1884
		9	T66621/1992	481.6851
		RE	T66621/1992	310.4786
		RE3	T126760/2003	396.0727
	DM Erasmus	RE1	T34446/1999	481.6850
	PJ Honeyborne	4	T8684/2010	278.7939
	JJJ Harmse Trust	7	T82587/1996	278.7940
	Jaco Harmse Trust	6	T12669/2001	278.7892
Haasfontein 28 IS	AOPL	10	T2989/2004	96.1786
		28	T46246/2004	100.4209
		3	T158132/2003	126.3385
		6	T2989/2004	216.7026
		RE2	T21530/2003	226.0496
		RE4	T151648/1999	37.7454
	CH Rossouw	9	T79956/1996	340.6014
	Isabel Schoeman Landgoed cc	27	T4622/2011	308.8920
		RE	T1684/2009	82.0326
	Islardu Boerdery cc	11	T14349/2016	170.3014
		14	T14349/2016	116.7368
	JH Pretorius	RE8	T79957/1996	170.3000
	Transnet Ltd	18	T68065/1991	4.9133
Kleinfontein 49 IS	AOPL	10	T53528/1998	211.2779
		RE1	T55006/2001	222.6969
		RE4	T83528/1998	479.5537
	CJ Lourens	12	T16114/2016	274.0902
	Ukufisa Inv Holdings (Pty) Ltd	5	T18144/2014	69.0092

Farm Name and Number	Surface Owner	Farm Subdivision	Deed	Area (ha)
Kleinkopje 15 IS	AOPL	11	T27780/1977	23.9409
	Ingwe Surface Holdings Ltd	RE4	T76581/1999	54.7323
Komati 56 IS	Eskom	RE	T24999/1975	121.5149
Koornfontein 27 IS	AOPL	16	T1098/1982	62.7829
		17	T470/1982	62.7852
		18	T952/1982	125.5632
		41	T46241/2004	133.1306
		RE	T55977/1992	188.9073
		RE12	T1097/1982	166.5400
	G & M Farming Enterprises cc	19	T12754/2012	87.8936
		RE20	T12754/2012	142.4456
	Nederduitch Hervormde Kerk van Afrika	26	T39817/1969	1.6907
	Rudolph Schoeman Landgoed (Pty) Ltd	32	T87253/2000	335.0489
		RE34	T68338/1998	400.8646
	Transnet Ltd	13	T9986/1954	12.9205
		27	T108796/1992	0.1195
		28	T108796/1992	6.8920
		29	T108796/1992	1.4821
		30	T79370/1991	2.7513
		31	T79370/1991	2.0125
Vlaklaagte 21 IS	Ingwe Surface Holdings Ltd	RE	T76553/1999	705.2289
	Telkom SA Ltd	RE6	T1089/1974	0.0900
Wilmansrust 47 IS	AOPL	8	T126760/2003	171.3064
	Section 102 (Puckree Group (Pty) Ltd) in progress	RE2	T126760/2003	120.2366
	AOPL	RE6	T126760/2003	157.0256
		RE7	T126760/2003	65.3602
	South African National Roads Agency Ltd	15	T4201/2011	5.2977
		16	T253/2012	1.0826
		18	T254/2012	8.5178
	WA de Klerk Familie Trust	10	T110394/1998	117.0898
		11	T110394/1998	25.2062
Bultfontein: MP 30/5/1/2/2/124 MR				
Bultfontein 187 IS	Beestepan Boerdery (Pty) Ltd	14	T14248/2010	15.9978
		RE6	T14248/2010	22.7300
	MM von Wielligh	12	T24713/1986	39.6260
		RE3	T24713/1986	79.5108
	Umcebo Prop (Pty) Ltd	10	T18090/2008	85.6532
		13	T18090/2008	42.8266
	WA Trust	1	T54176/2006	196.3828
Komati Power Station: MP 30/5/1/2/2/23 MR				
Komati 56 IS	Eskom	RE	T24999/1975	145.6280
	Middelburg Local Municipality	6	T15324/2006	3.9990
VanDyksdrift: MP 30/5/1/2/2/38 MR				
Kleinkopje 15 IS	AOPL	11	T27780/1977	18.4046
	Ingwe Surface Holdings Ltd	RE4	T76581/1999	11.3426
Steenskoolspruit 18 IS	Ingwe Surface Holdings Ltd	2	T76581/1999	10.8478
Van Dyksdrift 19 IS	Ingwe Surface Holdings Ltd	RE3	T76548/1999	21.6627
Vlaklaagte 21 IS	Ingwe Surface Holdings Ltd	RE	T76553/1999	94.2488
		RE1	T76550/1999	26.0477
Wolvekrans 17 IS	Ingwe Surface Holdings Ltd	RE	T76586/1999	25.0941
Kleinfontein: MP 30/5/1/2/2/466 MR				
Kleinfontein 49 IS	AOPL	RE4	T83528/1998	64.7081

Numerous portions of the surface rights of the Company-owned farms are leased to nine tenants, for agricultural or business purposes (Table 3-6). A total of approximately ZAR2 million in fees are collected annually.

Table 3-6: Surface Rights Leases

Lessee	Farm	Subdivisions	Area (ha)
BJ van Dyk	Enkeldebosch 20 IS	3, 5, 24, RE	1109.94
	Haasfontein 28 IS	2, 6, 10	
DS van Wyk	Bankfontein 340 JS	10	459.11
Islardu Boerdery	Enkeldebosch 20 IS	Potion of 9, RE/22	515.51
	Haasfontein 28 IS	10	
	Goedehoop 46 IS	RE/3, RE,2 ,5, 8	821.00
	Haasfontein 28 IS	3	91.55
JM de Beer	Bank Colliery 608 IS	Entire farm	543.27
	Hartbeesfontein 339 JS	8	
	Welverdiend 23 IS	7	
	Blesbokvlakte 24 IS		
Makova Supply Chain Holdings (Pty) Ltd	Koornfontein 27 IS	RE/12	17.80
PJ Honeyborne	Goedehoop 46 IS	RE, 5	495.45
	Wilmansrust 47 IS	2, 8	
SIS Farming Group (Pty) Ltd	Wolvenfontein 471 JS	8, 9, 11	238.77
Valco Boerdery (Pty) Ltd	Vlaklaagte 21 IS (rehabilitation lease)	RE	67.93
WA de Klerk	Wilmansrust 47 IS	6, 7, 8	262.28

3.3.3. Sufficiency of Rights

[12.9(e)] [12.10(h)(iv)] [SR1.1(ii)]

Goedehoop has the appropriate Mining Rights in place over both sections of Goedehoop; the rights expire in 2038 and 2042. The conversion application from a prospecting to Mining Right over the Komati Power Station area has been submitted and is awaiting conversion.

The Company has the appropriate surface rights where required; the remainder of the surface rights are held by numerous different entities, mostly concerning private agriculture, as well as the State, the Middleburg Municipality, two churches, Transnet, Eskom, Ingwe Surface Holdings Ltd and Koornfontein Mines (Pty) Ltd.

Goedehoop Colliery (GHN and GHS) operates under several EMPrs, Environmental Authorisation (**EA**s) and WULs. The Colliery does not require a waste licence and no longer holds a valid an Air Emissions Licence (**AEL**). All the required environmental permits are therefore in place for the activities taking place on GHS and GHN. While these permits are in place, the Environmental Coordinator has acknowledged that there are certain conditions within the permits that are not being complied with. In order to mitigate this, amendments to the affected environmental permits are in process to address the non-compliances.

3.4. Legal Aspects and Permitting

3.4.1. Environmental Authorisations and Licences

[SR1.5(ii)(v), SR5.5(i)(ii)(iii)] [ESG4.3]

Goedehoop North and Goedehoop South operate under several EMPrs, EAs and WULs. The Colliery does not require a waste licence and no longer holds a valid an AEL as incineration activities have ceased. The EMPrs,

EAs and WULs applicable to Goedehoop North and Goedehoop South are described in Section 3.4.2.

Mine Waste Disposal

According to the Integrated Water and Waste Management Plans (**IWWMP**), compiled for both the Goedehoop North (**GHN)** and Goedehoop South (**GHS**) (IWWMP GHN, December 2018 and IWWMP GHS, December 2018 - Philo Environmental Management, 2018a and 2018b), the operations have a waste management procedure in place that specifies the various waste streams and management measures. The procedure details the disposal and handling of all waste generated. Based on discussions held with the Environmental Coordinator as well as the information obtained from the review of the 2018 IWWMPs, the operations have the following waste streams:

- General waste: Plastic, food landfill, glass, polystyrene, old stationary, garden waste, discarded Personal Protective Equipment (**PPE**), old clothing and pieces of wood, which is disposed of at the Middelburg Waste Disposal dumping site. Paper waste is recycled;
- Industrial waste: Scrap metal and scrap rubber is sent to the reclamation yard for resale and oil waste is sold to a waste oil recycling company;
- Hazardous wastes: Hydrocarbon containing waste (pain, contaminated rags, oil filters, batteries etc), radioactive waste and fluorescent tubes are all removed by permitted waste disposal contractors. Hydrocarbon containing waste is disposed of at the Holfontein Landfill site. Fluorescent tubes are sent for recycling; and
- Coal waste: Slurry and discard generated at the beneficiation plant is disposed of at the co-disposal site located on GHN and GHS. Reclaiming of the MRD is currently taking place at GHN and Goedehoop is busy assessing whether the reclamation of the GHS MRD is a viable option.

3.4.2. Environmental and Social Approvals

[SR1.2(ii), SR1.5(ii)(iv)(v), SR7.1] [ESG4.3]

The following environmental approvals are applicable to Goedehoop Colliery:

Environmental Management Programmes

The following Environmental Management Programme Report (after 8/12/2014, under NEMA) (**EMPr**) approvals are currently applicable to Goedehoop Colliery:

- Goedehoop North (previously Bank Colliery):
    - Main Bank Colliery EMPr (Reference Number: MP 30/5/1/2/2/143MR) approved on 30 May 2001;
    - Bank Colliery Addendum for Main Shaft Access Shaft, Block 10 and Brown Shaft 2 (Reference Number: MP 30/5/1/2/2/143MR) approved on 30 April 2004;
    - Bank Colliery Addendum for Roodepoort-Welverdiend (Reference Number: MP 30/5/1/2/3/2/1 (57)) approved on 24 April 2008;
    - Aligned Environmental Impact Assessment and Environmental Management Programme in respect of the farms Roodepoort 151 IS and Welvediend 23 IS - (DMR Reference Number.: MP 30/5/1/2/2/(57) MR) issued by the then DMR and now the DMRE approved on 6 December 2016;
    - Amended Environmental Impact Report (EIR) and EMPr for the changes to Brown Shaft 2 Project (Reference Number: MP 30/5/1/2/2/ (143) MR) approved on 3 September 2019; and

- Goedehoop South:
    - Goedehoop South Bultfontein Extension Aligned EMPr (Reference Number: MP 30/5/1/2/2/(122) EM) approved on 8 September 2015;
    - Goedehoop South Amended EMPr for reclamation and expansion of residue deposit and briquetting plant (Reference Number: MP 30/5/1/2/2/(122) MR) approved on 17 December 2015;

- Integrated Environmental Authorisation (**IEA**) issued in terms of NEMA as amended, the EIA Regulations, 2014 and the National Environmental Management: Waste Act 59 of 2008 ("NEMWA") and Government Notice 921 of 2013 for proposed mining and associated infrastructure (Hope 4 Seam) (Reference Number (MP) 30/5/1/2/3/2/1/ (122) EM). The IEA was received on 2 December 2016 from the then DMR and expires on 2 December 2021; and
- EMPr for the remaining extent of Portion 4 of the farm Kleinfontein 49 IS (Reference Number: MR 30/5/1/2/3/2/1 (466) EM) approved on 16 May 2019.

Environmental Authorisations (EA)

The following EAs are applicable to Goedehoop Colliery:

- Goedehoop North:
  - EA in terms of the NEMA as amended and NEMWA as amended, and the EIA Regulations, 2014 for the expansion of Bank 2 mine residue deposit and associated infrastructures in respect of Portion 9 of the Farm Bankfontein 340 JS, situated within the Magisterial district of Middelburg: Mpumalanga Region (Reference Number (MP) 30/5/1/2/3/2/1/ (143) EM). Received on 7 June 2018 from the then DMR and expires upon closure of Goedehoop; and

- Goedehoop South:
  - EA for the proposed construction of an upcast ventilation shaft for Goedehoop Colliery's Block 10 (Reference Number: 17/2/3N-281) received on 31 March 2014 from the Mpumalanga Department of Agricultural, Rural Development, Land and Environmental Affairs. The EA expires on closure of Goedehoop; and
  - EA for Mineral Residue Deposit Expansion and Briquetting Plant (Reference Number 17/2/3N – 23B) received on 29 January 2016 from the Mpumalanga Department of Agricultural, Rural Development, Land and Environmental Affairs. The EA expires on closure of Goedehoop.

According to the Environmental Coordinator, several EMPr and EA amendments are proposed to address various non-compliances that have been identified for GHS and GHN in internal and external performance assessment audits. These proposed amendments are included in Table 3-7.

Table 3-7: Proposed EMPr/EA Amendments

Project Name	Type of Permit	Project Application Reference Number	Relevant Authority
EA/EMP Amendment or EA	EMPr/EA Amendment	Not submitted, awaiting updated Mine Works Programme (due 30 October 2020)	DMRE

Water Use Licences, General Authorisations and GN704 exemptions

The following WULs, General Authorisations (**GA**) and GN704 exemptions have been issued to GHN and GHS for water use related activities:

- Goedehoop South:
  - The Goedehoop South WUL issued on 02 August 2013 (Licence Number: 04/B11B/ACFGIJ/1754) by the then DWA. This licence was amended and issued on 4 March 2020. Licence expires on 2 August 2033;
  - Dump expansion and Briquetting Plant WUL issued on 08 August 2016 (Licence Number: 03/B11B/CGI/4702) by the then DWS. Licence expires on 8 August 2033;

- The Hope 4 Seam WUL issued on 18 May 2017 (Licence Number: 06/B11B/ACGIJ/5269) by the then DWS. Licence expires on 18 May 2037;
- Block 20 WUL issued on 01 April 2011 (Licence Number: 04/B11B/ACGIJ/411) by the then DWA, although this WUL expired on 01 April 2016. A new WUL for Block 20 (Licence Number: 06/B11B/GICAJ/5339) was issued on 5 June 2017 by then DWS and expires on 5 June 2037; and
- Goedehoop South GNR 704 exemption (Exemption number: 27/2/2/B11G/254) for undermining of watercourses issued on 5 July 2018 by the then DWS. This exemption expires on closure of Goedehoop.

- Goedehoop North:
  - The Goedehoop North WUL issued on 08 July 2011 (Licence Number: 04/B11H/AFGJ/633) by the then DWA. The date of expiry is 8 July 2031;
  - Brown Shaft 2 WUL issued on 29 March 2016 (Licence Number: 04/B11H/ACGIJ/4329) and was amended on 31 May 2019 by the then DWS. The date of expiry is 24 March 2026;
  - Goedehoop North GNR 704 exemption (Exemption Number: 27/2/2/B11G/257) for undermining of watercourses issued on 5 July 2018 by the then DWS. Expires on closure of Goedehoop; and
  - Goedehoop Colliery General Authorisation for the proposed construction of a contractors' laydown/camp area for section 21(c) and (i) water uses (Reference Number: 27/2/2/B811/3/3) issued on 17 January 2019 by the then DWS.

In addition to the approved water use activities obtained for Goedehoop Colliery, the following authorisation processes for water activities are currently in progress (submitted to the DHSWS but not yet approved):

- Integrated Water Use Licence Application – Anglo Operations (Pty) Ltd): Bank Colliery (GHN) Bank 2 MRD Expansion Project, submitted on 5 July 2017 to the Department of Water and Sanitation Olifants Catchment Management Agency (CMA).

According to the Environmental Coordinator, several WUL amendments as well as applications for new WULs and GAs are also proposed to address various non-compliances, which have been identified for GHS and GHN in the WUL internal and external audits. These proposed licences and amendments are included in Table 3-8.

Table 3-8: Proposed Water Licences and Licence Amendments

Name	Permit Applied For	Application reference Number
Goedehoop WUL Amendments (s)	GHN WUL Amendment	04/B11H/AFGJ/633
WUL Water Pipeline: Komati	New WUL	Not yet submitted
	GN704 Exemption	Not yet submitted

Waste Management Licences

The colliery is registered as a waste producer however, they do not have a waste management licence in terms of the National Environmental Management: Waste Act (Act No. 59 of 2008) as this is not currently required.

Social and Labour Plan

An SLP was prepared as part of the Mining Right Application (**MRA**) in terms of the requirements of the MPRDA.

A Social and Labour Plan (**SLP**) was prepared as part of the requirements of the MPRDA. The SLP for the 2020 to 2024 period (AAC, 2020h) was submitted to the Department of Mineral Resources and Energy (DMRE) in September 2020.

In terms of section 28(2) of the MPRDA, "*the holder of a mining right or mining permit, or the manager of any*

processing plant operating separately from a mine, must submit to the Director-General— (c) an annual report detailing the extent of the holder's compliance with the provisions of section 2(d) and (f), the charter contemplated in section 100 and the SLP". An SLP Annual Report was submitted to the DMRE in 2015, 2016, 2017 and 2018. The SLP Draft Close Out Report which includes feedback on progress made in 2019 (AAC, 2020a) has been submitted to the DMRE (AAC, 2020*i*).

Based on information presented in the Goedehoop SLP Draft Close Out Report (AAC, 2020a), the site has a training centre that is ISO 9001: 2015 certified and has training provider status from the Mining Qualifications Authority (**MQA**). It submits an annual Workplace Skills Plan and an annual Training Report in accordance with the Sector Education and Training Authority's requirements. Verbal confirmation was provided that by the Human Resource (HR) manager that both of these documents were approved for 2019. Goedehoop pays levies and claim grants in line with the provisions of the MQA (levy number L120714680). Goedehoop complies with the requirements of the Skills Development Act.

The Goedehoop SLP Draft Close Out Report (AAC, 2020a) reports that the site has two skills development facilitators who are responsible for co-ordinating the Workplace Skills Plan and the Annual Training Report.

Table 3-9 provides a summary of all external and internal documents that guided the implementation of the Goedehoop SLP (AAC, 2020a).

Table 3-9: External and Internal Documents Relevant to the SLP

External	Internal
MPRDA and Regulations	Mine Workplace Skills Plan
DMRE Guidelines for SLPs	Mine Employment Equity Plan
Broad-based Socio-Economic Empowerment Charter for the South African Mining Industry (i.e. Mining Charter)	Mine Recruitment Plan
Skills Development Act No 97 of 1998	Employment Equity Policy
Employment Equity Act No 55 of 1998	Human Resource Development Policy
Labour Relations Act of 1995	Retrenchment Policy
Basic Conditions of Employment Act of 1997	BEE Specification Policy
Broad-based Black Economic Empowerment Act No 53 of 2003	Preferential Procurement Principles Policy
Integrated Development Plan for Local Municipality	Learnership Procedure
Integrated Development Plan for District Municipality	Mentorship Procedure

Goedehoop committed to six major community development projects in their 2015 - 2019 SLP (AAC, 2015). The first project, to the value of ZAR5m was to establish an Industrial Park at the Mhluzi township next to the Mhluzi Mall. The second project, with a budget of ZAR2m was to provide capacity building to the STLM. A further ZAR2.5m was allocated to the STLM Department of Gender and Social Development for skills development purposes. The SLP also allocated ZAR7m towards education infrastructure upgrades and scholarships, ZAR2m towards health and welfare and ZAR1.5m towards the resourcing of the STLM disaster management centre and fire department. As part of its 2020 – 2024 SLP (AAC, 2020h) Goedehoop has committed to three community development projects as follows: community scholarships to the value of ZAR3m; water supply sustainability (boreholes and tanks) with a budget of ZAR4m; and a mobile clinic for Ward 4 to the value of ZAR3m. None of the 2015 – 2019 projects were carried across to the new SLP.

Table 3-10 provides a summary of the current social obligations as part of the 2020 - 2024 SLP.

Table 3-10: SLP LED projects

Project	Total budget over 5 years (ZARm)
Community scholarships	3
Water supply sustainability (boreholes and tanks)	4
Mobile clinic for Ward 4	3
Total	**10**

3.4.3. Legal Claims and Proceedings

[12.10(h)(iv)] [SR1.5(iv)] [SV1.2] [ESG4.3]

The Restitution of Land Rights Act, 1994 (Act No. 22 of 1994) provides for individuals or communities with claims to land ownership rights to apply for the restitution of, or compensation for, those rights. The process of redress is limited to the period after 19 June 1913 and the cut-off date for lodging such claims is 31 December 2018. This was addressed by the Draft Restitution of Land Rights Amendment Bill, published in Government Gazette No. 36477 of 23 May 2013 with the aim of amending the cut-off date for lodging such claims and regulating the administrative functions under the Land Rights Act. Submissions from the mining industry in this regard were made to the Minerals Council of South Africa, who submitted comments on the draft bill to the National Economic Development and Labour Council, who is addressing these and other comments with Government in a specially constituted task team.

The Company has signed a Memorandum of Understanding (**MOU**) with the Department of Land Affairs and Rural Development, (now called the Department of Agriculture, Land Reform and Rural Development) agreeing that all Company land claims, no matter to which property they apply, will be addressed in a separate forum and the claims on the properties will be researched and validated by an independent specialist.

Several lease agreements have been entered into by Goedehoop. Lease and servitude agreements are, in many cases, based on gentlemen's agreements and agreements that are undocumented and often unclear. In some cases, farm dweller settlements are located on these sites (AAC, 2020b).

The land claims pertaining to the Goedehoop operation that have been registered with the Regional Land Claims Commission are shown in Table 3-11, along with the status of each claim; the claims are in terms of Section 11(1) of the Restitution of the Land Rights Act No 22. As per information provided at a clarification meeting, the land claims are currently being considered by the Department of Agriculture, Rural Development, Land and Environmental Affairs (**DARDLEA**). Land claims and lease agreements are manged at a Company Group level; however, Goedehoop actively participates in land claims requirements and inspections from DARDLEA.

There are multiple grave sites on the Goedehoop North and South MRDs that were relocated as part of the MRD expansion projects. The relocation of 21 graves located in two informal burial grounds within the Goedehoop mining operations on the farms Koornfontein 27 IS and Bankfontein 340 JS, were undertaken in December 2017. The public consultation process, to identify next of kin for the graves, commenced in May 2017. There are currently 19 known graves sites with two sites having been relocated. According to the Environmental Audit Report by Shangoni Management Services (**Shangoni**) (Shangoni, 2019c), all the necessary permission required to relocate the graves were obtained. Gravesites identified at Goedehoop Colliery South Section are included in the grave site plan and are monitored on a regular basis as per the National Heritage Resources Act, No 25 of 1999. The grave relocation gave rise to numerous expectations from the affected families, which is addressed through continued and regular stakeholder engagement. According to the Environmental and Social Risks Assessment (AAC, 2014), the Mthimunye family has raised grievances regarding the grave relocation process and has allegedly been promised resettlement.

Table 3-11: Registered Land Claims over Goedehoop Colliery

Number	Farm and Portion	Current Owner	Description of Land Claim	Status
3217 & 6217	Kleinfontein 49 IS (4)	AOPL	L Fulathelwa	Selected financial compensation
1293	Enkeldebosch 20 IS (27)	AOPL	W Masimula	Selected land restoration
850	Enkeldebosch 20 IS (2)	Islardu Boerdery cc	Mosehla Family	Selected land restoration
2307	Enkeldebosch 20 IS (4)	Beestepan Boerdery(Pty) Ltd	Masango Family	Selected land restoration
10857	Enkeldebosch 20 IS (5)	AOPL	L Mashiloane	Requires claimant verification
9915	Bankfontein 340 JS (10)	AOPL	J Mabena	Selected financial compensation
10854	Hartbeestfontein 339 JS (1)	AOPL	BL Mahlangu	Requires gazetting
2096 & 1219	Koornfontein 27 IS (16, 17, 18)	AOPL	SS Mahlangu	Selected financial compensation
2287	Goedehoop 46 IS (2)	AOPL		
	Kleinfontein 49 IS (10)	AOPL	BP Masango	Selected financial compensation
	Kleinfontein 49 IS (5)	Ukufisa Inv Holdings (Pty) Ltd		
9901	Haasfontein 28 IS (11)	Islardu Boerdery cc	M Mushweni	Requires claimant verification
1381 & 10282	Haasfontein 28 IS (11)	Islardu Boerdery cc	P Masango	Requires claimant verification
9814	Welverdiend 23 IS (20)	C & J Boerdery cc	JM Mgibe	Requires claimant verification
9866	Welverdiend 23 IS (21)	Rudolf Schoeman Landgoed Pty Ltd	JM Sithole	Requires claimant verification

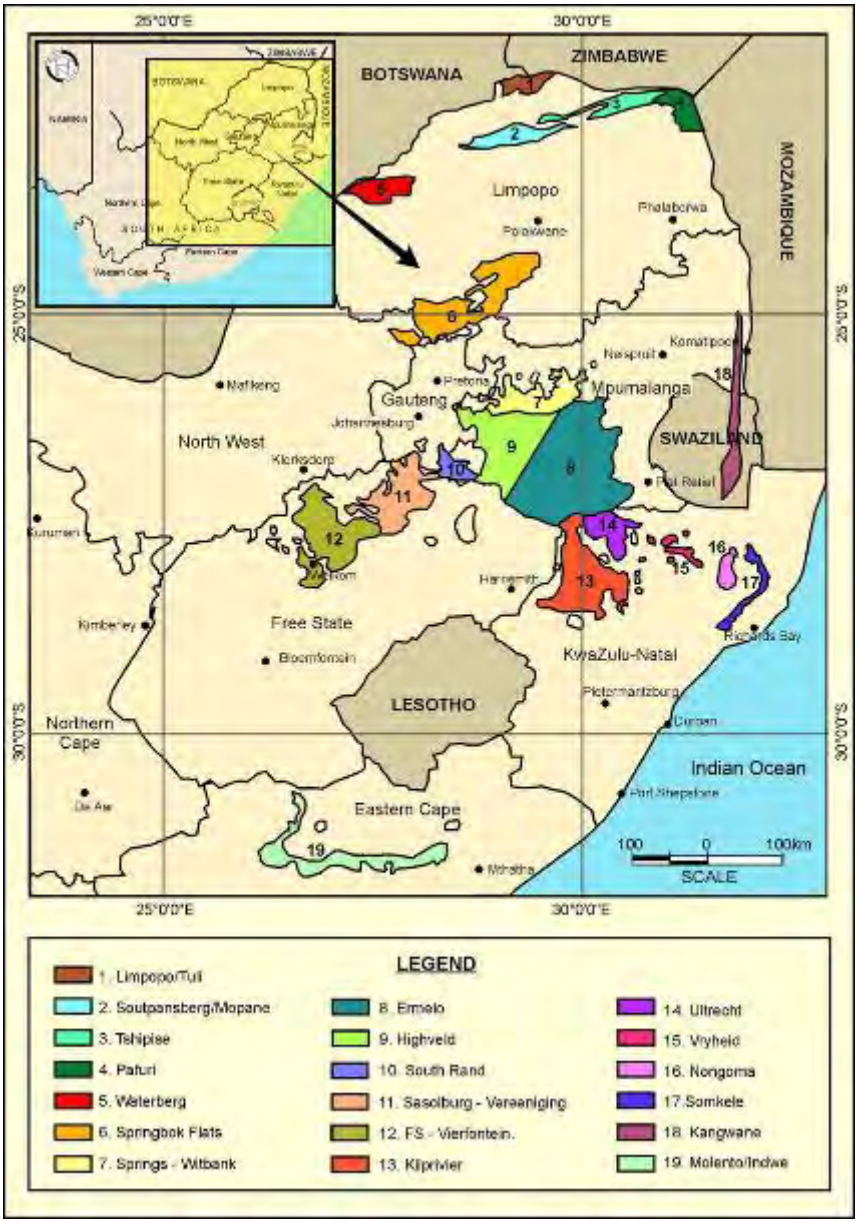
4. Geological Setting, Deposit and Mineralisation

[12.10(h)(v)] [SR2.1, SR3.1(vii)] [SV1.7]

4.1. Regional Geology

[SR2.1(i)]

Coal is found in South Africa in 19 coalfields, located mainly in KwaZulu-Natal, Mpumalanga, Limpopo, and the Free State, with lesser amounts in Gauteng, the North West Province and the Eastern Cape (Figure 4-1). All the coal deposits are found in the Karoo Supergroup, the majority in the Vryheid Formation of the Ecca Group, consisting predominantly of sedimentary rocks. Goedehoop Colliery is located in the Witbank Coalfield, within the Mpumalanga Province of South Africa (refer to Figure 1-2).

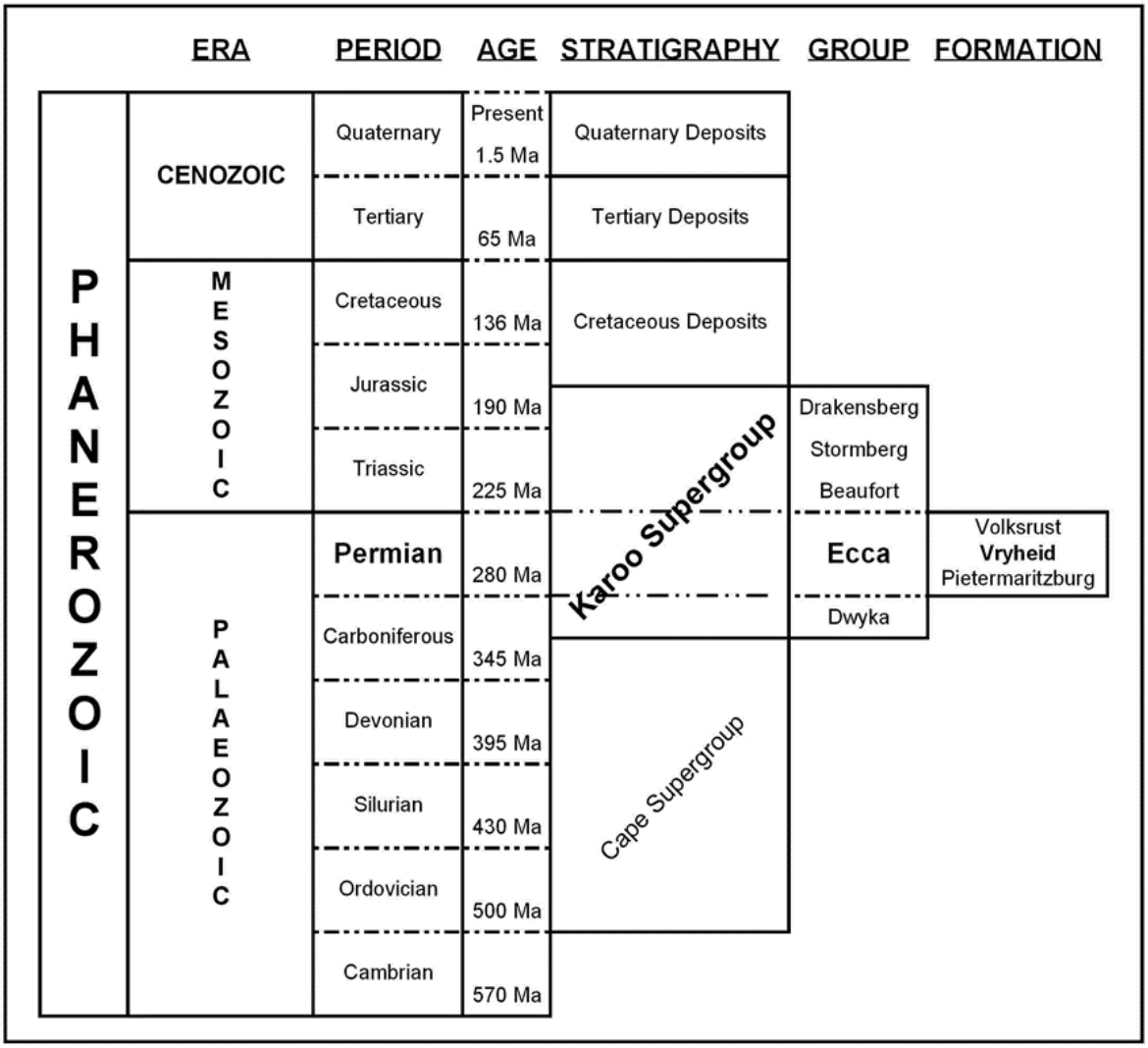


srk consulting | **GOEDEHOOP COLLIERY CPR** Location and Distribution of Coalfields in South Africa | Project No. 566657

Figure 4-1: Location and Distribution of Coalfields in South Africa

The Witbank Coalfield extends for over 180 km in an west-east direction between Springs in the west to Belfast in the east and 50 km from north to south between Middelburg in the north and Rietspruit in the south, where it is separated from the Highveld Coalfield by the basement palaeohigh known as the Smithfield Ridge. The area is underlain by sedimentary rocks of the Karoo Supergroup, deposited 248 – 290 Ma during the Permian Period (Hancox & Götz, 2014). The thickness of the Karoo Supergroup varies from thin in the north to thickest the palaeovalleys and towards the south, with the variation in thickness primarily due to the uneven nature of the pre-Karoo topography. This uneven pre-Karoo topography is also responsible for the controlling the presence and thickness of the Dwyka Group sequence.

The Karoo Supergroup comprises, from oldest to youngest, the Dwyka, Ecca and Beaufort Groups, with the coal seams hosted within the Vryheid Formation of the Middle Ecca Group (270 Ma) as illustrated in Figure 4-2.



srk consulting	**GOEDEHOOP COLLIERY CPR** Geological Timeline Indicating the Karoo Supergroup	Project No. 566657

Figure 4-2: Geological Timeline Indicating the Karoo Supergroup

4.2. Stratigraphy

The stratigraphy of the Witbank Coalfield is well described by Hancox & Götz (2014). The basal Dwyka Group sequence comprises massive diamictites with lesser matrix-supported conglomerates and coarse-grained

sandstones. Occasional siltstone interbedded with sandstone, pebbly mudstones and varved siltstones are also present. The diamictites are composed of sub-angular to sub-rounded clasts primarily comprising granites, quartzites, mudstones and calcareous sandstones.

The Vryheid Formation (Figure 4-3) overlies the diamictites and other glacially derived sediments of the Dwyka Group. The Vryheid Formation sediments represent bituminous coal-capped upward fining cycles of clastic sediments, deposited in a fluviodeltaic/shallow marine environment. The formation is characterised by a variety of sandstones, mudstones and siltstones, with lesser amounts of coal and occasional gritstones. Five coal seams are present within the Vryheid Formation, the Number 1, 2, 3, 4 and 5 Seams, named from the base up (Figure 4-3). The Number 1 Seam (**No 1 Seam**) is patchily developed across the coalfield, occurring the in lower parts of the palaeovalleys, and is rarely more than three metres thick (Jeffrey, 2005). In some areas of the Witbank Coalfield, the No 1 Seam is a source of high-grade steam coal suitable for export after beneficiation (Smith and Whittaker, 2005 and Snyman, 1998). According to Barker (1999), the No 1 Seam frequently has very low phosphorus content and in such cases, it is usually mined separately as metallurgical feedstock.

Due to its high coal quality, No 2 Seam has historically been the most valuable seam to mine and export. In the latter part of the last century it formed the bulk of the high-grade steam coal exported to Japan. However, much of the seam has now been extracted and only remnants remain. The seam is generally in excess of four metres thick and frequently displays up to seven well-defined, vertical quality zones, related to the environment of deposition and peat accumulation. The three basal zones are the highest quality coal and were mined mainly for the production of low-ash metallurgical coal and export steam coal to Japan (Jeffrey, 2005). The upper part of the seam is generally shaley and frequently unmineable; selective mining takes place within the better-quality lower part of the seam.

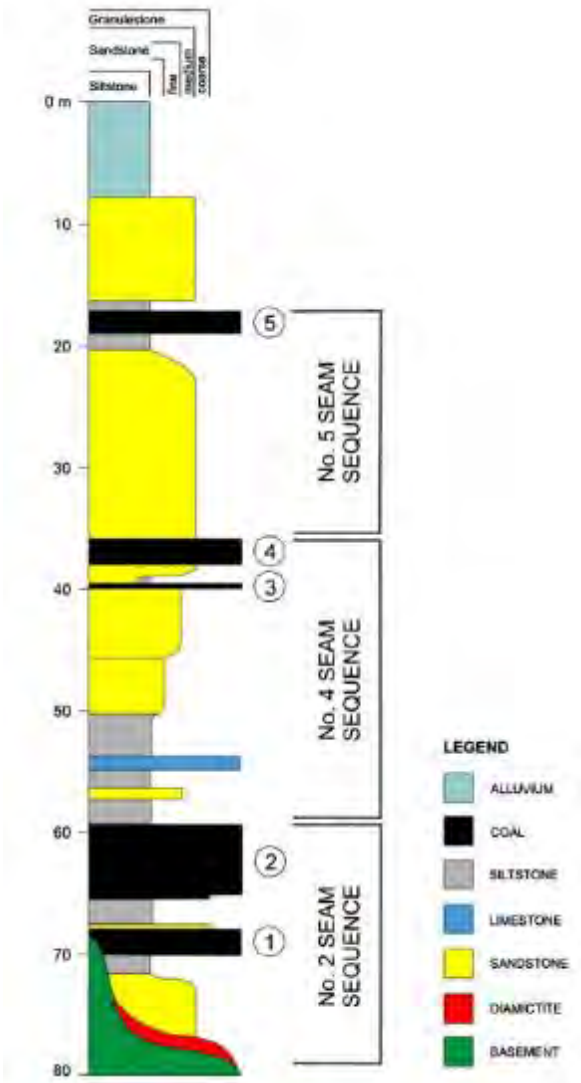
Although No 3 Seam also consists of high-quality coal, it is usually thin (0.5 m) and is generally not mineable, except where it reaches thicknesses around one metre in surface operations. However, sulphur content in the No 3 Seam can be high and unfortunately is not reduced by beneficiation.

The No 4 Seam ranges in thickness between 2.5 to 6.5 m and is frequently split into an No 4 Seam Upper (S4U) and No 4 Seam Lower (S4L), with an additional upper (split S4A) also occurring in places. The partings between the seams consist of mudstone or siltstone and the coal is usually dull to dull-lustrous; the upper coal splits are generally lower quality than the lower splits. The coal is commonly used as feedstock for local Eskom power generation, but portions can be beneficiated to produce an export coal (Jeffrey, 2005). This seam is now the most commonly mined seam in the coalfield, due to the near exhaustion of the No 2 Seam.

The No 5 Seam occurs as an erosional remnant in higher lying areas of the coalfield and has been extensively mined in the central Witbank Coalfield as a source of blend coking coal (Smith and Whittaker, 2005). It is usually less than two metres thick but very little now remains due to previous mining.

Witbank coal seams dip gently to the south (1 - 3°), are flat to gently undulating and pinch out against the basin edge to the northwest. Localised steepening of the seams may occur close to basement highs. The seam floor topography is a direct result of the underlying palaeofloor and significant conformity in the floor topographies is observed from the base to the top of the coal bearing sequence.

During the mid-Jurassic break-up of the Gondwana continent, dolerite intruded the Karoo sediments (Hancox and Götz, 2014) in the form of sills and dykes. These occur throughout the stratigraphy, transgressing the seams in places and becoming more frequent south of the Ogies Dyke, a major west-east striking intrusion of up to 15 m in thickness and over 100 km in length. The sills vary from 15 to 50 m in thickness and may transgress the coal seams, causing tilting and displacement of the strata and resulting in discrete mining blocks at different elevations. Most dykes are usually less than a few metres thick and trend east, northeast or north. Some devolatilization of the coal is generally associated with these intrusions, varying in both severity and extent and having a negative impact on mining conditions. However, the metamorphic impact of the bifurcating 20 m thick so-called Witbank Sill has caused a localised increase in rank, with areas of high moisture content corresponding to devolatilized areas (Hancox and Götz, 2014). Faulting is usually not severe and is generally associated with dolerite intrusions.



srk consulting	**GOEDEHOOP COLLIERY CPR** General Stratigraphy of the Vryheid Formation in the Witbank Coalfield *(Hancox and Götz, 2014)*	Project No. 566657

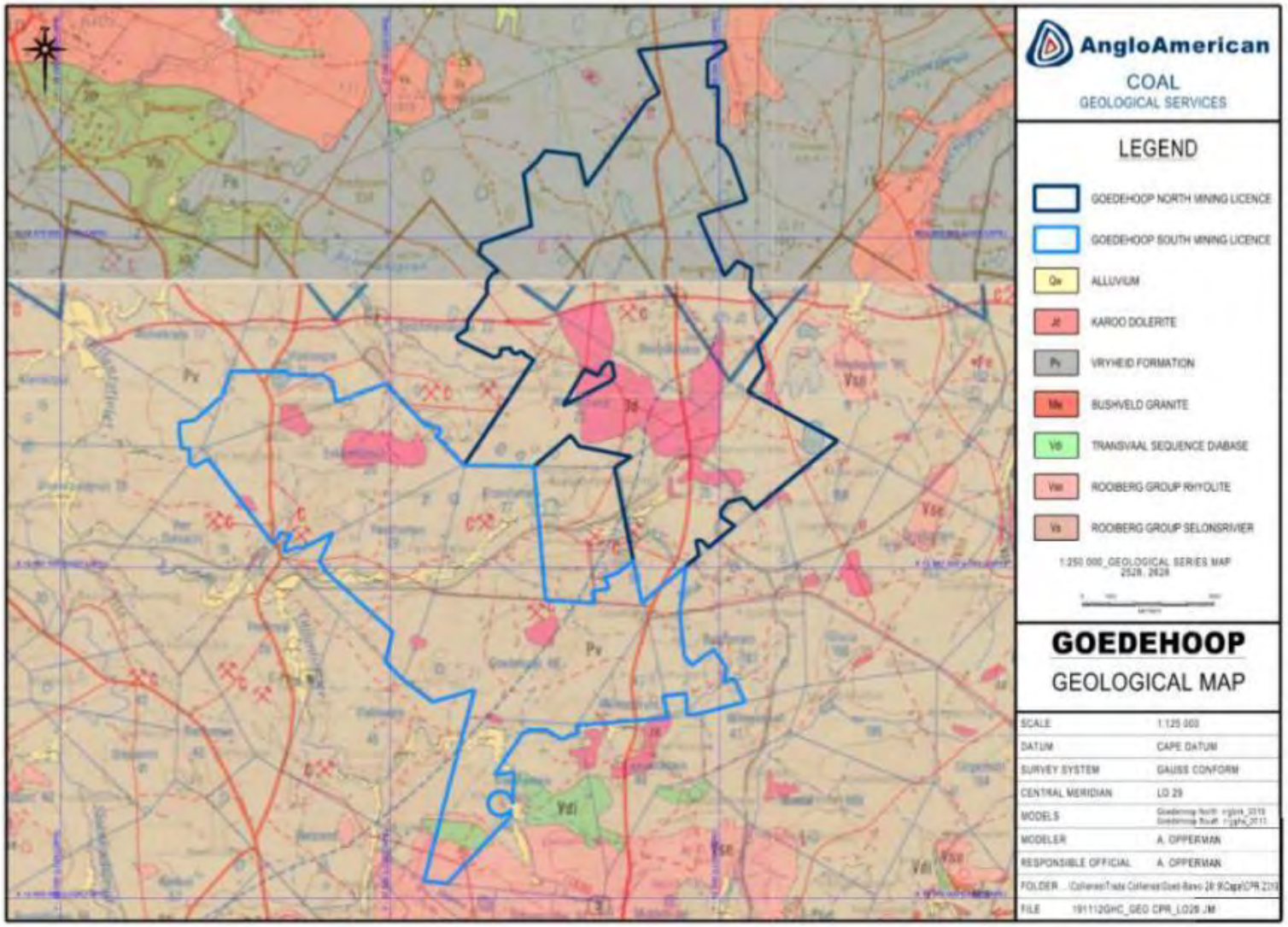
Figure 4-3: General Stratigraphy of the Vryheid Formation in the Witbank Coalfield

4.3. Local Geology

[SR2.1(ii)(iii)(iv)]

4.3.1. Surface Geology

Surface material at Goedehoop consists of weathering products of the sandstones, siltstones and mudstones of the Vryheid Formation as well as Karoo dolerite. The top layer consists of reddish-brown sandy soil, with clayey-sandy subsoil below. The Goedehoop surface geology is illustrated in Figure 4-4.



srk consulting	**GOEDEHOOP COLLIERY CPR** Goedehoop Surface Geology *(Source: Goedehoop South Resources CPR 2019 – AAC,2019l)*	Project No. 566657

Figure 4-4: Goedehoop Surface Geology

4.3.2. Weathering

Weathering generally does not extend deeper than approximately 10 m at Goedehoop, although isolated areas display weathering to depths of around 40 m. Weathering negatively affects the mineable Coal Resource, but rarely has an impact of the physical mining operation in terms of mining method and design.

4.3.3. Sub-surface Geology

Strata at Goedehoop are typical of the Witbank Coalfield, with all five coal seams being present on the property. Underlying the coal sequence of the Vryheid Formation are glacial deposits of the Dwyka Group, which accumulated on the erosional pre-Karoo basement surface. Figure 4-5 illustrates the typical stratigraphy encountered at Goedehoop, as determined from drill hole intersections. The units are described from the base upwards in the following paragraphs.

Pre-Karoo Basement

The palaeotopography of the pre-Karoo basement largely controlled the deposition of the lower coal seams and partings. At Goedehoop, the basement consists of an uneven floor of older rocks composed of gabbro, diabase and felsite associated with the Bushveld Complex.

Dwyka Group

The glacial deposits of the Dwyka Group vary within the project area and consist of diamictites, sandstones, siltstones and mudstones that have frequently been reworked by fluvial action.

Ecca Group

The Vryheid Formation of the Ecca Group conformably overlies the Dwyka Group and comprises zones of alternating conglomerates, sandstone and mudstones within which the coal seams are located. The general stratigraphy of the Vryheid Formation may be divided into three main sequences, all of which are observed at Goedehoop: a basal No 2 Seam Sequence, overlain by the No 4 Seam Sequence, which in turn is overlain by the uppermost No 5 Seam Sequence. Due to slight variations in, for example, partings as well as seam thicknesses, the Ecca Group characteristics are discussed separately for Goedehoop North and Goedehoop South. Figure 4-5 depicts the typical stratigraphy for both Goedehoop North and Goedehoop South.

<u>Goedehoop North</u>

No 2 Seam Sequence

Both the No 1 and the No 2 Seams occur in this sequence and are described from the base of the sequence upwards (Figure 4-3 and Figure 4-5). The Vryheid Formation of the Ecca Group conformably overlies the Dwyka Group, with the No 1 Seam conformably overlying these glacial sediments.

The No 1 Seam is present over 70% of the Goedehoop North area. It is highly variable with respect to both quality and thickness (increasing to the west). Although the No 2 Seam is the primary mining seam, there are areas where the No 1 Seam can be mined in a “Bottom Coaling” operation, if the safety factor allows. The remaining No 1 Seam Coal Resources (the majority of which lie under the current Goedehoop North MRD) are on average 3.25 m thick and host two erratic, gritty sandstone in-seam partings ranging in thickness from 0.22 to 0.70 m. Mining of the No 1 Seam is constrained by the cuttability challenges presented by these intra-seam partings.

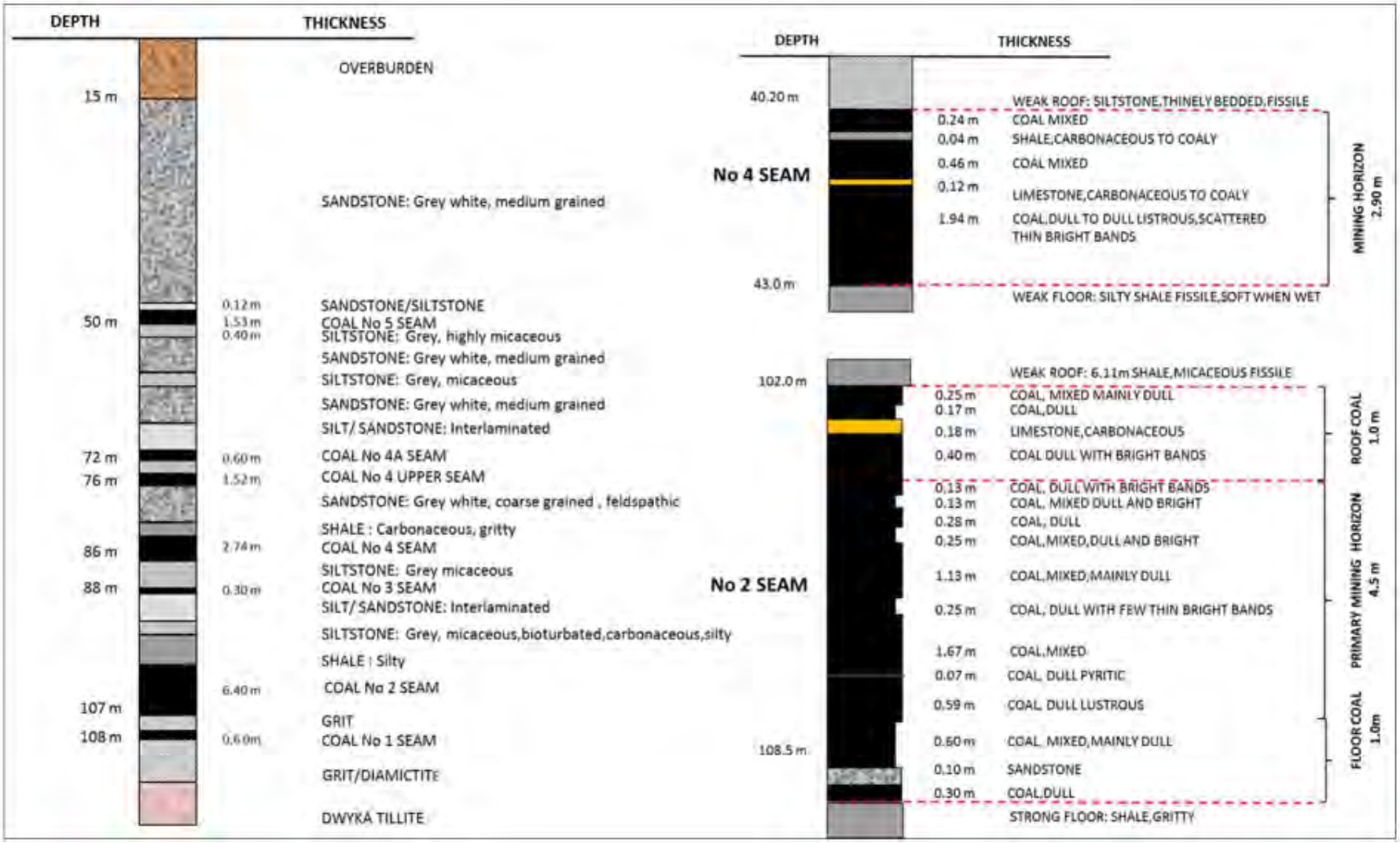
The No 2 Seam is developed over the entire mine area, has an average thickness of six metres and varies in depth from 20 to 140 m below surface. Thicker coal (up to 10 m) occurs mainly to the south of the Ogies Dyke. Thicker seams also usually occur where the P1 parting is not developed, resulting in a combined No 1 and No 2 Seam. Five broad zones are recognised within the No 2 Seam:

- The lowest zone, the Floor Coal (**S2FC**) consists of dull to shaley coal and may not always be present;
- This is followed by the Bottom Coal (**S2BC**), typically a dull-lustrous with a few bright bands, which is between one to two metres thick. Separating the Bottom Coal from the overlying Select Coal (especially at the Simunye Shaft) is a thin, persistent pyritic, coaly shale band, locally referred to as the Simunye Marker. In the “Schoonie Rolls”, the Simunye Marker is poorly developed, making it difficult to separate the Bottom Coal from the Select horizon;
- This marker is overlain by approximately three metres of Select Coal (**S2S**), varying between 0.5 and

6 m thick and representing the main mining horizon. One or more siltstone bands, typically 0.10 to 0.25 m thick can be used as marker horizons. Thicker siltstone lenses have been encountered on the eastern side of South Shaft and are known to cause significant problems during the mining process;

- The fourth, or Top Coal zone (**S2TC**), is approximately 1.5 m thick, has bright coal bands at its base, becoming duller towards the top. It can also be identified by shaley, pyritic limestone lenses (markers). At Simunye Shaft, these are used as important roof markers; and
- The fifth and uppermost zone, or Roof Coal (**S2RC**) is not always present but can be up to 1.5 m thick. It consists mainly of dull to shaley coal of inferior quality. Where present, Roof Coal is included in the mining horizon as the current reserve blocks are mined from the roof down to a height of 4.50 m. In areas where the roof shales are not slickensided or fractured (commonly associated with steep floor gradients), roof conditions are generally good. Due to the mining height being selected from the roof down, coal from either the Select Coal, Bottom Coal or Floor Coal usually makes up the floor.

Contrary to the Simunye main shaft and region south of the Ogies Dyke, the remaining No 2 Seam Coal Resources (north and southeast) are extremely variable in occurrence. In the northern and northeastern region, the seam pinches to 2.0 m thick, with a gritty in-seam parting characterizing the seam. The coal quality is inherently extremely poor. The well-developed zones in these areas are: S2RC, S2BC and S2FC with a very thin top coal zone occurring in patches.



srk consulting	**GOEDEHOOP COLLIERY CPR** Typical Stratigraphy encountered at Goedehoop *(Source: Goedehoop South Resources CPR 2019 – AAC,2019l)*	Project No. 566657

Figure 4-5: Typical Stratigraphy encountered at Goedehoop

The southeastern region (Brown 2) of Simunye Shaft contains thick partings (sandstone/gritstone/ limestone and a combination of mudstone and shale). This has necessitated a separate schema in the geological model, with different sub-seams for this area:

- The lowermost sub-seam, the S2L, is comprised of dull to shaley coal with low yields and averages approximately 0.40 m thick. This is overlain by a parting, referred to as the P2L (gritstone/siltstone and sometimes shale/mudstone), which averages 0.17 m in thickness.
- The middle sub-seam, the S2M, is characterised by dull lustrous coal with very thin bright bands and averages 0.90 m in thickness. The P2M parting (gritstone/siltstone and sometimes shale/mudstone) overlies the S2M and averages 0.35 m in thickness.
- The uppermost sub-seam, the S2U, hosts good qualities (bright coal) and averages 4.10 m thickness, with a larger portion ranging from 4.50 to 5.70 m.

This vertical zoning of the No 2 Seam is summarised in Table 4-1.

Table 4-1: Sub-seams of the No 2 Seam at Goedehoop North

Sub-seam	Description	Lithology	Average Thickness (m)	Partings
Simunye Shaft and south of the Ogies Dyke				
S2RC	Roof Coal	Dull to shaley coal	1.51	
S2TC	Top Coal	Bright coal at the base, duller coal towards the top	2.28	Shaley, pyritic limestone lenses
S2S	Select Coal	Lustrous and dull coal layers	2.72	One or more siltstone bands
S2BC	Bottom Coal	Dull-lustrous coal with a few bright bands	1.87	
S2FC	Floor Coal	Dull to shaley coal	1.49	
Brown 2				
S2U	Upper Coal	Bright coal	4.10	
S2M	Middle Coal	Dull lustrous coal with very thin bright bands (20 – 40% bright)	0.90	P2M: Gritstone/siltstone, shale/mudstone
S2L	Lower Coal	Dull to shaley coal	0.40	P2L: Gritstone/siltstone, shale/mudstone

No 4 Seam Sequence

Although often of good quality, the No 3 Seam is poorly developed throughout the coalfield and is not exploited at Goedehoop.

The No 4 Seam Coal Resources underlie most of the Goedehoop area, except in the northeastern part, where the distribution is patchy. The seam thickness is generally between 2.00 and 3.00 m. The expected practical Steam Coal yield (at 26.40 MJ/kg) is 30 to 40 percent in the north and east, increasing to 50 to 65% in the south and west. The seam is also shallowest in the area immediately to the north and east of the Simunye Shaft complex and rapidly deepens to the south and west. Opencast potential exists to the north of the shaft area, where the No 4 Seam is on average 25 m below surface.

There is no recognisable vertical quality variation in the No 4 Seam. The coal is dull lustrous to lustrous with occasional bright bands and in certain areas, intra-seam partings (comprising limestone, siltstone, shale and occasionally sandstone) occur.

The floor, consisting largely of a sandstone/siltstone or a micaceous siltstone combination, is expected to be

reasonably competent with floor breakages restricted to the north western portion of Simunye No 4 Seam resource area. However, the interlaminated shale-siltstone roof may present stability issues during extraction.

The No 4A and No 4U Seams are found above the No 4 Seam but are relatively thin and are not mined at Goedehoop.

No 5 Seam Sequence

The No 5 Seam is present in the western, southern and southeastern parts of Goedehoop North. In the resource area, the seam is generally between 1.30 and 1.80 m thick, with the depth below surface ranging between 20 and 50 m.

Several dykes, with wide zones of burnt coal, have been encountered. Dolerite sills have also displaced the seam into blocks at different elevations and burnt substantial areas. Dolerite intrusions in the vicinity of the East Shaft have caused severe burning.

An interlaminated siltstone/sandstone layer (up to 0.3 m thick) overlies the seam and separates easily from the overlying strata and must be removed to ensure stable roof conditions. Roof conditions are good in areas where the immediate roof consists of sandstone, except where the sandstone is waterlogged. The floor of the seam generally consists of mudstone, which breaks easily under passage by heavy equipment.

Goedehoop North MRD

Lower quality discard material from previously mined and beneficiated coal (both the No 5, No 4, No 2 and No 1 Seams) has been placed on the MRD. The deposit is heterogenous in character, due to the deposition of discard material from different mining areas and different seams being placed at similar times. A raw product coal is currently being sold to a third party under contract.

Goedehoop South

No 2 Seam Sequence

Both the No 1 and the No 2 Seams occur in this sequence and are described from the base of the sequence upwards (Figure 4-5).

The No 2 Seam averages 6.50 m in thickness (but ranges from 5.00 to 7.50 m). The average depth below surface is 75 m, ranging from subcrop in topographic lows (such as along the Olifants River in the south), to a maximum of 130 m (in the eastern area of the Hope Shaft). The No 2 Seam shows well-defined zoning, with up to six zones of differing quality. It is mined to a maximum height of 4.5 m.

At Vlaklaagte and the northern blocks at Hope Shaft, the mining floor is below a sandstone/siltstone parting (designated the Springbok Parting) ranging from 0.01 to 0.04 m at the junction of Zone 1 and 2, one to two metres off the true floor. The No 2 Seam Select mining horizon is restricted to Zones 2, 3 and 4.

Table 4-2: Sub-seams of the No 2 Seam at Goedehoop South

Sub-seam	Lithology	Average Thickness (m)	Quality Description	Practical Yield (%)
6	Dull lustrous	0.4 – 1.0	Poor – moderate	> 40
5	Dull lustrous	0.5 -3 .5	Poor	< 20
4	Dull lustrous	1.0 – 1.50	Moderate – good	> 50
3	Dull lustrous (20 – 40% bright)	2.0 – 2.5	Good	> 65
2	Dull lustrous (20% bright)	1.0 – 1.5	Medium	> 50
1	Dull to shaley	0.0 – 2.0	Poor	< 30

No 4 Seam Sequence

The No 4 Seam at Goedehoop South varies in thickness from 2.20 to 3.30m, averaging 2.80 m. The average depth to the seam floor is 40 m, ranging from a subcrop (in the far northern extent of Vlaklaagte and in Koornspruit), to a maximum of 80 m (in the eastern part of the Hope area).

A limonitic mudstone parting (up to 0.20 m in thickness) separates a lower, better-quality zone (mainly dull lustrous coal) with an average thickness of 1.90 m, from an upper, poorer quality zone (mixed dull and bright coal) averaging 0.70 m. Other lenticular mudstone partings of up to 0.40 m in thickness occur within the upper zone. In the Block 14 area, seam displacements of up to 1.5 m occur due to faulting, creating higher contamination levels and poor roof conditions. The mineable horizon is defined as the full seam height.

No 5 Seam Sequence

The No 5 Seam has been extensively eroded and is therefore restricted in distribution. The seam ranges in thickness from 0.98 to 2.10 m with an average of 1.42 m. Overburden depth ranges from sub-outcrop to 58 m, with an average depth of 40 m. The seam comprises mixed, mainly bright, banded coal with a thin intermittent mudstone parting of 0.05 to 0.10 m thickness, located 0.20 to 0.30 m above the floor.

Goedehoop South MRD

Lower quality discard material from previously mined and beneficiated coal (both the No 5, No 4 and No 2 Seams) has been placed on the MRD. The deposits are heterogenous in character, due to the deposition of discard material from different mining areas and different seams being placed at similar times. A beneficiated product coal can be produced for an export grade product of 20.10 MJ/kg.

4.3.4. Pre-Karoo Topography

The underlying pre-Karoo topography and the present-day erosional surface control the coal seam topography and areal distribution. Both the No 2 and No 4 Seams are extensively developed, while the No 1 Seam distribution is restricted by the pre-Karoo palaeotopography and the No 5 Seam has been significantly impacted by the present-day erosion levels.

In the Goedehoop area, the coal seams are mainly flat lying to gently undulating, but gradients of up to 12 degrees can be encountered over pre-Karoo highs, particularly in the No 2 Seam resource areas.

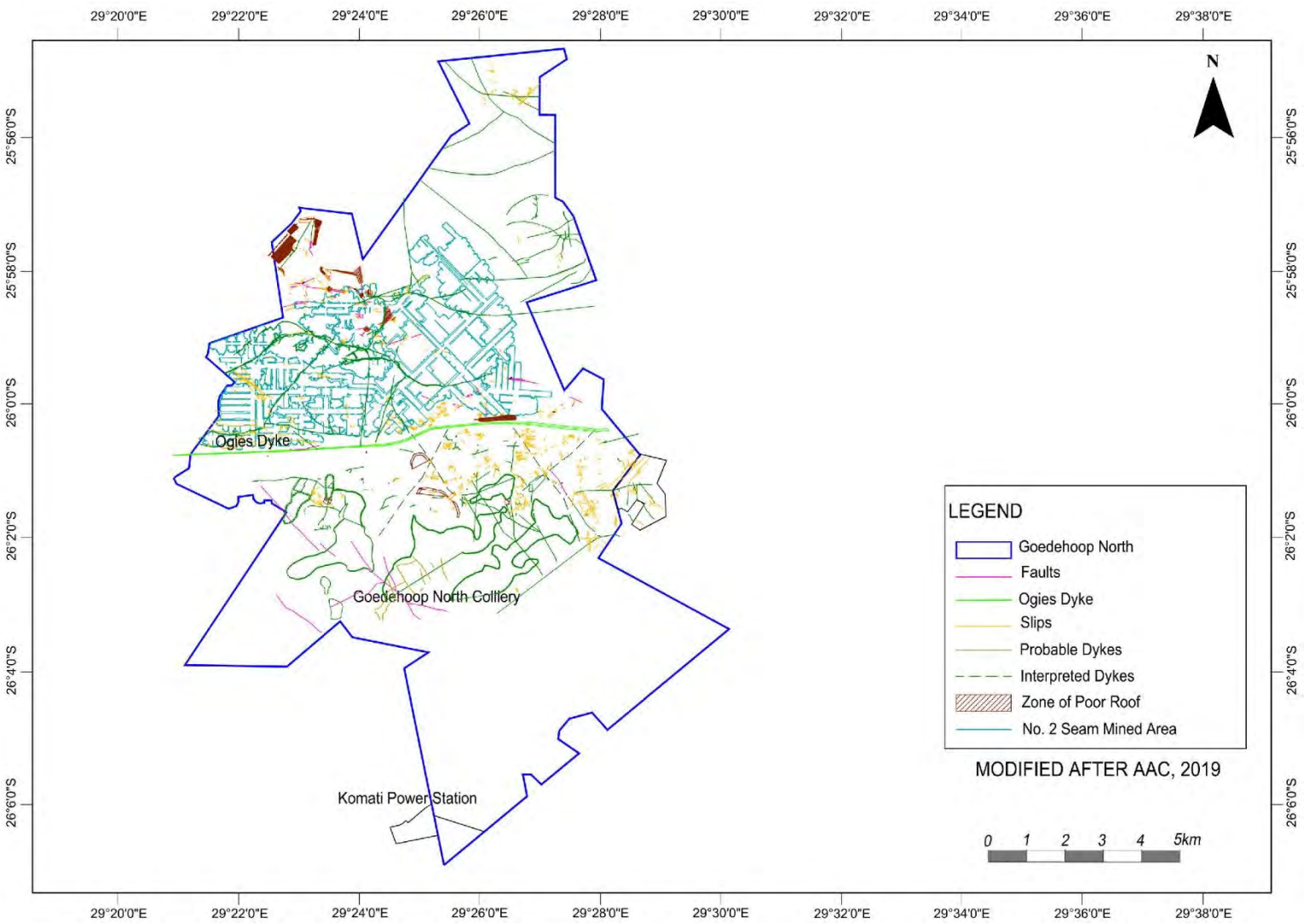
4.3.5. Faults and Slips

There are no reported faults in Goedehoop North, while minor small-scale (1.5 m throw) faulting has been reported in the No 4 Seam in the Block 14 area of Goedehoop South. Seam dislocations occur along some dykes or where sills transgress the coal seams, but these are not interpreted as true faulting.

4.3.6. Igneous Intrusions

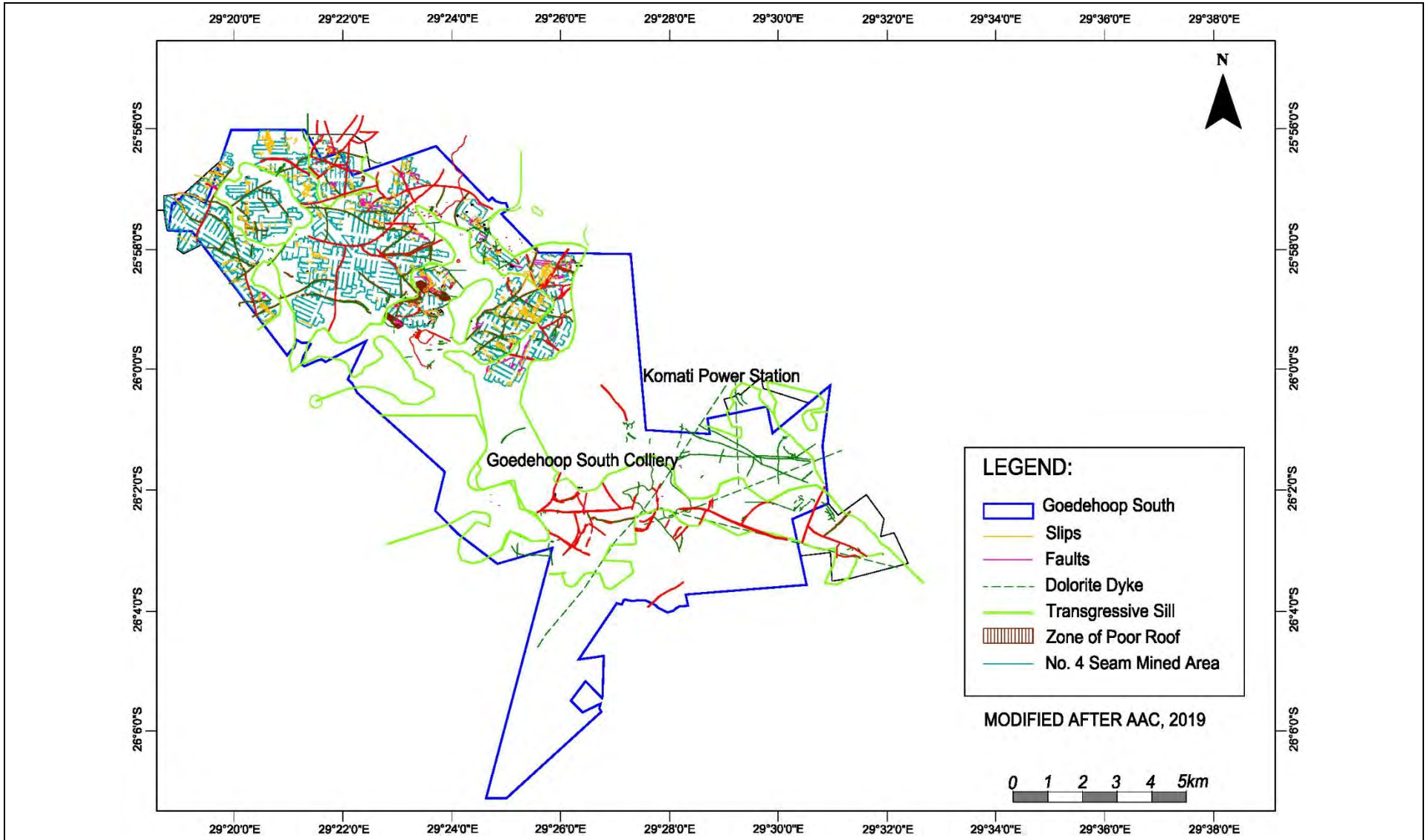
The Goedehoop area has been intruded by transgressive Karoo dolerite sills (Figure 4-6 and Figure 4-7), varying between 10 and 25 m thick. This has resulted in displacement of the seams approximately equivalent to the sill thickness and as a result, the line of the sill transgression forms the basis of the division of the resource blocks. Large areas of coal have been devolatilised where the sill is in close proximity to the seam. This burnt zone can range from a few metres to 100 m with the dry ash-free volatile limit of 24% defining the boundary of the devolatilised coal. All areas of burnt or devolatilised coal, related to sill intrusions, are excluded from the Coal Resources.

Dolerite dykes (and stringers), between 0.5 m to 3.5 m thick, are commonly encountered. The average dyke spacing is 200 to 500 m with a preferred orientation of northwest-southeast and northeast-southwest. The zone of devolatilisation associated with the dykes is highly variable (from one to ~100 m). The width of the devolatilised zone does not necessarily relate to the thickness of the dyke.



srk consulting	**GOEDEHOOP COLLIERY CPR** Structural Interpretation for Goedehoop North (*Source: Goedehoop North Resources CPR, 2019 – AAC, 2019m*)	Project No. 566657

Figure 4-6: Structural Interpretation for Goedehoop North



srk consulting	**GOEDEHOOP COLLIERY CPR** Structural Interpretation for Goedehoop South (*Source*: *Goedehoop South Resources CPR, 2019 – AAC, 2019l*)	Project No. 566657

Figure 4-7: Structural Interpretation for Goedehoop South

Aeromagnetic Data

Aeromagnetic data has provided additional structural information and indicated areas that would require additional exploration, either by surface vertical or underground directional drilling. Resistivity work has also been done in the past to determine the depth of weathering.

Four aeromagnetic surveys were flown over portions of the Goedehoop North Colliery during 1990 and 1992 and three aeromagnetic surveys over portions of the Goedehoop South Colliery between 1996 and 2004 (Figure 4-8). An internal memorandum (dated 2013) noted that these surveys are of good quality but recommended that the data be reprocessed professionally to improve the imagery and subsequent interpretations. The entire area is also covered by a regional aeromagnetic survey undertaken by the Council for Geoscience.

In 2018, Spectrem Air (Pty) Ltd conducted the interpretation of the data of Survey G30564– DouglasBank1, which covers a portion of Brown 2 at Goedehoop North, with the purpose of identifying structures, e.g. dykes, sills and faults (Khoza, 2018). None of the drill holes within proximity of the possible dykes interpreted from the survey, show any signs of devolatilisation. Possible reasons for this may be that the dykes are thin and therefore have limited influence on the surrounding coal or the dykes are located within the Pre-Karoo below the coal deposit. Underground horizontal drilling ahead of mining is recommended to confirm the locality and extent of these and any other dykes.

In 2012, a combined trial ground magnetic and resistivity survey was undertaken in the northwestern portion of Goedehoop North. The aim was to determine the depth of weathering, and to identify intrusive structures in virgin reserve blocks. No geological structures were confirmed with this trial survey, but a number of anomalies were identified. However, surface vertical drilling failed to confirm the source of these anomalies.

The possibility of completing a trial 3D Seismic survey was investigated, but due to technical and financial constraints, a decision was made not to pursue this option.

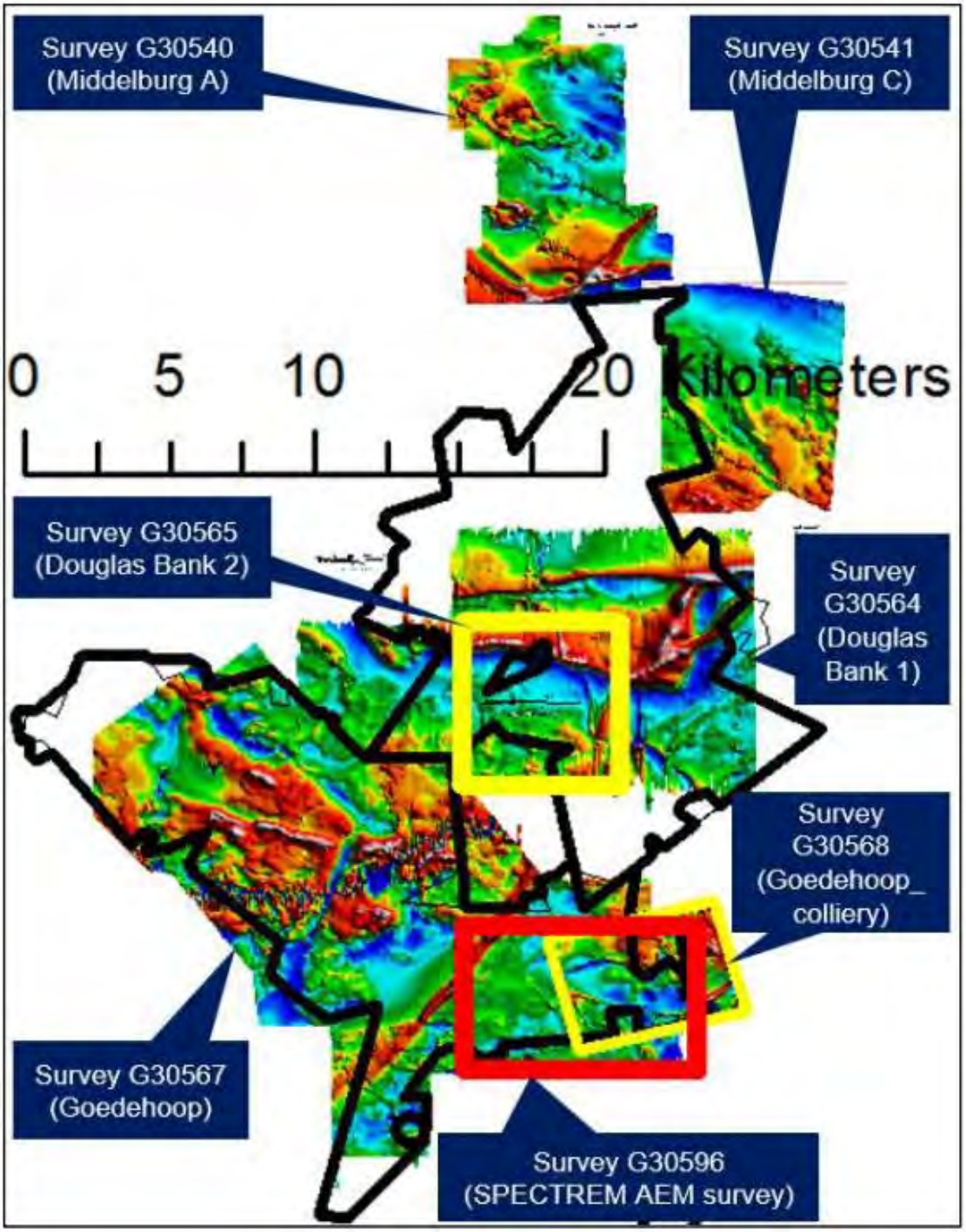
4.3.7. Geological Domains

Goedehoop North

Goedehoop North consists of a single horizontal sedimentological domain as the depositional environment is similar throughout the area. Structural elements such as dolerite dykes and sill transgressions subdivide the area into separate horizontal structural domains. However, the No 2 Seam domain varies in a vertical sense due to different geological characteristics and/or qualities, which divide the seam up into different sub-seams (refer to Section 4.3.3). The No 4 Seam is not subdivided vertically.

Goedehoop South

As with Goedehoop North, the Goedehoop South area consists of a single horizontal sedimentological domain and a number of separate horizontal structural domains. The No 2 Seam is subdivided vertically into six zones, based on the variable nature of the coal, but the No 4 Seam is not.



srk consulting	**GOEDEHOOP COLLIERY CPR** Aeromagnetic Interpretation of the Goedehoop Area (*Source*: *Goedehoop North Resources CPR, 2019 – AAC, 2019m*)	Project No. 566657

Figure 4-8: Aeromagnetic Interpretation of the Goedehoop Area

5. Exploration and Drilling, Sampling Techniques and Data

[12.10(e)(iii), 12.10(h)(vi)] [SR2.1(iii), SR3.1, SR3.2] [SV1.8]

5.1. Exploration

[SR2.1(iii), SR3.1] [SV1.8]

5.1.1. Historical Exploration

Historical exploration activities included vertical surface drill holes, underground in-seam drilling from within the working areas and geophysical surveys. The surface drilling has employed cored drill holes to gather information regarding horizon and strata depths and thicknesses and to recover samples for laboratory analysis. The underground drilling has employed non-cored drill holes to gather structural data ahead of mining from focused directional drilling; the data from these drill holes is not incorporated into the geological model but assist with long- and short-term planning.

Data gathered from aeromagnetic surveys has been used to provide additional structural information and to identify areas that require additional drilling. Ground magnetic and resistivity surveys have been trialled to estimate the depth of weathering. Some of the more recent drill holes have been geophysically surveyed using specialist downhole tools. This assists with depths of intersections, correlation of coal seams and provides quality control of the drilling operation.

Goedehoop North

In excess of 4 000 exploration holes have been drilled at Goedehoop North, the majority of them before 2008 (Table 5-1). 141 exploration holes have been drilled since 2016, and 36 holes were drilled to install geophones during the same period.

A total of 47 drill holes totalling 3 380 m were drilled in 2017, of which 32 were drilled for Simunye 4 Seam for resource classification drilling and 15 were drilled to better delineate the intra-seam parting in the No 1 Seam. In 2018, 22 structural, grade control and intra-seam parting delineation holes were drilled for the No 4 Seam, totalling 1 291 m.

There were no material changes in the No 4 Seam with the new data added in 2017/2018. However, the interpretation of the No 1 Seam in the north resulted in changes in the Coal Resources in that portion of the model. Delineation of No 4 Seam intra-seam parting (South Eastern Reserve Block) resulted in seam thickness changes in that portion of the model.

Goedehoop South

Over 4 600 exploration holes have been drilled at Goedehoop South, also mostly before 2008 (Table 5-1). Since 2017, 27 holes have been drilled for the installation of geophones, while another 34 were drilled for exploration purposes.

Table 5-1: Historical Drilling Programmes

Year	Number and Type of Drill Holes				Drilling Company
	Goedehoop North		Goedehoop South		
	Exploration	Geophone	Exploration	Geophone	
2019	35	10	4	5	Zaaiman Exploration Drilling
2018	24	13	22	14	Zaaiman/Fugro Earth Resources
2017	47	5	8	8	Zaaiman Exploration Drilling
2016	35	8	-		Zaaiman Exploration Drilling
2015	31		29		Zaaiman Exploration Drilling
2014	26		46		Zaaiman Exploration Drilling
2013	48		108		
2009 - 2012	587		437		Zaaiman/Fugro Earth Resources
2008 and prior	>3200		>4000		

5.1.2. Current Exploration

Current exploration drilling is governed by the relevant sections of Anglo American Coal Standard(s) and Requirements Document (**AAC SRD**):

- Anglo American Coal OMS Operations Geology Standard AAC SD 23-25-107: Exploration (**AAC SD 23-25-107: Exploration**):
  - Manage Borehole Drill Data;
  - Manage Exploration Plan;
  - Manage Surface Drill Performance;
  - Perform Surface Drilling and Preparation; and
  - Seal Surface Geological Boreholes & Rehabilitation.

Exploration drilling should ideally be performed on a regular grid; however, various obstacles prevent this:

- The existing irregular drilling pattern;
- Surface water features; and
- Existing infrastructure (for example, the Rapid Load-out Terminal (**RLT**), power lines, road servitudes and agricultural activities).

Where possible, drilling is done when any of these areas become accessible. The impact of an irregular grid on the modelling is reduced as much as possible; residue impacts are catered for in the modelling algorithms.

5.1.3. Future Planned Exploration

[12.10(e)(iii)]

Future exploration is planned for Goedehoop North only:

- Surface Diamond Drilling: this is aimed at ensuring the minimum drill hole spacing for classifying Measured Coal Resources as specified by SANS 10320:2020 (refer to Section 6.5 for details). More closely spaced drilling is done in areas where structural complexities occur (for example, faulting, intrusions, seam thinning, areas of subcrop). This ensures the geological model better reflects the actual geological conditions. The holes are geologically and geotechnically logged and sampled; the samples

are sent to the appropriate laboratories for analysis and the results incorporated into the modelling;

- Downhole Geophysical (wireline) Logging: the aim of the downhole geophysical logging (calliper, resistivity and density tools) is to assist with quality control of the drilling process, and optimisation of the sampling of the coal seams. At least 40% of the drill holes drilled during 2017 were logged; from 2018 onwards, standard geophysical logging of all cored drill holes was included in the Exploration standard; and
- Underground Diamond Drilling: horizontal in-seam drilling is done ahead of mining to provide timeous information on geological structures and possible methane and water strikes. In-seam drilling is done in both production and development sections.

A summary of the planned exploration expenditure is given in Table 5-2.

Table 5-2: Goedehoop Exploration Drilling Budget (Goedehoop North)

Region	Core Drill Holes	Total Length (m)	Cost Estimate (ZAR)	Samples Planned	Cost Estimate (ZAR)	Indirect Costs (ZAR)	Labour Costs (ZAR)	Total Cost Estimate (ZAR)
Goedehoop North	20	1 200	2 256 108	82	271 200	1 192 690	1 584 332	5 033 129
Total	**20**	**1 200**	**2 256 108**	**82**	**271 200**	**1 584 690**	**1 584 332**	**5 033 129**

5.2. Surface Drilling Techniques

[SR3.2(i), SR5.3(i)]

Geological drilling is conducted by outside contractors under the conditions specified in the relevant Company drilling contract.

5.2.1. Cored Drill Holes

Goedehoop has typically used conventional vertical core drilling (diamond drilling) for most of the holes drilled. This produces a 60 mm diameter solid core for logging and sampling. Full core is usually produced once competent strata have been intersected. Open-hole drilling techniques are employed for the near-surface overburden material (usually by-products of current day weathering). All drill holes are fully cored with a minimum core recovery of 95% in coal. If the core recovery is less than 95%, the drill hole is re-drilled. The core is measured, any core loss is identified and recorded, and important geological units are marked off before logging commences. All drill holes are logged, each seam sampled, placed in sample bags, tagged and sent to the laboratory for raw and wash data analysis. The core is logged by the field geologist responsible for Goedehoop exploration drilling in the field. Core logging data are recorded manually on Geological Coding Sheets ("logging sheets"), using a logical letter coding system ("Dictionary of Codes"). These data are then captured into the Geological Information Management System (**GIMS**) database where standard quality assurance/ quality control (**QA/QC**) routines ensure the correctness of the data; these routines are monitored by both Goedehoop and the Company's Exploration Department at eMalahleni.

As the strata are almost horizontal, the apparent seam thickness as measured in the vertical drill holes is virtually identical to the true seam thickness and no adjustment is required.

5.2.2. Non-cored Drill Holes

Goedehoop North and South utilise underground in-seam drilling for acquisition of structural data that may not have been picked up by vertical surface drilling methods. This involves rotary and directional drilling of 65 mm or 90 mm diameter holes. These drill holes are not incorporated when updating the geological model; however, they assist in short- and long-term planning of mining areas.

Underground Rotary (Non-Directional) Horizontal Drilling

This drilling method produced chips of coal, which were composited and sampled every 20 m. These samples

were then sent to the on-mine laboratory for volatile analysis. In cases where a geological feature (for example, a dyke or fault) is intercepted, the drilling method would be changed to core drilling, so that the geological feature can be better understood. Rotary drilling only provided data for short-term planning, since the technique did not allow for drill holes longer than approximately 300 m, particularly in the challenging ground conditions.

Underground Directional Drilling

Directional drilling provides long hole cover up to 800 m and is planned for resource blocks with highly undulating seams and to test for potential access to adjacent blocks and is currently being undertaken by a contractor. Underground directional drilling gives more advanced warning of mining conditions and of unknown features not identified from the surface vertical drilling (i.e. faults, dykes, sandstone channels and seam pinching). On intercepting a geological feature (such as a dyke, the drill switches to coring so that the geologist can assess and confirm the geological feature.

Since c. 2017, underground directional drilling not only focuses on intercepting unknown features that could not be identified by surface vertical drilling; the adopted practice is to provide cover for each panel with at least six months' coverage. Budget constraints always remain a challenge, leading to drilling by exception (priority being critical areas comprising complex geological structures).

5.2.3. Other Boreholes

In 2017 at Goedehoop North, one geotechnical borehole (65 m) was drilled at Brown 2 Shaft and five geophone drill holes (ranging from 363 – 830 m deep) were drilled in the corridor area (Enhanced Monitoring District) on behalf of the Project and Rock Engineering Departments. The geophone drill holes were drilled for inter-burden stability monitoring purposes where the No 2 Seam has been previously mined. In 2017, two geotechnical drill holes (54 m) were drilled for Brown 2 Shaft. Thirteen drill holes, totalling 901 m, were drilled in the Enhanced Monitoring District for geophone monitoring.

In 2017 at Goedehoop South, eight drill holes were drilled in the low safety factor area (Block G) for geophones monitoring. An additional eleven drill holes for geophone monitoring were completed by the end of November 2017. In 2018, 14 geophone holes totalling 999 m were drilled in the Enhanced Monitoring District areas.

5.2.4. Drill Hole Survey

[SR3.1(v)]

Surveying activities are governed by the Company's OMS Operations Geology Standard AAC SD 23-25-107: Exploration, specifically the section on Geology Survey Equipment Standard. Drill hole collar positions are either surveyed or determine using the Global Positioning System. The collars are checked against topographic data and the existing geological model to ensure accuracy.

5.2.5. Geological Logging Procedure

[SR3.2(iii)(iv)]

Two sections of AAC SD 23-25-107: Exploration control core logging and geophysical logging:

- Perform Core Logging Procedure; and
- Perform Down Hole Geophysical Survey.

Logging and coal sampling are done as soon after drilling as possible to avoid deterioration of the core. The core is photographed, and the logging sheets completed. Table 5-3 lists the information recorded for each lithological unit. The responsible geologist checks all geological logs and sample results; in addition, the data are validated by the geological modeller before incorporated into the geological model.

Table 5-3: Recorded Drill Hole Data

Data Description	Data Description
Width of lithological interval	Lithological qualifiers (based on the Dictionary of Codes)
Depth to base	Grain size
Main lithotype	Degree of sorting
Seam name	Bedding features - spacing and dip
Sample number	Sedimentary structures - type and dip
Percentage core recovery	Tectonic structures - type, spacing, description and dip
Weathering	Mechanical state
Colour (including shade and hue)	

Geophysical Logging

Downhole geophysical logging (calliper, resistivity and density tools) was done on at least 40% of the drill holes drilled during 2017; from 2018 onwards, standard geophysical logging of all cored drill holes was included in the Exploration standard;

5.2.6. Core Recovery

[SR3.2(i)(v)]

The following section of AAC SD 23-25-107: Exploration applies to sample recovery:

- Monitor Core Recovery for Surface Vertical Drilling.

Core recovery is used as a guide to ensure that the data obtained from drilling are representative of the strata and coal seams. The core recovery is calculated by the logging geologist for each core run and reviewed against the driller's depth figures. Net losses are physically identified in the core, assisted by the geophysical log when required. Losses are usually revealed by circular grinding marks or crushed core, either as a result of the drilling process or due to the presence of faulting with associated weak material.

The Company requires a minimum core recovery in the coal seams to be at least 95%; if this is not achieved, the hole is redrilled, provided the coal is not weathered or burnt. The geologist's records of core recovery are stored in the Company Hummingbird database while copies of the driller's daily reports are filed at the Company's Coal Geological Services offices in eMalahleni.

5.3. Coal Sampling and Analysis

Coal sampling and analysis is done to identify quality variations within the seams and to identify mining horizons. The Company has prescribed methods to sample and analyse the coal and to verify and store the results.

5.3.1. Sampling Governance

[SR3.5]

The AAC SD 23-25-107: Exploration sections listed below determine the coal sampling procedures followed:

- Manage Borehole Drill Data;
- Exploration Technical Pack; and
- Monitor Methane During Surface Drilling.

SRK has reviewed the AAC SRDs pertaining to sampling and analysis and is satisfied that they represent good practice.

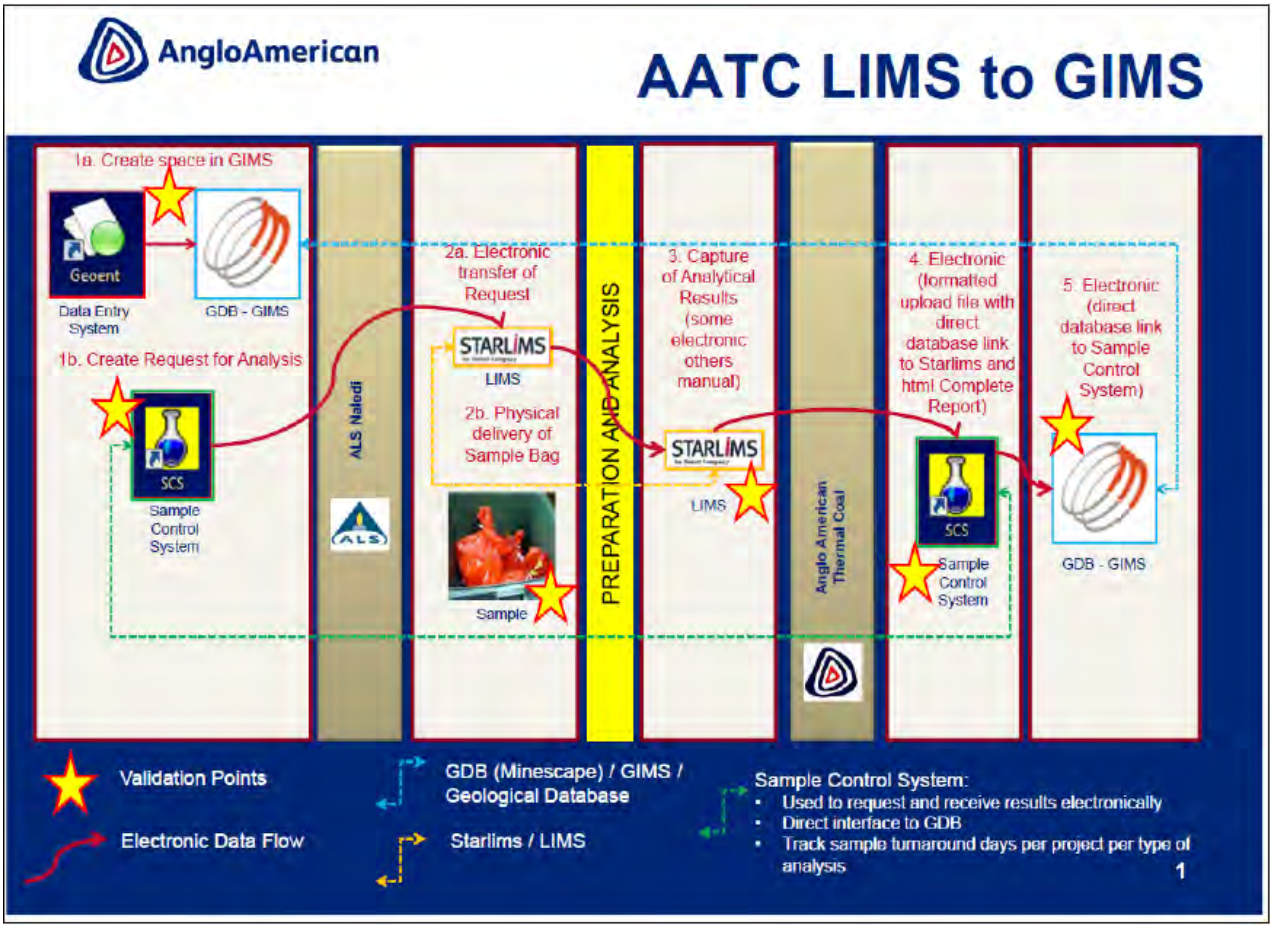
5.3.2. Sampling Method and Data Collection, Capture and Storage

[SR3.3]

The full core is used to ensure samples are representative. Contamination and coal losses are prevented by laying the core on plastic sheeting immediately after recovery from the hole. Sample intervals are selected, where possible, to match the seams in the geological model.

All samples are sealed in plastic bags and identified by the sample number, a unique alpha-numeric sequence written on manila tags placed inside and attached to the outside of the sample bag. Samples are labelled alphabetically from the base up. The sample number is recorded on the Log Sheet. The samples are sealed after bagging and delivered to the laboratory as soon as practically possible. The Company's sampling governance and chain of custody requires that each sample to be submitted to the laboratories is accompanied by a sample submission list that also serves as a sample advice sheet with instructions for analysis. The laboratory is notified of samples that are ready for delivery. Upon receipt of the samples, the laboratory representative cross-checks all samples against the submission list to confirm the names and number of samples they are receiving. All submission lists are managed in duplicates with signed copies scanned and saved electronically.

The laboratory uses an electronic Laboratory Information Management System (**LIMS**) to keep track of samples and analytical results. The analytical results are received electronically by the Company and uploaded into GIMS after verification routines have been applied to ensure the correctness of the results (Figure 5-1).



srk consulting	**GOEDEHOOP COLLIERY CPR** Information Flow for Sampling and Analytical Data (*Source*: *Greenside CPR 2019 – AAC, 2019y*)	Project No. 566657

Figure 5-1: Information Flow for Sampling and Analytical Data

5.3.3. Coal Sampling Preparation and Analysis

[SR3.4, SR5.3(i)]

Samples are crushed and screened to produce a -25 mm +0.5 mm sample fraction for analysis; historically, the -0.5 mm fines were discarded. However, these are now being analysed. The mass percentage of the two size fractions are determined and reported. The samples are air-dried (under controlled, prescribed atmospheric conditions) and conditioned before being analysed.

Sample analysis protocols, modified by site specific analytical procedure(s), are determined by AAC SD 23-25-107: Exploration sections:

- Manage Borehole Drill Data; and
- Exploration Technical Pack.

The Goedehoop-specific analytical regime applied to each sample is determined by a set of "Mask Codes", developed in conjunction with the laboratory (Table 5-4). The Mask Codes are based on the seam and coal type/parting material Some samples are analysed raw, while others undergo full float and sink analysis; this applies to coal horizons that could potentially supply both the high and low-quality export markets. This allows the Company to perform all required export and domestic product simulations. Each float and sink fraction is analysed for proximate analysis (inherent moisture (**IM**) content, ash content (**ash)**, volatile matter (**VM**) content – expressed as percentages), calorific value (**CV**[1]) expressed in megajoules per kilogram (**MJ/kg**) and total sulphur (**TS**) content (also expressed as a percentage); fixed carbon (**FC**) content (as a percentage) is determined by difference; . Ash, IM, VM and FC sum to 100%. Full washability tables with fractional and cumulative values for each density fraction are provided for each sample where the seam is economic or potentially economic. The wash densities analysed are different for each seam (samples that are analysed raw (uneconomic seams or burnt coal) are described by a single line of data containing the proximate analysis, CV[1] and TS (mask code AN013)).

Table 5-4: Sample Mask Codes

Seam	Goedehoop North	Goedehoop South
No 5	SC088	SC012
No 4	SC017	SC017
No 2	SC225	SC225
No 1	SC225	SC225

Table 5-5: Analyses and Wash Densities per Seam

Seam	Analyses	Wash Density
No 5	Proximate, CV[1], TS	F1.35, F1.40, F1.50, F1.60, F1.70, S1.70
No 4	Proximate, CV[1], TS	F1.45, F1.50, F1.60, F1.70, F1.8, F2.00, S2.00
No 2	Proximate, CV[1], TS	F1.30, F1.35, F1.40, F1.50, F1.60, F1.70, F1.80, S1.80
No 1	Proximate, CV[1], TS	F1.30, F1.35, F1.40, F1.50, F1.60, F1.70, F1.80, S1.80

Note:
F = Float
S = Sink

5.4. Quality Control/Quality Assurance

[SR3.5(i)(iii), SR3.6(i)]

5.4.1. Data Acquisition/Validation and Storage

Drill hole and analytical data is acquired, stored and validated according to AAC SD 23-25-107: Exploration

sections:

- Manage Borehole Drill Data;
- Manage Exploration Reporting;
- Manage Geological Domain;
- Geological Photography Standard; and
- Exploration Benchmarks - Mandatory Minimum Resource Knowledge Requirements.

All data are initially logged manually onto paper capture sheets. These sheets are then scanned to provide documentary evidence of the original logging. Copies of these scanned documents have been kept since 2009 and are stored at the Company's Exploration Department.

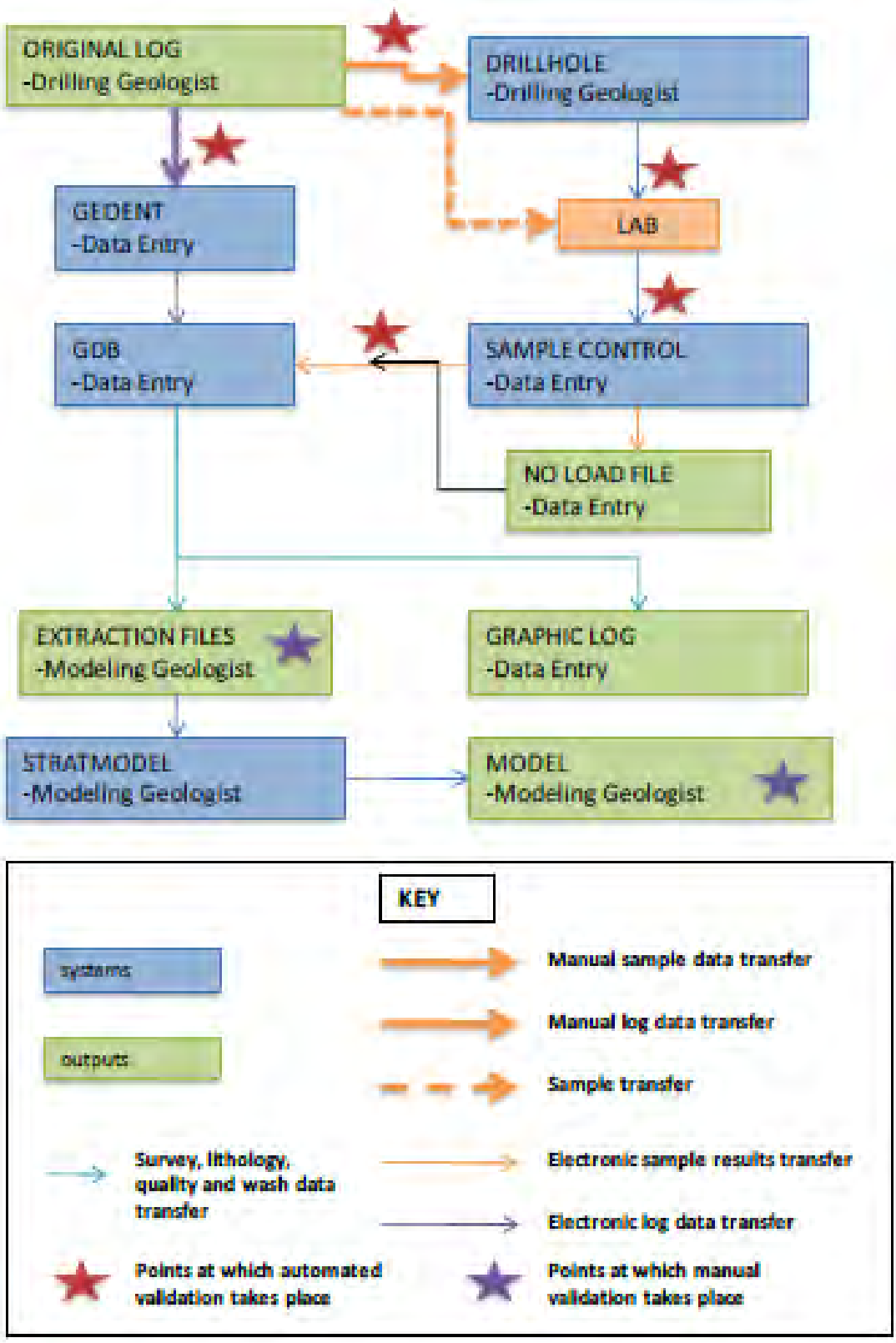
Drill hole collar survey data, core recovery information, geological logging and sampling data (including the type of analysis required and the analytical results) are then captured into an electronic database - GDB. GDB is a commercial geological database package, originally developed specifically for coal data and now supplied by Datamine. Data entry is via the GEOENT data entry system, an inhouse software package. GEOENT has automated checks to confirm correct seam intervals; however, the majority of data validation takes place within GDB.

During the early stages of data validation, automated checks are done by the software packages, while later data validation is done manually during geological modelling (Figure 5-2). If errors are identified during the automated validation, data entry/validation halts until the error is manually rectified. Standardised attribute ranges are pre-loaded into GDB; values outside this range generate an "out of range" warning and the values are excluded until such time as they are manually corrected, and the data reloaded. GDB also ensures that all quality data is related to a unique sample number and that this sample number is associated with a coordinated drill hole that contains coal seam information, If no such drill hole is found, the quality data is reported to the "no load" file and manual verification is required.

Figure 5-2 illustrates the data validation procedure, including points at which automated and manual data validation occurs.

5.4.2. Specific Data Validation for Coal Analyses

Coal samples were analysed by ALS Naledi and its predecessors until the 30 September 2018; thereafter samples were sent to Bureau Veritas (Pty) Ltd (**BV**) in Middelburg, Mpumalanga. BV is accredited by both the International Organization for Standardization (**ISO**) (ISO/IEC 17025:2017) and the South African National Accreditation System (**SANAS**). The accreditation is valid until 25 July 2021. ALS Witlab (no longer in operation) was also SANAS accredited. Figure 5-3 shows the ALS Naledi accreditation certificates while Figure 5-4 shows the BV accreditation certificates while Table 5-6 lists the standards used by BV during the preparation and analysis of the samples.



srk consulting	**GOEDEHOOP COLLIERY CPR** Data Validation Flow Diagram (*Source*: CP Report Resources 2017, *Goedehoop North – AAC, 2018h)*	Project No. 566657

Figure 5-2: Data Validation Flow Diagram

Table 5-6: Standards Employed by BV during Coal Sample Analysis

Property Measured	Standard Employed
Preparation of Test Sample	ISO 18283 Part 8
Ash Content (%)	ISO 1171
Volatile Matter Content (%)	ISO 562
Inherent Moisture Content (%)	SANS 5925
Total Moisture Content (single stage)	ISO 589
Gross Calorific Value (MJ/kg)	ISO 1928
Total Sulphur (%)	ASTM D4239
Calculation of Fixed Carbon Content (%)	ISO 17246

BV ensures accuracy, precision, repeatability and reproducibility of its results by:

- Analysis of Certified Reference Materials and control samples;
- Participation in the quarterly COALSPEC Proficiency Testing Scheme since 1998. The Scheme is conducted and administered by Coal & Mineral Technologies (Pty) Ltd, a subsidiary of the SABS and involves the participation of more than 50 national and international laboratories; and
- Outsourcing samples to external ISO accredited laboratories to verify analytical results. The following laboratories are used:
    - Anglo American Research Laboratories;
    - Coal and Mineral Technology (Pty) Ltd, a subsidiary of SABS; and
    - Inspectorate BV, UIS/ACT

5.5. Relative Density

[SR3.1(i), SR3.3(iii), SR3.5(iii), SR3.7(i)(iv)]

The raw relative density (**RD**) is not determined by the laboratory but calculated using a standardised formula based on the air-dried ash value. The formula was derived from regression analysis conducted in the 1980s on the proximate and apparent RD analysis of multiple deposits and seams within the Witbank Coalfield. In 2018, MinRes, a department of Anglo American plc, reviewed analysed data from 174 bulk core samples as well as data from seven other coal companies; data from five sub-basins of the Witbank Coalfield were included in the review. The conclusions are:

- There is sufficient evidence to support the use of the generic regression formula for RD from ash in both fresh and devolatilised samples; and
- The relationship describes an Apparent Density that is expected to approximate the in-situ density, on an air-dried basis.

The formula used is:

$$\text{Relative Density}_{adb} = 0.0126 \times \text{Raw Ash\%}_{adb} + 1.26$$

<u>Where:</u>

adb = air-dried basis

sanas
South African National Accreditation System

CERTIFICATE OF ACCREDITATION

In terms of section 23(2) (b) of the Accreditation for Conformity Assessment, Calibration and Good Laboratory Practice Act, 2006 (Act 19 of 2006), read with sections 23(1), (2) and (3) of the said Act, I hereby certify that –

ALS NALEDI (PTY) LTD
Co. Reg. No.: 2010/018634/07

Facility Accreditation Number: **T0611**

is a South African National Accreditation System accredited Testing laboratory provided that all SANAS conditions and requirements are complied with

This certificate is valid as per the scope as stated in the accompanying schedule of accreditation Annexure "A", bearing the above accreditation number for

CHEMICAL AND MICROBIOLOGICAL ANALYSIS

The facility is accredited in accordance with the recognised International Standard

ISO/IEC 17025:2005

The accreditation demonstrates technical competency for a defined scope and the operation of a laboratory quality management system

While this certificate remains valid, the Accredited Facility named above is authorised to use the relevant SANAS accreditation symbol to issue facility reports and/or certificates

Cleballo
Mrs C Leballo
Acting Chief Executive Officer

Effective Date: 11 JUNE 2014
Certificate Expires: 10 JUNE 2019

ANNEXURE A

SCHEDULE OF ACCREDITATION

Facility Number: T0611

Permanent Address of Laboratory: ALS Naledi (Pty) Ltd 75 Stevenson Street Extension 8 Wilbart 1035	**Technical Signatories:**	Mr S Bodiba (Chemistry) Ms P Skosana (Microbiology) Ms A Mojanaga (Coal) Ms D Shilubane (Coal) Mr M van Dyk (Coal)
Postal Address: P O Box 1569 Wilbark 1035	**Nominated Representative:**	Mr M Naude
Tel: (013) 692 5141 Fax: (013) 692 6202 E-mail: Malan.naude@alsglobal.com	Issue No.: Date of Issue: Expiry Date:	1 11 June 2014 10 June 2019

Materials / Products Tested	Type of Tests / Properties Measured, Range of Measurement	Standard Specifications, Equipment / Technique Used
CHEMICAL		
Drinking water, Waste water, Environmental water, rivers and dam water	Determination of Electrical Conductivity	ALS-NA-WL-WI-004 (ISO 7888-1985 (E))
	Determination of pH	ALS-NA-WL-WI-005 (ISO 10523)
	Determination of Fluoride	ALS-NA-WL-WI-007 (ISO 10359-1)
	Determination of Chloride	ALS-NA-WL-WI-008 (ISO 15923-1)
	Determination of Sulphate	ALS-NA-WL-WI-009 (ISO 15923-1)
	Determination of Alkalinity	ALS-NA-WL-WI-010 (ISO 9936)
	Determination of Ammonia	ALS-NA-WL-WI-011 (ISO 11732)

Original Date of Accreditation: 11 June 2014 Page 1 of 2

Field Manager

ANNEXURE A

Facility No.: T0611
Date of Issue: 11 June 2014
Expiry Date: 10 June 2019

Materials / Products Tested	Type of Tests / Properties Measured, Range of Measurement	Standard Specifications, Equipment / Technique Used
	Determination of Ortho Phosphate	ALS-NA-WL-WI-012 (ISO 15923-1)
	Determination of Nitrate	ALS-NA-WL-WI-013 (ISO 13395)
	Determination of Selected elements by ICP (Al, Ca, Mg, Na, K, Fe, Mn, B)	ALS-NA-WL-WI-026 (ISO 11885)
MICROBIOLOGY		
Drinking water, Waste water, Environmental water, rivers and dam water	Determination of total Coliforms in water	ALS-NA-WL-WI-014 (ISO 9308-1)
	Detection of Heterotrophic Plate Count in water	ALS-NA-WL-WI-015 (ISO 6222)
	Confirmation of *Escherichia coli* in water	ALS-NA-WL-WI-016 (ISO 9308-1)
COAL		
Bituminous	Conditioning of Samples	ALS-NA-CL-WI-019
	Determination of Volatile Matter Content	ALS-NA-CL-WI-021 (ISO 562: 2010)
	Determination of Ash Content	ALS-NA-CL-WI-021 (ISO 1171: 2010)
Bomb Calorimeter	Determination of Gross Calorific Value	ALS-NA-CL-WI-023 ALS-NA-CL-WI-038 (ISO 1928: 2009)
Infra Red Spectrometry	Determination of Sulphur	ALS-NA-CL-WI-032 ALS-NA-CL-WI-033 (ISO 1957: 2006)

Original Date of Accreditation: 11 June 2014 Page 2 of 2

ISSUED BY THE SOUTH AFRICAN NATIONAL ACCREDITATION SYSTEM

Field Manager

srk consulting	**GOEDEHOOP COLLIERY CPR** ALS Naledi SANAS Accreditation Certificate	Project No. 566657

Figure 5-3: ALS Naledi SANAS Accreditation Certificate

CERTIFICATE OF ACCREDITATION

In terms of section 22(2) (b) of the Accreditation for Conformity Assessment, Calibration and Good Laboratory Practice Act, 2006 (Act 19 of 2006), read with sections 25 (1), (2) and (3) of the said Act, I hereby certify that:-

BUREAU VERITAS INSPECTORATE LABORATORIES (PTY) LTD
Co. Reg. No.: 2000/013253/07
MIDDELBURG

Facility Accreditation Number: T0313

is a South African National Accreditation System accredited facility provided that all conditions and requirements are complied with

This certificate is valid as per the scope as stated in the accompanying schedule of accreditation, Annexure "A", bearing the above accreditation number for

CHEMICAL ANALYSIS

The facility is accredited in accordance with the recognised International Standard

ISO/IEC 17025:2017

The accreditation demonstrates technical competency for a defined scope and the operation of a quality management system

While this certificate remains valid, the Accredited Facility named above is authorised to use the relevant accreditation symbol to issue facility reports and/or certificates

Mr R Joslas
Chief Executive Officer

Effective Date: 10 October 2019
Certificate Expires: 25 July 2021

Facility Number: T0313

ANNEXURE A

SCHEDULE OF ACCREDITATION

Facility Number: T0313

Permanent Address of Laboratory:
Bureau Veritas Inspectorate Laboratories (Pty) Ltd
9 Hektaar Street
Middelburg
1050

Technical Signatories:
Ms S Bierman (All Methods)
Ms C Abbey (All Methods)
Ms WN Fambarega (All Methods)
Ms FY Kajee (All Methods)
Mr R Potgieter (All Methods)
Ms R Fourie (Sample prep, TM and PSD)

Postal Address:
P O Box 11261
Middelburg
1050

Nominated Representative:
Mrs L Oosthuizen

Tel: (013) 246-1212/2892
Fax: (013) 246 2575
E-mail: Lezanne.oosthuizen@bureauveritas.com

Issue No.: 18
Date of Issue: 10 October 2019
Expiry Date: 25 July 2021

Material or Products Tested	Type of Tests/ Properties Measured, Range of Measurement	Standard Specifications, Techniques / Equipment Used
CHEMICAL		
Coal	Determination of Moisture Content by Air-Oven Method	BV-CTD-T4-WI-MIAS (Based on SANS 5925)
	Determination of Carbon	BV-CTD-T4-WI-Total Carbon (Based on ASTM D5373 & ISO 29541)
	Determination of Particle Size Distribution	BV-CTD-T7-WI-Size Analysis (Based on ISO 1953 & ISO 728)
	Determination of Float and Sink Characteristics	BV-CTD-T4-WI-Float and Sink (Based on ISO 7936)
	Determination of Abrasiveness Index	BV-CTD-T4-WI-Abrasiveness index (Eskom Method, Yancey, Gear and Price Method)
	Determination of Ash Fusion Temperature	BV-CTD-T4-WI-AFT2 (Based on ISO 540:2008 and ASTM D1857-04)
	Determination of Relative Density	BV-CTD-T4-WI-TRD (Based on AS1038.21.1.1)
	Determination of Fixed Carbon by difference	BV-CTD-T10-QP-Reporting (Reference to ISO 17246)

Page 1 of 2

Facility Number: T0313

Hard Coal	Determination of Volatile Matter	BV-CTD-T4-WI-Volatile (Based on ISO 562)
	Determination of Total Moisture	BV-CTD-T7-WI-Total Moisture (Based ISO 589)
	Sample preparation method	BV-CTD-T7-WI-Prep (Based on ISO 18283 Par 8)
Solid Mineral Fuels	Determination of Ash content	BV-CTD-T4-WI-Ash (Based on ISO 1171)
	Determination of Gross calorific value by the bomb calorimetric method	BV-CTD-T4-WI-CV (Based on ISO 1928)
Coal and Coke	Determination of Sulphur using High temperature tube furnace combustion methods	BV-CTD-T4-WI-Sulphur (Based on ASTM D4239 & ISO 19579)

Original Date of Accreditation: 26 July 2006

ISSUED BY THE SOUTH AFRICAN NATIONAL ACCREDITATION SYSTEM

Accreditation Manager

Page 2 of 2

srk consulting	**GOEDEHOOP COLLIERY CPR** Bureau Veritas SANAS Accreditation Certificate	Project No. 566657

Figure 5-4: Bureau Veritas SANAS Accreditation Certificate

5.6. Drill Hole Data and Geological Model Validation

[SR2.1(iv), SR3.2(ii), SR3.3]

The validation is undertaken to ensure that data are correctly transferred from the original logs to GDB, the electronic geological database, and then into the modelling software database. The final step is to check the model values against those in the model database, ensuring integrity between all steps of the data collection and modelling process. This is to enhance the reliability of the geological interpretation and the resource estimation process, by ensuring the validity of the data.

5.6.1. Drill Hole Data Validation

SRK has reviewed a random selection of 48 original drill hole logs, sampling records and analytical results and compared them with the corresponding data contained in GDB, the electronic geological database, as well as the resultant values in the geological model. The drill holes were selected from areas ahead of the mining faces and/or in areas of complex geology or mining. The results of this comparison exercise are shown in Appendix 1 and described below.

- **Drill Hole Collar Co-ordinate Verification:** The collar co-ordinates contained in the original logs were compared with those contained in the GDB database and the geological model; no differences greater than 40 cm were found.
- **Drill Hole Collar Elevation Verification**: The collar elevation comparison showed no major discrepancies. The original log for drill hole GHC4240 only gave the collar elevation as a measurement below datum, but the elevation of that datum is not stated.
- **Seam Validation:** This check is used to identify incorrectly ordered seam intervals, negative interval thicknesses, interval overlaps and any other seam inconsistencies. The floor of the No 2 Seam in drill hole CBC0014 is different in the original and GDB logs compared with the model. It appears that a No 1A Seam may be present and has been incorrectly correlated. This should be reviewed by the modeller and a check for similar situations elsewhere in the model should be done. No depth discrepancies were found in the sample depths, not for the No 4 Seam and sample depths.
- **Raw Quality Data Validation:** The raw data quality data was verified by checking that the 'from' and 'to' depths of the individual sample plies corresponded to the composited sampled 'from' and 'to' depths.

  The proximate values (Ash %, VM %, IM %, and FC %) were checked to ensure that they summed to 100 % (99.8 % – 100.02 %).

  The CV[1] values were checked between the original and GDB logs and the value in the model database. Only one difference was identified (drill hole CBC0172, No 4 Seam, sample E). Note that very few of the original logs contained quality data.

  The raw relative densities were recalculated using the equation 0.012 x ash + 1.26 in order to determine if there were any inconsistencies in the densities calculated by the Company. None were identified.

SRK is satisfied that, with the exception noted above, the original data have been adequately transferred to the electronic database and that the processes and techniques used to validate the geological data prior to constructing the geological model are appropriate and have been correctly applied.

5.6.2. Geological Model Validation

- **Drill Hole Collar Co-ordinate and Elevation Validation:** During modelling, the model database values are compared with the digital terrain model (**DTM**) and any discrepancies are investigated. If these discrepancies are not able to be resolved, the drill hole is omitted from the database. During the model validation process, some collar-coordinates were flagged as requiring attention; the elevation differences were however, small, with no material impact on the model.
- **Seam Validation:** This check is used to verify for incorrectly ordered seam intervals, negative interval thicknesses, interval overlaps and any other seam inconsistencies. In an attempt to create a model with the flexibility to replicate the practical mining height, the No 2 Seam has been divided into multiple sub-

seams. Verification of the drill hole database has indicated that this process was carried out well, with only a small number of boreholes requiring further sub-division of the seam. Overall, no major anomalies were identified.

- **Raw Quality Data Validation:** The raw data quality data was verified by checking that the 'From' and 'To' depths of the individual sample plies corresponded to the composited sampled 'from' and 'to' depths. Where discrepancies were noted, they were small and would not have a material effect on the model. Nonetheless any discrepancies flagged should be investigated and corrected or removed, whichever is most suitable.

  The proximates (Ash %, VM %, IM %, and FC %) were checked to ensure that they summed to 100% (99.8% – 100.02%) which they did.

  The raw densities were recalculated using the equation 0.012 x ash + 1.26 in order to determine if there were any inconsistencies in the densities calculated by the Company (refer to Section 5.5). Regarding the coal samples, no anomalous densities were identified; however, regarding the standard parting code values with high ash contents (sandstone and mudstone), the densities varied slightly more when compared to the calculated values. The effect this would have on the overall composited sample qualities is negligible. It is understood that this method of determining the relative densities of the coal samples has been used on all of the Company's collieries for many years. It is, however, suggested that on a per colliery basis, a portion of the samples are sent for density testing, the results of which can be used to confirm the formula used.

6. Coal Resources

[12.10(h)(ix)]

6.1. Target Seams

The Simunye No 4 Seam and the upper horizon of the No 2 Seam within the Brown 2 area are considered the targeted mining horizons at Goedehoop North. Although mining has ceased, the No 2 and No 4 Seams were the target seams at Goedehoop South and will be treated as such for purposes of resource estimation.

6.2. Geological Modelling

[SR2.1(iii), SR4.1(i)(ii), SR4.2(iv), SR5.2(iii)]

The geological models (one each for Goedehoop North and Goedehoop South) under review were created by Adri Opperman, then Resource Geology Specialist at the Company, using Datamine's StratModel™ Software version 6.1.2 and reviewed by SRK using StratModel™ version 7. The Goedehoop North model is dated 19 March 2019, with a data cut-off date of 15 March 2019. The Goedehoop South model is dated 29 June 2019, with a data cut-off date of 17 May 2019.

6.3. Geological Model Review

[SR2.1(vii) SR4.1(ii)(iv)(v), SR4.2(v), SR7.1]

The Goedehoop models were evaluated by Ms K. Black of KJB Geoservices under the guidance of Ms L. Jeffrey. The following items were assessed:

- How the physical and quality drill hole data were loaded and evaluated;
- That the modelled data accurately reflected the original drill hole data;
- The interpolation parameters used to create the model;
- The interpretation of the data to ensure that the final structural model is a true reflection of the coal in the ground; and
- That the Coal Resource estimation methodologies were correct and appropriate.

Model and data validations included the following:

- Topographic surface generation and evaluation – evaluating whether surveyed collar coordinates fall within two metres of the model topographic surface and understanding any discrepancies.

  Very few drill hole collars were found to be more than two metres different from the model topographic surface and these drill holes were scattered across the areas;
- Evaluating any differences between the drill hole data and the model interpretation;

  Some differences were noted were modelled data did not honour the drill hole data. This is likely to be a function of the interpolator used and other interpolators should be tried to find a more accurate fit;
- Structural interpretation of dolerite intrusions, faulting, seam pinch out and subcrop, etc.;
- Quality checks and evaluation - checking that the data load tables contain no sampling gaps, that all standardised coal quality values for unsampled material have been included where necessary; the sample compositing rationale (the correct method is to only composite data for which there are no missing samples or depth overlaps) and examining quality plots for "bull's eyes" which require corroboration;
- The correct application of Coal Resource cut-off limits; for example, the dry ash free volatile (**DAFV**) limit, minimum seam thickness, subcrop lines and mined out areas; and
- The resource block classification was in accordance with the SANS 10320:2020 guidelines.

The Goedehoop models are established models that are well understood and managed. The supporting Company Standards and Procedure Documents ensure that there is a high level of confidence with regard to the geological modelling procedures. The models have undergone both internal and external audits, which add an additional level of confidence to the model. However, it is suggested that the models are re-run using the different interpolators available in Stratmodel to assess which interpolator is the best fit for the current data distribution, as some model interpretations do not honour the data as well as is desired. An interpolator which honours the data (checked by conducting a 'Verify Model' routine), is preferred. An example of a possible unsuitable interpolator is the large difference in the value of the No 1 Seam maximum thickness in the S1 UN block (drill hole statistics = 4.97 m; model statistics= 4.02 m). A change in interpolator is unlikely to make an overall material difference to the model but is highly likely to make a difference on a local scale.

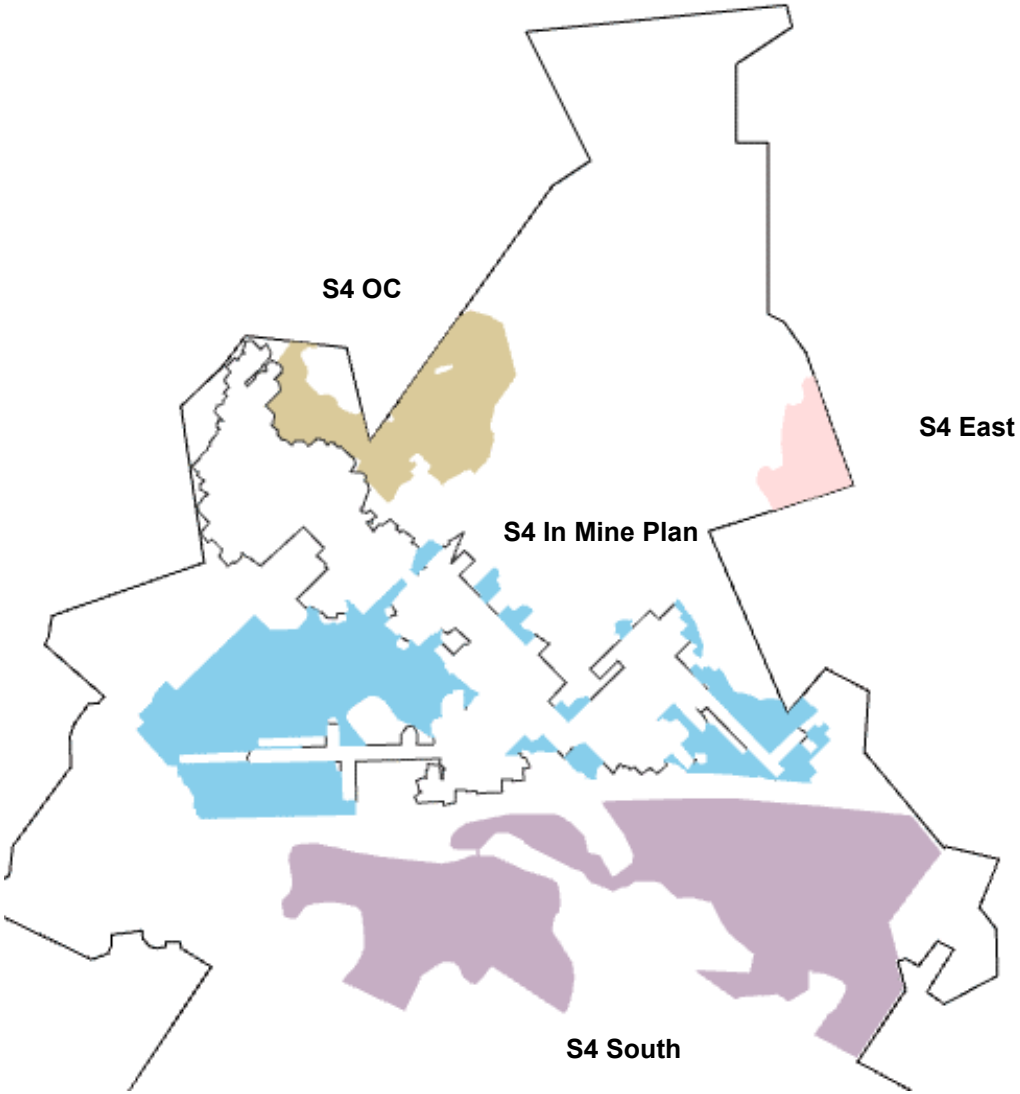
The SRK interrogation of the Goedehoop model and the checks on the data have revealed no noteworthy discrepancies. The modelling parameters and resultant geological and quality model are considered a true and accurate reflection of the Coal Resources at Goedehoop. SRK is therefore satisfied that the model is fit to use to estimate the Coal Resources for Goedehoop as at 31 December 2020.

A total of 4 687 drill holes are used in the Goedehoop North model and more than 5 160 in the Goedehoop South model. The data includes structural, raw and/or washed data for the various seams. The models include the No 5 Seam, No 4 Seam, No 2 Seam and No 1 Seam. The No 2 Seam and No 1 Seam have been mined extensively in the past and the No 4 Seam is now the main economic target.

The SRK interrogation of the Goedehoop models and the checks on the data have revealed no noteworthy discrepancies. The modelling parameters and resultant geological and quality models are considered a true and accurate reflection of the Coal Resources at Goedehoop. SRK is therefore satisfied that the models are fit to use to estimate the Coal Resources for Goedehoop as at 31 December 2020.

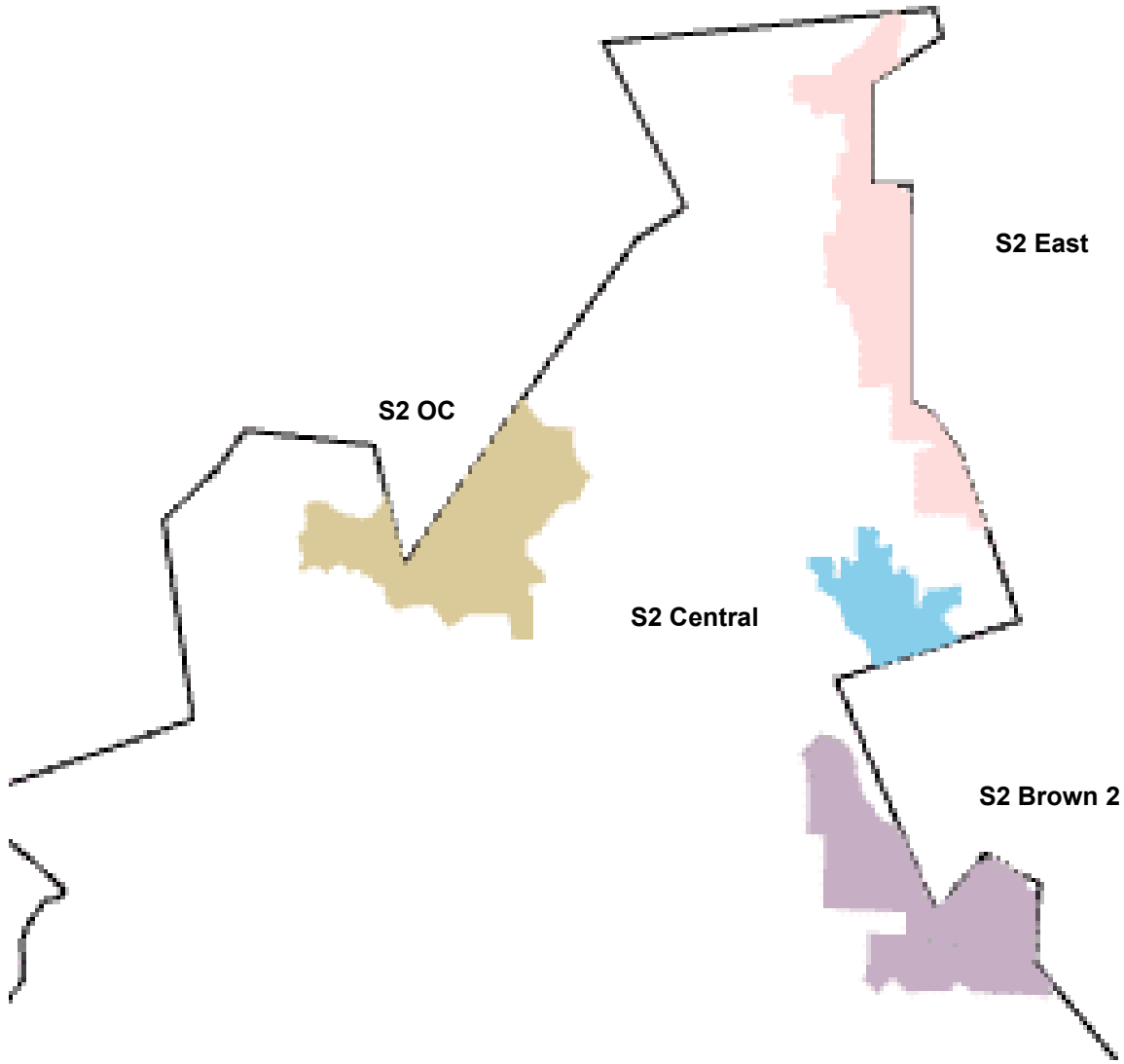
Resource Blocks

For ease of reference, Goedehoop North has been subdivided into a number of separate resource blocks per seam for the discussions in this section of the CPR (Figure 6-1 to Figure 6-3), while Goedehoop South resource blocks are shown in Figure 6-4 to Figure 6-5.



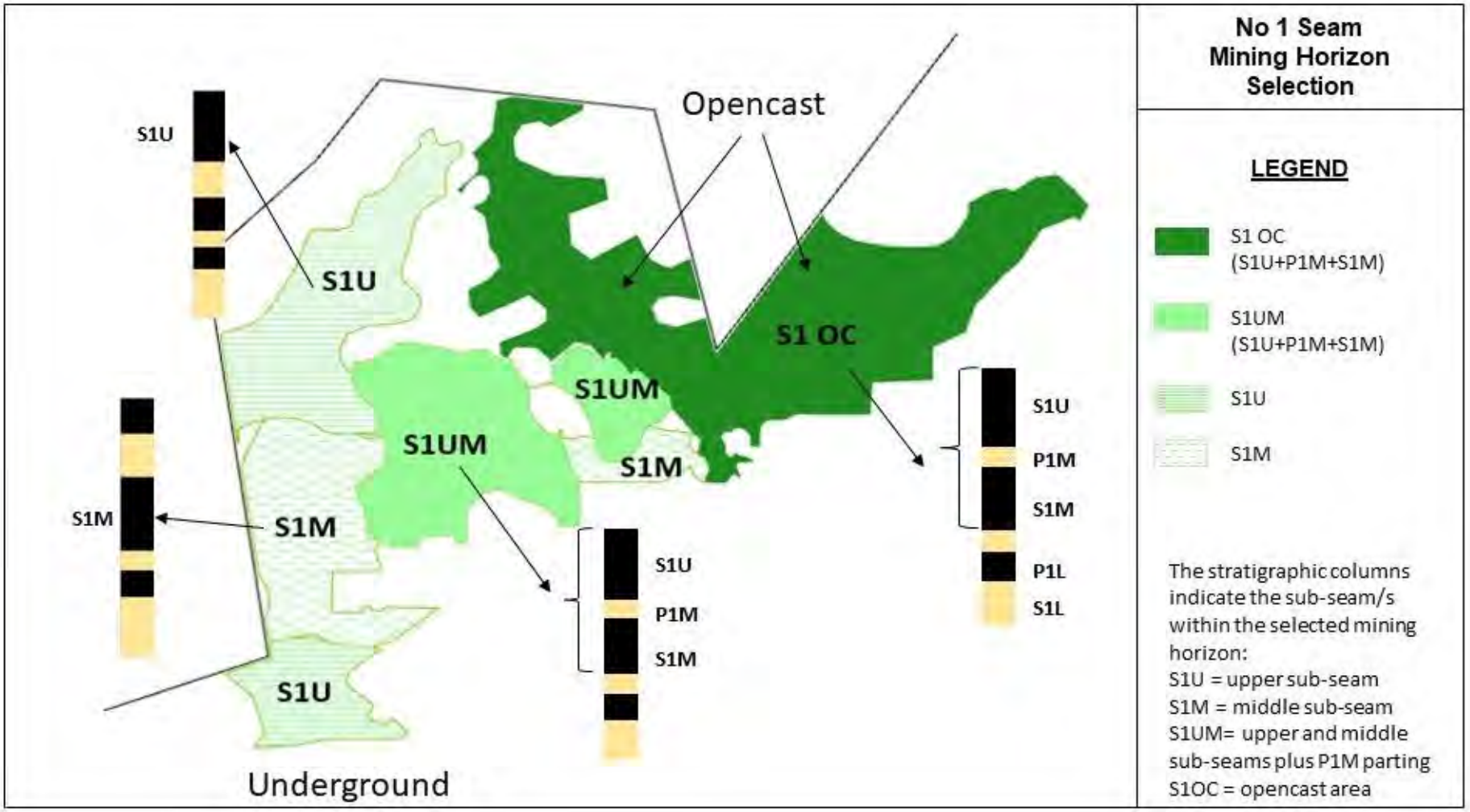
srk consulting	**GOEDEHOOP COLLIERY CPR** Goedehoop North: Location of No 4 Seam Resource Blocks	Project No. 566657

Figure 6-1: Goedehoop North: Location of No 4 Seam Resource Blocks



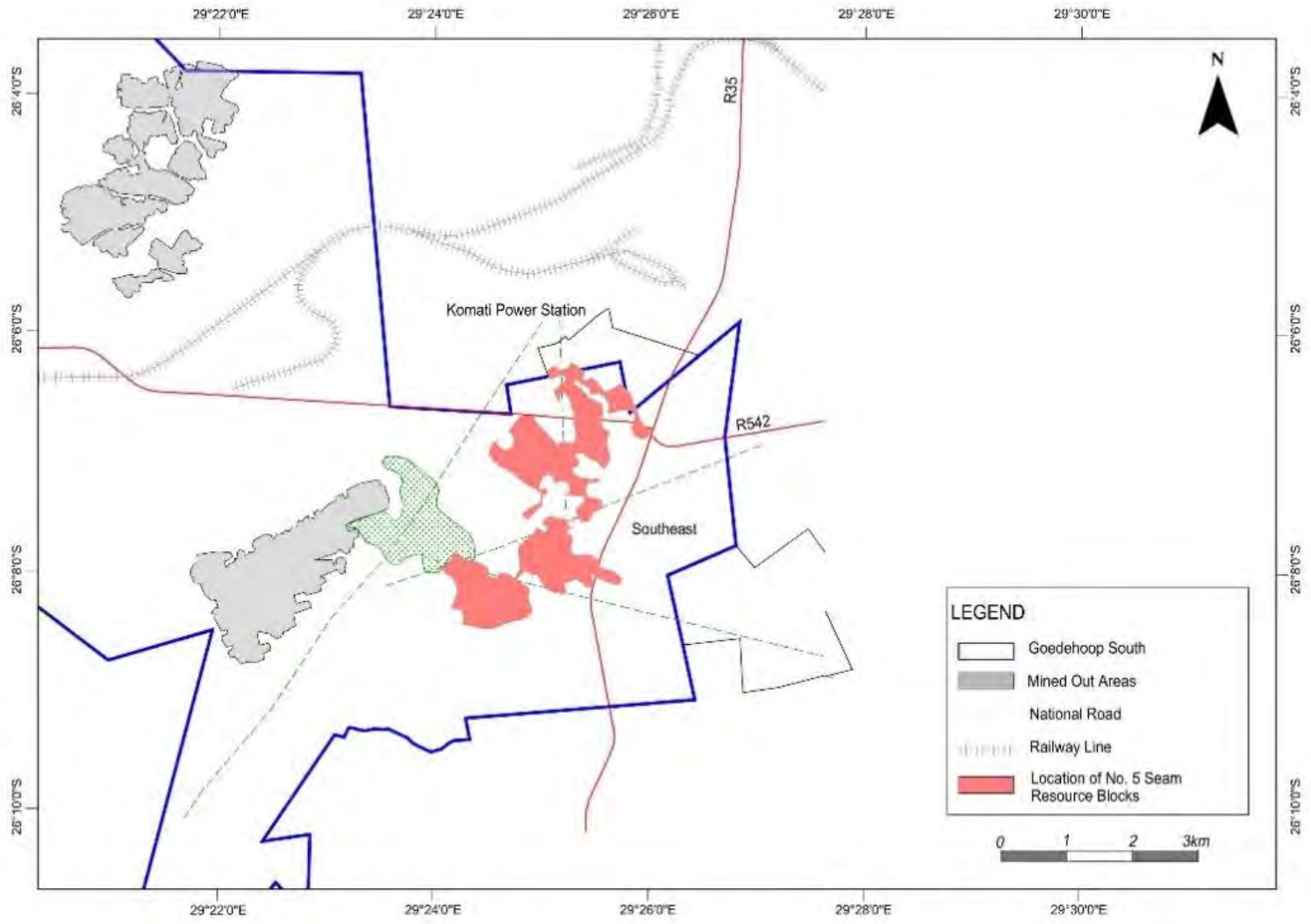
srk consulting	**GOEDEHOOP COLLIERY CPR** Goedehoop North: Location of No 2 Seam Resource Blocks	Project No. 566657

Figure 6-2: Goedehoop North: Location of No 2 Seam Resource Blocks



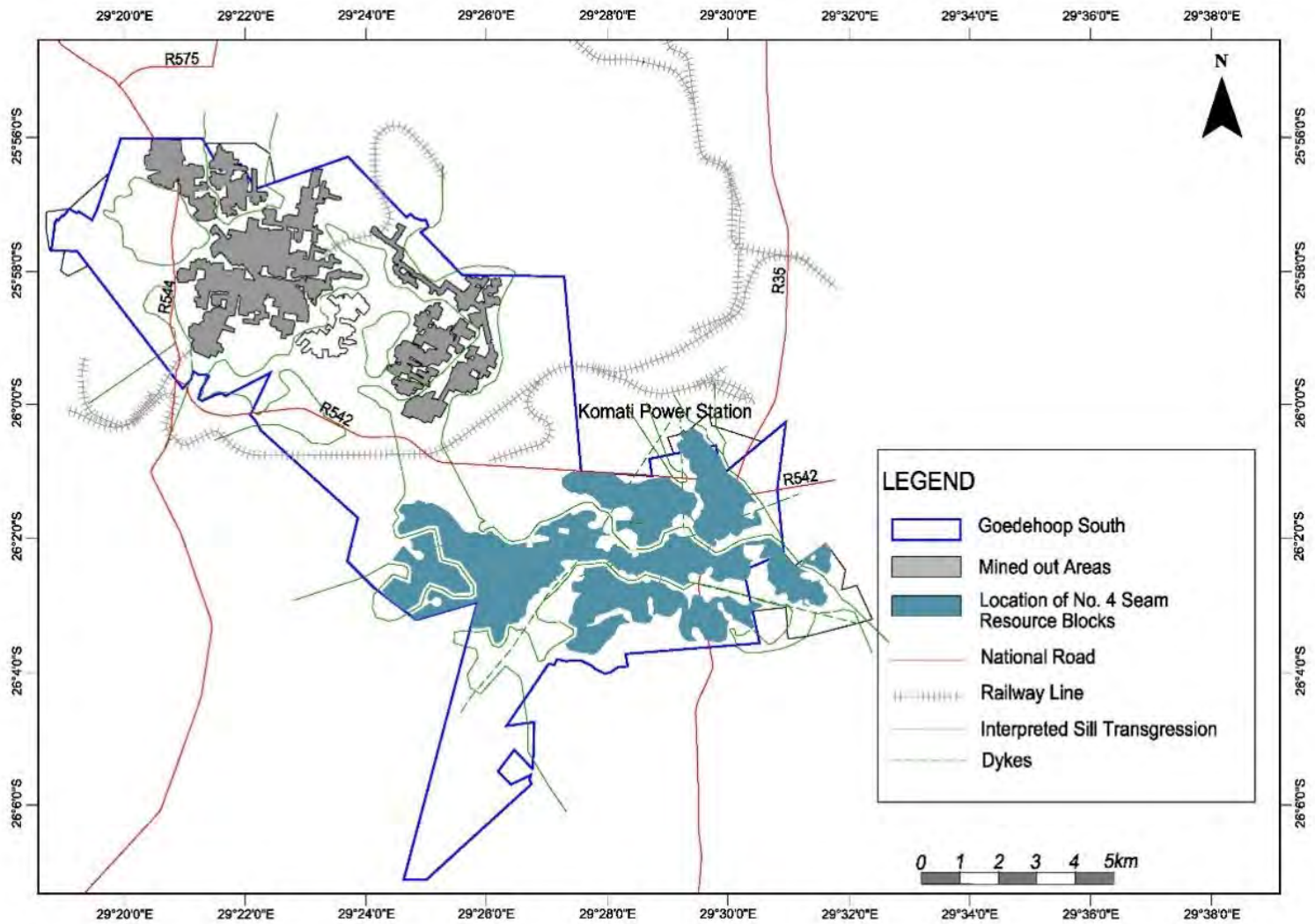
srk consulting	**GOEDEHOOP COLLIERY CPR** Goedehoop North: Location of No 1 Seam Resource Blocks	Project No. 566657

Figure 6-3: Goedehoop North: Location of No 1 Seam Resource Blocks



srk consulting	**GOEDEHOOP COLLIERY CPR** Goedehoop South: Location of No 5 Seam Resource Blocks	Project No. 566657

Figure 6-4: Goedehoop South: Location of No 5 Seam Resource Blocks



srk consulting	**GOEDEHOOP COLLIERY CPR** Goedehoop South: Location of No 4 Seam Resource Blocks	Project No. 566657

Figure 6-5: Goedehoop South: Location of No 4 Seam Resource Blocks

6.3.1. Physical Results

[SR2.1(v)(vi), SR3.1(vii), SR4.1(i)]

The physical parameters of the seam floor elevation and the depth from surface of the seam floors and roofs as well as the limit of weathering were modelled for each seam. The seam thicknesses were also modelled, and these were used as the basis for the estimation of the Coal Resource volumes. Although all these parameters were modelled, only the floor elevation, depth from surface and the seam thickness results for the seams are presented (Goedehoop North: Figure 6-6 to Figure 6-15; Goedehoop South: Figure 6-16 to Figure 6-22), along with a brief description of the results. In addition, classical statistics for the modelled seams are compared with similar statistics derived from the drill hole data; Goedehoop North statistics are found in Table 6-1 (model statistics) and Table 6-2 (drill hole statistics), while those for Goedehoop South are found in Table 6-3 (model statistics) and Table 6-4 (drill hole statistics). The purpose for this comparison is to determine whether the modelling algorithm used has changed the nature of the deposit (or whether the model is a true reflection of the data; for example, modelled the seams at greater depths than the data suggest in areas of sparse data or resulted in excessive thickening of thinning of the seam that is not supported by the underlying geological data).

Goedehoop North

Note that for this discussion the seam thicknesses are capped by the theoretical mining height of 4.5 m.

No 4 Seam

The No 4 Seam is absent over large areas of the northern part of Goedehoop North (Figure 6-6), mainly due to present-day erosion levels. It is well-developed southwards and attains its greatest thicknesses (greater than three metres) in the east mostly south of the Ogies Dyke. The seam thins westwards, becoming less than 1.5 m thick in the southwest just north of the Ogies Dyke. The modelled data (Table 6-1) compares well with the drill hole data (Table 6-2), except for the minimum seam thickness in two areas (the east and the opencast area) where the modelled seam thickness is significantly less than that of the drill hole data. This is likely to be a function of the thickness interpolator used.

The seam is topographically higher in the east and deepens westwards with gentle undulations (Figure 6-7). Differences in the elevation statistics between modelled and drill data again show up in the east and the opencast area (Table 6-1 and Table 6-2). In particular, the skewness (a measure of the symmetry of the data distribution around the mean) has changed sign, indicating a change in the nature of the data population. This again will be linked to the interpolator.

The depth to roof (Figure 6-8) varies from nil in the north where the seam subcrops against the gently rolling terrain, to in excess of 100 m in the southwest around the Ogies Dyke. The shallow depths in the northwest present an opportunity for opencast extraction. Once again, the model and drill hole data differ in the minimum values, with the modelled data being significantly less than the drill hole data (Table 6-1 and Table 6-2).

No 2 Seam

The No 2 Seam has been extensively mined (Figure 6-9) with the only remaining coal occurring along the eastern edge of the property and in the potential opencast area in the northwest. The seam is thickest in the east, (in excess of 4.5 m), but is thinner and more erratic in the northwest. In this area, the minimum model seam thickness is greater than that in the corresponding drill hole data (Table 6-1 and Table 6-2).

The seam is at higher elevations in the northeast (Figure 6-10) and dips towards the Ogies Dyke where it has been uplifted by dolerite transgressions (Figure 6-15). It is also lower in the northwest. The maximum model elevation (Table 6-1) is noticeably higher than the maximum drill hole data (Table 6-2).

The seam subcrops along a northwest-southeast oriented line towards the north of Goedehoop North, reflecting a present-day valley (Figure 6-11). The comparison of the model statistics (Table 6-1) with the drill hole data statistics (Table 6-2) shows some differences where the minimum depth to roof varies in three of the four areas (East, Central and Opencast); in each case, the modelled values are less than the drill hole values (by close to six metres in the case of the opencast area). In the Central area, the distribution about the mean has also changed character. It is suggested that these differences should be reviewed, as the impact on a local scale could be important, especially when considering stripping ratios in potential opencast areas.

No 1 Seam

The distribution and attitude of the No 1 Seam is almost identical to that of the No 2 Seam (Figure 6-12 and Figure 6-15). The seam is found over the majority of Goedehoop North but is very variable in thickness. The thicker areas are found in the northwest, where opencast extraction is possible, as well as some underground extraction. It should be noted that much of this potential opencast area is currently covered by the MRD and would be available for mining provided the MRD is completely removed. Only this area is shown in the diagrams and considered in the statistics. The No 1 Seam has been mined in small patches where its close proximity to the overlying No 2 Seam allowed a bottom coaling operation. The thickness shown in each block of Figure 6-12 reflects the thickness of the selected mining horizon, which varies from block to block (refer to Section 6.9.1 for an explanation of the mining horizons selected). Note that the minimum thickness of 1.40 m in the drill hole data (below the cut-off value of 1.50 m) is due to a single drill hole in the middle of the S1UM block that has been included in the block as it provides access to the surrounding thicker coal (Table 6-2). The model values (Table 6-1) and the drill hole values (Table 6-2) are significantly different, especially for the minimum thickness. The average thickness is also different (3.12 m in the model data as opposed to 4.43 m in the drill hole data) in the S1MW block, refer to Figure 6-3 for its location. The skewness varies considerably in four of the six blocks and changes character in one of them; the differences are too large to be ignored.

This northwest area shows the lowest occurrence of the seam (Figure 6-13), with the elevation rising towards the southeast, particularly south of the Ogies Dyke (Figure 6-15). The highest elevation in the model data (Table 6-1) is some three metres higher than the drill hole data (block S1US) and the skewness of the opencast area is only half that shown by the drill hole data (Table 6-2). There is a difference of more than three metres in the maximum floor elevation in the model value for block S1ME and a halving of the skewness for the opencast block.

The depth to roof is lowest in the northern half of the area (Figure 6-14), where an opencast operation exploiting all three seams is believed to be viable, based on the overall stripping ratios. The increased depth in the southern half of the area precludes an opencast operation and underground extraction of the mining horizon would need to be considered. Comparison of the statistics in Table 6-1 and Table 6-2 shows differences in the mean, minimum, maximum and skewness values. This shows that the interpolator used is not honouring data sufficiently well.

Cross sections through the model indicate the generally undulating nature of the seams (Figure 6-15), with some areas that indicate displacement of the seams by dolerite transgressions. The cross sections clearly show the removal of the No 4 Seam by current erosion; cross section A-A' suggests that the displacement of the seams has coincided with a topographic low, resulting in the removal of the upper seams. The impact of this uplift and erosion on the No 2 Seam is minimal.

Table 6-1: Goedehoop North: Model Statistics per Seam

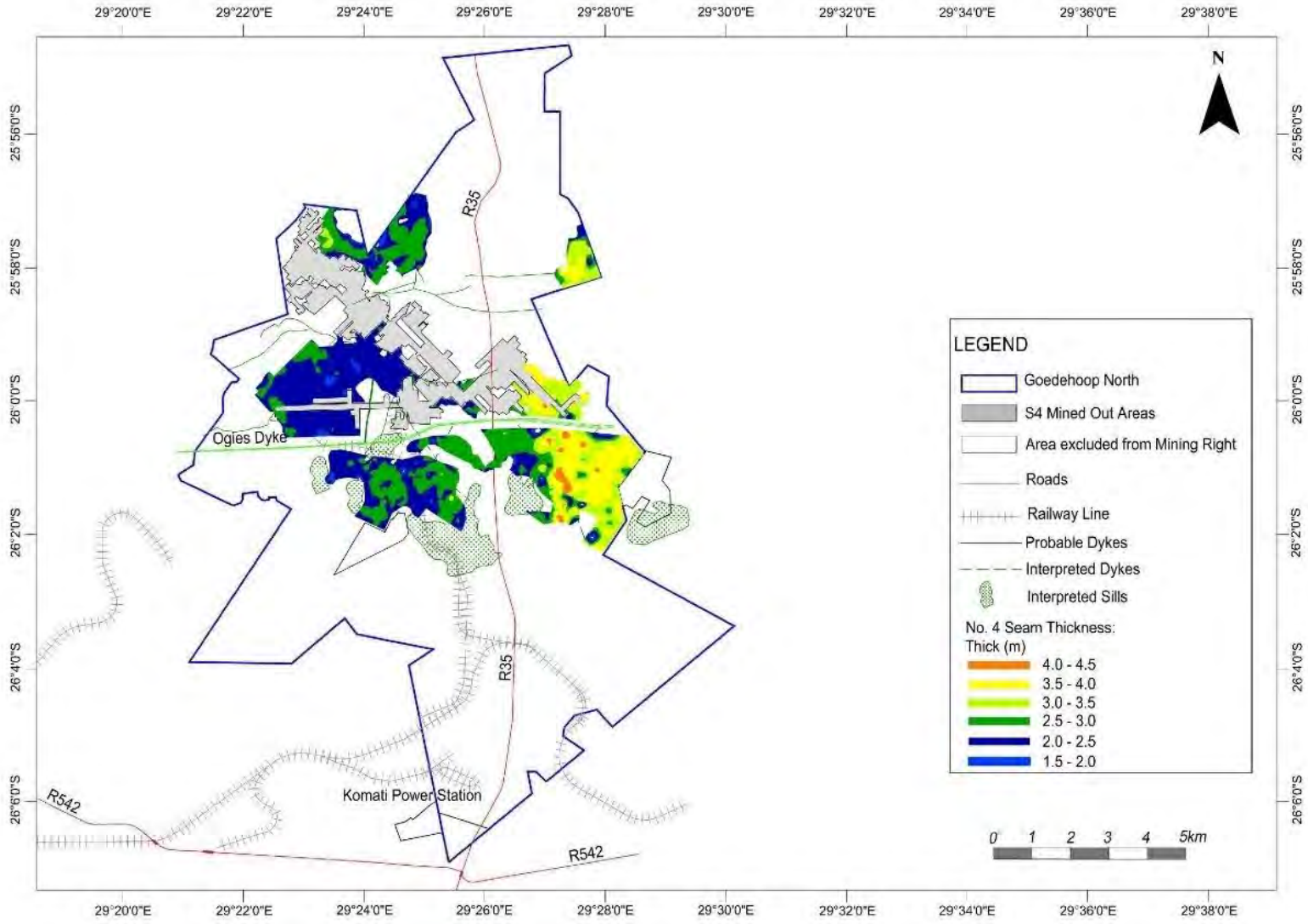
Seam	OC/UG	Block/Sub-seam	Number	Mean	Minimum	Maximum	Standard Deviation	Skewness
Thickness (m)								
S4	UG	S4 in Mine Plan	2 321	2.31	1.59	2.78	0.17	-0.45
S4	UG	S4 East	386	3.22	2.00	3.90	0.42	-1.00
S4	UG	S4 South	4 901	2.90	0.78	4.41	0.58	0.31
S4	OC	S4 OC	1 243	2.49	0.23	3.21	0.30	-1.77
S2	UG	S2 East	959	4.45	2.09	4.50	0.29	-6.37
S2	UG	S2 Central	353	4.47	3.73	4.50	0.11	-4.27
S2	UG	S2 Brown 2	1 056	4.33	2.29	4.50	0.39	-2.68
S2	OC	S2 OC	1 044	2.91	0.84	5.65	0.76	-0.14
S1	UG	S1UN	272	2.67	1.55	4.02	0.54	0.30
S1	UG	S1US	102	3.16	1.85	4.31	0.55	-0.35
S1	UG	S1ME	45	1.90	1.50	2.33	0.20	-0.04
S1	UG	S1MW	228	3.12	1.58	4.59	0.66	-0.64
S1	UG	S1UM	351	3.18	0.81	4.50	0.66	-0.09
S1	OC	S1OC	711	3.21	2.02	5.45	0.71	0.45
Floor Elevation (mamsl)								
S4	UG	S4 in Mine Plan	2 321	1 552.63	1 534.74	1 574.53	8.82	0.60
S4	UG	S4 East	386	1 586.37	1 579.83	1 590.34	1.89	-0.14
S4	UG	S4 South	4 901	1 568.94	1 540.43	1 605.63	10.79	0.08
S4	OC	S4 OC	1 243	1 553.91	1 535.55	1 575.81	11.56	0.12
S2	UG	S2 East	959	1 561.26	1 551.83	1 579.50	5.08	1.01
S2	UG	S2 Central	353	1 569.37	1 556.93	1 580.98	3.94	0.30
S2	UG	S2 Brown 2	1 056	1 563.81	1 540.31	1 590.60	7.76	-0.10
S2	OC	S2 OC	1 044	1 533.00	1 510.58	1 557.97	0.76	0.18
S1	UG	S1UN	272	1 517.50	1 507.83	1 524.16	3.79	-0.11
S1	UG	S1US	102	1 515.61	1 507.67	1 521.40	3.06	-0.55
S1	UG	S1ME	45	1 524.83	1 513.53	1 533.44	5.56	-0.62
S1	UG	S1MW	228	1 519.16	1 508.95	1 530.44	5.27	0.22
S1	UG	S1UM	351	1 521.29	1 505.45	1 537.17	7.11	0.34
S1	OC	S1OC	711	1 525.13	1 500.53	1 547.33	11.55	-0.56
Depth to Seam Roof (m)								
S4	UG	S4 in Mine Plan	2 321	66.79	37.32	100.65	13.68	0.43
S4	UG	S4 East	386	25.21	19.55	32.93	3.58	0.25
S4	UG	S4 South	4 901	56.14	19.99	99.10	15.94	-0.15
S4	OC	S4 OC	1 243	19.96	4.32	34.36	7.02	-0.29
S2	UG	S2 East	959	41.11	19.59	56.12	8.28	-0.63
S2	UG	S2 Central	353	35.29	18.82	54.91	7.86	-0.24
S2	UG	S2 Brown 2	1 056	42.02	20.07	83.12	14.16	0.55
S2	OC	S2 OC	1 044	40.66	19.87	54.35	8.02	-0.50
S1	UG	S1UN	272	72.45	58.27	82.63	4.11	-0.34
S1	UG	S1US	102	94.24	87.48	108.37	5.00	1.31
S1	UG	S1ME	45	69.28	58.34	81.41	6.70	0.38
S1	UG	S1MW	228	85.37	72.08	95.81	6.10	-0.37
S1	UG	S1UM	351	71.66	49.54	91.00	10.78	-0.31
S1	OC	S1OC	711	52.06	31.97	69.66	8.07	0.02

Note:
1. The seam thickness has been truncated at 4.50 m in the underground mining blocks– the theoretical mining height.
2. OC = Opencast; UG = Underground.
3. The minimum seam thickness: OC = 0.50 m; UG = 2.0 m, with the exception of the current mining area (1.5 m).
4. The S1 mineable horizon in block S1 UM includes a parting < 0.3 m thick.

Table 6-2: Goedehoop North: Drill Hole Statistics per Seam

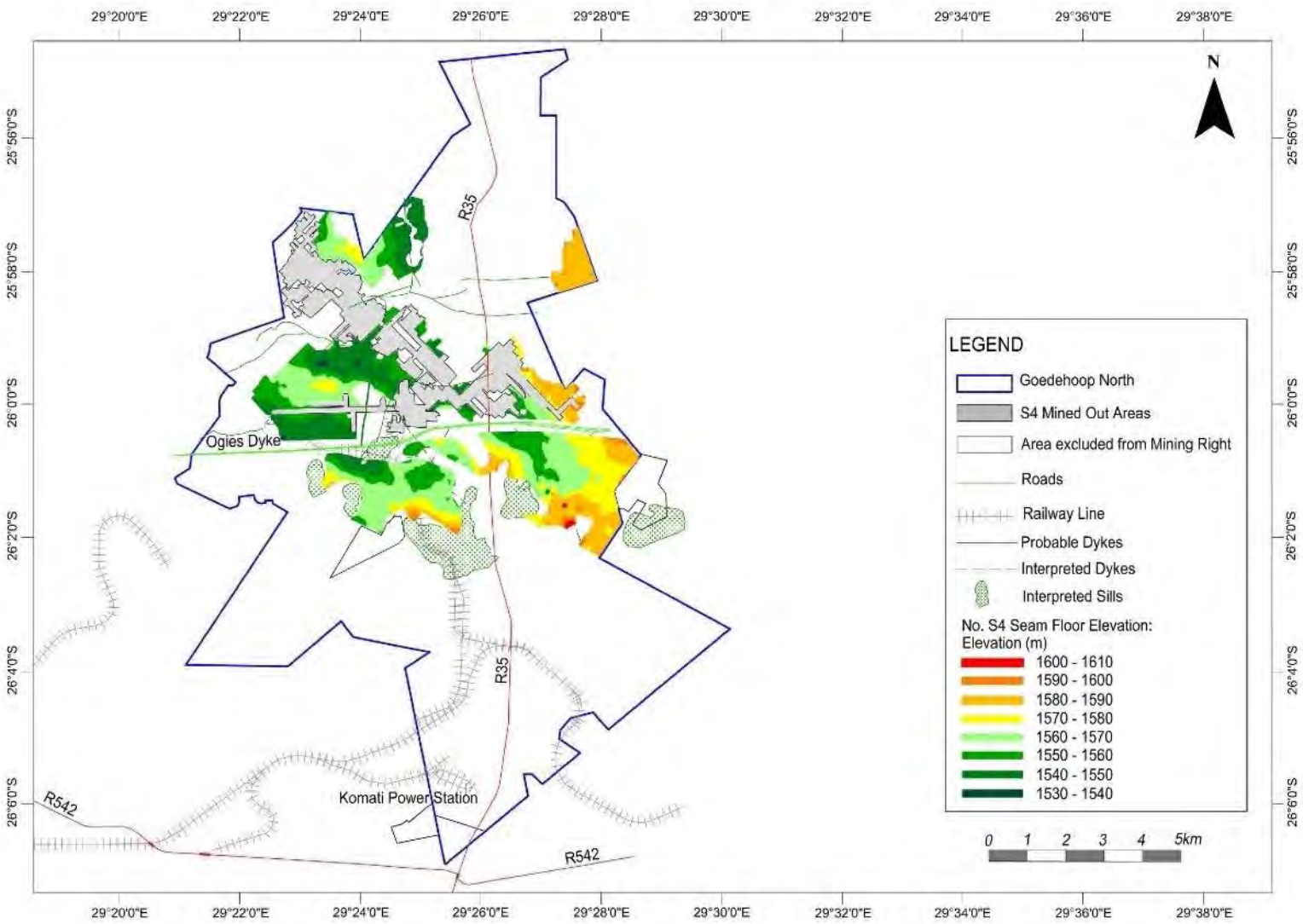
Seam	OC/UG	Block	Number	Mean	Minimum	Maximum	Standard Deviation	Skewness
Thickness (m)								
S4	UG	S4 in Mine Plan	115	2.32	1.52	2.90	0.19	-0.61
S4	UG	S4 East	16	3.26	2.57	3.98	0.39	0.05
S4	UG	S4 South	407	2.82	0.87	4.44	0.62	0.46
S4	OC	S4 OC	88	2.50	1.19	3.30	0.32	-1.32
S2	UG	S2 East	54	4.36	1.97	4.50	0.49	-3.95
S2	UG	S2 Central	21	4.40	3.56	4.50	0.28	-2.67
S2	UG	S2 Brown 2	114	4.34	2.54	4.50	0.40	-2.97
S2	OC	S2 OC	71	2.58	0.00	5.02	1.00	-0.05
S1	UG	S1UN	18	2.92	2.02	4.50	0.63	0.85
S1	UG	S1US	6	3.02	1.90	3.93	0.67	-0.46
S1	UG	S1ME	7	1.82	1.54	2.31	0.26	0.81
S1	UG	S1MW	13	3.43	2.13	4.02	0.51	-1.32
S1	UG	S1UM	34	3.27	1.40	4.50	0.80	-0.27
S1	OC	S1OC	53	3.16	1.82	5.18	0.90	0.46
Floor Elevation (mamsl)								
S4	UG	S4 in Mine Plan	115	1 553.15	1 537.41	1 574.54	9.83	0.33
S4	UG	S4 East	16	1 585.55	1 580.62	1 590.27	2.56	0.26
S4	UG	S4 South	407	1 566.61	1 542.21	1 605.99	10.8	0.19
S4	OC	S4 OC	88	1 558.15	1 535.78	1 573.31	11.08	-0.65
S2	UG	S2 East	54	1 561.09	1 553.85	1 579.00	5.50	1.37
S2	UG	S2 Central	21	1 569.36	1 556.93	1 580.69	5.27	0.01
S2	UG	S2 Brown 2	114	1 563.57	1 544.15	1 583.10	7.28	-0.11
S2	OC	S2 OC	71	1 535.58	1 512.87	1 553.93	12.63	-0.34
S1	UG	S1UN	18	1 515.97	1 508.11	1 523.24	4.20	-0.14
S1	UG	S1US	6	1 515.10	1 507.36	1 520.19	4.53	-0.64
S1	UG	S1ME	7	1 525.35	1 514.05	1 530.70	6.89	-0.81
S1	UG	S1MW	13	1 518.50	1 509.07	1 529.85	6.14	0.19
S1	UG	S1UM	34	1 520.66	1 507.05	1 536.23	7.84	0.23
S1	OC	S1OC	53	1 527.60	1 501.90	1 546.95	10.31	-1.01
Depth to Seam Roof (m)								
S4	UG	S4 in Mine Plan	115	68.57	36.64	99.96	12.95	0.10
S4	UG	S4 East	16	26.77	20.86	32.43	3.89	-0.05
S4	UG	S4 South	407	58.73	20.83	99.40	16.25	-0.12
S4	OC	S4 OC	88	20.68	6.94	33.28	5.57	-0.34
S2	UG	S2 East	54	40.37	22.33	54.01	8.28	-0.57
S2	UG	S2 Central	21	34.73	20.79	55.09	9.12	0.22
S2	UG	S2 Brown 2	114	40.38	21.14	72.83	13.97	0.66
S2	OC	S2 OC	71	41.31	25.61	54.26	7.00	-0.59
S1	UG	S1UN	18	72.30	59.90	82.90	5.44	-0.20
S1	UG	S1US	6	96.02	88.94	108.90	6.79	1.22
S1	UG	S1ME	7	68.12	61.76	81.03	8.03	0.73
S1	UG	S1MW	13	86.24	72.02	93.45	6.16	-0.99
S1	UG	S1UM	34	72.40	52.10	88.94	11.25	-0.35
S1	OC	S1OC	53	52.66	32.53	66.84	7.73	-0.50

Note:
1. The seam thickness has been truncated at 4.50 m in the underground mining blocks– the theoretical mining height.
2. OC = Opencast; UG = Underground.
3. The minimum seam thickness: OC = 0.50 m; UG = 2.0 m with the exception of the current mining areas (1.5 m). The exception is for the No 1 Seam in underground block S1 UM, where a single occurrence of 1.40 m is found in the middle of the block.
4. There are a few drill holes in block S4 South where the seam is anomalously thin; these drill holes have been removed from the resource estimates.



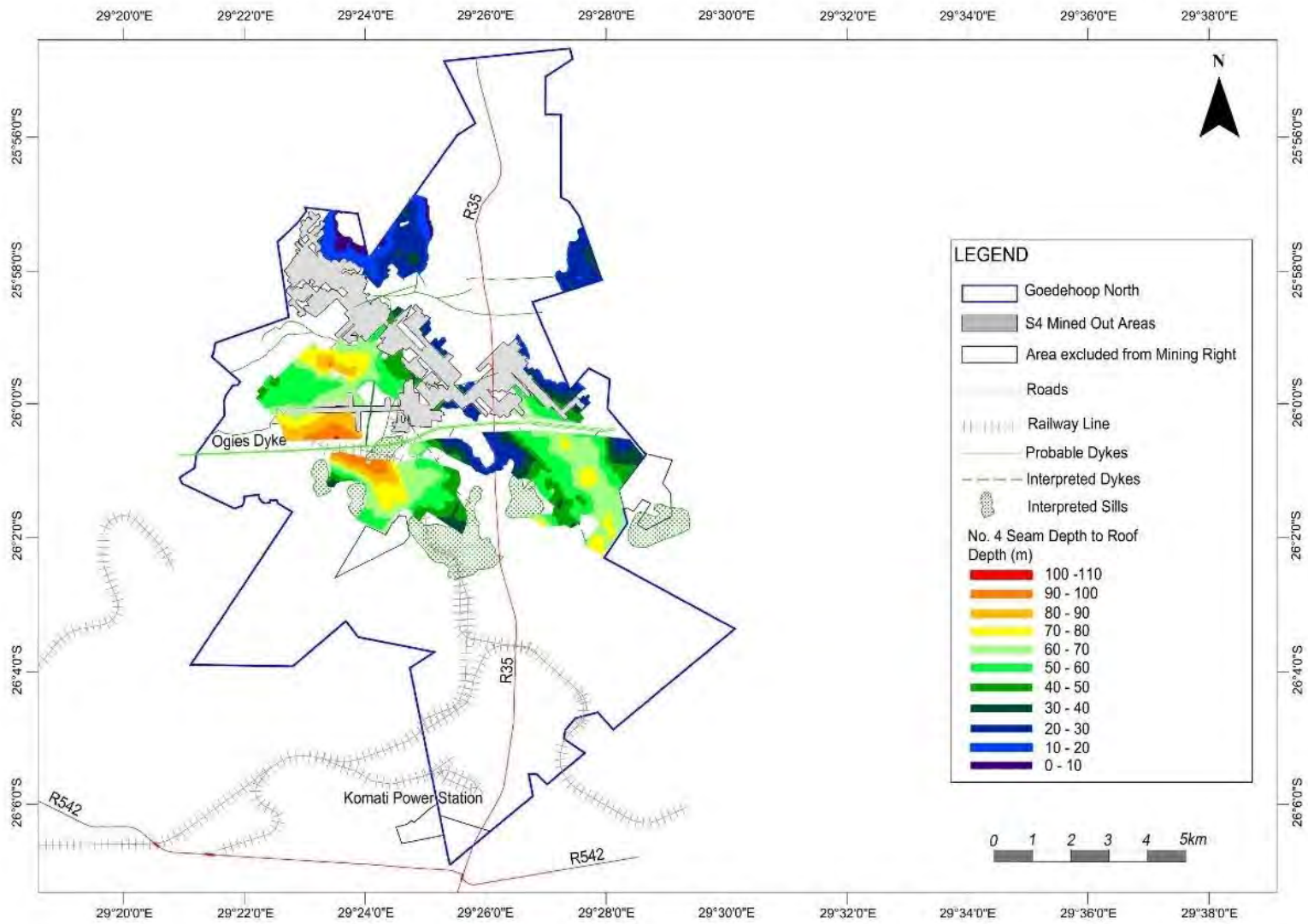
srk consulting	**GOEDEHOOP COLLIERY CPR** Goedehoop North: No 4 Seam Thickness (m)	Project No. 566657

Figure 6-6: Goedehoop North: No 4 Seam Thickness (m)



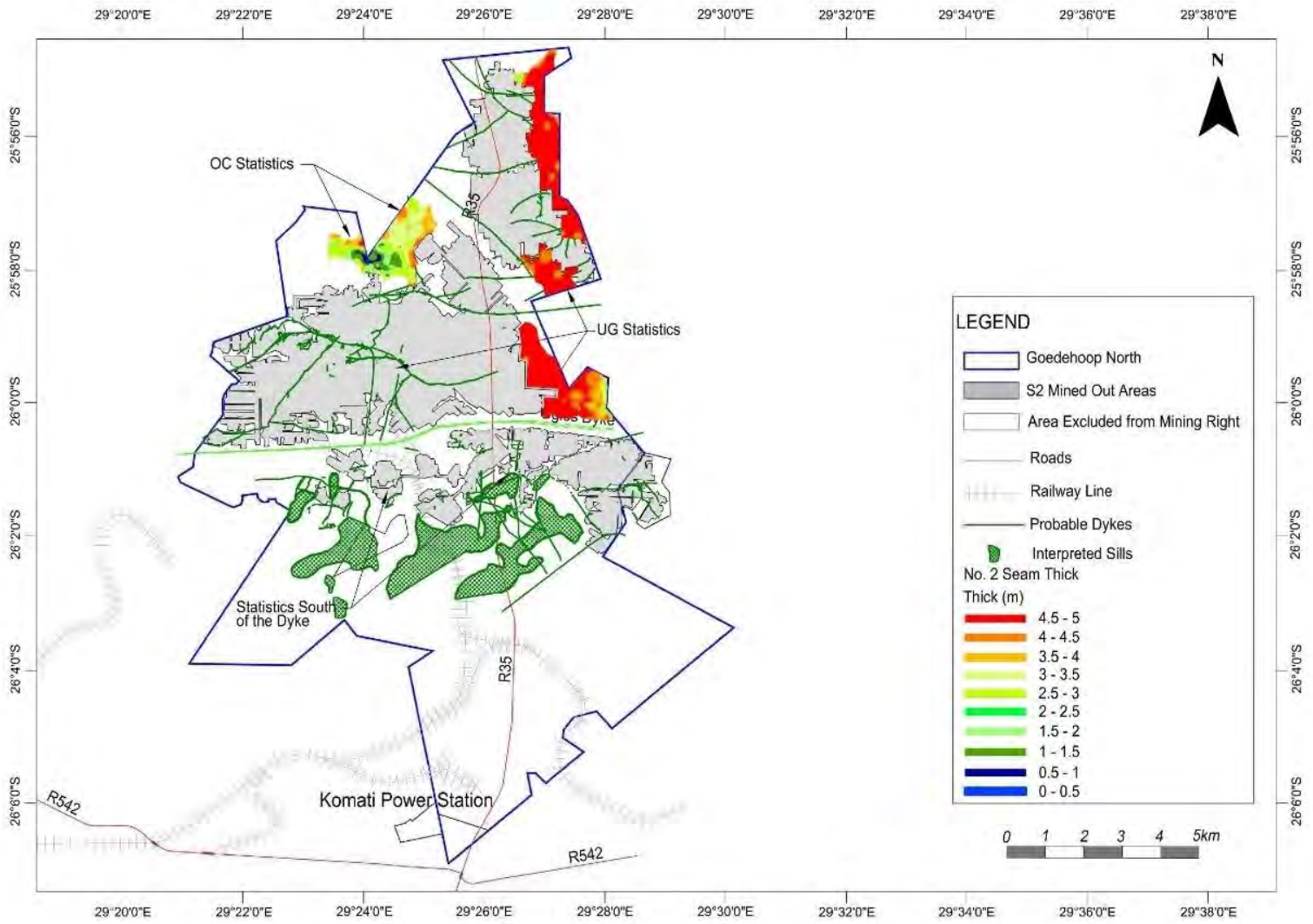
srk consulting	**GOEDEHOOP COLLIERY CPR** Goedehoop North: No 4 Seam Floor Elevation	Project No. 566657

Figure 6-7: Goedehoop North: No 4 Seam Floor Elevation (mamsl)



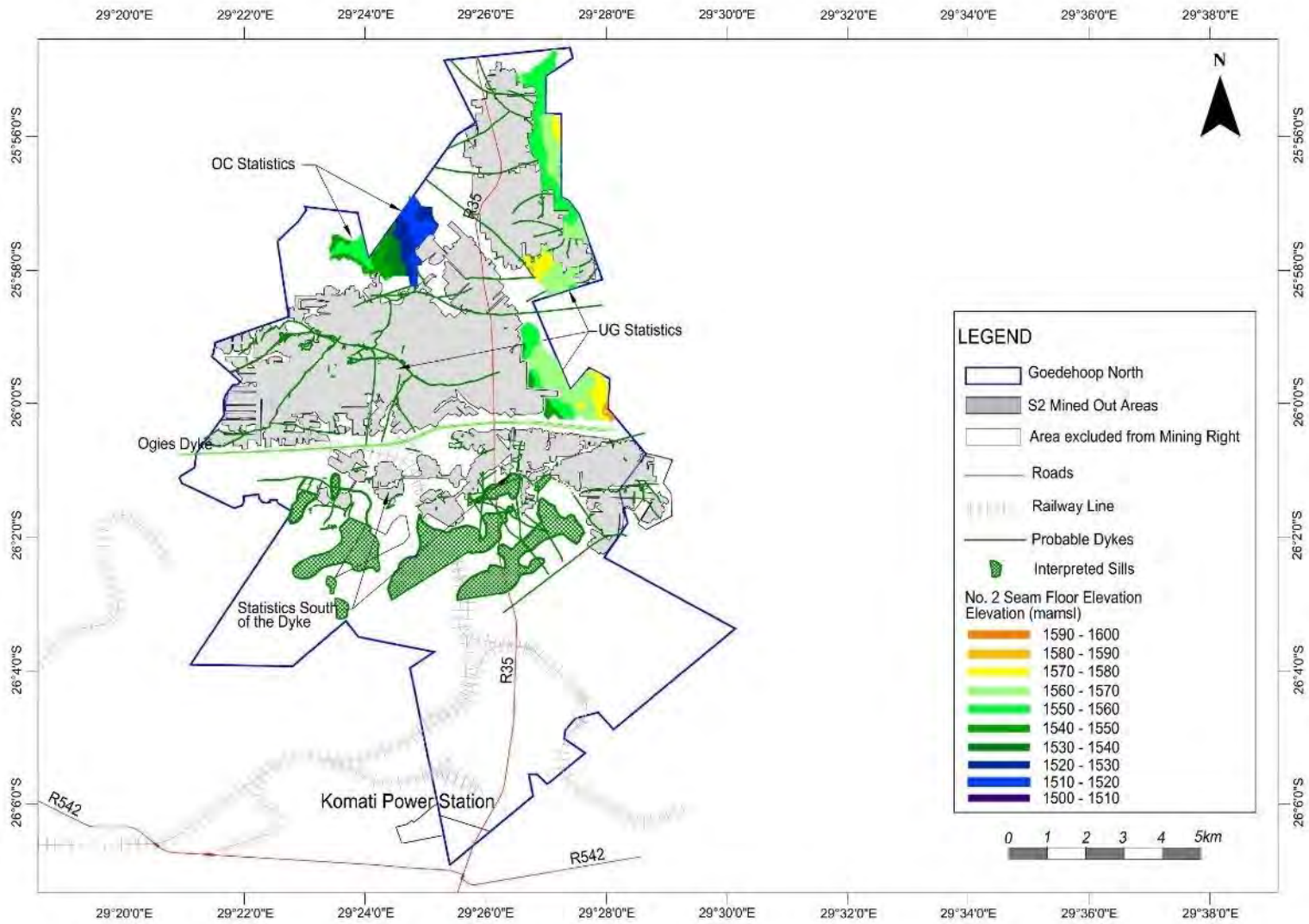
srk consulting	**GOEDEHOOP COLLIERY CPR** Goedehoop North: Depth to No 4 Seam Roof	Project No. 566657

Figure 6-8: Goedehoop North: No 4 Seam Depth to Roof (m)



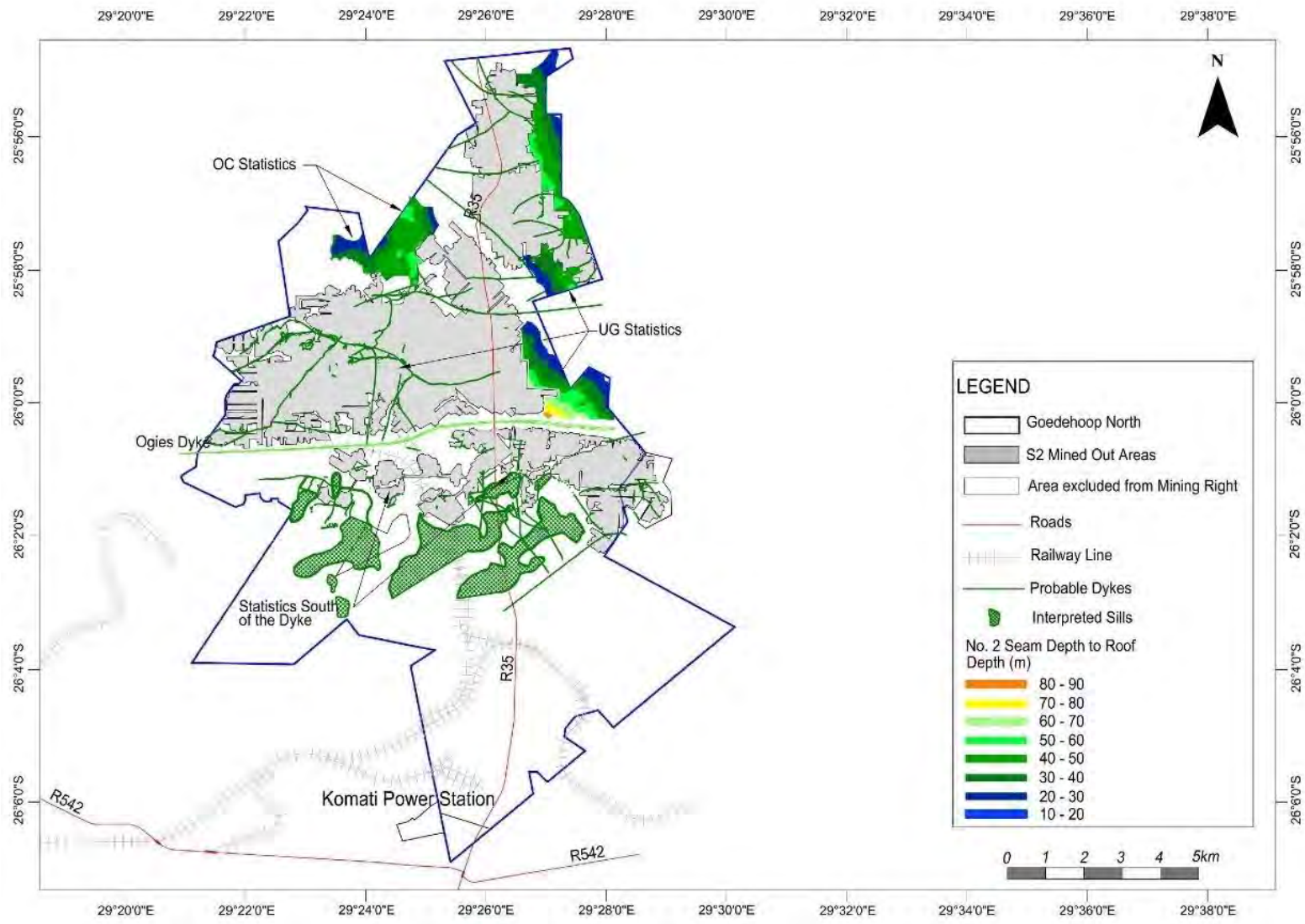
srk consulting	**GOEDEHOOP COLLIERY CPR** Goedehoop North: No 2 Seam Thickness (m)	Project No. 566657

Figure 6-9: Goedehoop North: No 2 Seam Thickness (m)



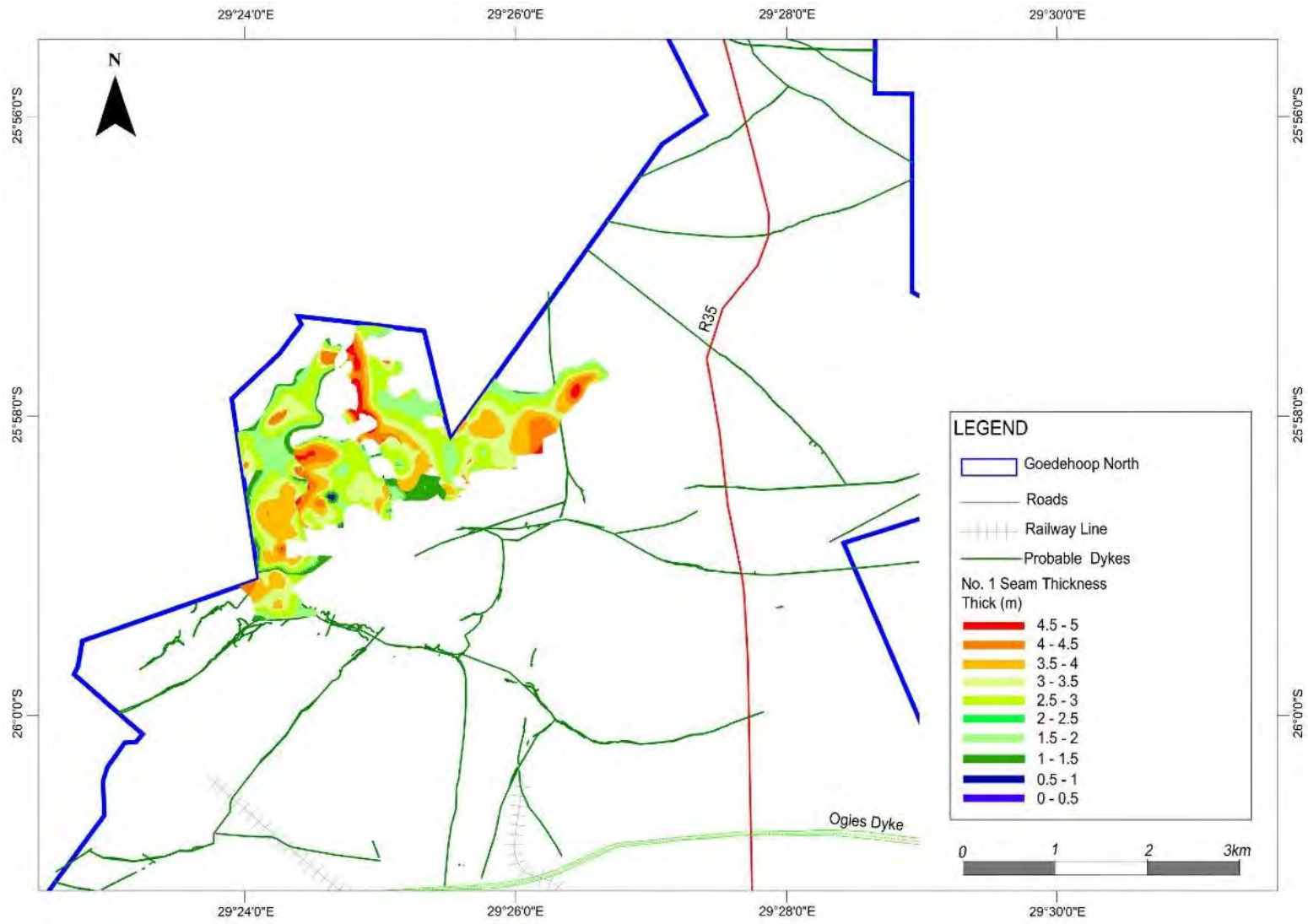
srk consulting	**GOEDEHOOP COLLIERY CPR** Goedehoop North: No 2 Seam Floor Elevation	Project No. 566657

Figure 6-10: Goedehoop North: No 2 Seam Floor Elevation (mamsl)



srk consulting	**GOEDEHOOP COLLIERY CPR** Goedehoop North: Depth to No 2 Seam Roof	Project No. 566657

Figure 6-11: Goedehoop North: No 2 Seam Depth to Roof (m)



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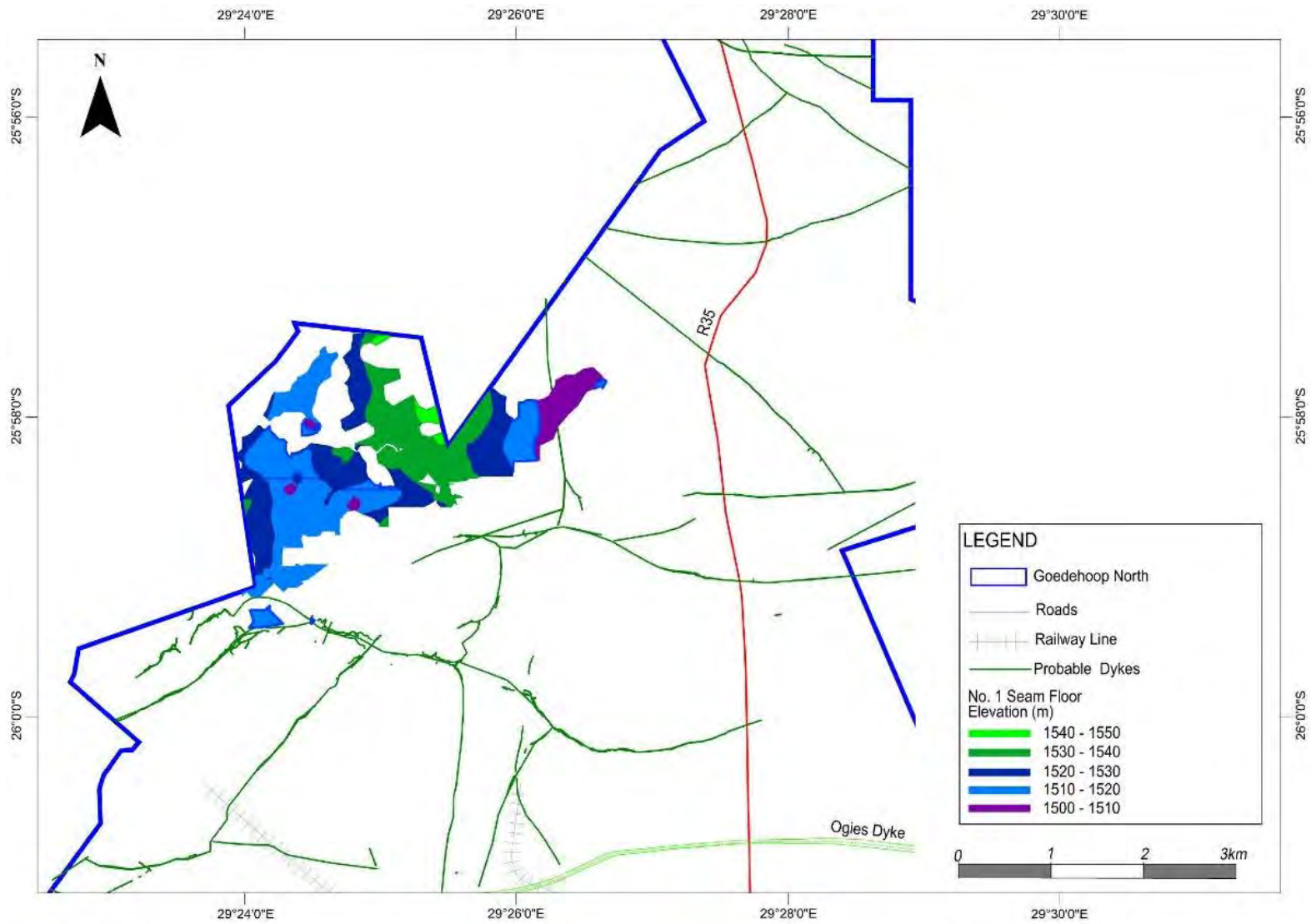
GOEDEHOOP COLLIERY CPR
Goedehoop North: No 1 Seam Thickness (m)

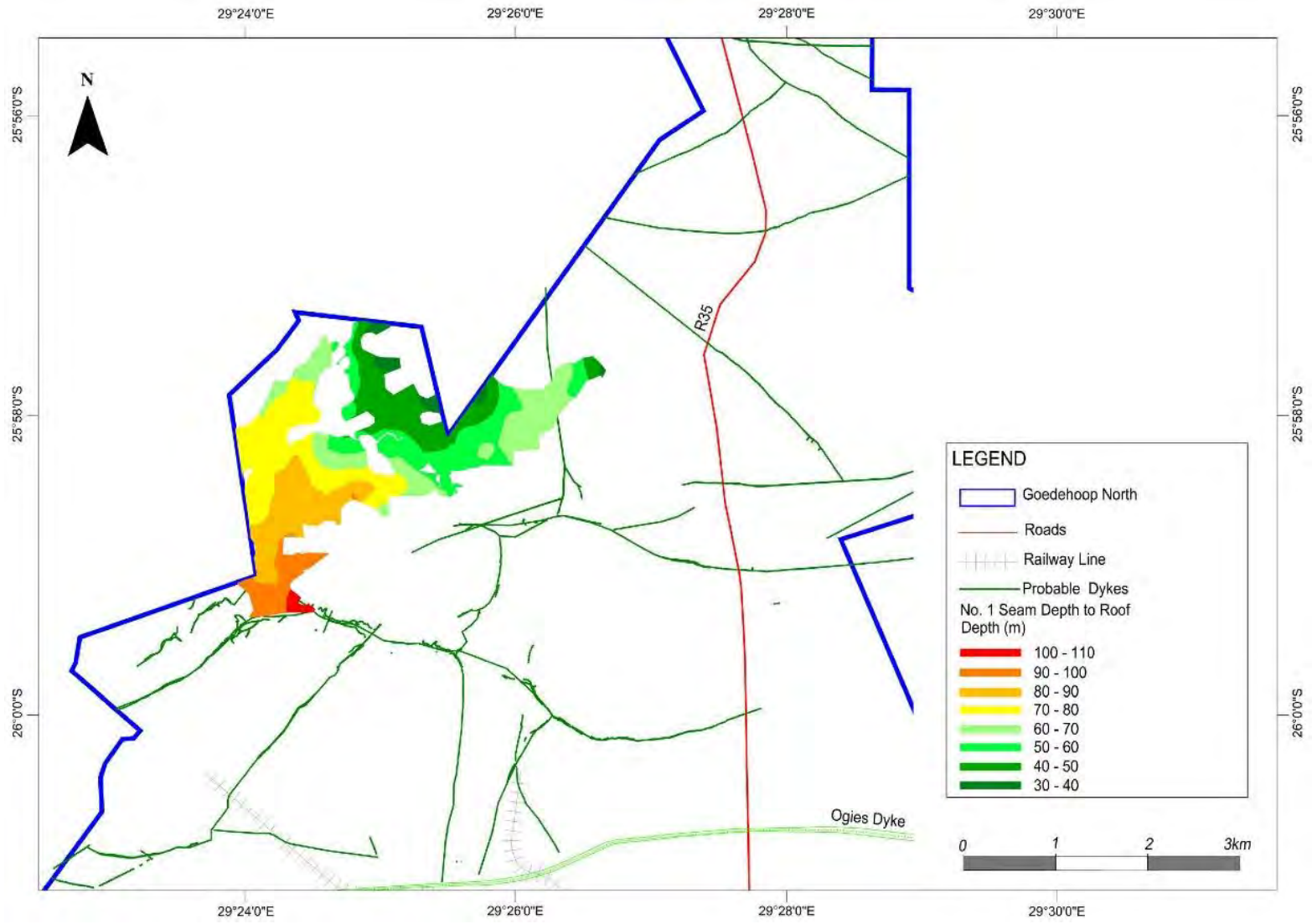
Project No.
566657

Figure 6-12: Goedehoop North: No 1 Seam Thickness (m)



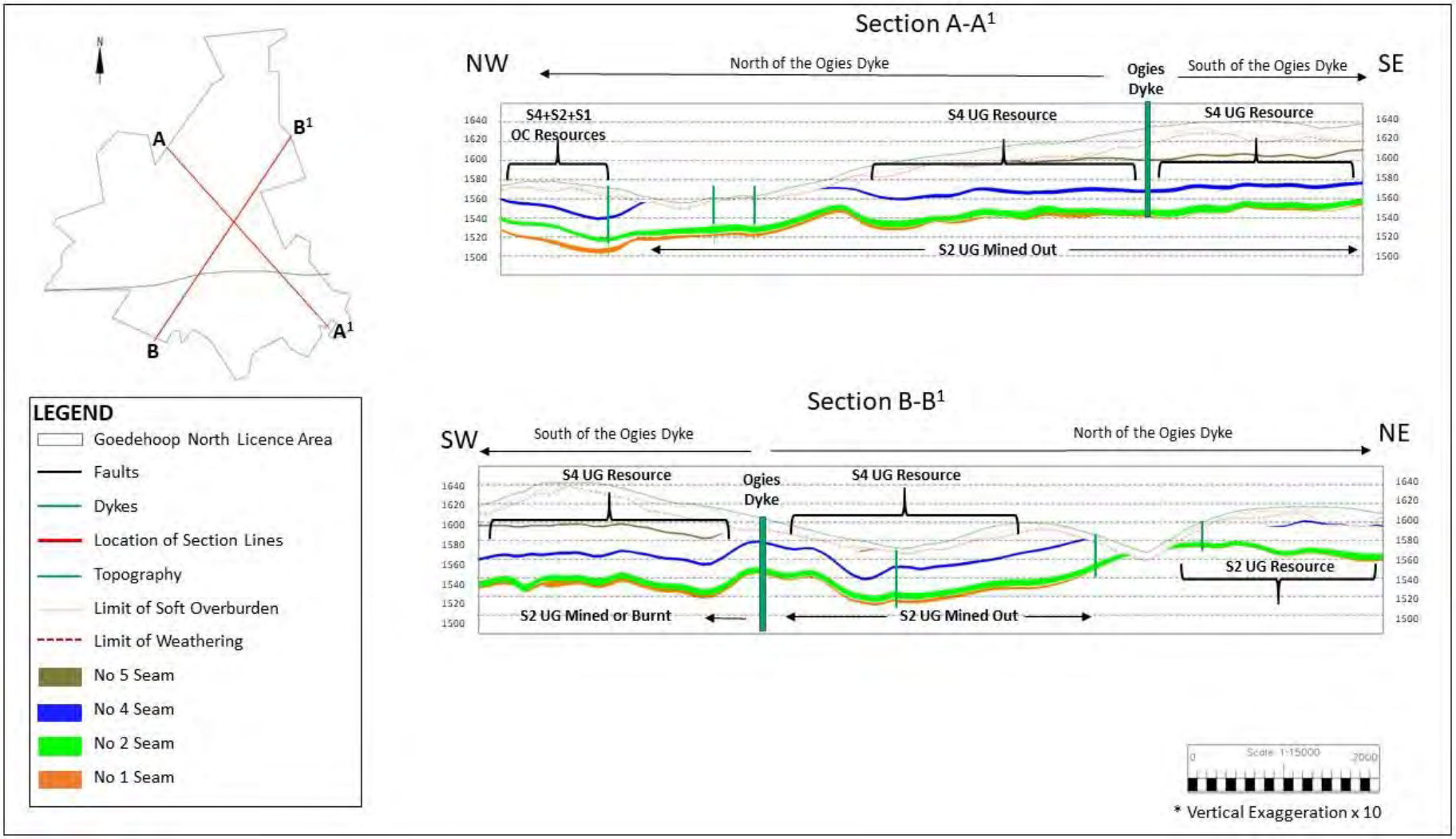
srk consulting	**GOEDEHOOP COLLIERY CPR** Goedehoop North: No 1 Seam Floor Elevation	Project No. 566657

Figure 6-13: Goedehoop North: No 1 Seam Floor Elevation (mamsl)



srk consulting	**GOEDEHOOP COLLIERY CPR** Goedehoop North: Depth to No 1 Seam Roof	Project No. 566657

Figure 6-14: Goedehoop North: No 1 Seam Depth to Roof (m)



srk consulting	**GOEDEHOOP COLLIERY CPR** Goedehoop North: Cross Sections *Vertical Exaggeration = 20*	Project No. 566657

Figure 6-15: Goedehoop North: Cross Sections

Goedehoop South

Note that for this discussion the seam thicknesses are capped by the theoretical mining height of 4.5 m.

No 5 Seam

Areas of No 5 Seam that meet all the criteria for determining a Coal Resource are restricted to the southeastern portion of Goedehoop South where the seam is found in three main zones. The seam is affected by the double dolerite sill transgressions (Figure 6-22), which have depressed the central zone by some ten metres.

The seam varies in thickness between 1.5 and 2.5 m (Figure 6-16) with a mean thickness of 1.68 m. The model data (Table 6-3) and the drill hole data (Table 6-4) are in close agreement. The floor elevations (Figure 6-17) show the impact of the sill transgressions seam is about ten metres lower in the central zone; the model and drill hole data again correspond well (Table 6-3 and Table 6-4). Large parts of the two outer zones are less than 40 m below surface, while the central zone is around 60 m below surface (Figure 6-18); the average depth is around 37 m. The maximum depth on the model (Table 6-3) is approximately two metres deeper than that of the drill hole data (Table 6-4), but the other statistics are in good agreement.

Although there is no impact of the resource estimation, the model around the No 5 seam should be reviewed as there appears to be some unexplained features around the dolerite transgressions (Figure 6-22).

No 4 Seam

The seam occurs approximately 40 m below the No 5 Seam. Large, unmined portions of the No 4 Seam are found in the southern half of Goedehoop, as opposed to the small remnants found in the north (Figure 6-19). The seam is more extensively impacted by the sill transgressions, which segment the resource into five main zones. The east-west orientation of the transgressions can be clearly seen in Figure 6-22. In the west, there is a second double transgression of the seam and a third transgression in the extreme east where the seam rises steadily towards the surface.

The seam is generally between 2.5 and 3.5 m thick, with the thicker seam mainly in the central portion; the mean thickness is around 2.90 m. The minimum thickness according to the model data (Table 6-3) is significantly higher than that of the drill hole data (Table 6-4), likely due to the chosen interpolator. The floor elevations (Figure 6-20) clearly show the east-west oriented lower elevations caused by the sill transgressions, with the seam rising to higher elevations north and south of the transgressions, particularly towards the eastern side of the property. Although the minimum floor elevations in both the model and the drill hole data compare well, the maximum model floor elevations (Table 6-3) differ from the model data (Table 6-4) significantly – 12 m – which is excessive. The skewness (distribution about the mean) has also changed character from a negative spread in the data to a strongly positive spread in the model. This should be reviewed. The seam reached depths in excess of 100 m in the central area along the dolerite transgressions and rises rapidly to the south and northwest where it can be found less than 10 m below surface (Figure 6-21); the seam statistics are generally in agreement.

Table 6-3: Goedehoop South Seam Model Statistics per Seam

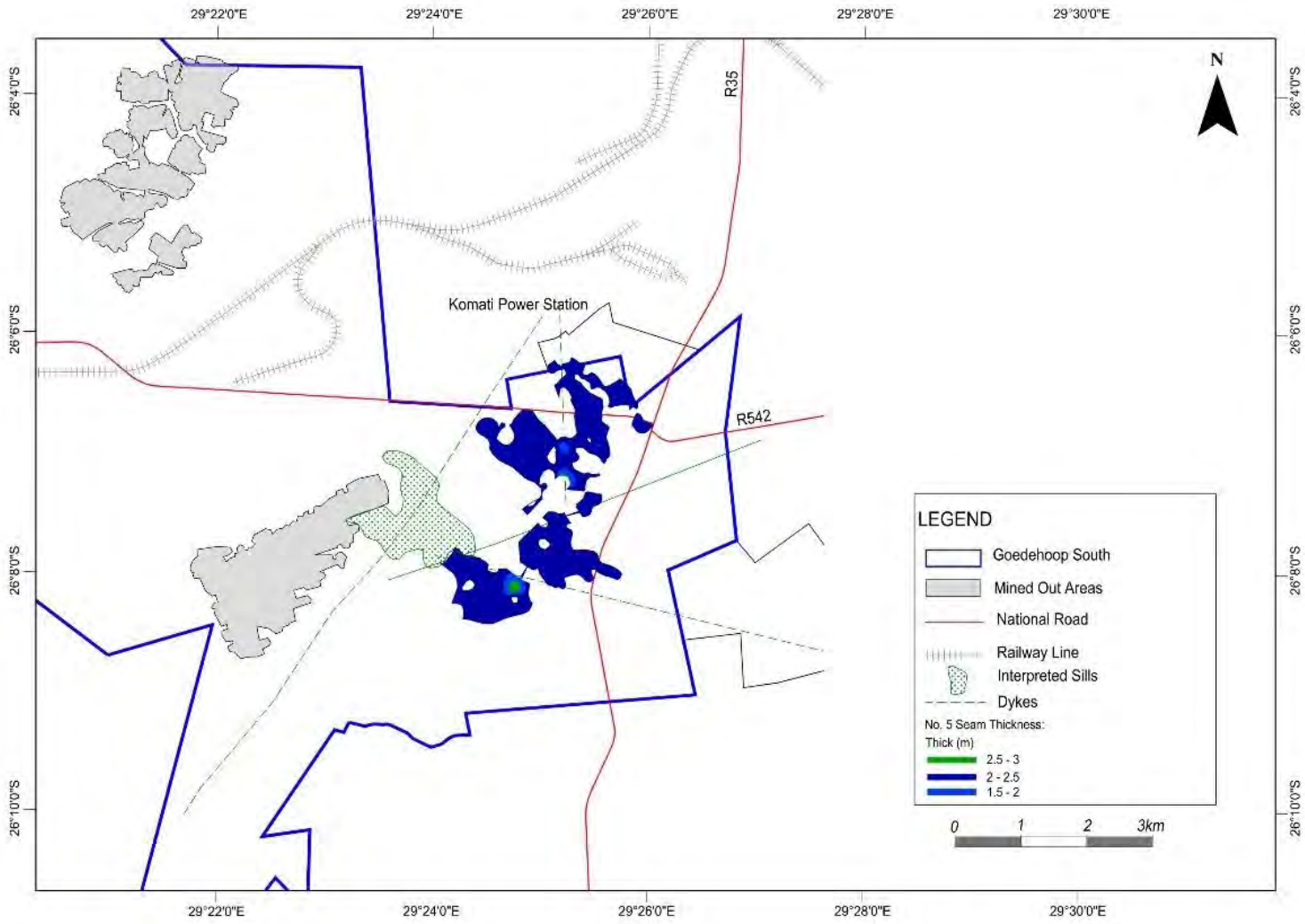
Seam	OC/UG	Block/Sub-seam	Number	Mean	Minimum	Maximum	Standard Deviation	Skewness
Thickness (m)								
S5	UG	Southeast	1 475	1.68	1.27	2.84	0.17	2.58
S4	UG	GHS	9 719	2.89	1.39	4.50	0.32	0.42
Floor Elevation (mamsl)								
S5	UG	Southeast	1 475	1 594.50	1 568.97	1 620.97	12.62	-0.51
S4	UG	GHS	9 719	1 554.56	1 525.12	1 600.65	12.46	0.03
Depth to Seam Roof (m)								
S5	UG	Southeast	1 475	36.98	19.88	61.72	11.09	0.35
S4	UG	GHS	9 719	55.71	19.53	104.19	21.25	0.34

Note:
1. The seam thickness has been truncated at 4.50 m in the underground mining blocks– the maximum mining height.
2. OC = Opencast; UG = Underground.

Table 6-4: Goedehoop South Drill Hole Statistics per Seam

Seam	OC/UG	Block/Sub-seam	Number	Mean	Minimum	Maximum	Standard Deviation	Skewness
Thickness (m)								
S5	UG	Southeast	116	1.68	1.19	2.99	0.20	2.73
S4	UG	GHS	651	2.91	1.00	4.50	0.38	0.44
Floor Elevation (mamsl)								
S5	UG	Southeast	116	1 594.03	1 569.46	1 619.38	13.28	-0.52
S4	UG	GHS	651	1 556.02	1 525.63	1 588.64	12.71	-0.17
Depth to Seam Roof (m)								
S5	UG	Southeast	116	38.24	19.93	59.73	11.51	0.21
S4	UG	GHS	651	54.30	20.31	101.97	21.02	0.46

Note:
1. The seam thickness has been truncated at 4.50 m in the underground mining blocks– the maximum mining height.
2. OC = Opencast; UG = Underground.
3. The thin S4 Seam occurs in one drill hole in the centre of the block.



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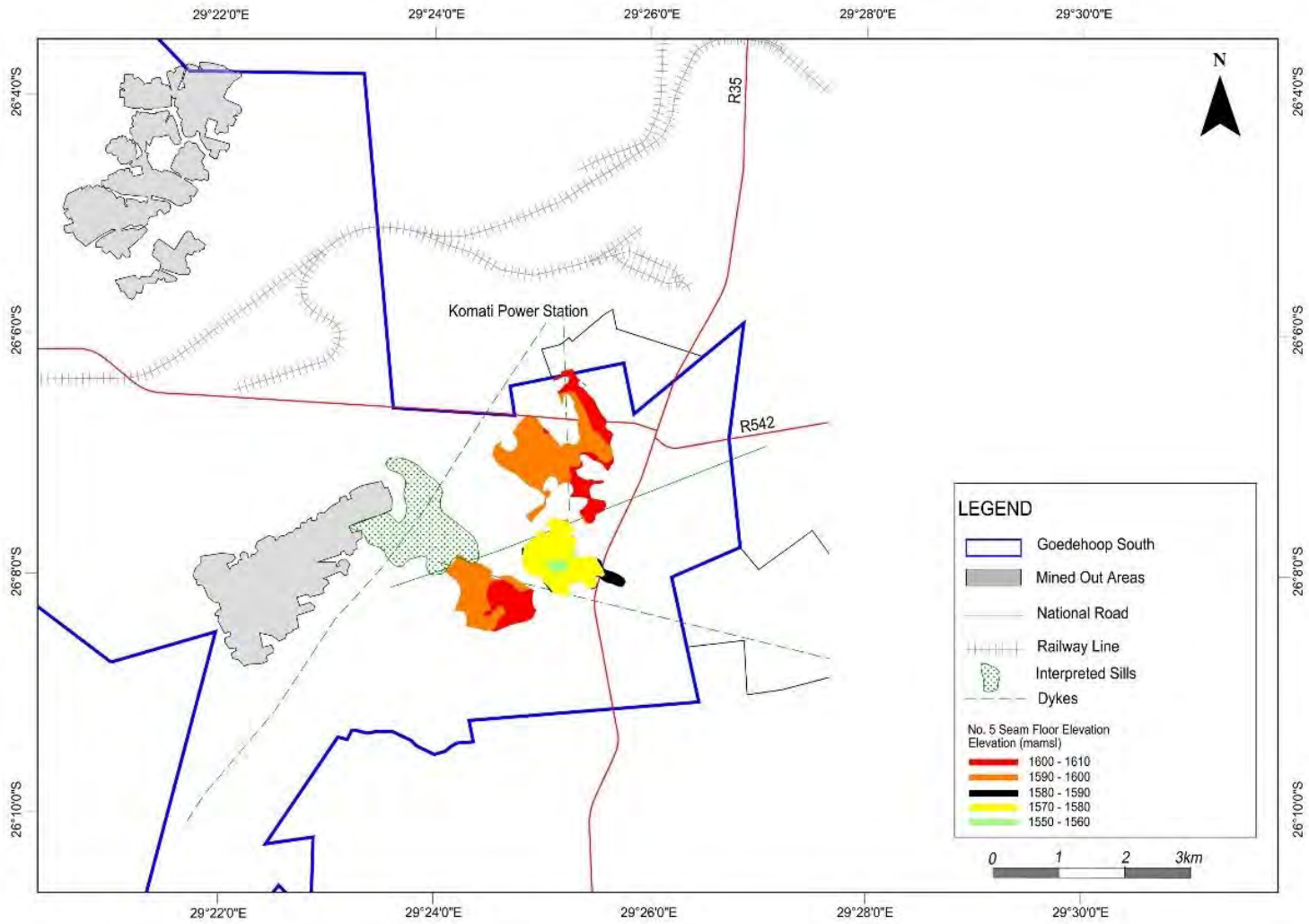
GOEDEHOOP COLLIERY CPR
Goedehoop South: No 5 Seam Thickness (m)

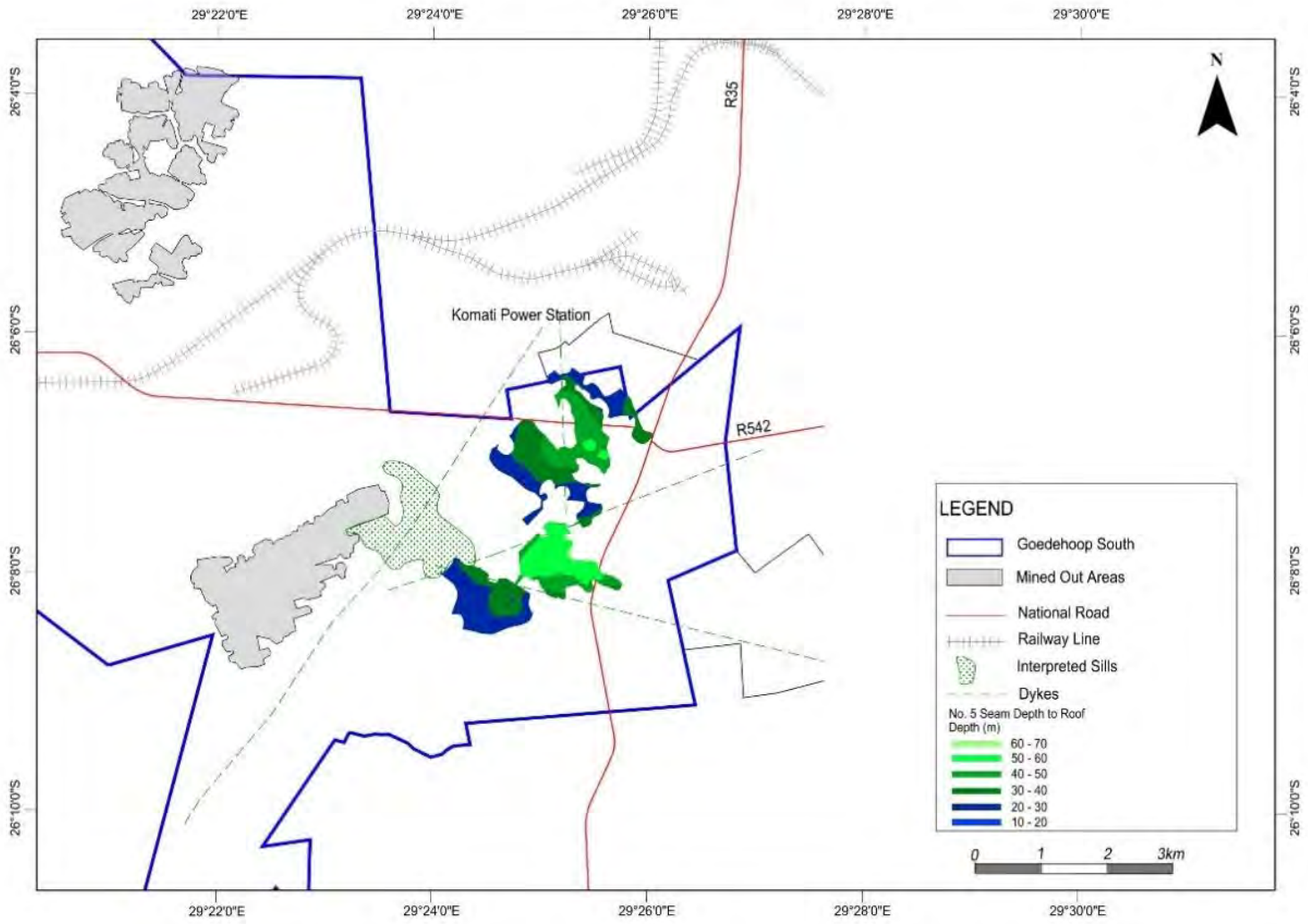
Project No. 566657

Figure 6-16: Goedehoop South: No 5 Seam Thickness (m)



srk consulting	**GOEDEHOOP COLLIERY CPR** Goedehoop South: No 5 Seam Floor Elevation	Project No. 566657

Figure 6-17: Goedehoop South: No 5 Seam Floor Elevation (mamsl)



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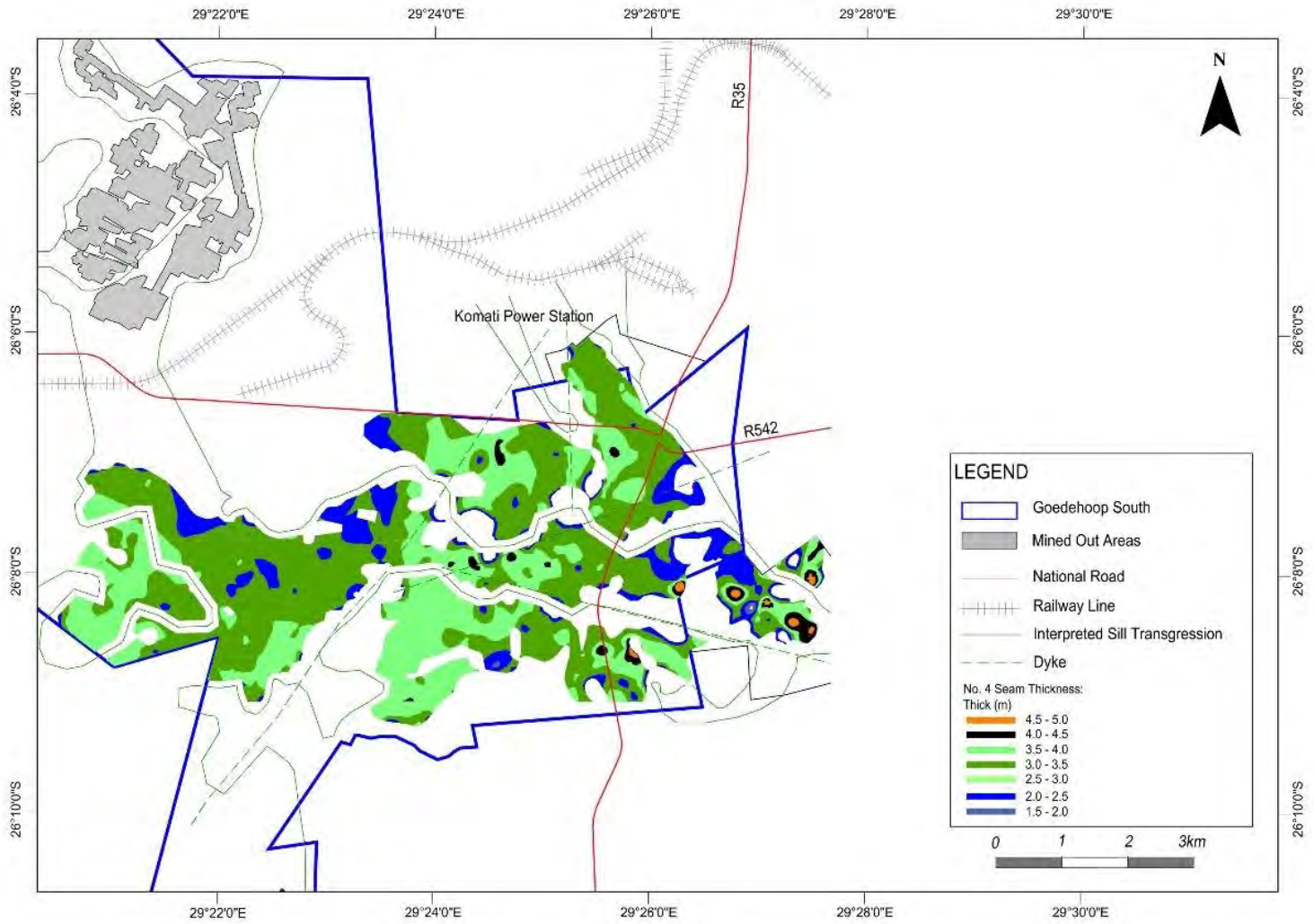
GOEDEHOOP COLLIERY CPR
Goedehoop South: Depth to No 5 Seam Roof

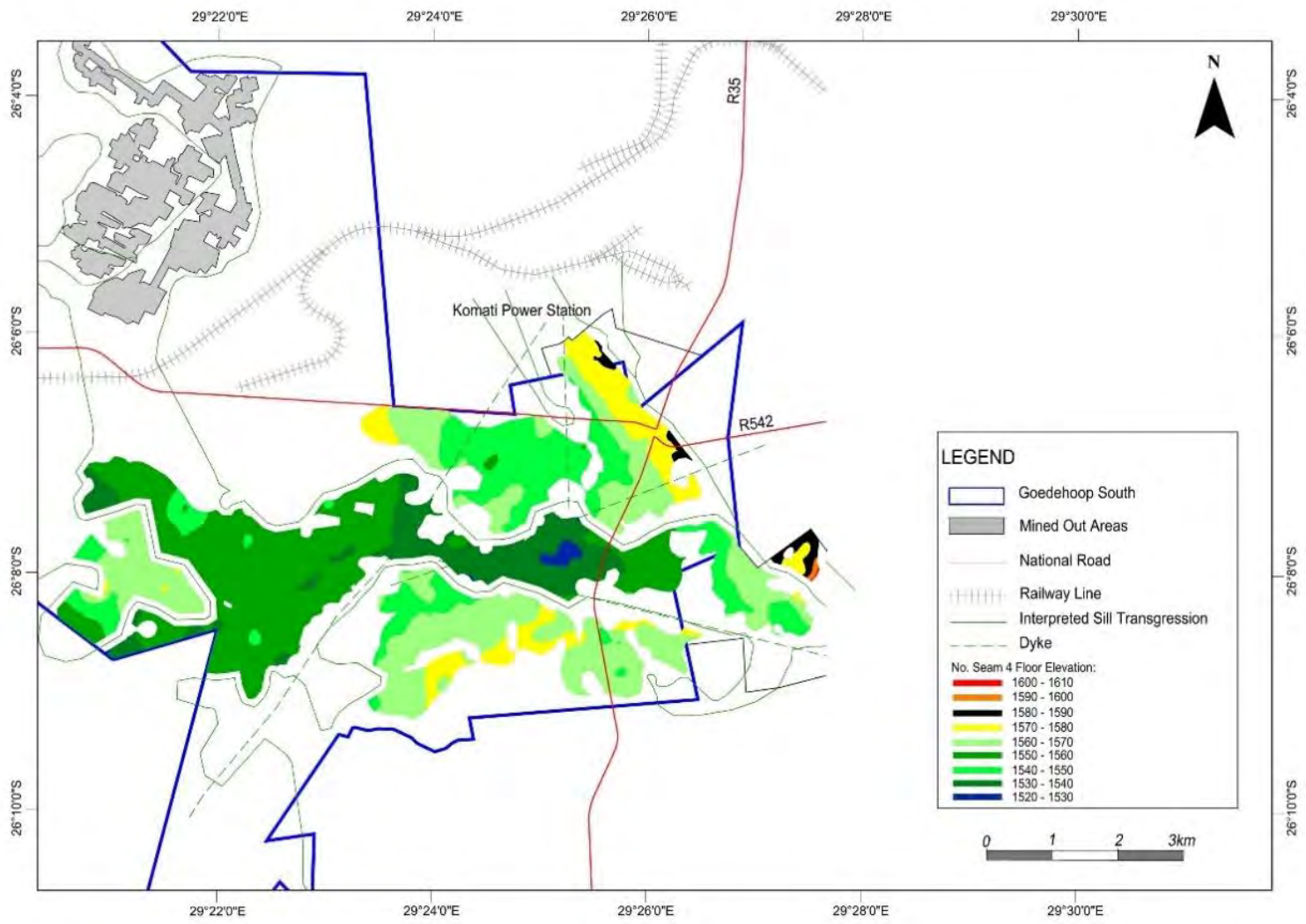
Project No. 566657

Figure 6-18: Goedehoop South: No 5 Seam Depth to Roof (m)



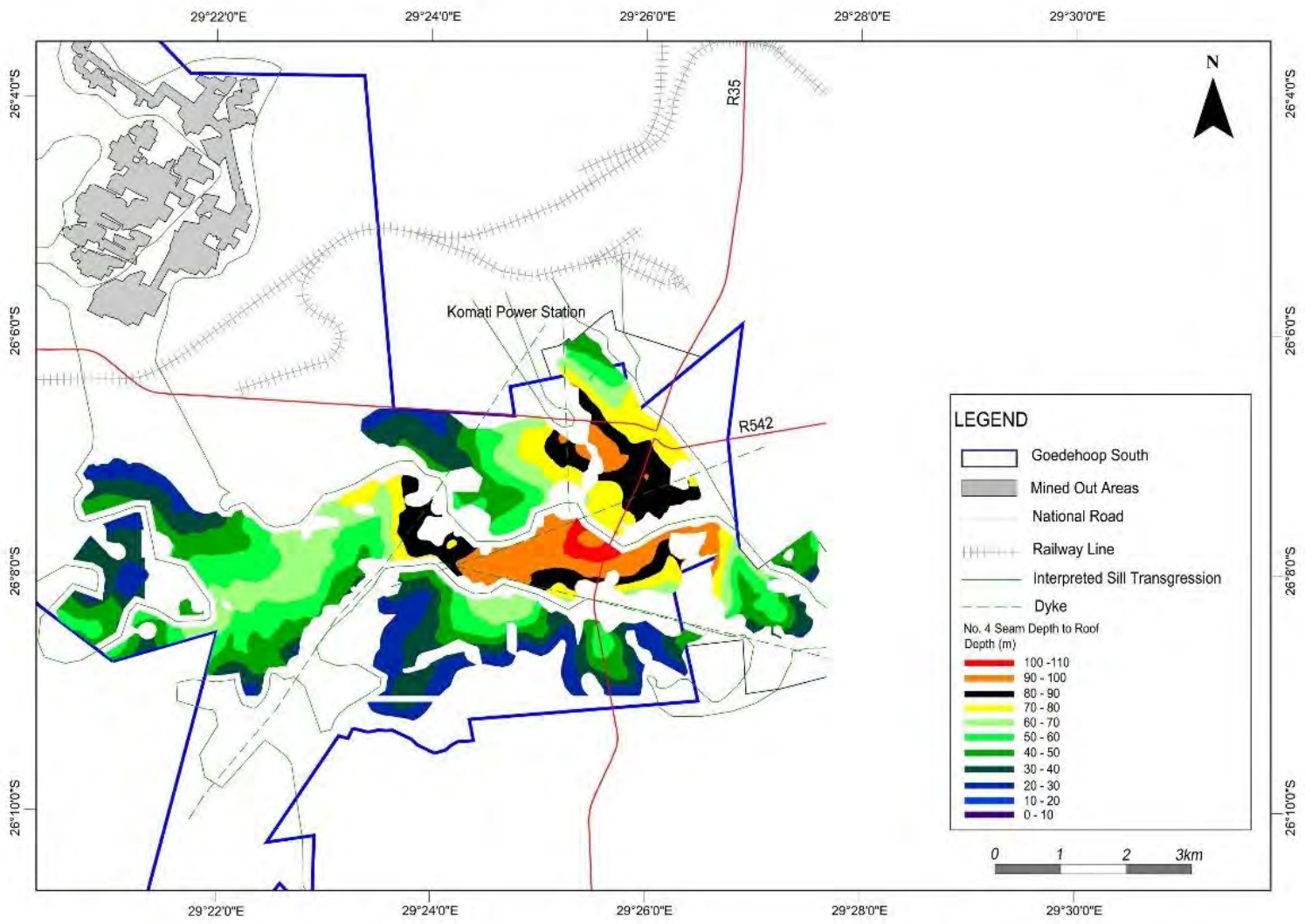
srk consulting	**GOEDEHOOP COLLIERY CPR** Goedehoop South: No 4 Seam Thickness (m)	Project No. 566657

Figure 6-19: Goedehoop South: No 4 Seam Thickness (m)



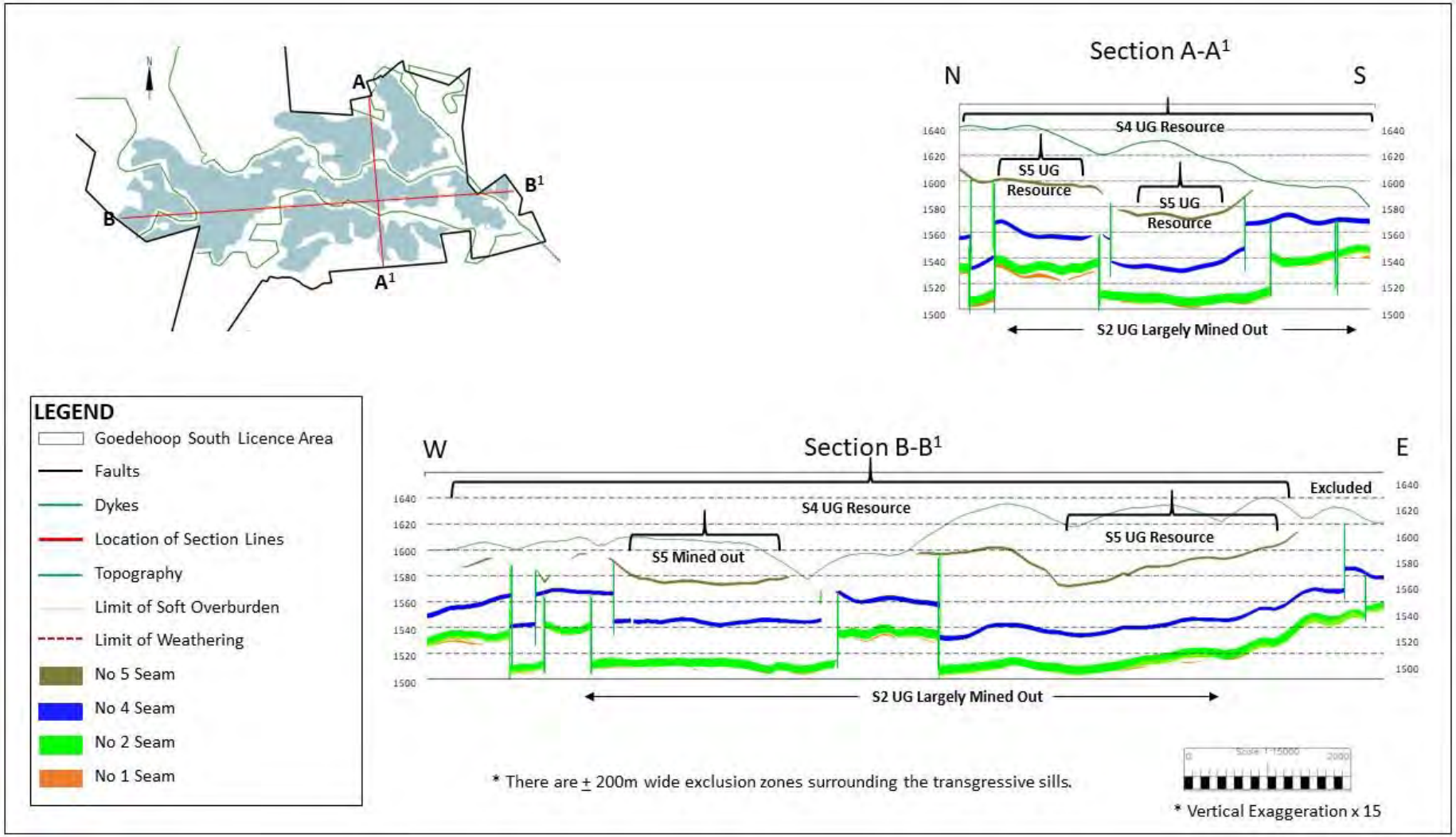
srk consulting	**GOEDEHOOP COLLIERY CPR** Goedehoop South: No 4 Seam Floor Elevation	Project No. 566657

Figure 6-20: Goedehoop South: No 4 Seam Floor Elevation (mamsl)



srk consulting	**GOEDEHOOP COLLIERY CPR** Goedehoop South: Depth to No 4 Seam Roof	Project No. 566657

Figure 6-21: Goedehoop South: No 4 Seam Depth to Roof (m)



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GOEDEHOOP COLLIERY CPR
Goedehoop South: Cross Sections
Vertical Exaggeration = 15

Project No.
566657

Figure 6-22: Goedehoop South: Cross Sections

6.3.2. Raw Coal Quality

[SR4.1(iv), SR4.5(i)]

Goedehoop North

The raw quality parameters Ash, CV[1], IM, FC, VM and TS were modelled, on an air-dried basis (**adb**). The average qualities were estimated by weight-averaging the individual sub-seam qualities on both thickness and RD. Plans detailing the modelled raw qualities together with the associated frequency distributions are included in Figure 6-23 to Figure 6-26 (No 4 Seam), Figure 6-27 to Figure 6-30 (No 2 Seam) and Figure 6-31 to Figure 6-34 (No 1 Seam). Note that the diagrams only show the qualities within the resource polygons determined by SRK and that the No 1 Seam diagrams show the selected mining horizon for each sub-polygon, as described in Figure 6-3.

Raw Ash

No 4 Seam

The raw ash content is mostly below 24% but increases to the east to values in the mid-30s (Figure 6-24). The opencast area displays a normal distribution, while the undergrounds areas both north and south of the Ogies Dyke show a negatively skewed distribution, with a greater range of values south of the Dyke.

No 2 Seam

The No 2 Seam shows the opposite trend for raw ash compared with the No 4 Seam; the ash content is lowest in the east (Brown 2) and increases to the north and the opencast area (Figure 6-27). The ash content over much of the opencast area is between 28 and 36%, rising to over 44% in the extreme west. Most of the underground area in the north has ash content values between 24 and 32% while Brown 2 shows a normal distribution, with most of the values occurring between 20 and 28%.

No 1 Seam

Examination of the raw ash contour plot illustrates that the ash content is more erratic than the upper two seams and increases from values less than 24% in the southeast to greater than 36% in the north (Figure 6-31). The ash frequency distributions show little discernible distribution pattern.

Raw Calorific Value

No 4 Seam

The lowest raw CV[1] values can be found in the southeast, both north and south of the Ogies Dyke (Figure 6-24). The CV[1] increases to the northwest and southwest, to between 22 and 26 MJ/kg. A normal distribution is displayed in the opencast area with over 70% of the coal having CV[1] between these values. The underground areas show a positively skewed distribution pattern, although north of the Ogies Dyke the tail of the distribution is longer, indicating a greater proportion of lower values than south of the Dyke.

No 2 Seam

The raw CV[1] mostly ranges between 18 and 22 MJ/kg over much of the area, increasing to around 24 MJ/kg in Brown 2 (Figure 6-28). There is little pattern to the distribution in the opencast area, but the underground areas both show a normal distribution. Around 70% of the coal in these two areas has heat contents of between 22 and 26 MJ/kg.

No 1 Seam

The CV[1] values are lowest in the area with the highest ash and again, show no distribution pattern. Raw CV[1] is above 18 MJ/kg and reach a maximum 28 MJ/kg in the northeast and southwest of the resource area (Figure 6-32).

Raw Total Sulphur

No 4 Seam

Raw TS is generally lower than 1.6%, although there are some isolated occurrences of high TS south of the Ogies Dyke (Figure 6-25). In general, the TS increase slightly towards the northwest, although distribution is erratic, as is usual for sulphur in coal.

No 2 Seam

TS in the No 2 Seam is lower than that for the No 4 Seam, being below 1.2% over the majority of the Coal Resources. Small, isolated patches of slightly higher TS occur, mainly along the eastern boundary of Goedehoop North (Figure 6-29). All areas show a negatively skewed distribution, indicating sporadic high values.

No 1 Seam

TS for the No 1 Seam is somewhat higher in the northeastern corner of the resource polygons (opencast area) but is mainly < 1.2% (Figure 6-33). The distribution for both the opencast and underground areas is negative, with a more erratic tail of higher values in the opencast area.

Raw Volatile Matter Content

No 4 Seam

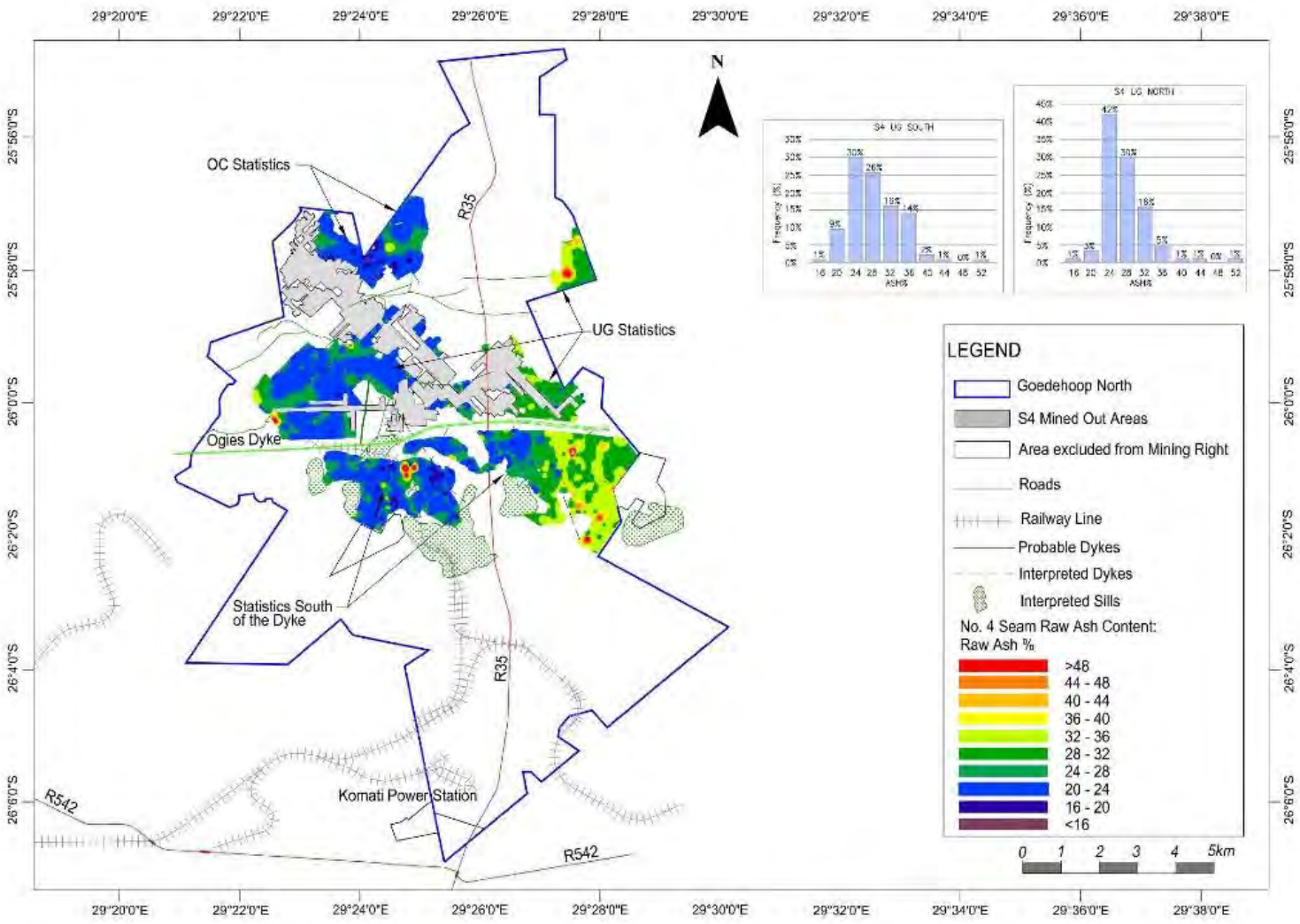
North of the Ogies Dyke the raw VM content is more uniform and ranges between 20 – 24%; south of the Dyke the distribution is more erratic and shows larger occurrences of lower (< 18%) VM content, due to the increased dolerite activity in this region (Figure 6-26). This is clearly demonstrated in the extreme southeast. Distribution in the opencast area is normal, while that in the underground areas is positively skewed.

No 2 Seam

The raw VM content is around 20 - 24% over much of Goedehoop North, although somewhat lower (16 – 20%) in the opencast area and in a few patches in the northern underground area (Figure 6-30). Brown 2 has the most consistent VM content. All three areas display a normal distribution, although there is some suggestion of positive skewness in the northern underground area.

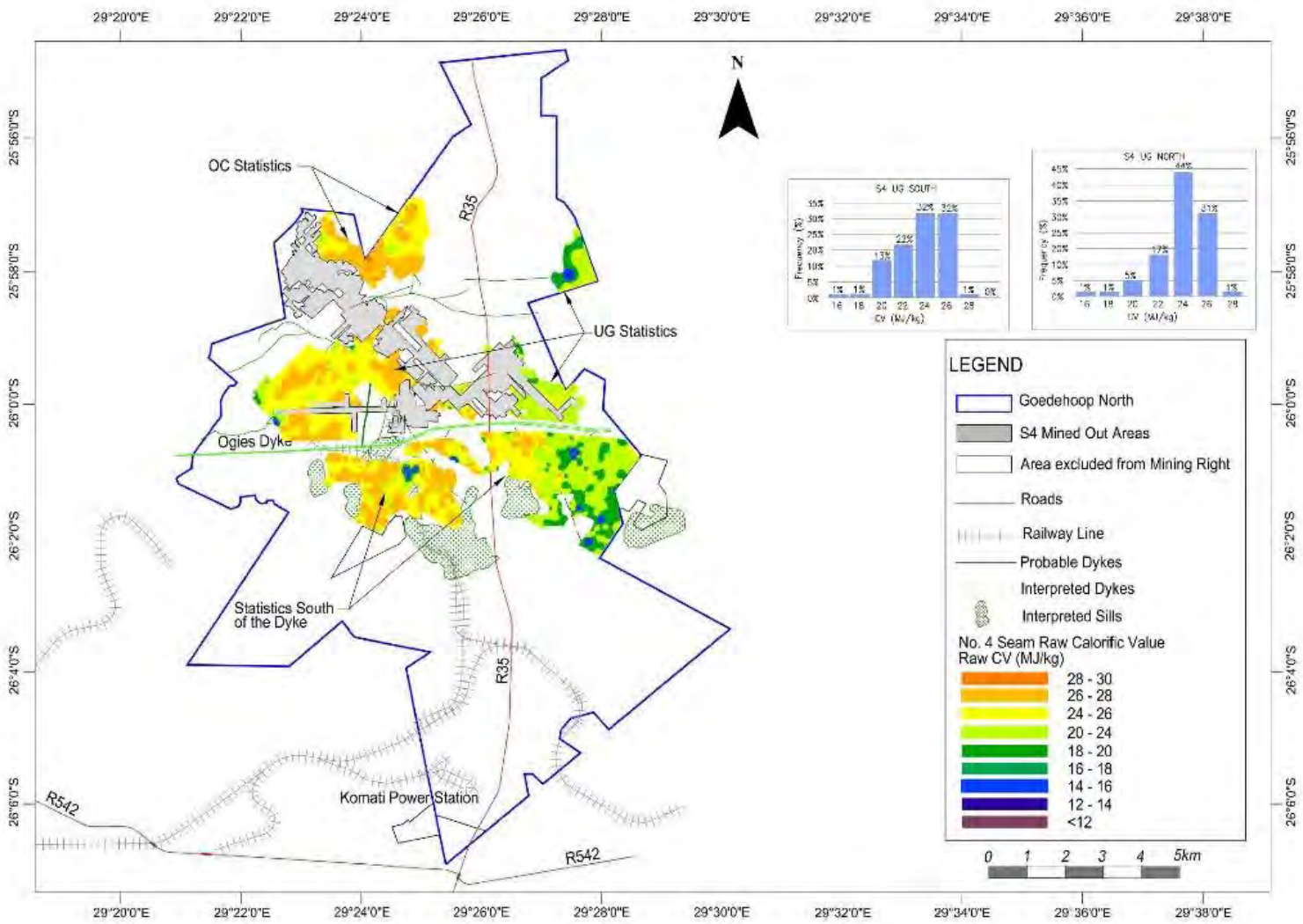
No 1 Seam

Raw VM content is mainly between 18 and 24%, with slightly lower values towards the central areas. The positively skewed distribution indicates a larger number of low values, although this is more pronounced in the opencast area (Figure 6-34).



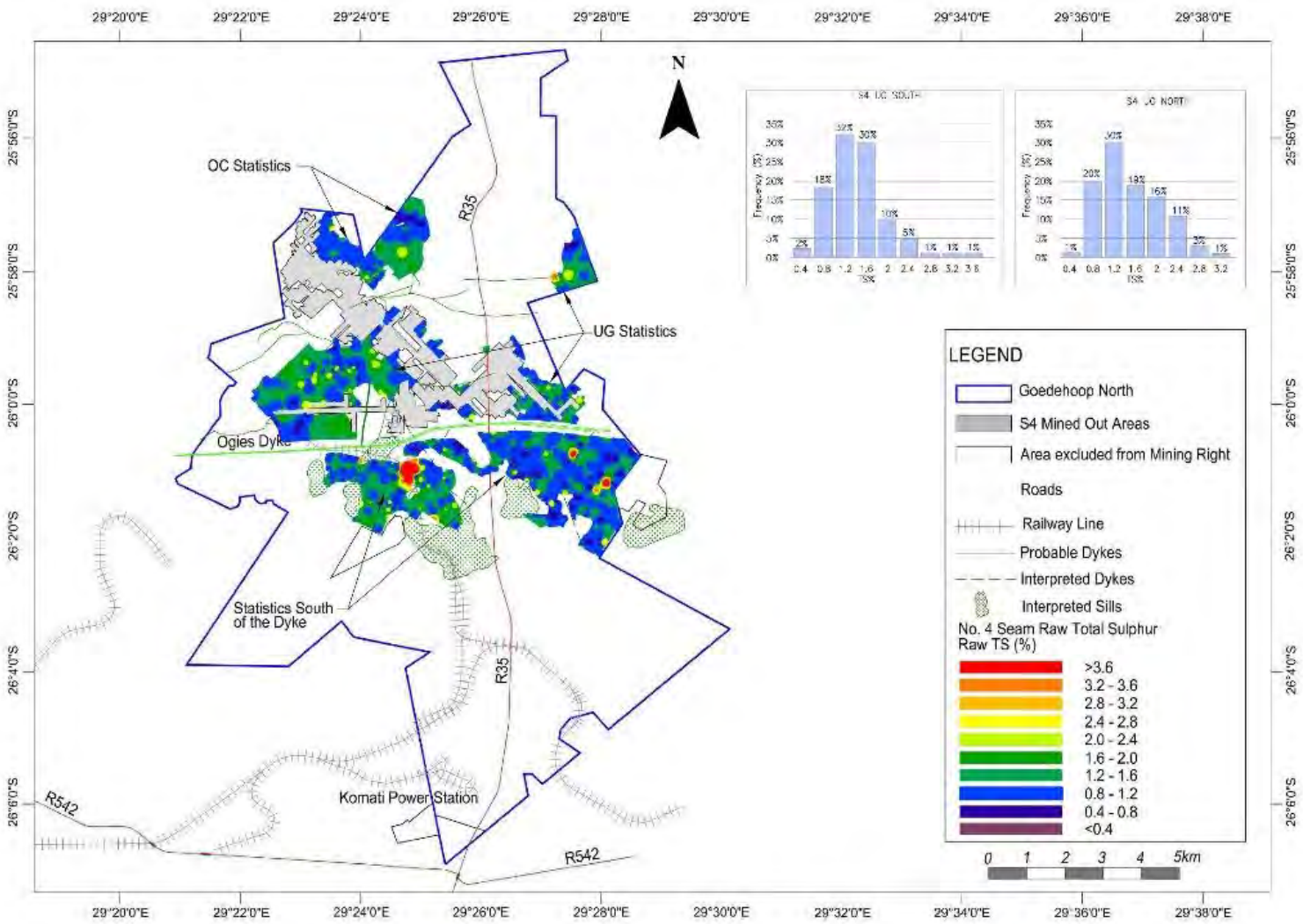
srk consulting	**GOEDEHOOP COLLIERY CPR** Goedehoop North: No 4 Seam Raw Ash Content (%)	Project No. 566657

Figure 6-23: Goedehoop North – No 4 Seam Raw Ash Content (%)



srk consulting	**GOEDEHOOP COLLIERY CPR** Goedehoop North: No 4 Seam Raw Calorific Value (MJ/kg)	Project No. 566657

Figure 6-24: Goedehoop North: No 4 Seam Raw Calorific Value (MJ/kg)



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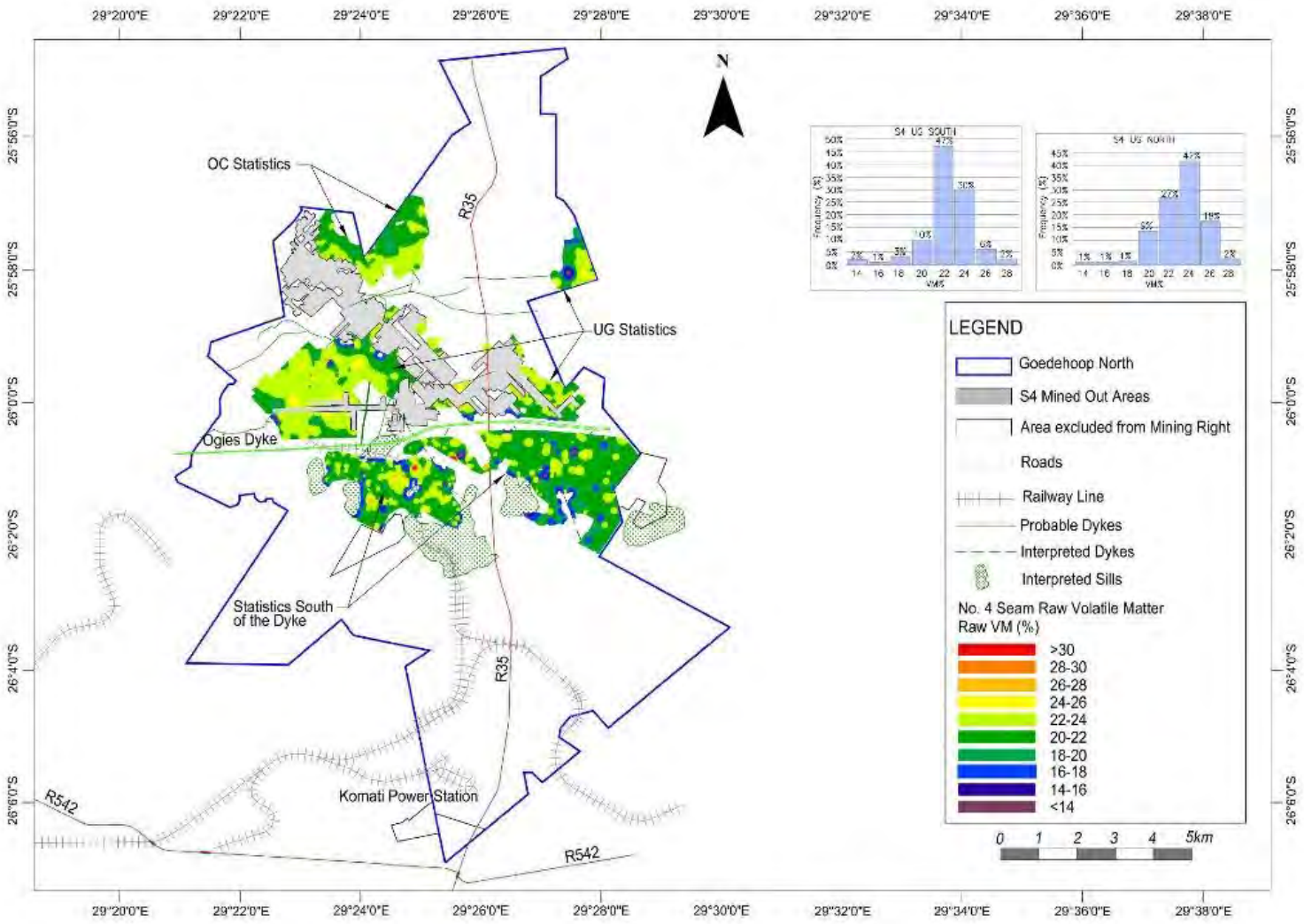
GOEDEHOOP COLLIERY CPR
Goedehoop North: No 4 Seam Raw Total Sulphur (%)

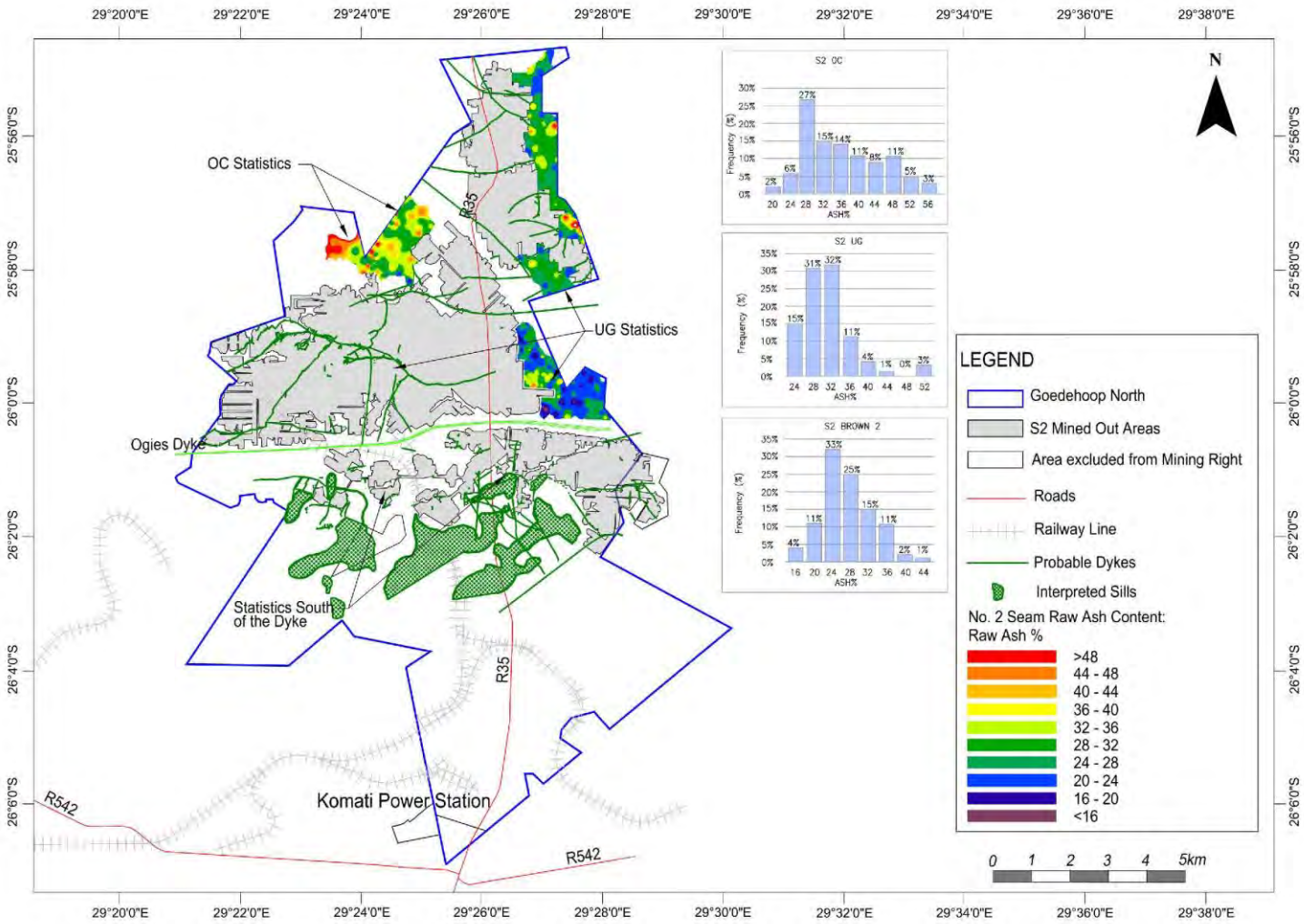
Project No. 566657

Figure 6-25: Goedehoop North: No 4 Seam Raw Total Sulphur (%)



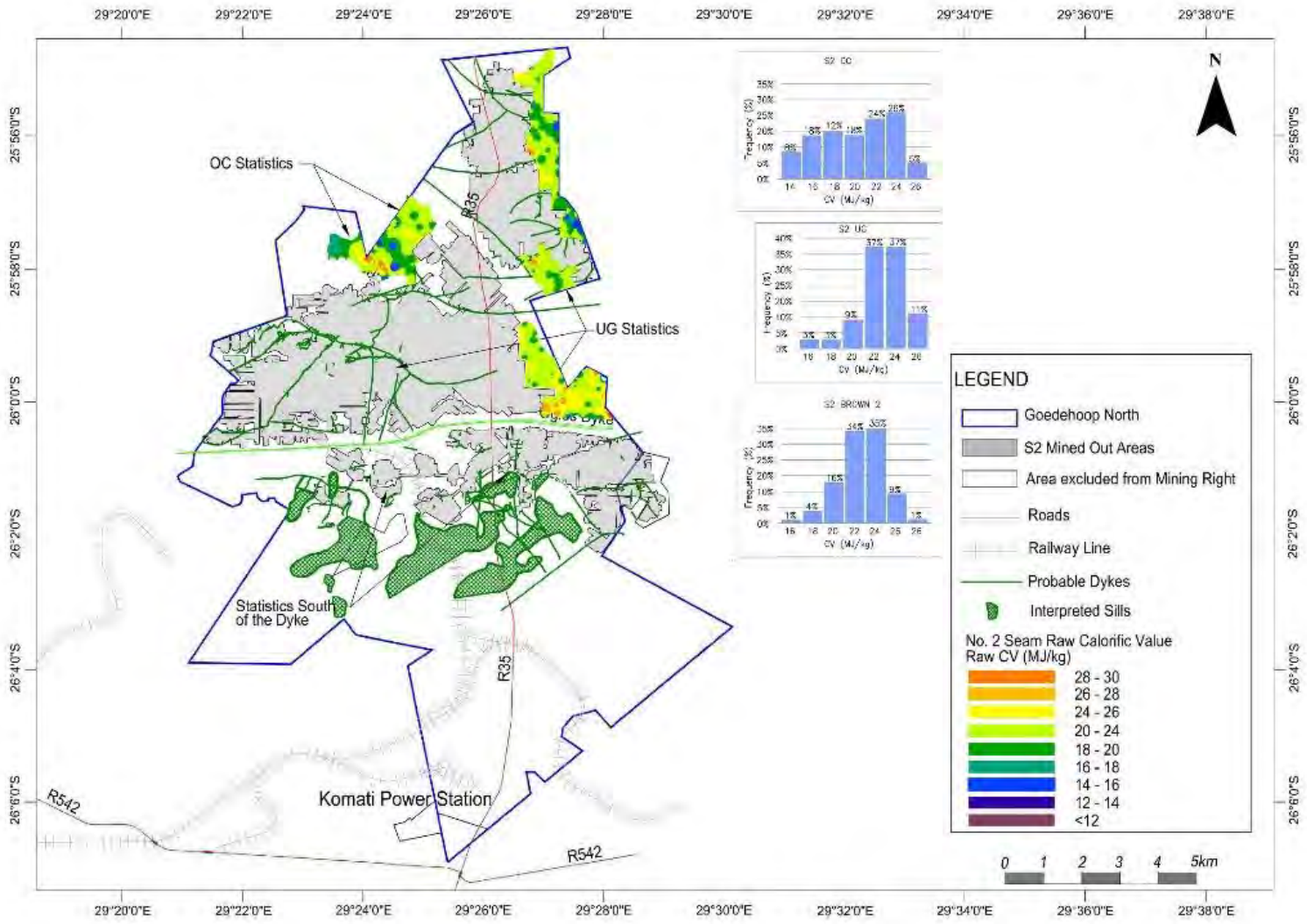
srk consulting	**GOEDEHOOP COLLIERY CPR** Goedehoop North: No 4 Seam Raw Volatile Matter Content (%)	Project No. 566657

Figure 6-26: Goedehoop North: No 4 Seam Raw Volatile Matter Content (%)



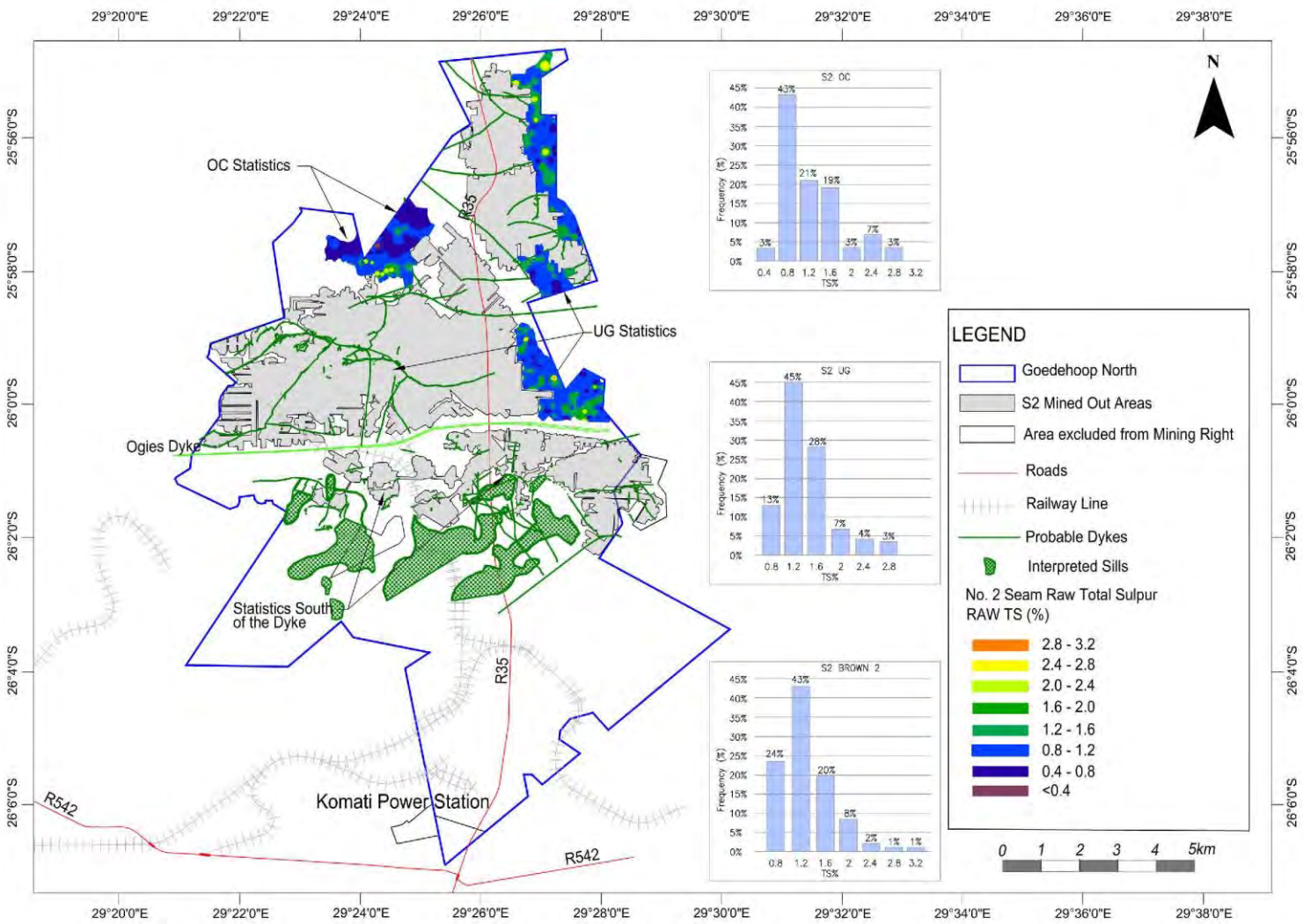
srk consulting	**GOEDEHOOP COLLIERY CPR** Goedehoop North: No 2 Seam Raw Qualities: Ash Content and Calorific Value	Project No. 566657

Figure 6-27: Goedehoop North: No 2 Seam Raw Ash Content (%)



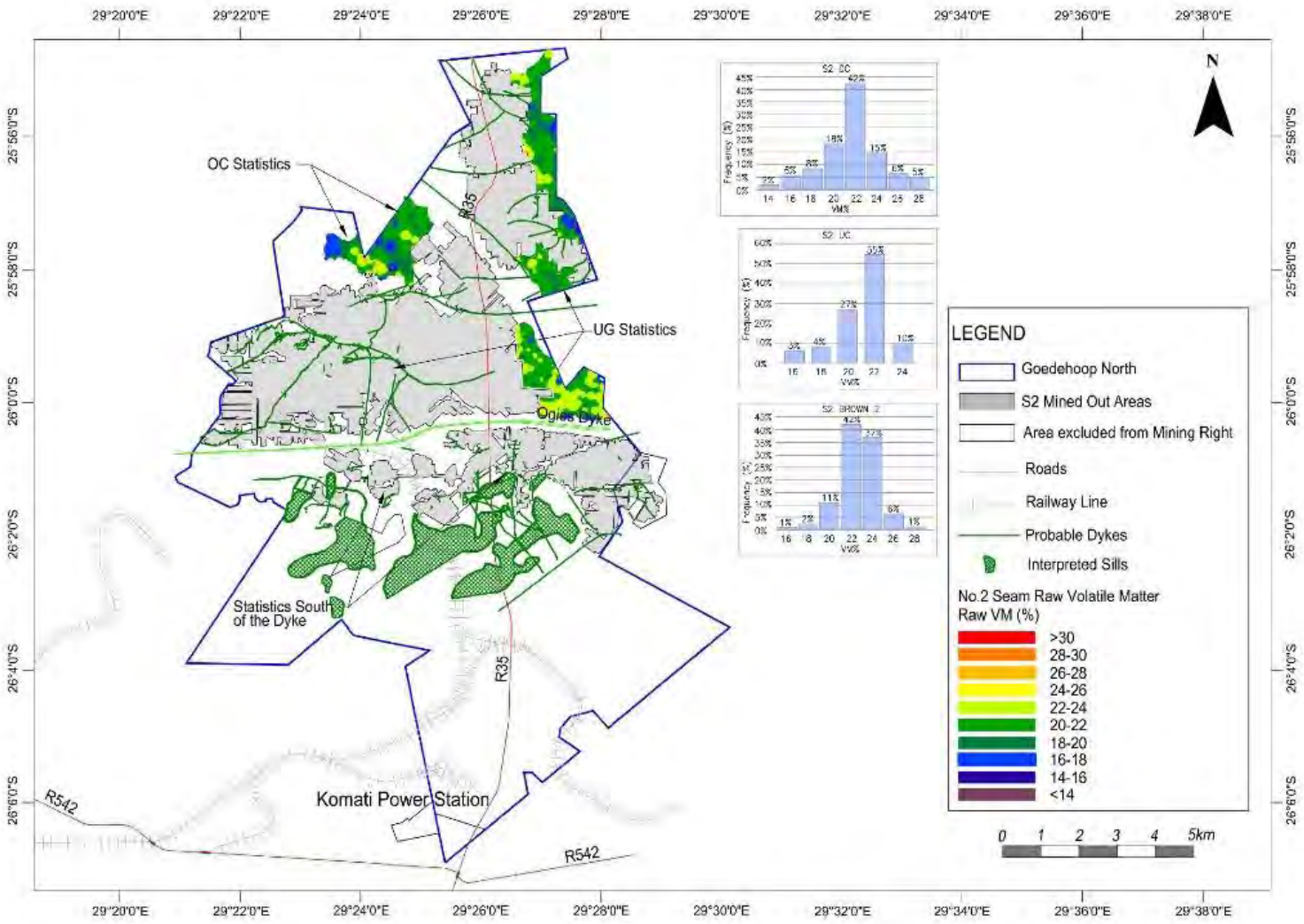
srk consulting	**GOEDEHOOP COLLIERY CPR** Goedehoop North: No 2 Seam Raw Calorific Value (MJ/kg)	Project No. 566657

Figure 6-28: Goedehoop North: No 2 Seam Raw Calorific Value (MJ/kg)



srk consulting	**GOEDEHOOP COLLIERY CPR** Goedehoop North: No 2 Seam Raw Total Sulphur (%)	Project No. 566657

Figure 6-29: Goedehoop North: No 2 Seam Raw Total Sulphur (%)



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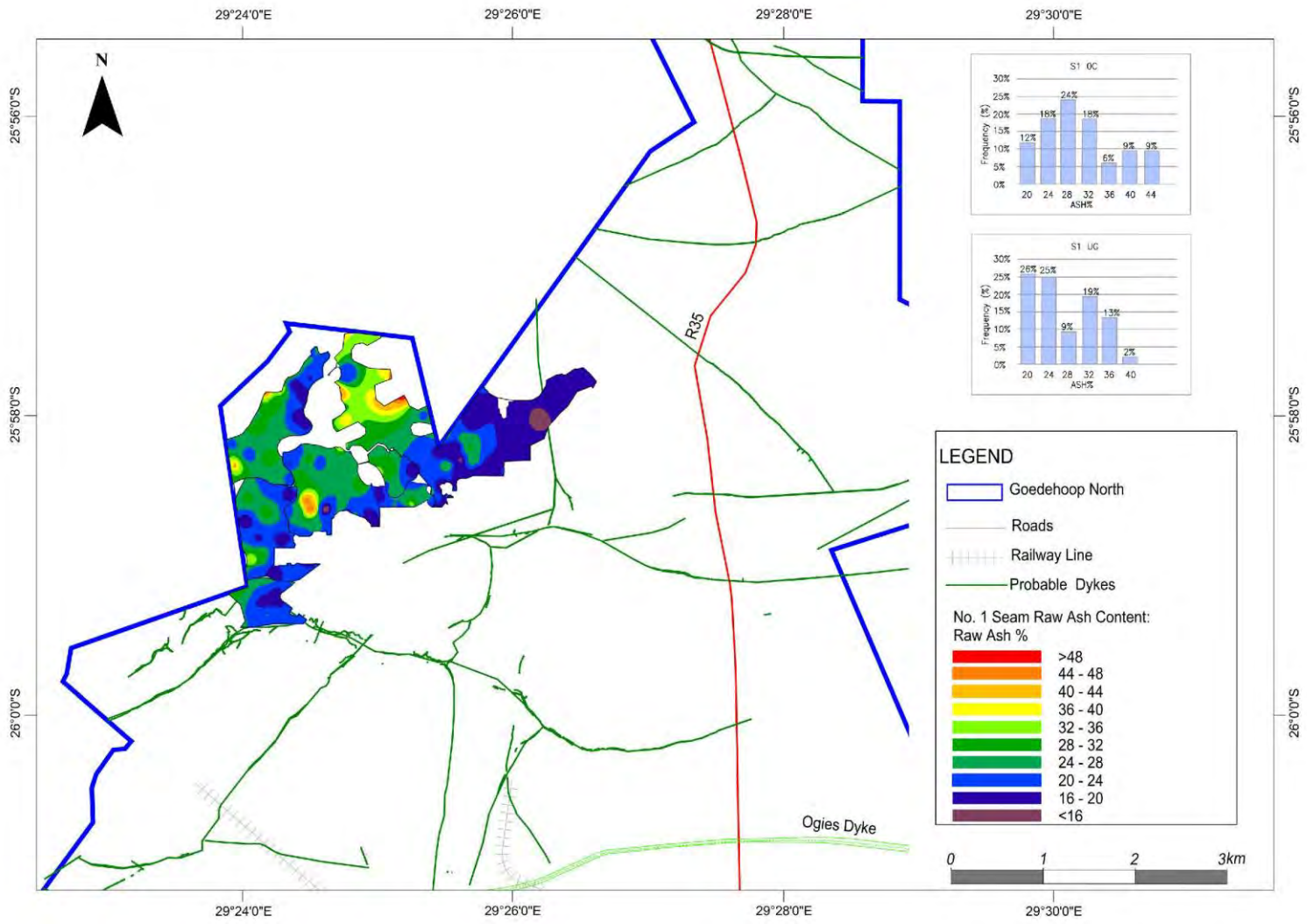
GOEDEHOOP COLLIERY CPR
Goedehoop North: No 2 Seam Raw Volatile Matter Content (%)

Project No. 566657

Figure 6-30: Goedehoop North: No 2 Seam Raw Volatile Matter Content (%)



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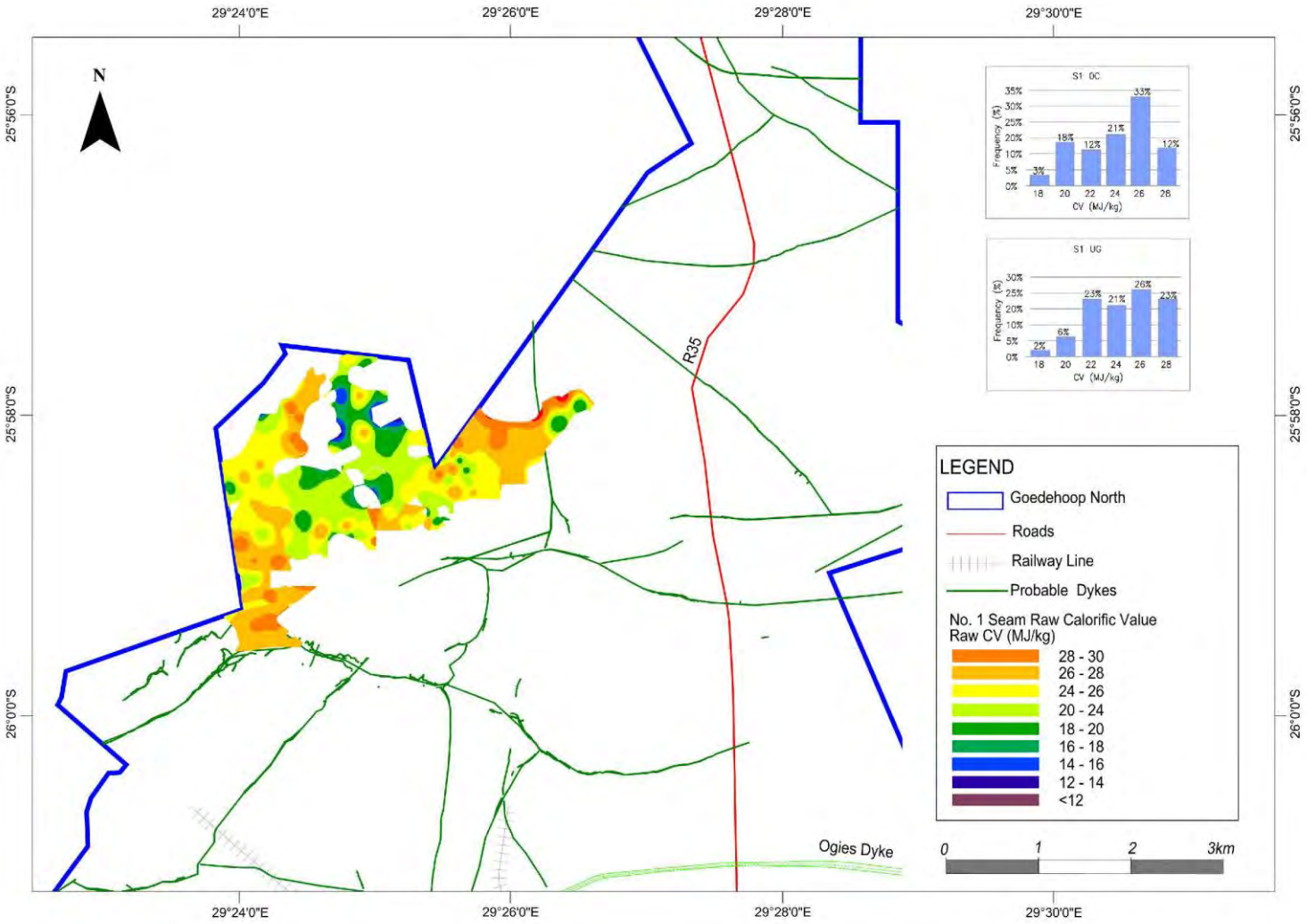
GOEDEHOOP COLLIERY CPR
Goedehoop North: No 1 Seam Raw Ash Content (%)

Project No. 566657

Figure 6-31: Goedehoop North: No 1 Seam Raw Ash Content (%)



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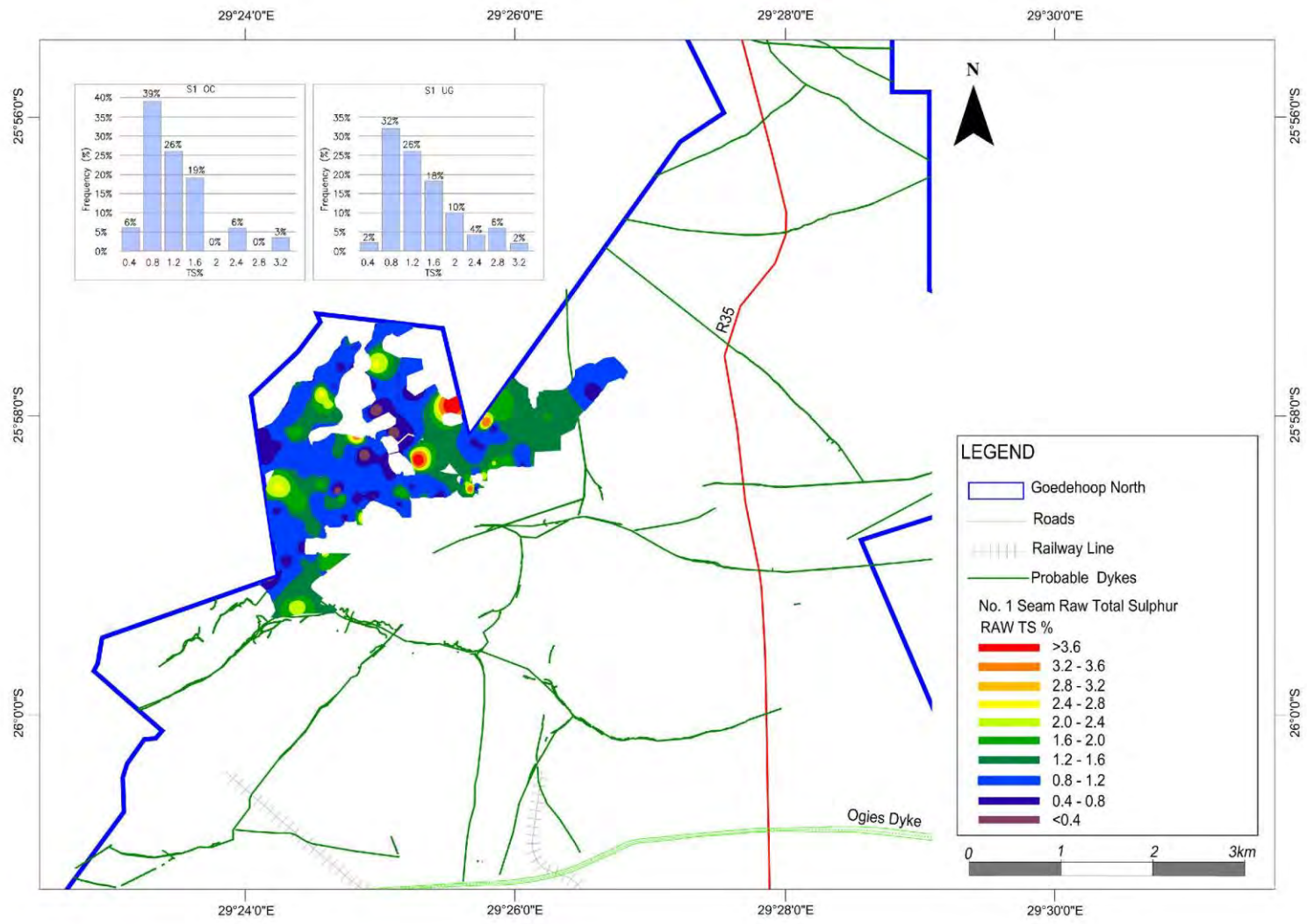
GOEDEHOOP COLLIERY CPR
Goedehoop North: No 1 Seam Raw Calorific Value (MJ/kg)

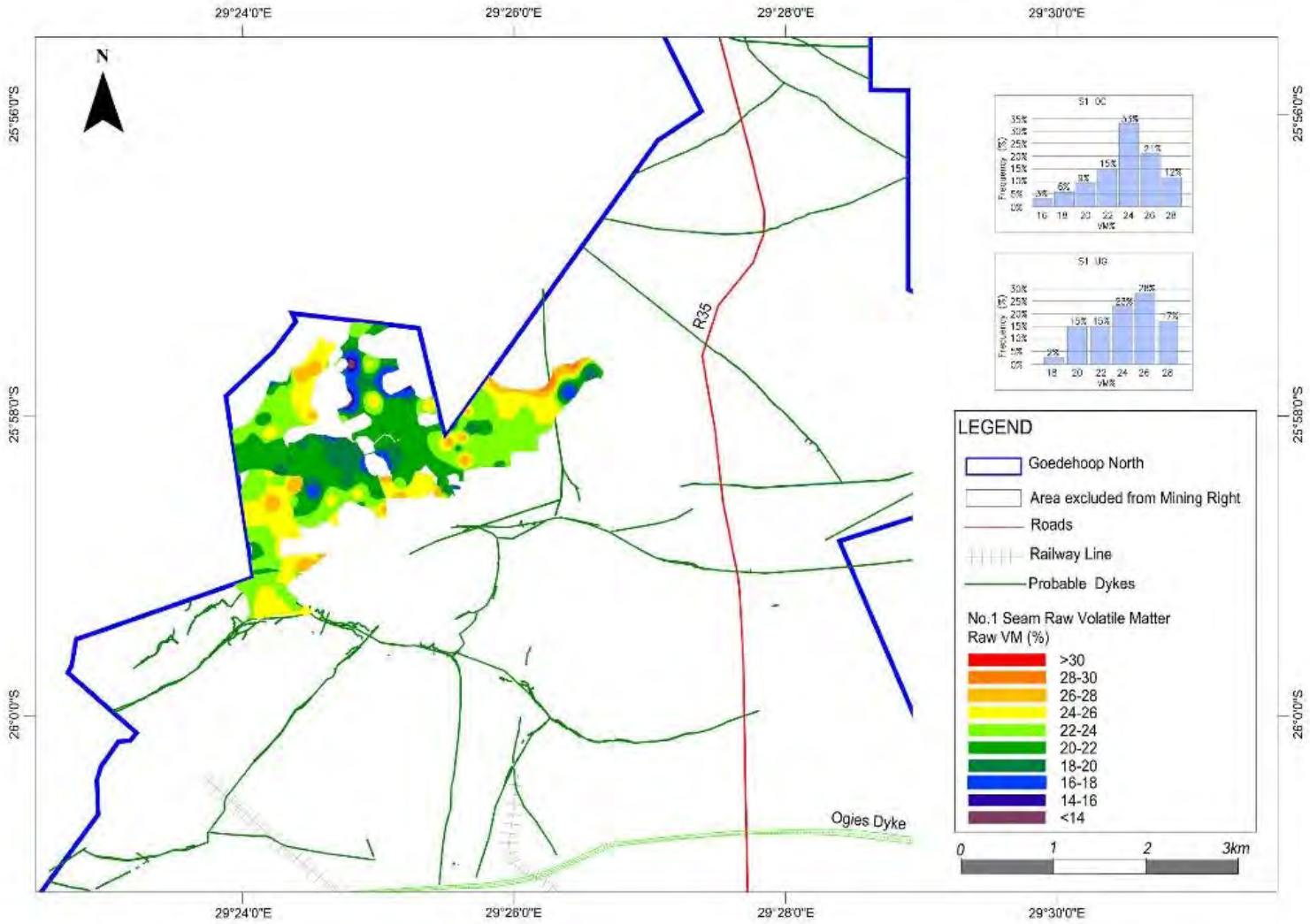
Project No. 566657

Figure 6-32: Goedehoop North: No 1 Seam Raw Calorific Value (MJ/kg)



srk consulting	**GOEDEHOOP COLLIERY CPR** Goedehoop North: No 1 Seam Raw Total Sulphur Content (%)	Project No. 566657

Figure 6-33: Goedehoop North: No 1 Seam Raw Total Sulphur Content (%)



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GOEDEHOOP COLLIERY CPR
Goedehoop North: No 1 Seam Raw Volatile Matter Content (%)

Project No. 566657

Figure 6-34: Goedehoop North: No 1 Seam Raw Volatile Matter Content (%)

Goedehoop South

The raw quality parameters Ash, CV[1], IM, FC, VM and TS were modelled (adb). The average qualities were estimated by weight-averaging the individual sub-seam qualities on both thickness and RD. Plans detailing the modelled raw qualities together with the associated frequency distributions are included in Figure 6-36 to Figure 6-38 (No 5 Seam) and Figure 6-39 to Figure 6-42 (No 4 Seam). Note that the diagrams only show the qualities within the resource polygons identified by SRK.

Raw Ash

No 5 Seam

Examination of the raw ash contour plot (Figure 6-35) illustrates that the ash content is below 20% over most of the resource areas. Small, isolated patches of slightly higher ash content can be found; the distribution is slightly positively skewed, although 73% of the values lie between 14 and 20% ash.

No 4 Seam

Raw ash contents are characterised by a distinct north-south pattern of increasing ash to the south. The southern half of the area has ash contents > 28% while that to the north is less than that (Figure 6-39). The distribution is negatively skewed and reflects the very high values found in the southeast corner (> 44%).

Raw Calorific Value

No 5 Seam

The raw CV[1] is greater than 24 MJ/kg over almost the entire area (Figure 6-36); some areas of slightly lower CV[1] is reflected in the positive tail in the frequency distribution. The average raw CV[1] is around 28 MJ/kg.

No 4 Seam

Figure 6-40 shows that the northern part of the area has higher CV[1]s (> 22 MJ/kg) (than that to the south while the lowest values are found in the extreme southeast corner (< 16 MJ/kg), the opposite pattern shown by the raw ash content. An isolated patch of CV[1] between 24 and 26 MJ/kg is found in the central northern portion. The distribution is positively skewed.

Raw Total Sulphur

No 5 Seam

The raw TS distribution is very patchy, with areas of higher values scattered throughout (Figure 6-37). The distribution is somewhat bimodal with 26% of the values greater than 2.8% and 68% between 0.8 and 2.4%.

No 4 Seam

Raw TS is highest along the eastern edge of the resource area (1.6 – 2.4%) and decreases significantly to the southwest (Figure 6-41, where most values are < 1.2%. The frequency distribution is gently negatively skewed, which reflects the higher values in the east.

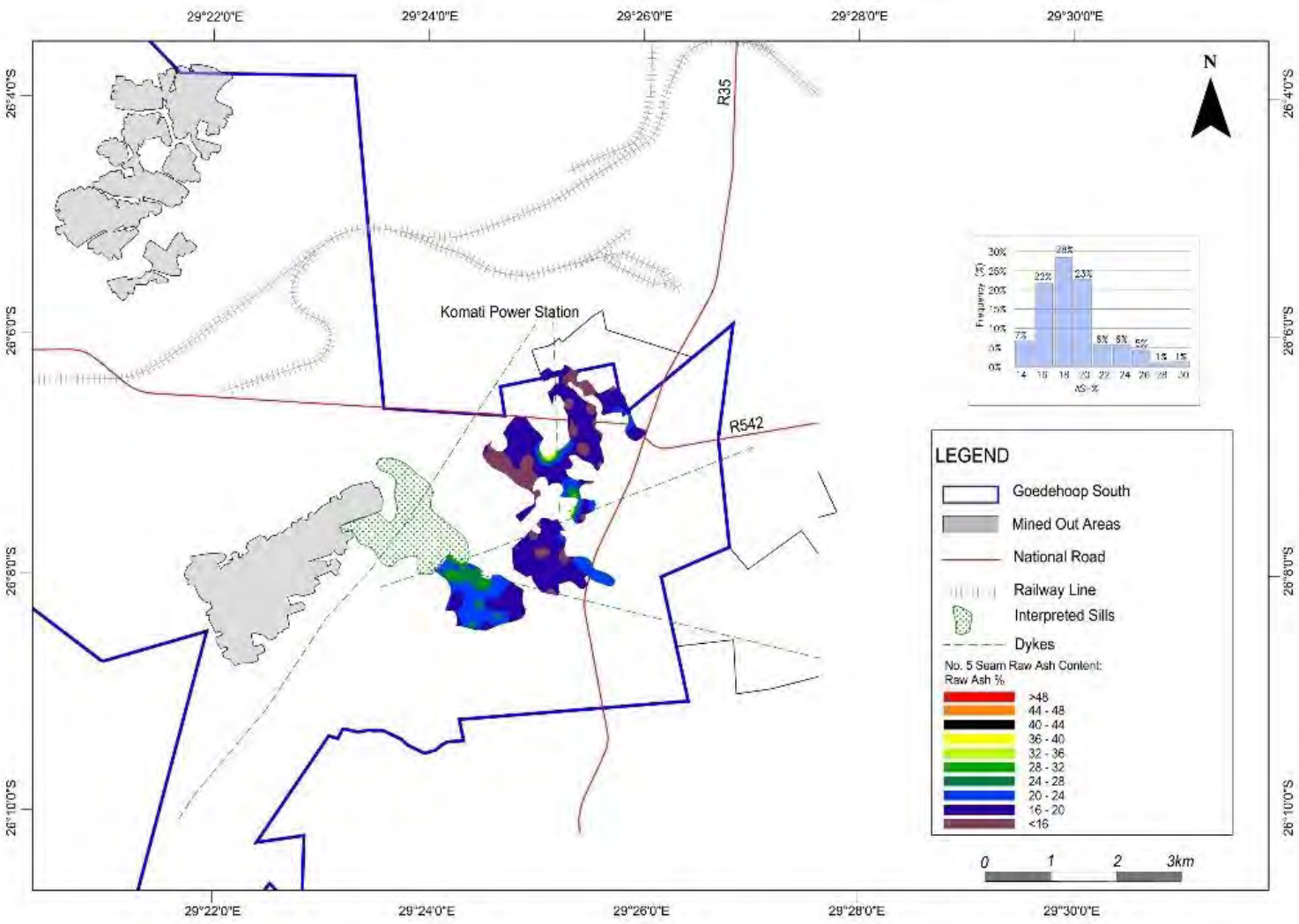
Raw Volatile Matter Content

No 5 Seam

Figure 6-38 shows that the VM content of the No 5 Seam increases northwards to > 30% and is lowest in the southwest close to the dolerite sill. The distribution is positively skewed, with the most frequent VM content (41%) around 32%.

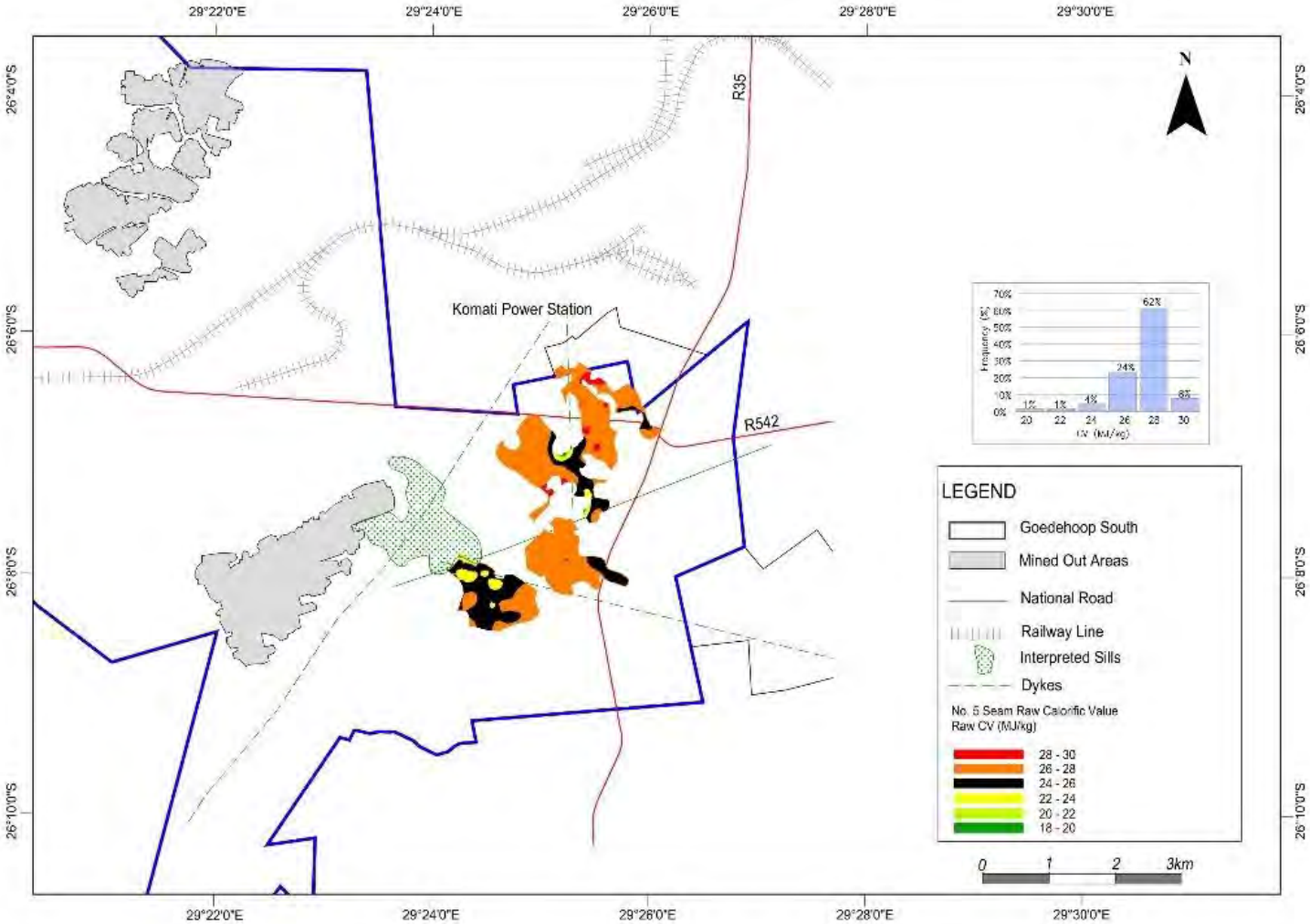
No 4 Seam

Most of the northern part of the resource area is characterised by raw VM content > 20%, while the southern part of the area has lower VM content – (< 20%) down to <14% in the extreme south (Figure 6-42. The distribution is close to normal, although some positive skewness can be observed.



srk consulting	**GOEDEHOOP COLLIERY CPR** Goedehoop South: No 5 Seam Raw Ash Content (%)	Project No. 566657

Figure 6-35: Goedehoop South: No 5 Seam Raw Ash Content (%)



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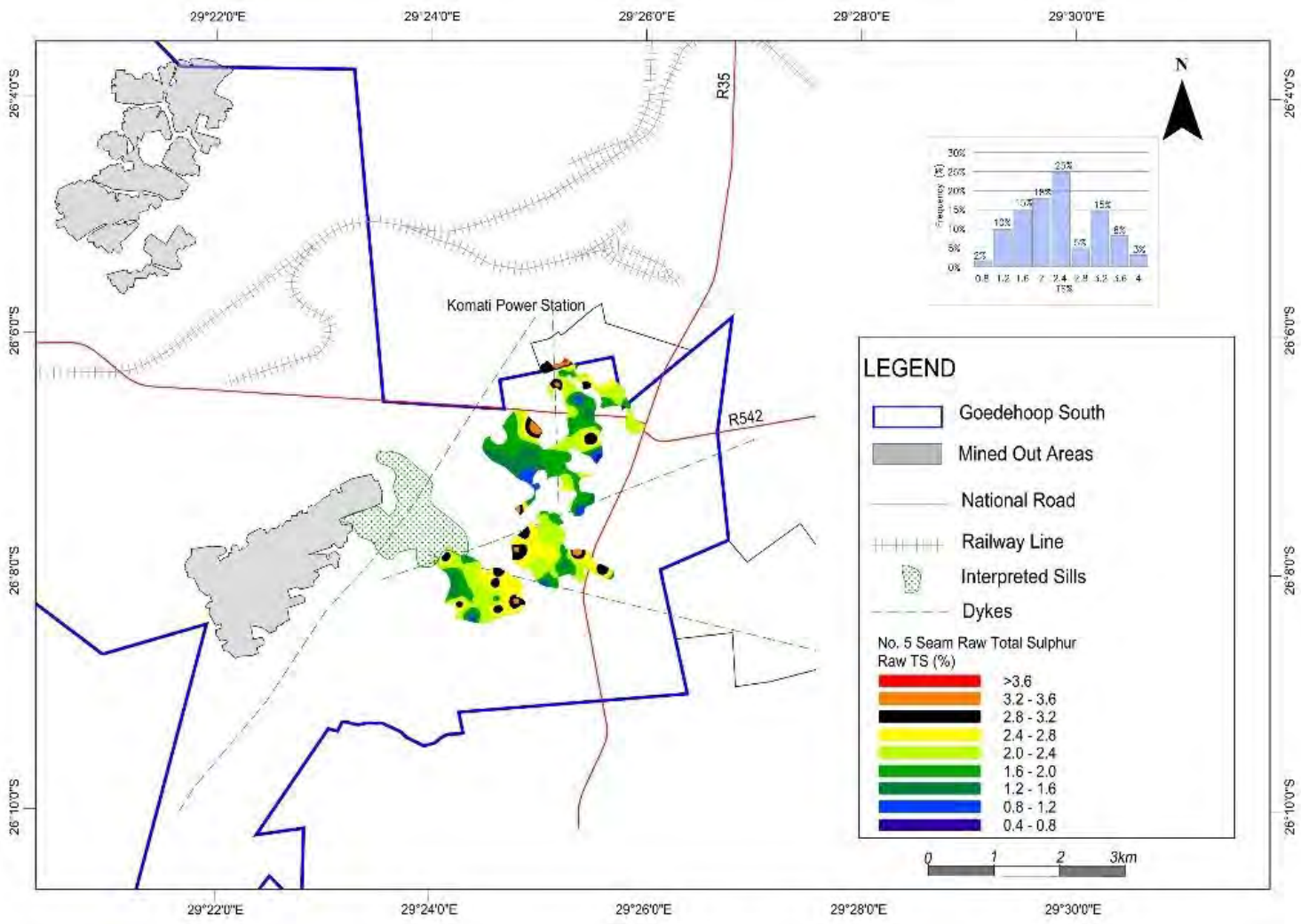
GOEDEHOOP COLLIERY CPR
Goedehoop South: No 5 Seam Raw Calorific Value (MJ/kg)

Project No. 566657

Figure 6-36: Goedehoop South: No 5 Seam Raw Calorific Value (MJ/kg)



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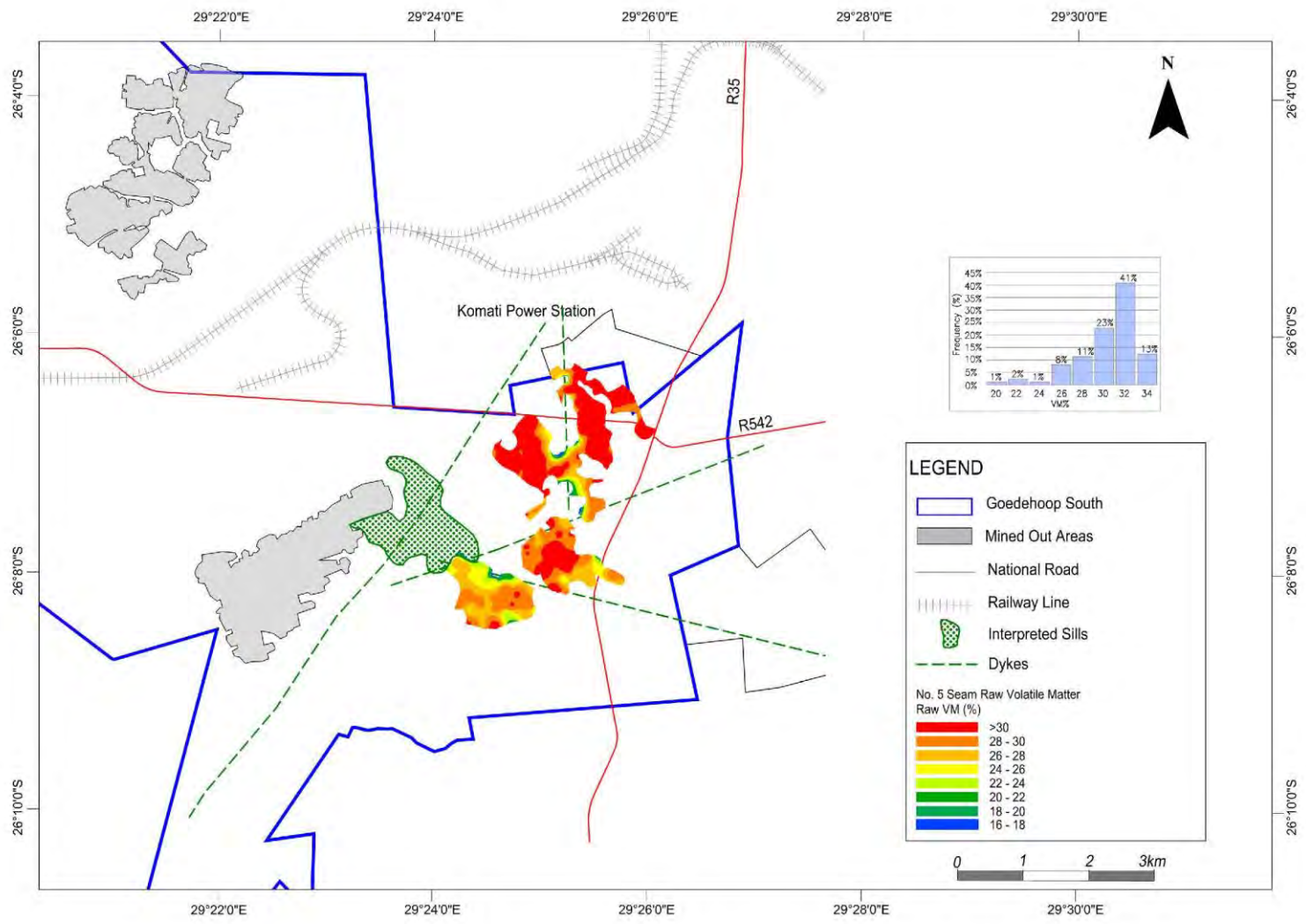
GOEDEHOOP COLLIERY CPR
Goedehoop South: No 5 Seam Raw Total Sulphur Content (%)

Project No. 566657

Figure 6-37: Goedehoop South: No 5 Seam Raw Total Sulphur Content (%)



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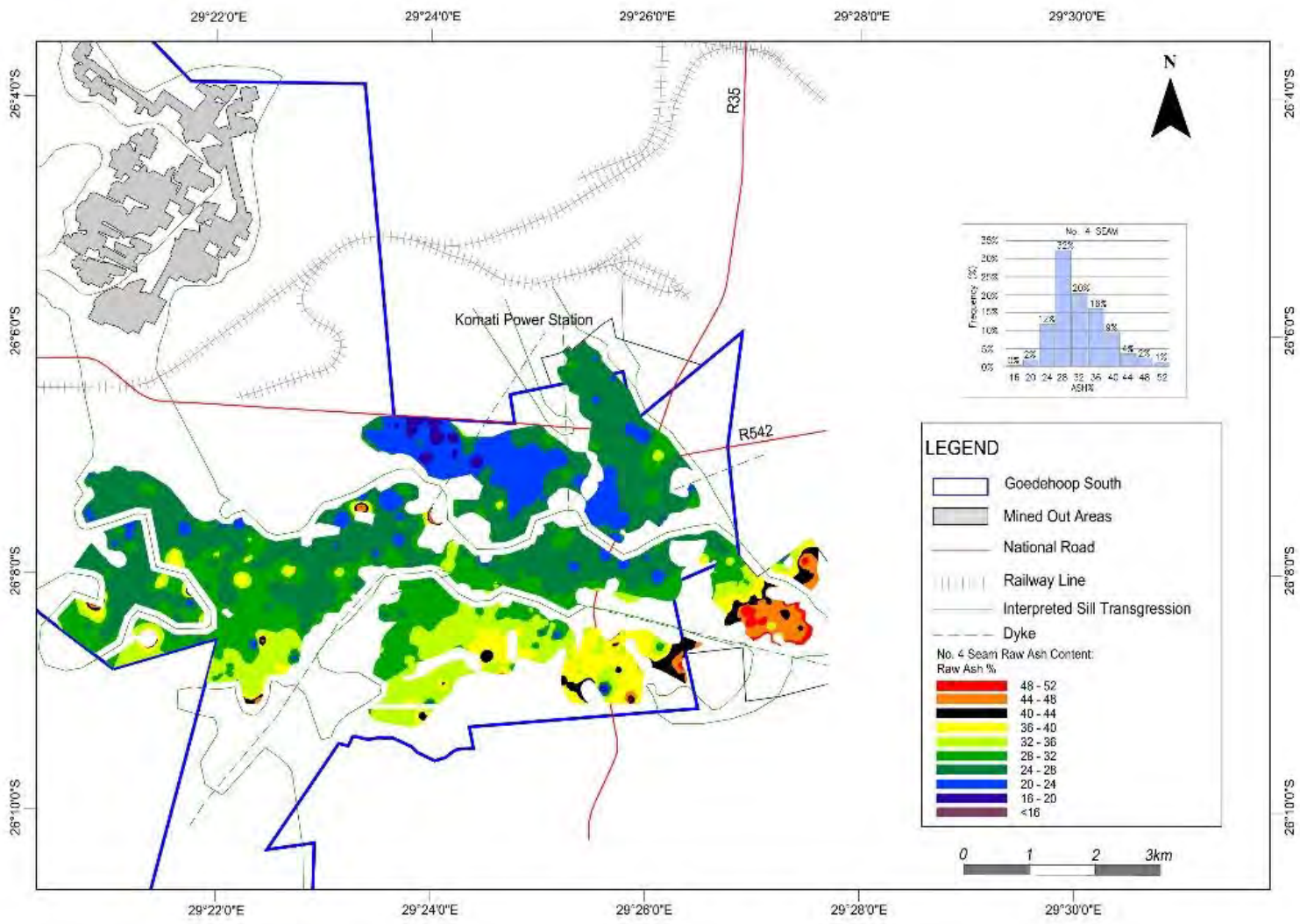
GOEDEHOOP COLLIERY CPR
Goedehoop South: No 5 Seam Raw Volatile Matter Content (%)

Project No. 566657

Figure 6-38: Goedehoop South: No 5 Seam Raw Volatile Matter Content (%)

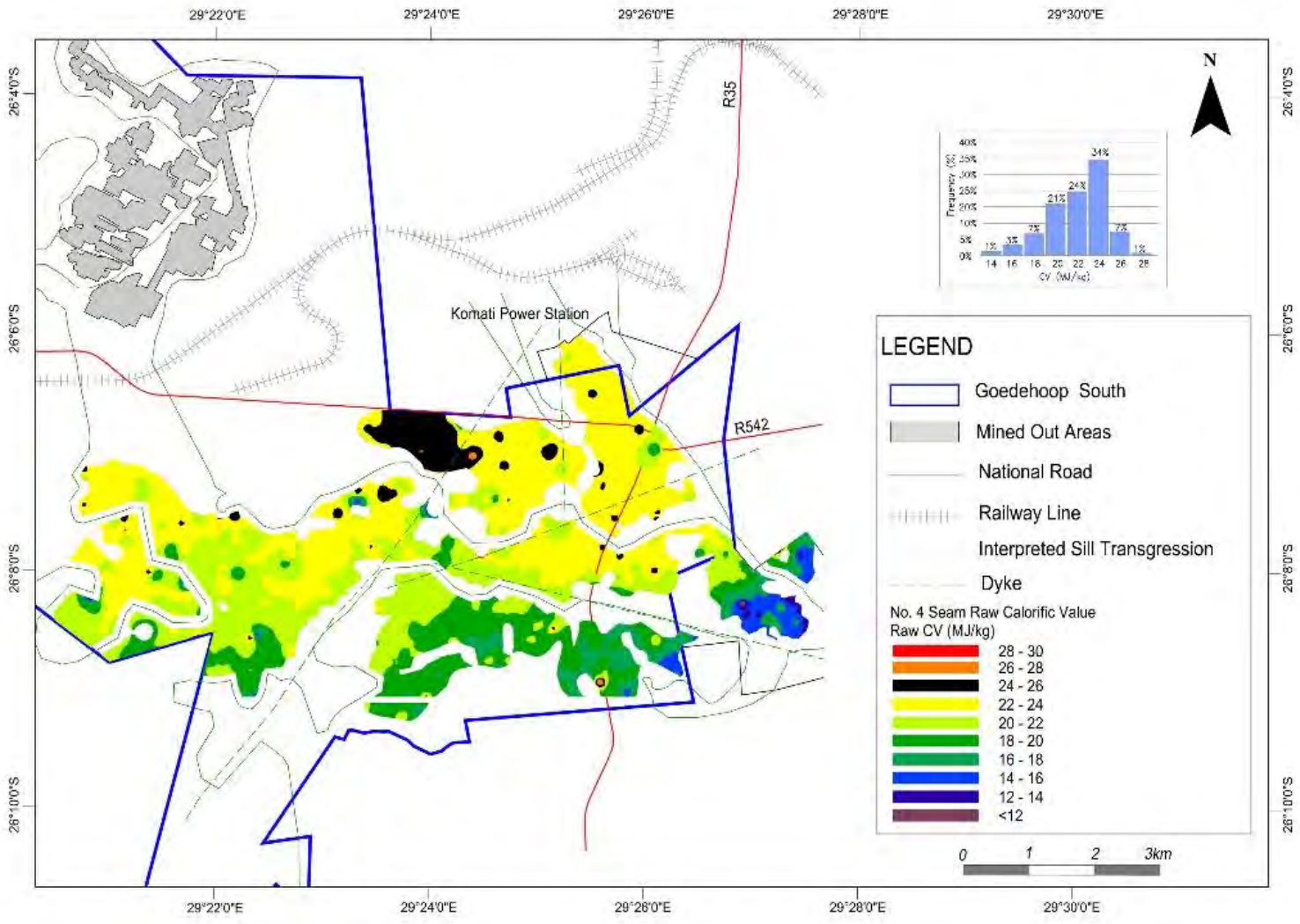


srk consulting

GOEDEHOOP COLLIERY CPR
Goedehoop South: No 4 Seam Raw Ash Content (%)

Project No. 566657

Figure 6-39: Goedehoop South: No 4 Seam Raw Ash Content (%)

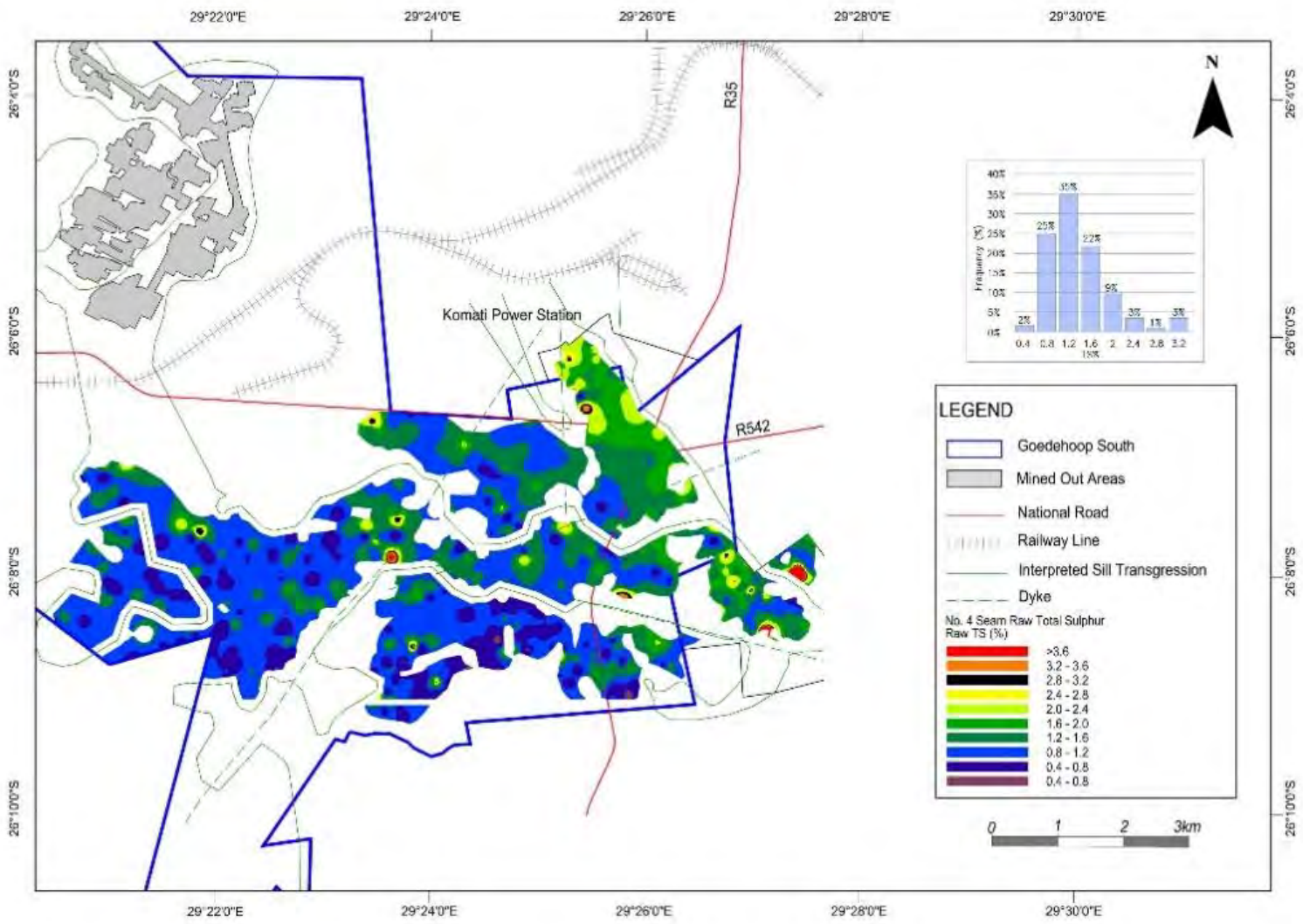


srk consulting

GOEDEHOOP COLLIERY CPR
Goedehoop South: No 4 Seam Raw Calorific Value (MJ/kg)

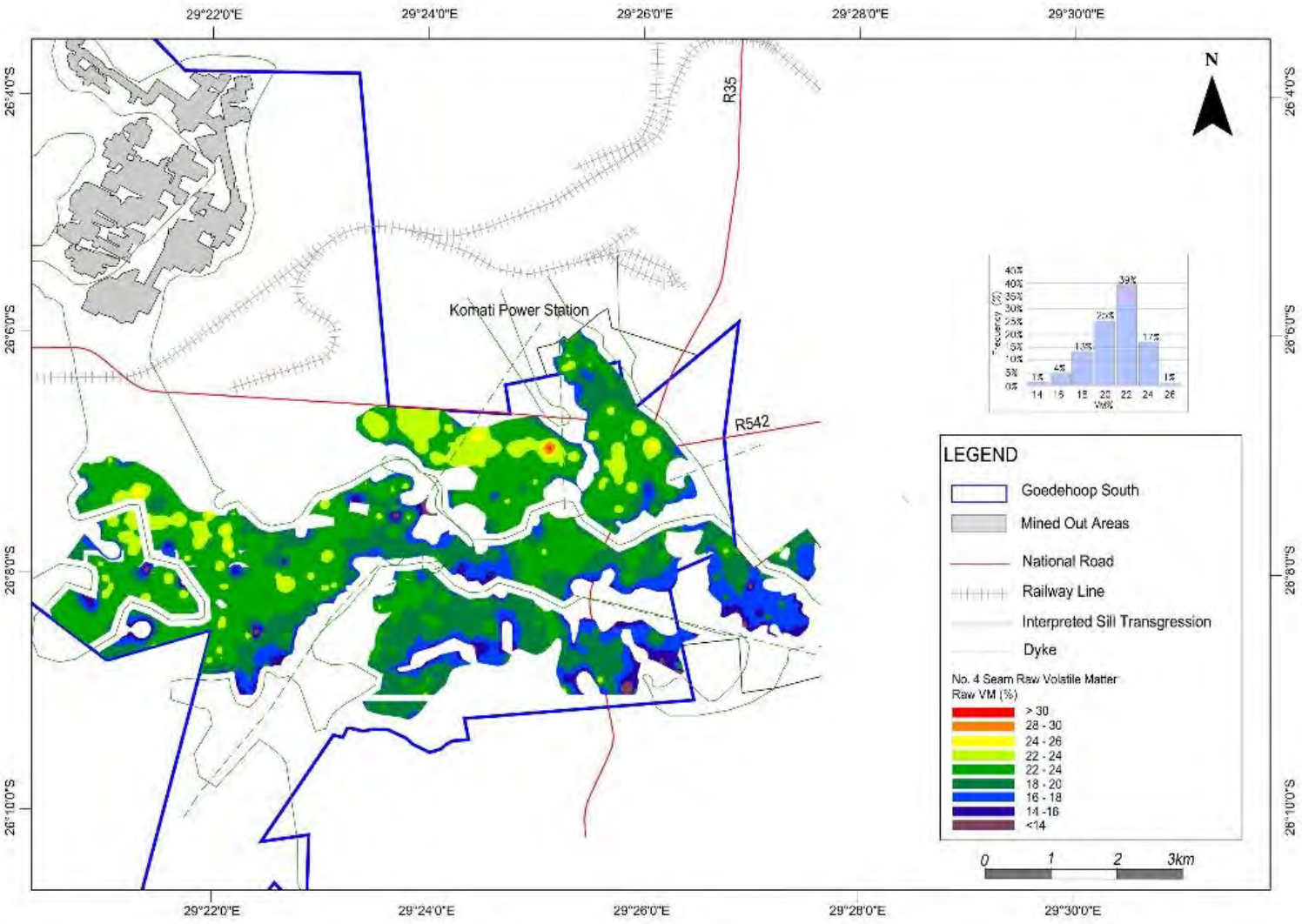
Project No. 566657

Figure 6-40: Goedehoop South: No 4 Seam Raw Calorific Value (MJ/kg)



srk consulting	**GOEDEHOOP COLLIERY CPR** Goedehoop South: No 4 Seam Raw Total Sulphur Content (%)	Project No. 566657

Figure 6-41: Goedehoop South: No 4 Seam Raw Total Sulphur Content (%)



srk consulting

GOEDEHOOP COLLIERY CPR
Goedehoop South: No 4 Seam Raw Volatile Matter Content (%)

Project No. 566657

Figure 6-42: Goedehoop South: No 4 Seam Raw Volatile Matter Content (%)

6.3.3. Washed Coal Product

The Company stores standardised wash tables in the geological model; these wash tables conform to user-defined density fractions and can be used to estimate potential products and their associated Coal Resources. The density fractions defined for Goedehoop North and Goedehoop South are shown in Table 6-5.

Table 6-5: Wash Table Density Fractions

Seam	Analyses	Wash Density
No 5	Proximate, CV[1], TS	F1.35, F1.40, F1.50, F1.60, F1.70, S1.70
No 4	Proximate, CV[1], TS	F1.45, F1.50, F1.60, F1.70, F1.8, F2.00, S2.00
No 2	Proximate, CV[1], TS	F1.30, F1.35, F1.40, F1.50, F1.60, F1.70, F1.80, S1.80
No 1	Proximate, CV[1], TS	F1.30, F1.35, F1.40, F1.50, F1.60, F1.70, F1.80, S1.80

All wash tables are standardised using an in-house Company software package, Prodint5b, which simulates potential products (coal qualities and yields) using prescribed parameters such as contamination and organic efficiency. This is done by fitting a curve to the quality/yield relationship interpolations and also uses various formulae for extrapolation. This procedure requires a minimum of four valid points on a wash table; wash tables with less than four analysed density fractions or four float fraction yields are excluded. Stratmodel is able to generate an average wash table for each resource block, using the inverse distance cubed interpolator, using thickness and yield as the weighting factors.

6.4. Reasonable and Realistic Prospects for Eventual Economic Extraction

[SR4.1(iv), SR4.2(ii)(iii)(iv), SR4.3, SR5.6(iii)(iv)]

Both the SAMREC Code and SANS10320:2020 provide guidelines on the determination of Reasonable Prospects for Eventual Economic Extraction (**RPEEE**). Table 1 of the SAMREC Code requires disclosure and discussion of the following items "*which, in the opinion of the Competent Person, are likely to influence the prospect of economic extraction"* (SAMREC Code, 2016). SRK has considered those items which it believes impacts on the prospects for extraction; they are listed below, together with the section in this CPR where they have been addressed:

- The geological parameters, including volume/tonnage, grade and value/quality estimates, cut-off grades and strip ratios (Sections 6 and 9);
- The engineering parameters, including mining method, dilution, geotechnical, geohydraulic, and coal processing parameters (Sections 8.3, 7, 16, 10);
- Infrastructure including power, water and access to site (Sections , 2.4.2, 2.4.2 and 12);
- Legal, governmental, permitting and statutory parameters (Section 3);
- Environmental and social parameters (Section 15);
- Marketing parameters (Section 17);
- The economic assumptions and parameters, including the coal price, capital and operating costs (Section 18.8.1);
- Any material risks (Section 20); and
- The parameters used to support the concept of "eventual" (Goedehoop has been in operation for over 60 years and has projected remaining LoM of seven years in the current schedule).

SANS10320:2020 states that there should be reasonable expectations that the coal deposit will be economically mineable and extractable and that a saleable raw or beneficiated coal product can be produced. The criteria that are used to determine this should consider the items below; the section referred to after the item is the section in this CPR where these items are discussed:

- Seam thickness and depth below surface (Section 6.3.1);
- The potential mining method (Section 8.3);
- The coal qualities (Section 6.3.2);
- The theoretical product yield and the target product quality (Section 6.3.3);
- The surface infrastructure (Section 2.4.2);
- Natural and manmade features that may impact on the extraction (Sections 4.3 and 2.4); and
- The time period over which this extraction might be possible (Section 8.8).

The Company states they have followed the SAMREC Code, 2016 and SANS10320:2004 guidelines, as well as internal company guidelines:

- Anglo American Group Technical Standards AA GTS 25 and AA RD 22-25; and
- AAC standard (AAC SD 23-35-104 Resource-Reserve Reporting);
    - AAC RD 23-35-104B: Determination of Reasonable Prospects for Eventual Economic Extraction (RPEEE) Requirements Document; and
    - AAC CK 23-35-104A: Factors for the Determination of RPEEE.

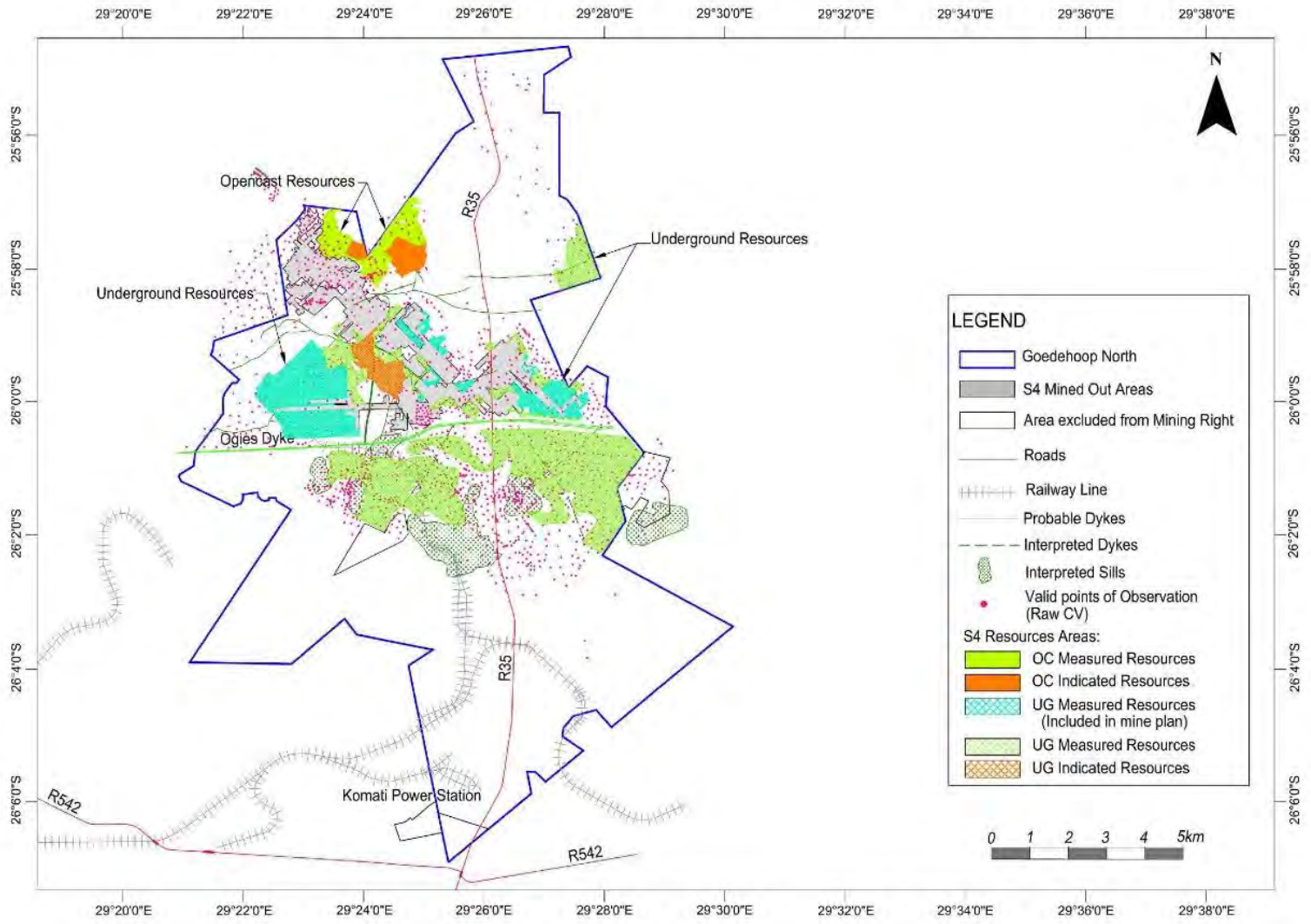
6.5. Resource Category Classification

[SR4.4(i)]

This CPR has been compiled in accordance with SANS10320:2020, although the Company's documentation reviewed was compiled in accordance with SANS10320:2004. This does not impact on the Coal Resource estimation and classification, nor in the criteria used to determine the classification.

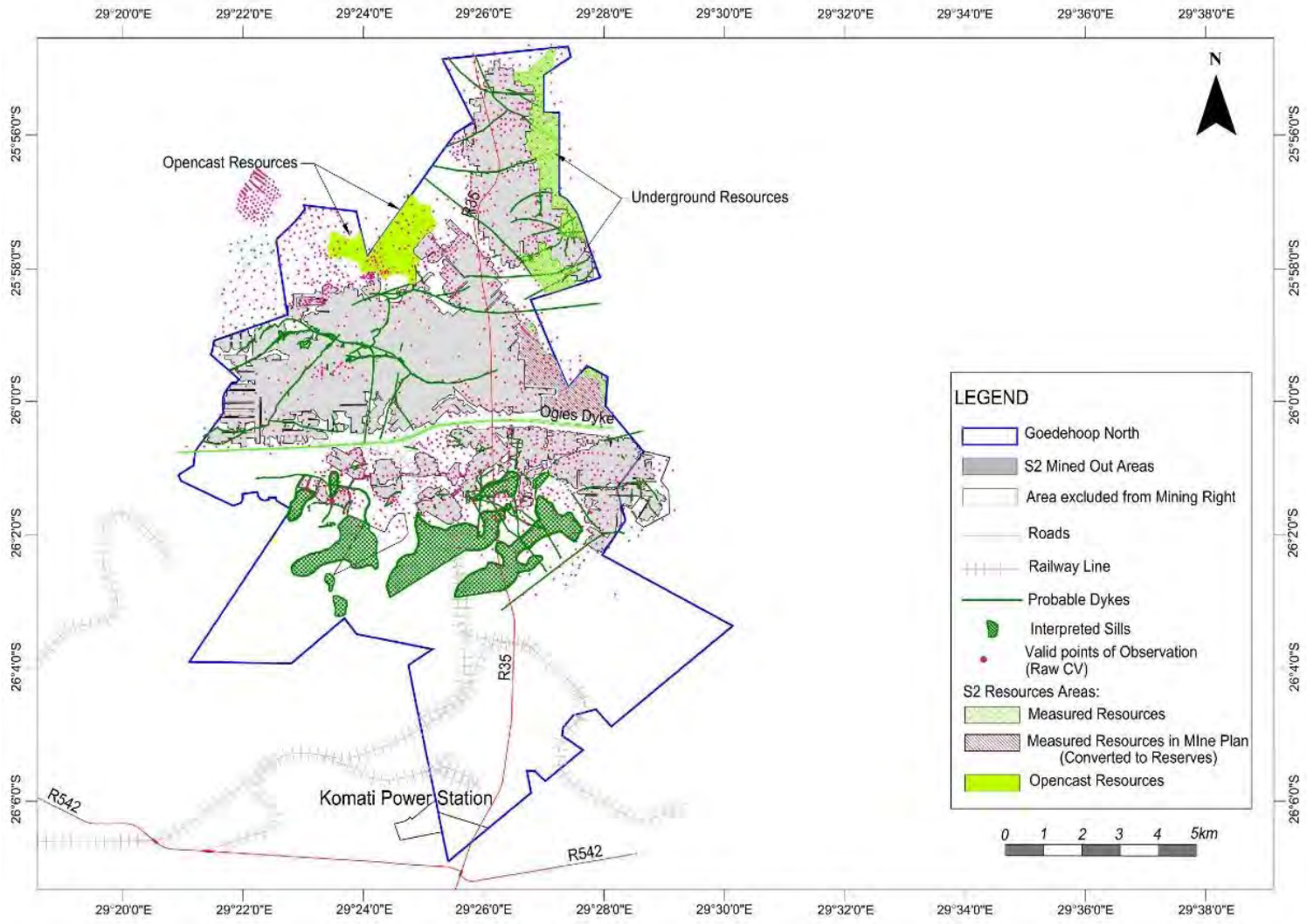
The coal seams at Goedehoop are of the multiple seam coal deposit-type, defined in SANS10320:2020 as "characterised by a discrete number of coal seams, typically between 0.5 m and 7.0 m in thickness, separated by interburden units with a thickness that generally significantly exceeds the thickness of the individual coal seams". The resource classification is based on the geological knowledge of the deposit, including that gained from mapping, remote sensing, geophysics, etc. and drilling.

Only valid Points of Observation (**PoO**) may be used to determine the resource classification categories. This is based on the number of cored drill holes that have appropriate quality data; in the case of Goedehoop, which produces a washed coal product, washed coal quality data is required for a drill hole to be considered a PoO. However, SRK has noted that not every sample in a seam has a valid wash table and therefore does not meet the definition of a valid PoO according to SANS 1032:2020. To overcome this problem, SRK has used the raw quality data for each sample and manually evaluated the available wash tables for each drill hole to ensure that a suitable beneficiated product can be derived from the coal. The drill holes determined to be valid PoOs in this manner by SRK are shown in Figure 6-44 to Figure 6-45 (Goedehoop North) and Figure 6-46 and Figure 6-47 (Goedehoop South).



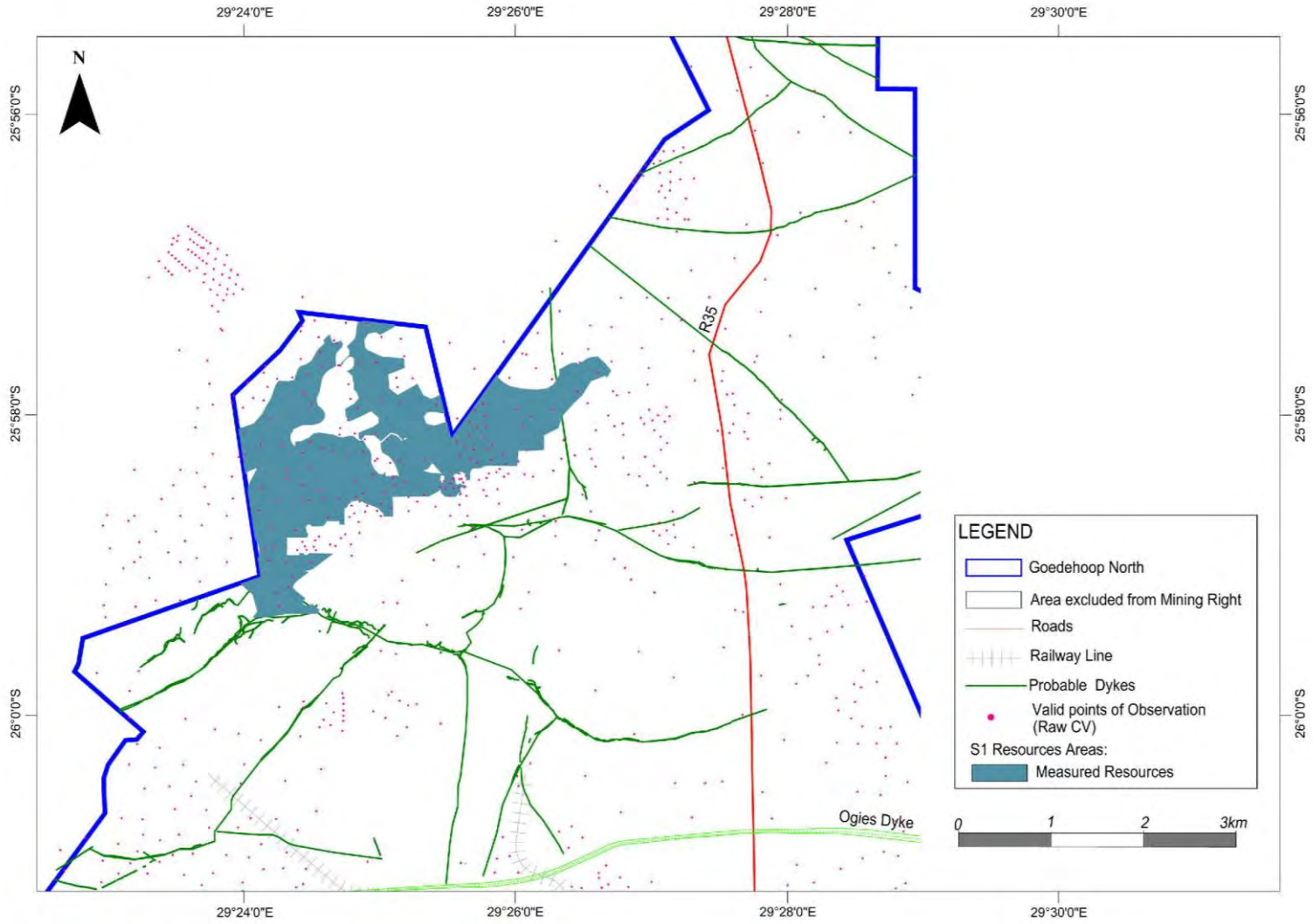
srk consulting	**GOEDEHOOP COLLIERY CPR** Goedehoop North: No 4 Seam Valid Points of Observation	Project No. 566657

Figure 6-43: Goedehoop North – No 4 Seam Valid Points of Observation



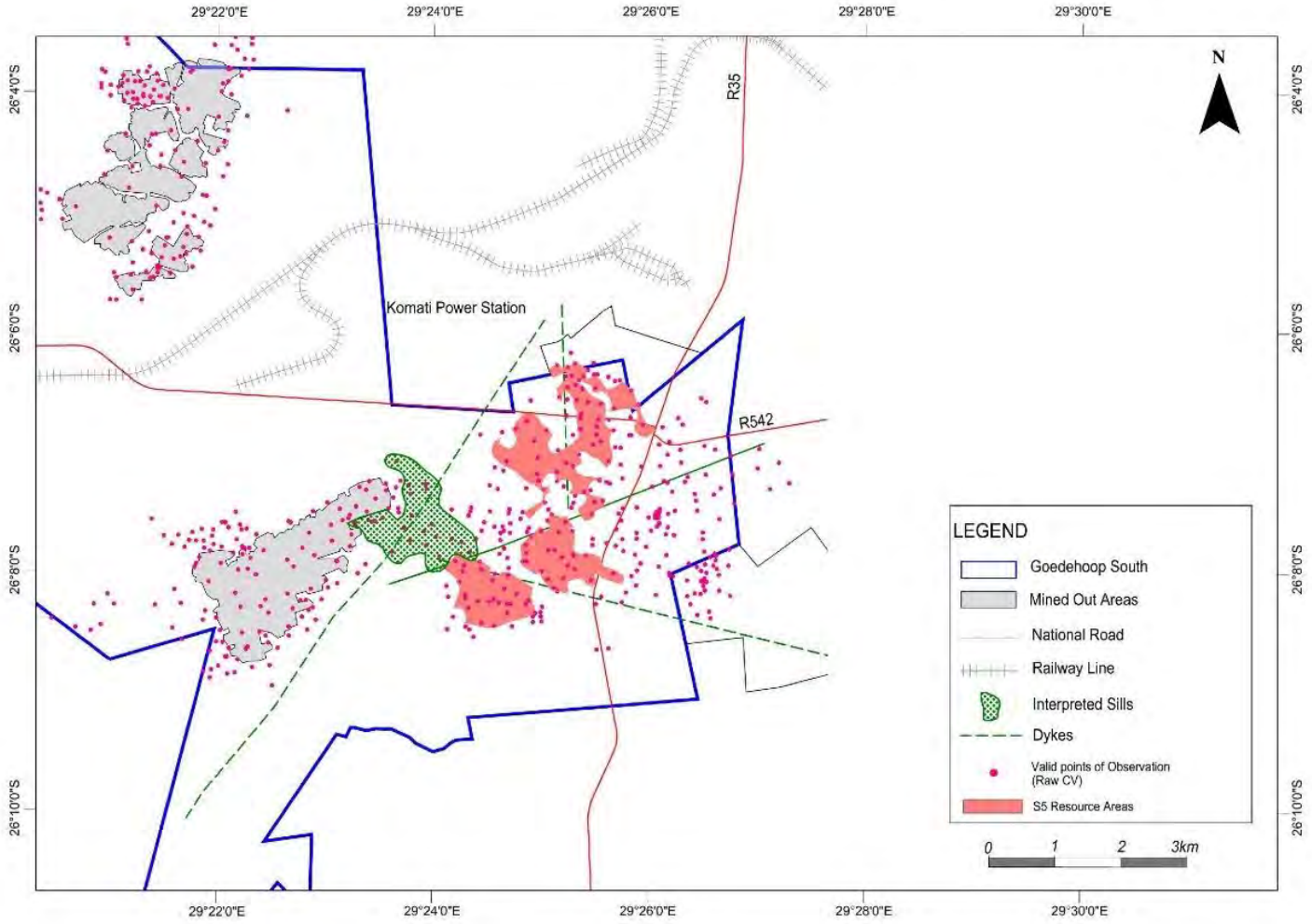
srk consulting	**GOEDEHOOP COLLIERY CPR** Goedehoop North: No 2 Seam Valid Points of Observation	Project No. 566657

Figure 6-44: Goedehoop North: No 2 Seam Valid Points of Observation



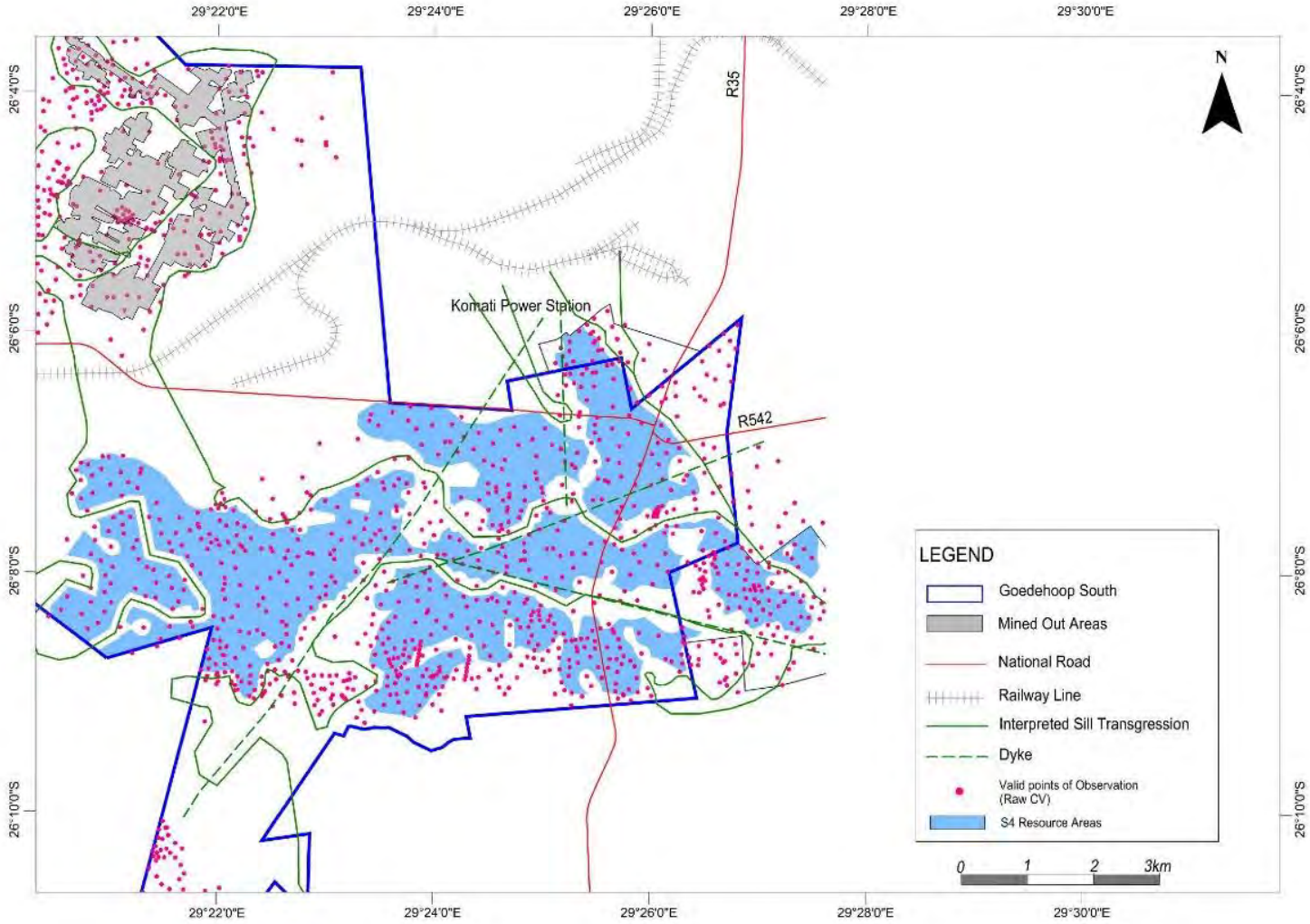
srk consulting	**GOEDEHOOP COLLIERY CPR** Goedehoop North: Valid Points of Observation – No 1 Seam	Project No. 566657

Figure 6-45: Goedehoop North: Valid Points of Observation – No 1 Seam



srk consulting	**GOEDEHOOP COLLIERY CPR** Goedehoop South: No 5 Seam Valid Points of Observation	Project No. 566657

Figure 6-46 Goedehoop South: No 5 Seam Valid Points of Observation



srk consulting	**GOEDEHOOP COLLIERY CPR** Goedehoop South: No 4 Seam Valid Points of Observation	Project No. 566657

Figure 6-47: Goedehoop South: No 4 Seam Valid Points of Observation

Drill hole spacing is used as a proxy for data density; for coal that is of the multiple seam coal deposit-type, the following drill hole spacings apply:

- Inferred Coal Resource 1000 m;
- Indicated Coal Resource 500 m; and
- Measured Coal resource 350 m.

This translates to a drill hole density as follows:

- Inferred Resource, one cored drill hole with washed coal quality data per 100 ha;
- Indicated Resource, four cored drill holes with washed coal quality data per 100 ha; and
- Measured Resource, eight cored drill holes with washed coal quality data per 100 ha.

The resource classification for Goedehoop North is shown in Table 6-6 and illustrated in Figure 6-49 and Figure 6-50 (Goedehoop North) and Figure 6-51 and Figure 6-52 (Goedehoop South).

The classification of Coal Resources into Inferred, Indicated and Measured categories is a function of increasing geological confidence in the estimate based on the density of points of observation, the physical continuity of the coal seams, the distribution and the reliability of the coal sampling data, the coal quality continuity, the reliability of the geological model and the estimation methods. Factors that contribute to the uncertainty in Coal Resource estimation include the key constraints used to construct the geological model, such as the seam thickness variation, structural complexity and the coal quality distribution. Figure 6-49 and Figure 6-50 (Goedehoop North) and Figure 6-51 and Figure 6-52 (Goedehoop South) illustrate the resource categories per seam as determined by SRK.

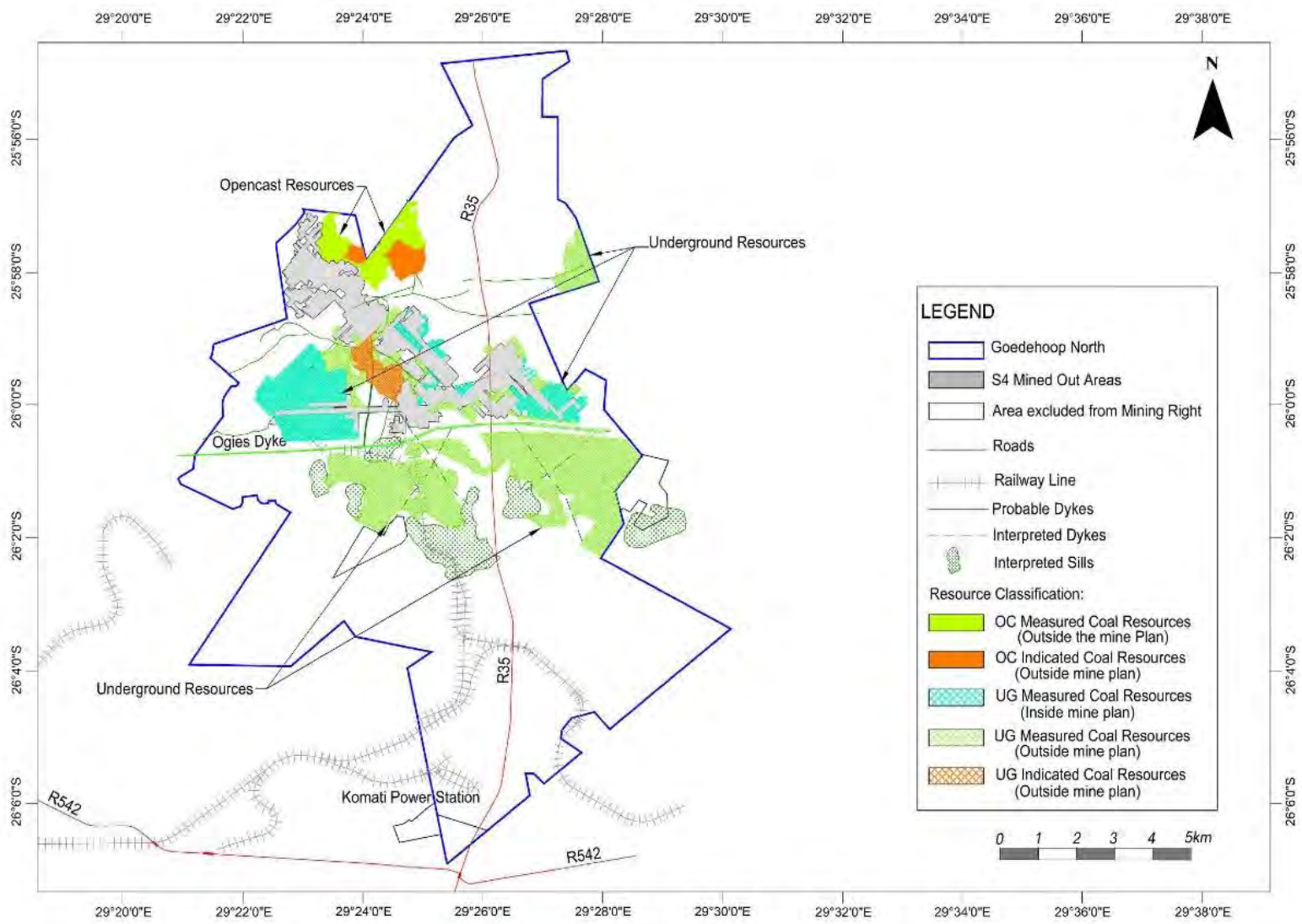
It should be noted that Coal Resource tonnages are estimates with an associated degree of uncertainty in the actual values. Uncertainty is introduced by the key constraints used to construct the geological model, such as the coal seam thickness variation, structural complexity, and the coal quality distribution.

Table 6-6: Drill Hole Density

Seam	Block	Area (ha)	Number of PoO	PoO per 100 ha	Classification
Goedehoop North:					
No 4 Seam	S4 in Mine Plan	724.22	135	18.64	Measured
	S4 East	96.33	17	17.65	Measured
	S4 South	1180.95	384	32.52	Measured
	S4 OC	321.04	64	19.94	Measured
No 2 Seam	S2 East	235.99	53	22.46	Measured
	S2 Central	86.66	21	24.23	Measured
	S2 Brown 2	263.30	114	43.30	Measured
	S2 OC	261.17	68	26.04	Measured
No 1 Seam	S1 UN	68.22	16	23.45	Measured
	S1 US	26.55	4	15.07	Measured
	S1 ME	11.71	5	42.70	Measured
	S1 MW	57.20	13	22.73	Measured
	S1 UM	88.54	19	21.46	Measured
	S1 OC	177.97	36	20.23	Measured
Goedehoop South:					
No 5 Seam	S5 Meas	274.36	65	23.69	Measured
	S5 Inf	92.85	24	25.85	Inferred
No 4 Seam	S4 Meas	2237.62	566	25.29	Measured
	S4 Ind	67.18	10	14.89	Indicated
	S4 Inf	31.63	2	6.32	Inferred

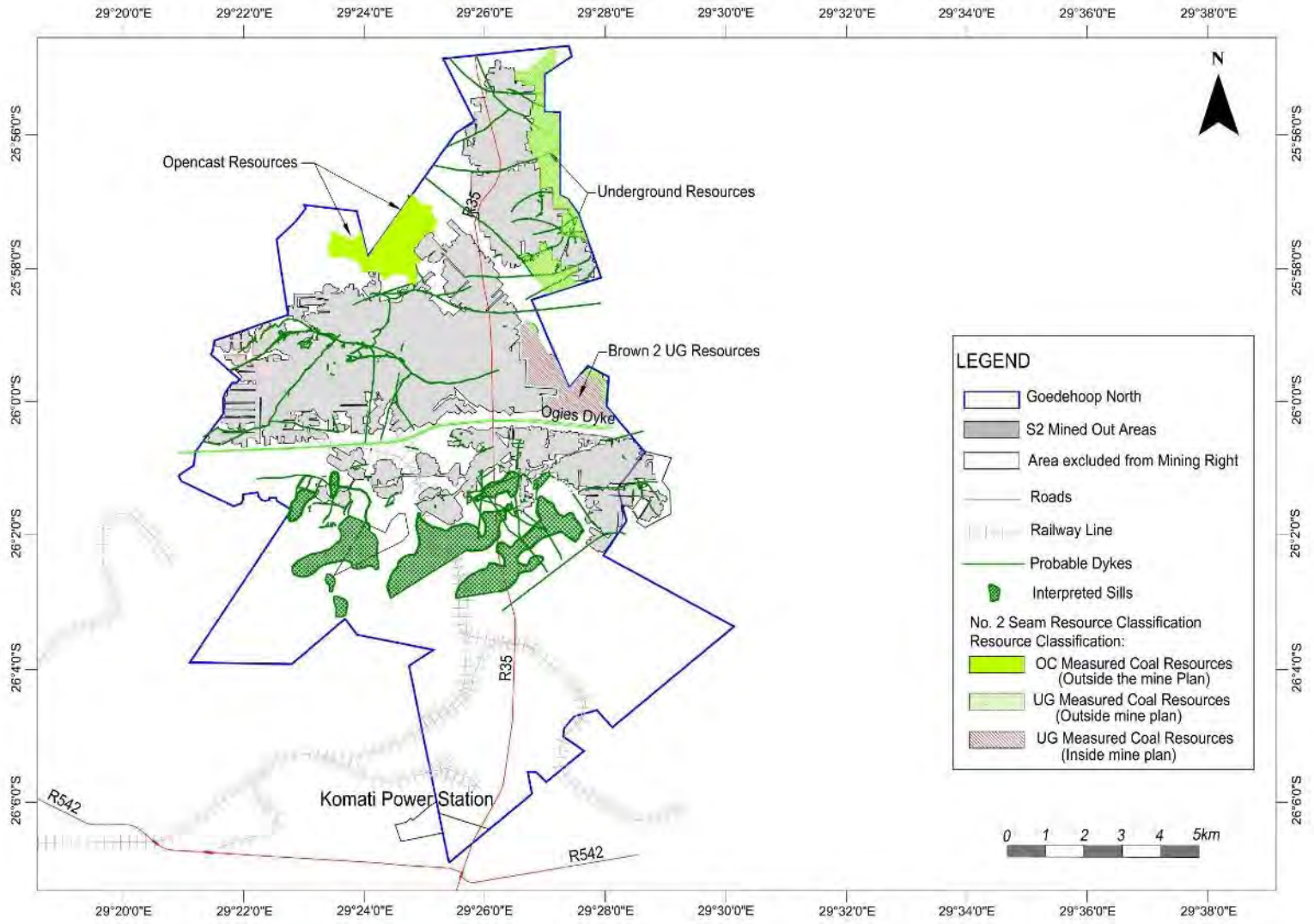
The polygons and their resource category classification selected by SRK for inclusion in the Coal Resource estimation differ slightly from those selected by the Company. This is illustrated in the following figures:

- Goedehoop North: Figure 6-53 to Figure 6-55; and
- Goedehoop South: Figure 6-56.



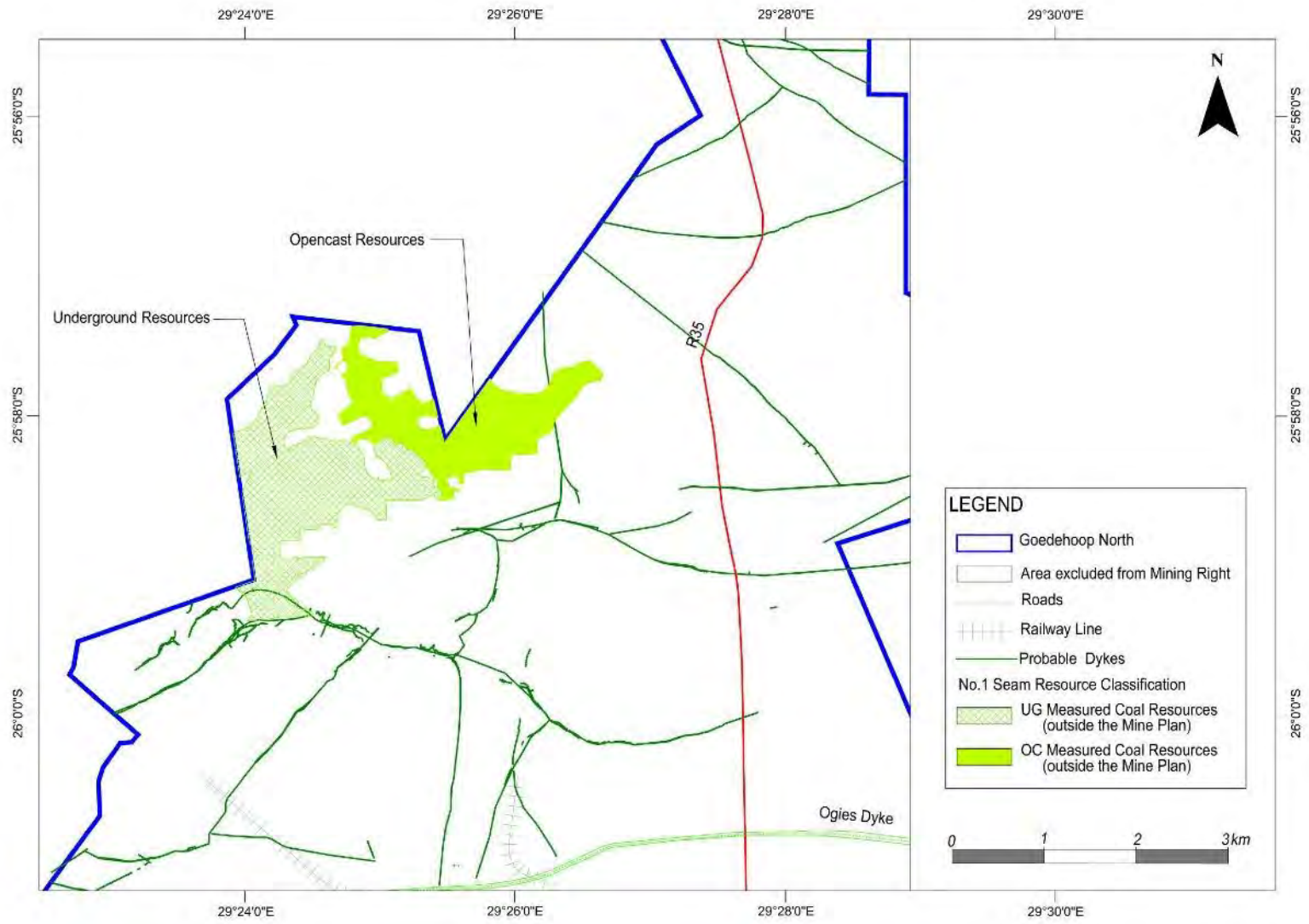
srk consulting	**GOEDEHOOP COLLIERY CPR** Goedehoop North: No 4 Seam Resource Classification (SRK)	Project No. 566657

Figure 6-48: Goedehoop North: No 4 Seam Resource Classification (SRK)



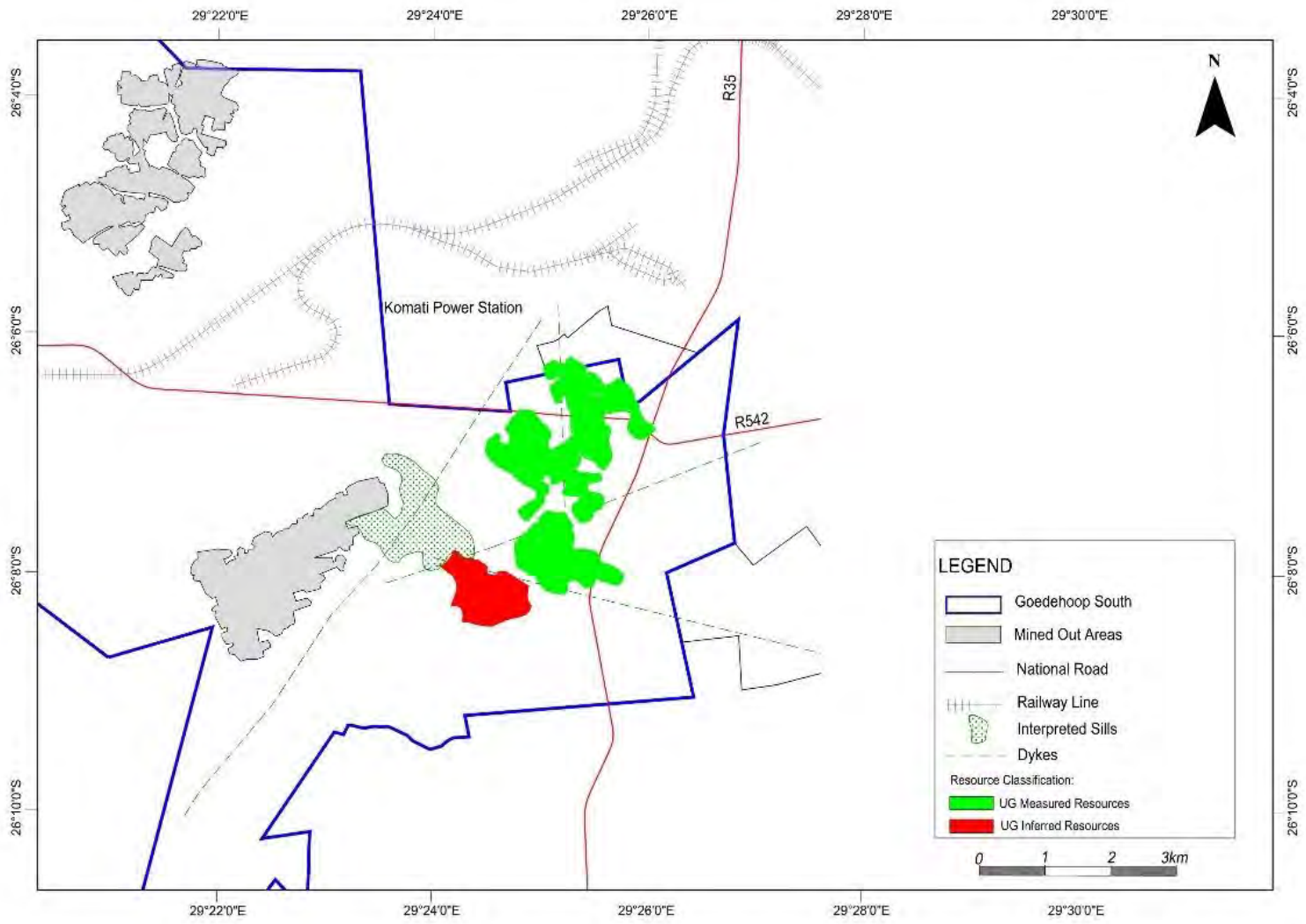
srk consulting	**GOEDEHOOP COLLIERY CPR** Goedehoop North: No 2 Seam Resource Classification (SRK)	Project No. 566657

Figure 6-49: Goedehoop North: No 2 Seam Resource Classification (SRK)



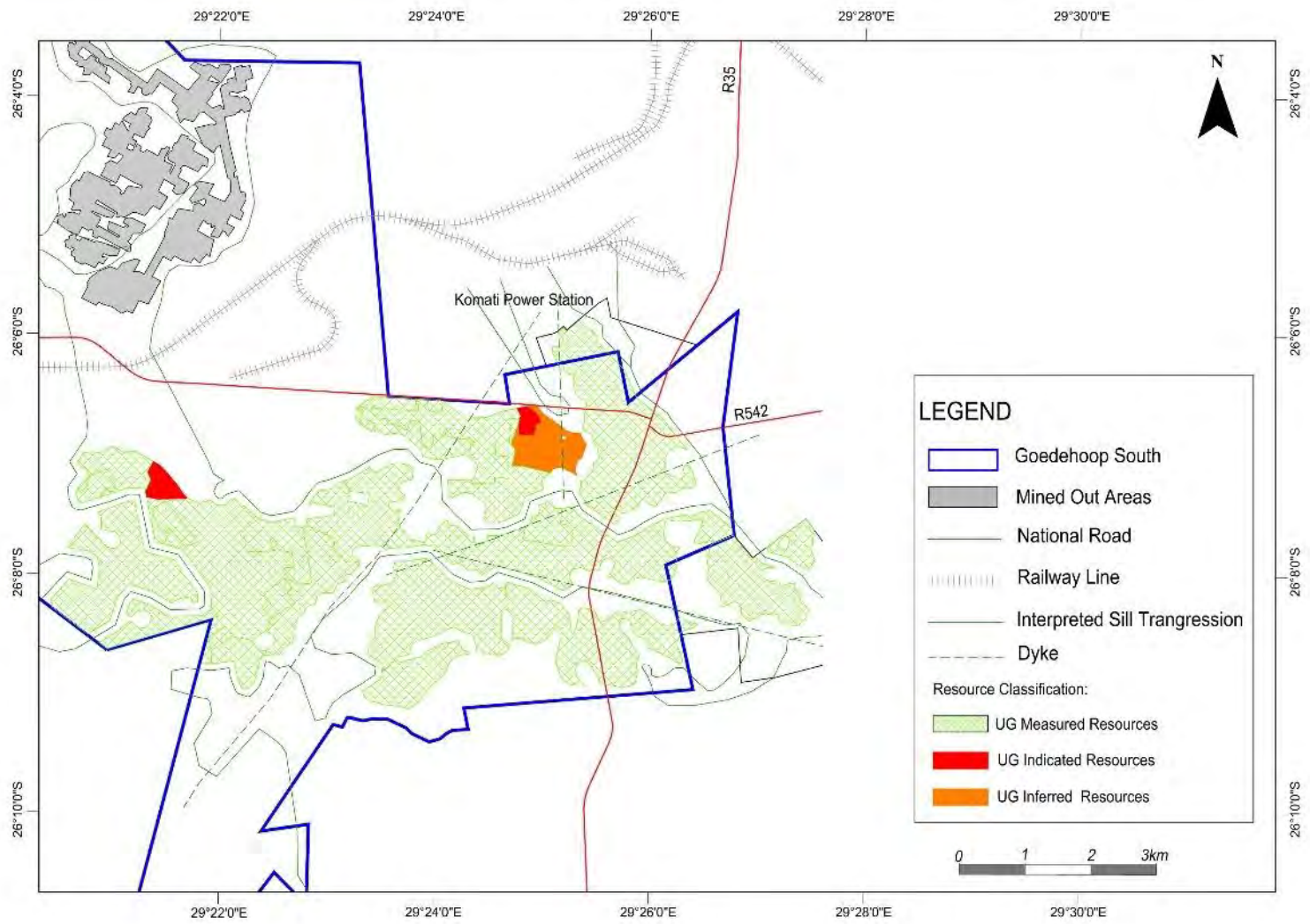
srk consulting	**GOEDEHOOP COLLIERY CPR** Goedehoop North: No 1 Seam Resource Classification (SRK)	Project No. 566657

Figure 6-50: Goedehoop North: No 1 Seam Resource Classification (SRK)



srk consulting	**GOEDEHOOP COLLIERY CPR** Goedehoop South: No 5 Seam Resource Classification (SRK)	Project No. 566657

Figure 6-51: Goedehoop South: No 5Seam Resource Classification (SRK)



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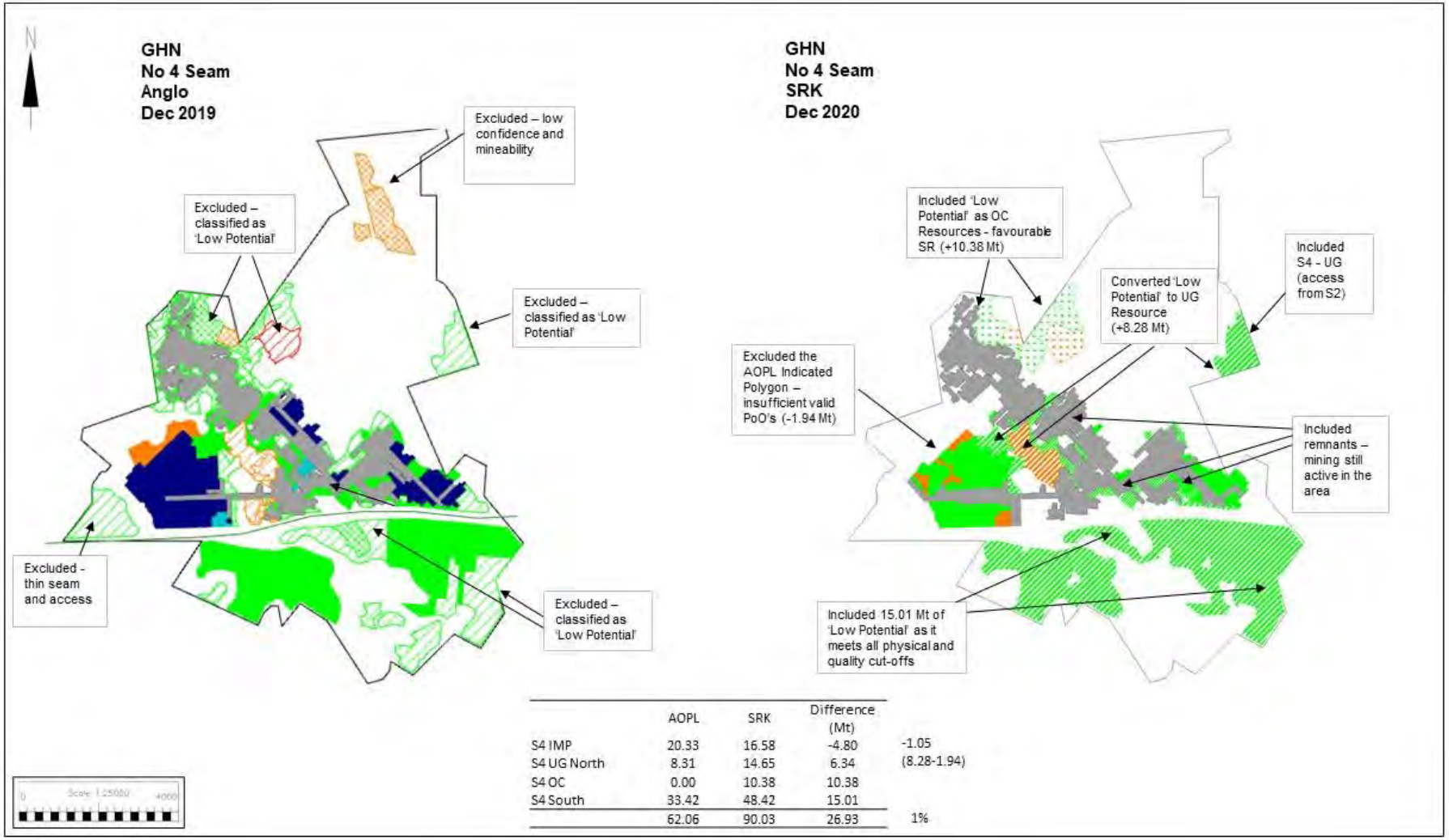
GOEDEHOOP COLLIERY CPR
Goedehoop South: No 4 Seam Resource Classification (SRK)

Project No.
566657

Figure 6-52: Goedehoop South: No 4Seam Resource Classification (SRK



	AOPL	SRK	Difference (Mt)	
S4 IMP	20.33	16.58	-4.80	-1.05
S4 UG North	8.31	14.65	6.34	(8.28-1.94)
S4 OC	0.00	10.38	10.38	
S4 South	33.42	48.42	15.01	
	62.06	90.03	26.93	1%

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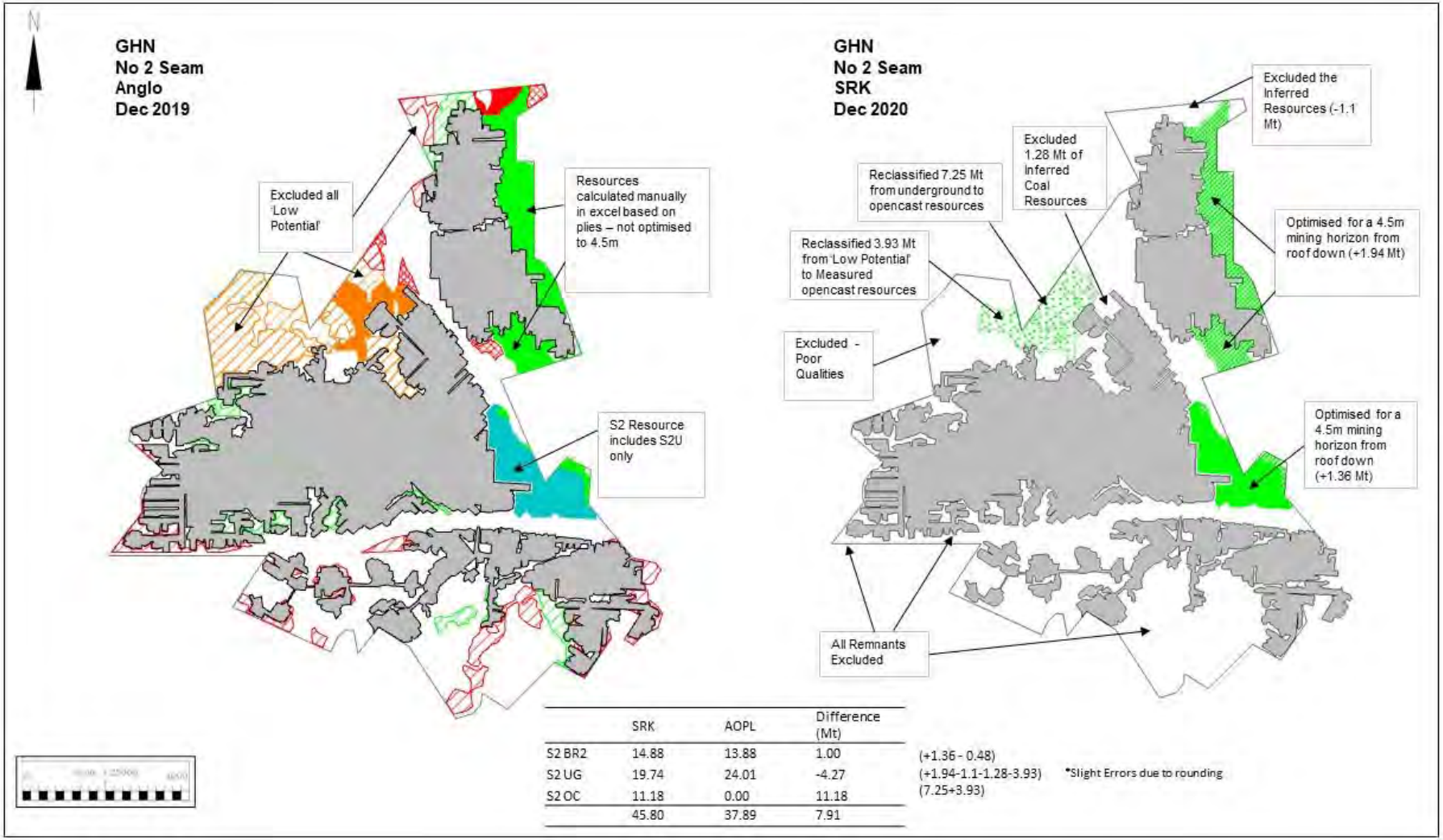
GOEDEHOOP COLLIERY CPR
Goedehoop North: Comparison of the Company's and SRK's Resource Polygons - No 4 Seam

Project No. 566657

Figure 6-53: Goedehoop North: Comparison of the Company's and SRK's Resource Polygons (No 4 Seam)



	SRK	AOPL	Difference (Mt)	
S2 BR2	14.88	13.88	1.00	(+1.36 - 0.48)
S2 UG	19.74	24.01	-4.27	(+1.94-1.1-1.28-3.93)
S2 OC	11.18	0.00	11.18	(7.25+3.93)
	45.80	37.89	7.91	

*Slight Errors due to rounding

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GOEDEHOOP COLLIERY CPR
Goedehoop North: Comparison of the Company's and SRK's Resource Polygons - No 2 Seam

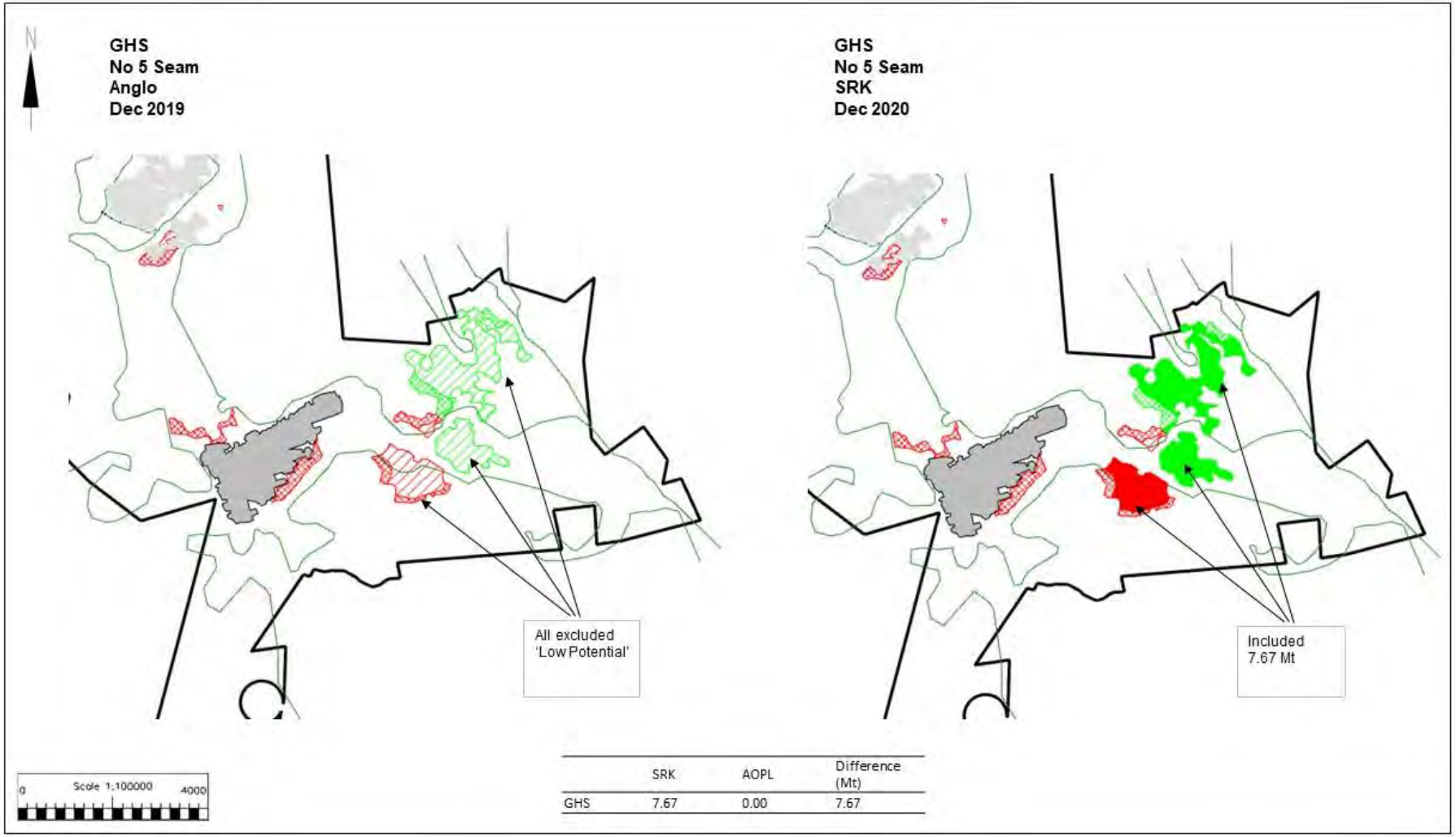
Project No. 566657

Figure 6-54: Goedehoop North: Comparison of the Company's and SRK's Resource Polygons (No 2 Seam)

	SRK	AOPL	Difference (Mt)	
S2 BR2	10.57	15.76	-5.19	(-5.43+0.24)
S2 OC	6.79	0.00	6.97	(+ 5.43+1.54)
	17.54	15.76	1.78	

srk consulting	**GOEDEHOOP COLLIERY CPR** Goedehoop North: Comparison of the Company's and SRK's Resource Polygons - No 1 Seam	Project No. 566657

Figure 6-55: Goedehoop North: Comparison of the Company's and SRK's Resource Polygons (No 1 Seam)



	SRK	AOPL	Difference (Mt)
GHS	7.67	0.00	7.67

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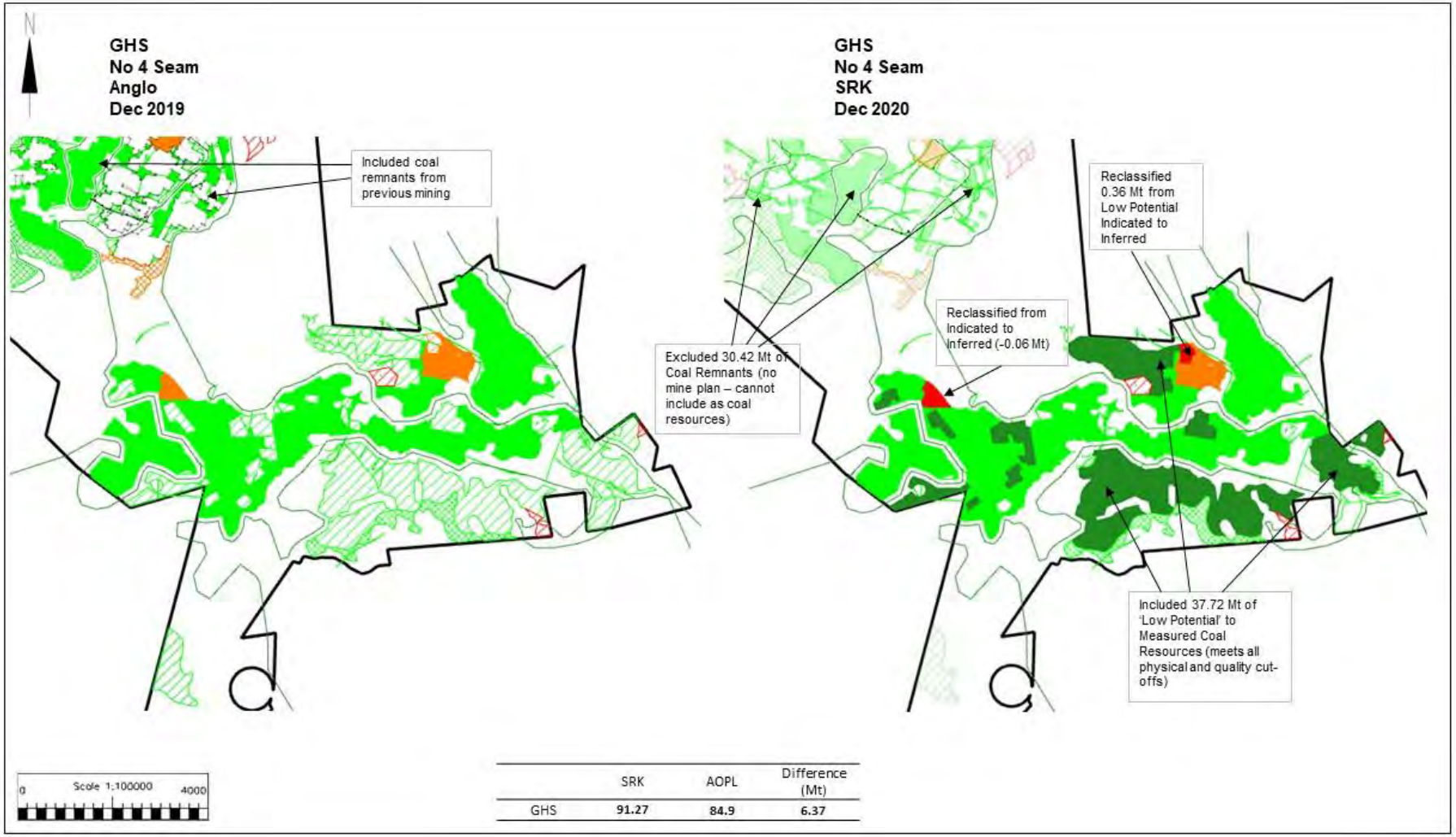
GOEDEHOOP COLLIERY CPR

Goedehoop South: Comparison of the Company's and SRK's Resource Polygons - No 5 Seam

Project No. 566657

Figure 6-56: Goedehoop South: Comparison of the Company's and SRK's Resource Polygons (No 5 Seam)



	SRK	AOPL	Difference (Mt)
GHS	91.27	84.9	6.37

srk consulting	**GOEDEHOOP COLLIERY CPR** Goedehoop South: Comparison of the Company's and SRK's Resource Polygons - No 4 Seam	Project No. 566657

Figure 6-57: Goedehoop South: Comparison of the Company's and SRK's Resource Polygons – No 4 Seam

6.6. Reporting Definitions

The SAMREC Code, 2016 requires that only the Mineable Tonnes *In situ* (**MTIS**) Coal Resource estimate is reported (Clause 55). Reporting definitions as extracted from SANS0320:2020 are given in Table 6-7 and adhered to in this CPR.

Table 6-7: Summary of Reporting Definitions (SANS10320:2020)

Category	Definition
Mineable Tonnes *In situ* (**MTIS**)	The tonnage and coal quality, at a specified moisture content, contained in the coal seam, or section of the coal seam, which is proposed to be mined, at the theoretical mining height, adjusted by the geological loss factors and de-rating factors for previous mining activities, with respect to a specific mining method and after the relevant minimum and maximum mineable thickness cut-offs, depth cut-off and relevant coal quality cut-off parameters have been applied. *NOTE 1 Mineable Tonnes In situ (MTIS) Coal Resources are subdivided in order of increasing geoscientific knowledge and confidence into Inferred, Indicated or Measured Mineable Tonnes In situ Coal Resource categories.* *NOTE 2 The geological loss factor is applied to the Gross Tonnes In situ tonnage estimates and, therefore the impact of the geological loss is included in the Mineable Tonnes In situ Coal Resource tonnage estimates.*
Measured Coal Resource	That part of a Coal Resource for which quantity, grade or quality, densities, shape, and physical characteristics are estimated with confidence sufficient to allow the application of Modifying Factors to support detailed mine planning and final evaluation of the economic viability of the deposit. *NOTE 1 Geological evidence is derived from detailed and reliable exploration, sampling and testing and is sufficient to confirm geological and grade or quality continuity between points of observation. A Measured Coal Resource has a higher level of confidence than that applying to either an Indicated Coal Resource or an Inferred Coal Resource. It may be converted to a Proved Coal Reserve or to a Probable Coal Reserve.* *NOTE 2 A Measured Coal Resource is defined by coal meeting the thickness cut-offs, depth cut-offs, and the relevant coal quality cut-offs, as defined by the competent person, which meets the criteria for reasonable prospects for eventual economic extraction.* *NOTE 3 Although a Measured Coal Resource has sufficient confidence to allow Coal Resource estimation and life of mine planning, it does not imply that further drilling and sampling would not be needed for optimization purposes prior to mining taking place.*
Indicated Coal Resource	That part of a Coal Resource for which quantity, grade or quality, densities, shape and physical characteristics are estimated with sufficient confidence to allow the application of Modifying Factors in sufficient detail to support mine planning and evaluation of the economic viability of the deposit. *NOTE 1 Geological evidence is derived from adequately detailed and reliable exploration, sampling and testing and is sufficient to assume geological and grade or quality continuity between points of observation. An Indicated Coal Resource has a lower level of confidence than that applying to a Measured Coal Resource and may only be converted to a Probable Coal Reserve.* *NOTE 2 An Indicated Coal Resource is defined by coal above the minimum thickness cut-off, depth cut-off, and the relevant coal quality cut-offs, as defined by the competent person, which meets the criteria for reasonable prospects for eventual economic extraction.* *NOTE 3 The level of confidence in an Indicated Coal Resource is usually sufficient to support a decision on whether a pre-feasibility study or feasibility study is warranted.*
Inferred Coal Resource	That part of a Coal Resource for which quantity and coal quality are estimated on the basis of limited geological evidence and sampling and shall not be converted to a Coal Reserve. *NOTE 1 Geological evidence is sufficient to imply but not verify geological and grade or quality continuity. An Inferred Coal Resource has a lower level of confidence than that applying to an Indicated Coal Resource. It is reasonably expected that the majority of Inferred Coal Resources could be upgraded to Indicated Coal Resources with continued exploration.* *NOTE 2 An Inferred Coal Resource is defined by coal above the minimum thickness cut-off, depth cut-off, and the relevant coal quality cut-offs, as defined by the Competent Person, which meets the criteria for reasonable prospects for eventual economic extraction.* *NOTE 3 The level of confidence in an Inferred Coal Resource is usually insufficient to justify a pre-feasibility study.*

6.7. Coal Resource Cut-off Parameters

[SR4.1(vi), SR4.2(i)(ii)(vi)]

SRK applied the following cut-off parameters when estimating the Coal Resources:

- The seam extent was constrained by:

  - The Mining Right boundary (15 m exclusion zone);
  - Structurally complex areas (10 m exclusion zone from significant dykes);
  - Depth from surface > 20 m for current underground mining areas where geotechnical investigations indicate that mining is feasible;
  - Depth from surface > 40 m for underground areas where geotechnical investigations are not yet complete; and
  - The limit of weathering;
- Maximum ash content 50%;
- Minimum DAFV content 24%;
- Minimum seam thickness:
  - No 4 Seam = 2.00 m, except for current mining area where 1.5 m;
  - No 2 Seam = 2.00 m; and
  - No 1 Seam = 1.5m
- Maximum underground mining height 4.5 m;
- Minimum opencast seam thickness 0.5 m; and
- Maximum stripping ratio 6:1.

6.8. Coal Resource Estimates

[12.10(a)] [SR1.4(iii), SR4.1(iv), SR4.5(ii)(iv)(v)(vii), SR6.1(i), SR6.3(vi)] [SV1.9]

The Coal Resource estimates were conducted in accordance with the SAMREC Code, as well as SANS10320:2020.

The Coal Resource estimates have been independently estimated by Ms K. Black of KJB GeoServices and signed off by Ms L. Jeffrey on behalf of SRK, based on the model supplied by the Company and verified by SRK. The Coal Resource estimate is declared as at 31 December 2020. SRK estimated the Goedehoop Coal Resources as at 31 December 2020.

During the resource verification process carried out by SRK, certain coal measures, either excluded totally by the Company, or included as 'Low Potential' Coal Resources in their internal coal inventory, were deemed by SRK as meeting the necessary requirements (RPEEE) to be included in the SRK Coal Resource Estimate for both Goedehoop North and Goedehoop South. These Coal Resources were excluded by the Company predominantly on the basis of access (current mining had ceased in the immediate vicinity), as well as challenging mining conditions, while some of the coal measures were excluded on the basis of poor quality (did not meet the current strategy of an underground export product; however, these Coal Resources could meet the quality requirements of a local steam coal). After careful consideration, SRK took the decision to include some of these coal measures as reportable Coal Resources, because different mining methodologies and markets could result in this coal becoming economically viable.

There are no Inferred Coal Resources at either Goedehoop North or Goedehoop South.

6.8.1. Goedehoop North Coal Resource Estimates

The Goedehoop North Coal Resource estimate has been subdivided as follows:

- Resources within the current Mine Plan (underground coal only);
- Resources outside of the current Mine Plan, further subdivided as follows:
  - Underground coal north of the Ogies Dyke;
  - Opencast coal north of the Ogies Dyke, including the MRD; and
  - Underground coal south of the Ogies Dyke (there is no opencast coal south of the Ogies Dyke.

Note that the *in situ* opencast Coal Resources will only be available for mining provided the MRD has been completely removed.

Provision has been made for a geological loss factor (discount). Losses may occur mainly as a result of intersection of dolerite dykes, faulting and other unforeseen geological losses.

The Company has applied geological losses of between 10 to 15% for the Measured Coal Resources and between 15 and 20% for the Indicated Coal Resources. However, SRK is of the opinion that lower geological losses are warranted, based on the redefined resource polygons. SRK has thus applied geological losses of between 5 to 15% for the Measured Resources and 15% for the Indicated Coal Resources; this translates to an average geological loss of 9.3%.

The Coal Resources for Goedehoop North inside the Mine Plan on a total basis[7] (100% attributable to Goedehoop) at 31 December 2020 are summarised in Table 6-8; the average raw coal qualities on an air-dried basis are shown in Table 6-9. Note that these Coal Resources are all north of the Ogies Dyke.

The Coal Resources have been subdivided into those inside and outside the Life of Mine Plan, which has been determined using the specified mine design parameters within the economic footprint (SANS 10320:2020, Clauses 3.2.5, 8.1.1.1, 8.1.2.3 and Table F1).

Coal Resources inside the Mine Plan are reported inclusive of the Coal Reserves.

The Goedehoop North Coal Resource within the current Mine Plan on an MTIS air-dried basis amounts to 38.07 Mt. This estimate consists of Measured and Indicated Coal Resources only; there are no Inferred Coal Resources within the current Mine Plan. 31.47 Mt of the Coal Resources are derived from the *in situ* coal with an average moisture content of 2.5%. The Measured Coal Resources account for 95.1% (29.93 Mt) of the *in situ* Coal Resources, while the Indicated Coal Resources account for 4.9% (1.54 Mt). The MRD contributes 6.6 Mt with an average moisture content of 2.3%.

Table 6-8: Goedehoop North: MTIS Coal Resource Statement at 31 December 2020 (Inside the Mine Plan – north of the Ogies Dyke)

Block	Resource Classification Category	Mining Method	Seam	Area (ha)	Seam Thickness (m)	Raw ARD	Geo. Loss (%)	MTIS (Mt)
Simunye	Measured	UG+BP	No 4	399.38	2.67	1.57	10	15.05
	Indicated	UG+BP	No 4	47.91	2.42	1.56	15	1.54
Brown 2	Measured	UG+BP	No 2	236.95	4.37	1.56	8	14.88
MRD	***Measured***	***OC***	***Discard***	**-**	**-**	**-**	**-**	***6.6***
Total Inside the Mine Plan		**UG+BP**	**No 4, 2**	**684.23**	**3.46**	**1.56**	**9.3**	**38.07**

Note:
1. Note that "total basis" refers to 100% of the Coal Resources and/or Coal Reserves within the Goedehoop Mining Rights and is not necessarily the percentage attributable to the holder of the Mining Rights.
2. Coal within Mining Right boundary.
3. UG+BP = Underground Bord and Pillar; OC = Opencast.
4. MRD = Mineral Residue Deposit (derived from the No 4 and No 2 Seam discard material).
5. Minimum UG seam thickness cut-off: No 4 Seam = 1.5 m; No 2 Seam = 2.0 m (the same as the minimum mining height)
6. Maximum UG seam thickness cut-off = 4.5 m (the same as the maximum mining height)
7. Minimum UG depth = 20 m.
8. Ash < 50% cut-off applied.
9. DAFV > 24% cut-off applied.
10. ARD – Apparent Relative Density.
11. The bulk density for the MRD is not stated in the Company's estimate.
12. All seam thicknesses used are true thicknesses.

[7] Note that "total basis" refers to 100% of the Coal Resources and/or Coal Reserves attributable to Goedehoop North and South and are equivalent to the term "gross" used in the AIM Mining Guidance.

Table 6-9: Goedehoop North: Average Raw Coal Qualities (adb) (Inside the Mine Plan)

Block	Resource Classification Category	Seam	Ash (%)	CV[1] (MJ/kg)	FC (%)	IM (%)	TS (%)	VM (%)	DAFV (%)
Simunye	Measured	No 4	25.7	22.93	49.2	2.6	1.39	22.6	31.6
	Indicated	No 4	24.8	23.26	50.0	2.6	1.66	22.6	31.2
Brown 2	Measured	No 2	23.1	22.38	49.3	2.4	1.04	19.9	29.4
MRD	*Measured*	*Discard*	*-*	*12.64*	*-*	*2.3*	*-*	*-*	*-*
Average		**All**	**26.9**	**22.69**	**49.3**	**2.5**	**1.24**	**21.3**	**30.5**

Note:
1. Weighted average qualities estimated on MTIS.
2. adb = air-dried basis.
3. CV[1] - Calorific Value, VM – Volatile Matter Content, FC - Fixed Carbon, TS - Total Sulphur, IM - Inherent Moisture, DAFV – Dry Ash Free Volatile Matter Content.
4. MRD = Mineral Residue Deposit (derived from No 4, No 2 and No 1 Seam discard material).
5. The CV for the MRD has been converted by SRK from kcal/kg to MJ/kg (kcal/kg * 0.004187 = MJ/kg).
6. Note that the MRD CV and IM have not been considered in the average values.

The Goedehoop North Coal Resource outside of the current Mine Plan on an MTIS air-dried basis amounts to 121.91 Mt at an average IM of 2.5%. The estimate consists of:

- 90.48 Mt of Measured underground Coal Resources (74%);
- 2.90 Mt of Indicated underground Coal Resources (2%);
- 25.51 Mt Measured opencast Coal Resources (21%); and
- 3.02 Mt of Indicated opencast Coal Resources (3%).

The Coal Resources for Goedehoop North outside the Mine Plan on a total basis[8] (100% attributable to Goedehoop) at 31 December 2020 are summarised in Table 6-10; the average raw coal qualities on an air-dried basis are shown in Table 6-11.

[8] Note that "total basis" refers to 100% of the Coal Resources and/or Coal Reserves attributable to Goedehoop North and South and are equivalent to the term "gross" used in the AIM Mining Guidance.

Table 6-10: Goedehoop North: MTIS Coal Resource Statement at 31 December 2020 (Outside the Mine Plan)

Block	Resource Classification Category	Mining Method	Seam	Area (ha)	Seam Thickness (m)	Raw ARD	Geo. Loss (%)	MTIS (Mt)
North of the Ogies Dyke								
Simunye + Brown 1+ Brown 2	Measured	UG+BP	No 4	289.64	2.82	1.60	10.0	11.75
	Indicated	UG+BP	No 4	99.22	2.22	1.55	15.0	2.90
	Total No 4 Seam	***UG+BP***	***No 4***	***388.86***	***2.70***	***1.59***	***11.0***	***14.65***
	Measured	UG+BP	No 2	327.84	4.46	1.59	15.0	19.74
	Total No 2 Seam	***UG+BP***	***No 2***	***327.84***	***4.46***	***1.59***	***15.0***	***19.74***
	Measured	UG+BP	No 1	247.76	3.00	1.58	10.0	10.57
	Total No 1 Seam	***UG+BP***	***No 1***	***247.76***	***3.00***	***1.58***	***10.0***	***10.57***
Subtotal Simunye, Brown 1+2		**UG+BP**	**No 4, 2, 1**	**964.46**	**3.54**	**1.59**	**12.5**	**44.96**
Simunye	Measured	OC	No 4	215.13	2.48	1.53	10.0	7.36
	Indicated	OC	No 4	91.88	2.53	1.53	15.0	3.02
	Total No 4 Seam	***OC***	***No 4***	***307.01***	***2.49***	***1.53***	***11.5***	***10.38***
	Measured	OC	No 2	255.62	2.91	1.67	10.0	11.18
	Total No 2 Seam	***OC***	***No 2***	***255.62***	***2.91***	***1.67***	***10.0***	***11.18***
	Measured	OC	No 1	171.51	2.84	1.59	10.0	6.97
	Total No 1 Seam	***OC***	***No 1***	***171.51***	***2.84***	***1.59***	***10.0***	***6.97***
Subtotal Simunye		**OC**	**No 4, 2, 1**	**734.14**	**2.74**	**1.60**	**10.5**	**28.53**
Total North of the Ogies Dyke		**UG + OC**	**No 4, 2, 1**	**1 698.60**	**3.23**	**1.59**	**11.7**	**73.49**
<u>South of the Ogies Dyke</u>								
South	Measured	UG+BP	No 4	1 204.76	2.96	1.60	15.0	48.42
Total South of the Ogies Dyke		**UG+BP**	**No 4**	**1 204.76**	**2.96**	**1.60**	**15.0**	**48.42**
TOTAL		**UG+OC**	**No 4**	**2 903.36**	**3.12**	**1.59**	**13.0**	**121.91**

Note:
1. Note that "total basis" refers to 100% of the Coal Resources and/or Coal Reserves within the Goedehoop Mining Rights and is not necessarily the percentage attributable to the holder of the Mining Rights.
2. Coal within Mining Right boundary.
3. UG+BP = Underground Bord and Pillar; OC = Opencast.
   13. Minimum UG seam thickness cut-off: No 4 Seam north of the Ogies Dyke = 1.5 m and 2.0 m south of the Ogies Dyke; No 2 Seam = 2.0 m, No 1 Seam = 1.5 m (the same as the minimum mining height)
4. Maximum UG seam thickness cut-off of 4.5 m (the same as the maximum mining height).
5. Minimum UG depth = 20 m.
6. Minimum OC seam thickness cut-off of 0.5 m.
7. Strip ratio < 6.5.
8. Ash < 50% cut-off applied.
9. DAFV > 24% cut-off applied.
10. ARD – Apparent Relative Density.
11. All seam thicknesses used are true thicknesses.

Table 6-11: Goedehoop North: Average Raw Coal Qualities (adb) (Outside the Mine Plan)

Block	Resource Classification Category	Seam	Ash (%)	CV[1] (MJ/kg)	FC (%)	IM (%)	TS (%)	VM (%)	DAFV (%)
North of the Ogies Dyke									
Simunye + Brown 1+ Brown 2	Measured	No 4	28.3	21.80	47.3	2.6	1.29	21.7	31.6
	Indicated	No 4	23.7	23.80	51.4	2.8	1.40	22.1	30.1
	Average No 4 Seam	***No 4***	***27.4***	***22.19***	***48.19***	***2.6***	***1.31***	***21.8***	***31.3***
	Measured	No 2	27.9	22.27	48.9	2.4	1.18	20.7	30.1
	Average No 2 Seam	**No 2**	**27.9**	**22.27**	**48.9**	**2.4**	**1.18**	**20.7**	**30.1**
	Measured	No 1	27.8	22.82	47.5	2.1	1.14	22.6	32.9
	Average No 1 Seam	**No 1**	**27.7**	**22.82**	**47.5**	**2.1**	**1.14**	**22.6**	**32.9**
Average Simunye, Brown 1+2		**No 4, 2, 1**	**27.7**	**22.3**	**48.3**	**2.4**	**1.22**	**21.5**	**31.1**
Simunye	Measured	No 4	23.0	23.94	52.3	2.9	1.14	21.8	29.4
	Indicated	No 4	23.0	24.18	52.6	2.7	1.44	21.7	29.3
	Average No 4 Seam	***No 4***	**23.0**	**24.01**	**52.4**	**2.9**	**1.23**	**21.8**	**29.4**
	Measured	No 2	35.3	19.19	42.2	2.3	0.83	20.2	33.2
	Average No 2 Seam	**No 2**	**35.3**	**19.19**	**42.2**	**2.3**	**0.83**	**20.2**	**33.2**
	Measured	No 1	30.2	22.36	45.6	2.0	1.01	22.2	32.8
	Average No 1 Seam	**No 1**	**30.2**	**22.36**	**45.6**	**2.0**	**1.01**	**22.2**	**32.8**
Average Simunye		**No 4, 2, 1**	**29.6**	**21.72**	**46.8**	**2.4**	**1.02**	**21.3**	**31.7**
Average North of the Ogies Dyke		**No 4, 2, 1**	**28.4**	**22.12**	**47.7**	**2.4**	**1.14**	**21.4**	**31.4**
South of the Ogies Dyke									
South	Measured	No 4	28.3	21.83	47.4	2.7	1.30	21.5	31.6
Average South of the Ogies Dyke		**No 4**	**28.3**	**21.83**	**47.4**	**2.7**	**1.30**	**21.5**	**31.6**
Average		**No 4, 2, 1**	**28.4**	**22.00**	**47.6**	**2.5**	**1.20**	**21.5**	**31.4**

Note:
1. Weighted average qualities estimated on MTIS.
2. adb = air-dried basis.
3. CV[1] - Calorific Value, VM – Volatile Matter Content, FC - Fixed Carbon, TS - Total Sulphur, IM - Inherent Moisture, DAFV – Dry Ash Free Volatile Matter Content.
4. MRD = Mineral Residue Deposit (derived from the No 4 and No 2 Seam discard material).
5. The CV[1] for the MRD has been converted by SRK from kcal/kg to MJ/kg (kcal/kg * 0.004187 = MJ/kg)
6. Note that the MRD CV[1] and IM have not been considered in the average values.

Goedehoop North Mineral Residue Deposit

The Goedehoop North MRD (previously known as the Bank 2 Dump) is a co-disposal facility consisting of both a coarse and a fines fraction, derived from lower quality discard material from previously mined and beneficiated coal (both the No 5, No 4, No 2 and No 1 Seams). The MRD is currently being mined, combined with some of the as-arising material from the CHPP and being sold, without further beneficiation, to a third party. The Coal Resources for the MRD as declared by the Company are based on the current contract, which continues for a further two years at 3.0 Mtpa (refer to Section 9.5). This translates into a Coal Resource of 6.6 Mt, taking 10% losses incurred during recovery of the material into account. The classification of the Coal Resources has been based on CHPP and mining records and a knowledge of the material placed on the MRD.

In addition to a surveying exercise conducted in early 2020, a basic geological model was constructed by the Company in February 2020. This model was built using Stratmodel Minescape version 6.1.2 and consists of data from 13 drill holes drilled between 2010 and 2013, 206 raw/cumulated samples and 23 washed samples. The model contains nine vertical layers in order to assess the vertical variation in raw quality data. The washability data has been derived from analysis of two composited layers, each 16 – 18 m thick. The top surface of the MRD

is represented by a DTM flown in September 2019 and the base of the MRD has been estimated from the pre-mined topography surface data as contained in the Company's official Goedehoop geological model. The drill holes intersected soil underneath the MRD, indicating the pre-mined topography surface, which was then utilised to position the drill hole collars.

A raw quality model has been constructed and the washability data have been used to interpret a potential product. The product interpretation was done using Prodint5b, resulting in a 21.55 MJ/kg theoretical wash product. The exercise demonstrated that such a product could potentially be produced, at a yield of around 31%. Note however, that the material is sold unbeneficiated, i.e. at a yield of 100%.

An assumed bulk density of 1.6 g/cm^3 for the coarse fraction only has been used to estimate the tonnage (the fines fraction is not included in the estimates). The assumption was based on previous work done by the Company on various MRDs (unpublished studies) and internal Company discussions.

Note that no practical mining limitations or buffers that may be required to be left around the fines (slimes) portion of the MRD have been taken into account in the geological model.

The indicative Coal Resource estimate and average qualities for the coarse fraction only are shown in Table 6-12; these are based on the geological model and illustrate the potential volume and quality of the material available and are not declared; only the 6.6 Mt referred to above are declared and included in the Coal Resource statement for Goedehoop North.

Table 6-12: Goedehoop North MRD Coarse Fraction – Indicative Coal Resource Estimate (adb)

Area (ha)	Volume (Mm^3)	Bulk Density (g/cm^3)	GTIS (Mt)	Ash (%)	CV[1] (MJ/kg)	IM (%)	TS(%)	VM (%)
3.765	13.845	1.6	22.152	47.00	13.76	2.7	2.19	20.3

Notes:
1. Weighted average qualities estimated on MTIS.
2. adb = air dried basis.
3. CV[1] - Calorific Value, IM - Inherent Moisture, TS - Total Sulphur, VM – Volatile Matter.

6.8.2. Goedehoop South Coal Resource Estimates

The Goedehoop South Coal Resource on an MTIS air-dried basis amounts to 167.74 Mt. This estimate is made up of Measured, Indicated and Inferred Coal Resources, all of which are outside any Mine Plan.

Coal Resources contributing to the *in situ* estimate include 93.47 Mt of Measured Coal Resources (94.5%), 2.57 Mt of Indicated Coal Resources (2.6%) and 2.90 Mt of Inferred Coal Resources (2.9%). The average IM is 2.8%.

The Coal Resources for Goedehoop South on a total basis[9] (100% attributable to Goedehoop) at 31 December 2020 are summarised in Table 6-13; the average raw coal qualities pertaining to the Coal Resources are shown in Table 6-14.

Provision has been made for a geological loss factor (discount). Losses may occur mainly as a result of intersection of dolerite sills and dykes, faulting and other unforeseen geological losses. SRK believes the geological losses indicated in Table 6-13 are appropriate considering the dolerite intrusions prevalent in the area. The geological losses applied by the Company are similar to those applied by SRK.

[9] Note that "total basis" refers to 100% of the Coal Resources and/or Coal Reserves attributable to Goedehoop North and South and are equivalent to the term "gross" used in the AIM Mining Guidance.

Table 6-13: Goedehoop South: MTIS Coal Resource Statement at 31 December 2020 (Outside a Mine Plan)

Block	Resource Classification Category	Mining Method	Seam	Area (ha)	Thickness (m)	Raw ARD	Geological Loss (%)	MTIS (Mt)
GHS	Measured	UG+BP	No 5	277.25	1.66	1.47	15.0	5.77
	Inferred	UG+BP	No 5	90.16	1.76	1.52	20.0	1.90
	Subtotal No 5 Seam	***UG+BP***	***No 5***	***367.42***	***1.69***	***1.48***	***16.24***	***7.67***
	Measured	UG+BP	No 4	2 171.86	2.90	1.61	13.5	87.70
	Indicated	UG+BP	No 4	67.18	2.90	1.55	15.0	2.57
	Inferred	UG+BP	No 4	31.63	2.61	1.57	20.0	1.00
	Subtotal No 4 Seam	***UG+BP***	***No 4***	***2 270.67***	***2.90***	***1.61***	***13.6***	***91.27***
GRAND TOTAL		**UG+BP**	**No 5, 4**	**2 638.09**	**2.81**	**1.60**	**13.8**	**98.94**

Note:
1. Note that "total basis" refers to 100% of the Coal Resources and/or Coal Reserves within the Goedehoop Mining Rights and is not necessarily the percentage attributable to the holder of the Mining Rights.
2. Coal within Mining Right boundary.
3. UG + BP = Underground Bord and Pillar
4. OC = Opencast
5. GHS = Goedehoop South
6. Minimum No 5 Seam thickness cut-off of 1.5 m; minimum No 4 Seam thickness cut-off of 2.0 m (the same as the minimum mining height).
7. Maximum seam thickness cut-off of 4.5 m (both seams) (the same as the maximum mining height).
8. Ash < 50% cut-off applied.
9. DAFV > 24% cut-off applied.
10. ARD – Apparent Relative Density.
11. All seam thicknesses used are true thicknesses.

Table 6-14: Goedehoop South: Average Raw Coal Qualities (All Seams) (adb) (Outside a Mine Plan)

Block	Resource Classification Category	Seam	ASH (%)	CV[1] (MJ/kg)	FC (%)	IM (%)	TS (%)	VM (%)	DAFV (%)
GHS	Measured	No 5	18.1	26.59	49.9	2.8	2.08	29.3	36.7
	Indicated	No 5	-	-	-	-	-	-	-
	Inferred	No 5	21.7	25.20	48.9	2.7	2.27	26.7	35.4
	Average No 5 Seam	***No 5***	***19.0***	***26.25***	***49.6***	***2.7***	***2.1***	***28.6***	***36.4***
GHS	Measured	No 4	29.8	21.41	48.2	2.8	1.18	19.9	29.2
	Indicated	No 4	24.7	23.02	50.9	3.0	1.23	21.4	29.6
	Inferred	No 4	25.9	22.72	50.8	2.8	1.17	20.6	28.7
	Average No 4 Seam	***No 4***	***29.6***	***21.24***	***47.9***	***2.8***	***1.18***	***19.8***	***29.3***
AVERAGE		**No 5, 4**	**28.2**	**21.84**	**48.4**	**2.8**	**1.25**	**20.6**	**29.8**

Note:
1. Weighted average qualities estimated on MTIS.
2. adb = air-dried basis.
3. CV[1] - Calorific Value, VM – Volatile Matter Content, FC - Fixed Carbon, TS - Total Sulphur, IM - Inherent Moisture, DAFV – Dry Ash Free Volatile Matter Content.
4. GHS = Goedehoop South

6.9. Reconciliation with the Previous Coal Resource Estimate

[SR1.4(iii), SR4.5(vi)] [SV1.6]

6.9.1. Goedehoop North

Table 6-15 shows the reconciliation between the 2020 and 2019 Coal Resource estimates for the No 4, No 2 and No 1 Seams. The 2020 estimate was done by SRK as at 31 December 2020, while the 2019 estimate was done

by the Company as at 31 December 2019 (AAC, 2019m).

Table 6-15: Reconciliation between the Goedehoop North 2020 and 2019 Coal Resource Estimates

Block	Resource Classification Category	MTIS Coal Resources			
		Mass (Mt)		CV[1] (MJ/kg)	
		2020	2019	2020	2019[1]
GHN	Measured	145.92	107.5	22.07	22.82
	Indicated	7.46	7.2	23.84	21.27
	Inferred	-	1.1	-	19.01
MRD		*6.6*	*4.5*	*12.63*	*12.64*
GRAND TOTAL		**159.98**	**120.3**	**21.76**	**22.69**

Note:
1. GHN = Goedehoop North
2. MRD = Mineral Residue Deposit (derived from the No 5, No 4, No 2 and No 1 Seam discard material).
3. CV[1] converted by SRK from kcal/kg to MJ/kg (kcal/kg * 0.004187 = MJ/kg)
4. Note that the MRD CV[1] has not been considered in the average CV[1].

The differences between the SRK Coal Resource estimates and those of the Company amount to 39.68 Mt (approximately 25%) and are explained by the following:

- No 4 Seam (refer to Figure 6-53):
  - SRK included opencast Coal Resources of 10.38 Mt based on a favourable stripping ratio of less than 6:1 bcm/t when considering all seams (No 4, No 2 and No 1 Seams); this coal was classified by the Company as “Low Potential”;
  - SRK has included 15.01 Mt of Measured No 4 Seam “Low Potential” south of the Ogies Dyke; SRK is of the opinion that these could be economically extractable and have thus included them in the estimate;
  - SRK has included 8.28 Mt of No 4 Seam “Low Potential” (Measured and Indicated) as the same category of Coal Resources; SRK is of the opinion that these could be economically extractable and have thus included them in the estimate;
  - SRK has excluded 1.94 Mt of Indicated “Additional” Coal Resources as there are insufficient appropriate PoOs to categorize this coal according to SANS 10320:2020. Note that as with the Company “Low Potential” category, “Additional” is not a recognised SAMREC category;
  - SRK has relaxed the minimum mining height cut-off from 2.0 m as applied by the Company to 1.5 m. The relaxation in the minimum mining height was guided by the SRK Mining Team, who are of the opinion that as seam heights of close to 1.5 m are already being successfully mined elsewhere in the mine, the same cut-off could be applied to the No 4 Seam; SRK has thus allowed for the inclusion of an additional 0.6 Mt of No 4 Seam coal;
  - Mining that took place between December 2019 and December 2020; this is forecast to be 4.8 Mt; and
  - There is an overall difference of 1.05 Mt (1%) between the “Inside the Mine Plan” SRK Coal Resource Estimates and those of the Company, which is potentially explained by a minor difference in the way the geological losses are applied. SRK is of the opinion that this difference is not material.

- No 2 Seam:
  - SRK has included an additional 7.25 Mt of opencast Coal Resources not included by the Company. SRK is of the opinion that these Coal Resources could be economically extractable

(based on favourable depths to the coal seam roof, as well as a favourable stripping ratio) and have thus included them in the estimate;

- SRK converted 3.93 Mt of underground Indicated Coal Resources to opencast Measured Coal Resources;
- SRK has included an additional 1.36 Mt in the Brown 2 area and 1.94 Mt in the Simunye UG area by consistently applying the theoretical mining height of 4.5 m over the entire areas; SRK has excluded 1.1 Mt of Inferred Coal Resources as reported by the Company due to unfavourable coal qualities, as well as excluding 1.28 Mt of Indicated Coal Resources during the reclassification of Coal Resources from underground to opencast; and
- Mining that took place between December 2019 and December 2020; this is forecast to be 0.48 Mt.

- No 1 Seam:
  - SRK has included an extra 1.78 Mt of Coal Resources not included by the Company. This was achieved by revising the categorization of the No 1 Seam Coal Resources as follows:
    - 6.97 Mt of opencast Coal Resources, categorized by the Company as underground Coal Resources;
    - The remaining underground Coal Resources (10.57 Mt) were subdivided into separate polygons (Figure 6-3) based on different mining horizons dictated by the thickness of the clastic parting:
      - Parting < 0.3 m – the S1UM mining horizon is defined as the uppermost coal sub-seam (S1U) plus the P1M parting plus the middle coal sub-seam (S1M) with a thickness ≤ 4.5 m; and
      - Parting > 0.3 m – the mining horizon is defined as either the S1U or the S1M, whichever is the thicker, with a minimum thickness of 1.5 m and a maximum mining height of 4.5.
  - SRK converted 5.43 Mt of underground Coal Resources included by the Company, to opencast Coal Resources.
  - There is an overall difference of 0.24 Mt (1%) between the SRK underground Coal Resource Estimates and those of the Company, which is potentially explained by a change in Coal Resource Estimation methodology. SRK is of the opinion that this difference is not material.
- MRD:
  - Production during 2020, which amounted to 3.6 Mt; and an update to the MRD estimate by the Company, resulting in an updated estimate of 6.6 Mt for the next two years.

Comparison of the SRK and Company estimates on an approximate like-for-like basis reveals that the difference between the estimates is not material.

However, it is suggested that there is potential for revisiting the current Company rationale behind the Goedehoop North extraction plan and resultant resource classification. This will enable the additional 38.8 Mt derived from the potential OC area and south of the Ogies Dyke to be exploited.

6.9.2. Goedehoop South

Table 6-16 shows the reconciliation between the 2020 and 2019 Coal Resource estimates for the No 5 and No 4 Seams. The 2020 estimate was done by SRK as at 31 December 2020, while the 2019 estimate was done by the Company as at 31 December 2019 (AAC, 2019l).

Table 6-16: Reconciliation between Goedehoop South 2020 and 2019 Coal Resource Estimates

Block	Resource Classification Category	Seam	MTIS Coal Resources			
			Mass (Mt)		CV[1] (MJ/kg)	
			2020	2019	2020	2019[1]
GHS	Measured	No 5	5.77	-	26.59	-
	Indicated	No 5	-	-	-	-
	Inferred	No 5	1.90	-	25.20	-
	Subtotal No 5 Seam	**No 5**	**7.67**	**-**	**26.25**	**-**
	Measured	No 4	87.70	80.6	21.18	22.86
	Indicated	No 4	2.57	4.3	23.02	22.69
	Inferred	No 4	1.00	-	22.72	-
	Subtotal No 4 Seam	**No 4**	**91.27**	**84.9**	**21.24**	**22.86**
GRAND TOTAL			**98.94**	**84.9**	**21.61**	**22.86**

Note:
1. GHS = Goedehoop South.
2. CV[1] converted by SRK from kcal/kg to MJ/kg (kcal/kg * 0.004187 = MJ/kg).

The differences between the SRK Coal Resource estimates and those of the Company amount to 14.04 Mt (approximately 17%) and are explained by the following:

- No 5 Seam:
  - The Company categorized all No 5 Seam Coal Resources as “Low Potential” (a category not recognised by SAMREC); SRK is of the opinion that some these Coal Resources could be economically extractable and have thus included them in the estimate (7.67 Mt);
- No 4 Seam:
  - SRK has included 37.74 Mt of No 4 Seam “Low Potential”; again, SRK is of the opinion that these could be economically extractable and have thus included them in the estimate;

    Note that both the No 5 Seam tonnage and this tonnage is not included in the 84.90 Mt in the Company’s estimate in Table 6-16.
  - SRK has included 0.36 Mt of Indicated No 4 Seam “Low Potential” to Inferred Coal Resources; SRK is of the opinion that these could be economically extractable and have thus included them in the estimate;
  - SRK excluded 30.42 Mt contained in coal remnants in the northern part of Goedehoop South as SRK is of the opinion that these could not be economically extractable; Note that these Coal Resources are included in the Company’s estimate. According to SANS 10320:2020 Clause 3.18, coal in remnants or pillars may not be included in public reporting until such time as an extraction and coal processing plan has been defined;
  - SRK further excluded 0.65 Mt based on the DAFV quality cut-off of 24%; and
  - SRK downgraded 0.06 Mt of Indicated Coal Resources to the Inferred category.

Comparison of the SRK and Company estimates on a like-for-like basis reveals that the difference between the estimates amounts to only 1.31 Mt; the difference is thus not material. However, it is suggested that there is potential for revisiting the current Company rationale behind the Goedehoop South extraction plan and resultant resource classification. This will enable the additional 14.04 Mt as per SRK’s estimate to be exploited.

7. Rock Engineering

[12.10(h)(vii)] [SR3.1(i), SR4.1(ii), SR4.3(ii), SR5.2(ii)(viii)]

A geotechnical review was carried out on Goedehoop Colliery, including a site visit by SRK's Mr W Joughin on 17 June 2020. The review included all aspects of the geotechnical environment on site from data acquisition, through to geotechnical design and operational controls on design implementation. For the purpose of this review, several data streams and documents were assessed.

7.1. Codes of Practice

The Company has compiled and implemented a Mandatory Code of Practice (**CoP**) to Combat Roof Fall Accidents in Underground Coal Mines for Goedehoop in accordance with the DMRE's Guideline 16/3/2/1-A4. This is a mandatory CoP in terms of sections 9(2) and 9(3) of the MHSA. It was last updated on 03 June 2019 and is next due for review on 03 June 2022. This is in accordance with the requirements of the Company's Operational Management System. In section 7.3 of the CoP, it states that it should be reviewed after every serious incident or if significant changes to procedures, mining layouts, mining methods or equipment and material, which complies with the MHSA and the DMRE Guideline. There are many standards and procedures, which address specific hazards and are linked to the CoP. In general, the CoP complies with the DMRE Guideline.

7.2. Technical Reports

In addition to the CoP, Goedehoop has numerous standards and procedures for managing geotechnical hazards. These are comprehensive and align with best practice in the industry.

Seventy two rock engineering audits reports from February 2020 to April 2020 and Fall of Ground (**FoG**) reports from 2017 to 2019 were provided for the review. These were selectively reviewed for background information.

7.3. The Geotechnical Environment

Goedehoop South is no longer included in the reserve. At Goedehoop North, extensive mining has taken place on the No. 2 Seam and an area in the South East (Brown 2) is included in the reserve. The No. 2 Seam is thick, but a select cut of up to 4.5 m is made, leaving both roof and floor coal. The roof conditions with roof coal are generally good, but if the seam is thin and the roof coal is removed, then weak shale is exposed. Mining is currently taking place on the No 4 Seam and this forms the major part of the reserve. The No. 4 Seam roof typically comprises sandy siltstone, which provides reasonably good roof conditions. The middling between the two seams is generally large enough to prevent significant interaction between the two seams.

Dykes and sill occur across the property and poor ground conditions (burnt coal and jointing) can be expected in close proximity to these structures.

Downward transmission of groundwater through the rock mass is limited by horizontally bedded sediments, which act as aquicludes. However, small quantities of groundwater reach the coal roof through sub vertical geological structures.

Shallow mining (<40 m depth) of the No. 4 Seam is planned in the South East. All planned mining is less than 100 m depth. Guttering is unusual but may occur when adverse stress conditions are encountered. Pillar scaling due to high stress is also rare, but joints can influence ribside stability.

There are several standards and procedures, which deal with the identification and management of geotechnical hazards.

Goedehoop requires the preparation of a Ground Control Hazard Plan (**GCHP**) to identify and demarcate hazardous areas; this provides mine personnel with a pro-active warning of the possible need for additional support, controls or strategies. This is based on geotechnical logging and impact splitting of drill hole core in the immediate roof (2.0 m) and geological mapping (at least once per week in each section). Potentially hazardous roof conditions and geological features are displayed on the GCHP.

Goedehoop has developed a Trigger Action Response Plan (**TARP**) (AAC, 2019k) for personnel to identify geotechnical hazards and to assign responsibilities for actions to deal with the hazards. The Continuous Miner (**CM**) Operator, Bolter Operator and Face boss have primary responsibility for identifying hazards, with oversight by the Shift boss. Green triggers are dealt with by the operators and Orange triggers must be reported to the Face boss and Shift boss for further action. Red hazards must be barricaded off and require the intervention of a Red

Response Team (**RRT**), comprising the Mine Overseer, Section Manager and a member of the rock engineering department. The Section Manager and Mine Manager must ensure that all actions are closed out. The TARP addresses each geotechnical hazard and photographs are used to assist with identification of the hazards. Specific actions are required for each hazard. There is a TARP system standard for production sections and outbye areas. It caters for bord and pillar mining with CMs and development by drill and blast methods in stone.

Roof Monitoring Devices (**RMD**) must be installed in the intersections of all belt roads and travelling roads and whenever hazards, such as geological structures, guttering and excessive water are identified as part of the TARP. The RMDs provide early warning of strata movement. The TARP may also indicate the requirement for feeler gauge inspections to enable the identification of delamination. When excessive water is indicated by the TARP, four metre-long holes must be drilled to allow drainage and to prevent a build-up in pressure along a parting plane, which could trigger a rockfall. In shallow mining areas (<25 m depth), RMDs must be installed and water relieving holes must be drilled in every intersection.

The section visit reports by the rock engineering services and recent compliance statistics indicate that compliance to the TARP system is generally good. In a few cases, the TARP guidelines were not properly observed, requiring an intervention from the rock engineering services. This is managed through the close out for these reports.

7.4. Underground Engineering Design

[SR5.2(vi)]

The CoP stipulates the design parameters for mining dimensions, pillar dimensions, support patterns and guidelines for mining at shallow depth and prevention of subsidence. More detail is then provided in specific standards and procedures to address all these aspects.

In good ground conditions the maximum bord width is 7.2 m, intersection span (diagonal) is 11.5 m and cutting distance is 12 m. These dimensions have been determined from experience and are typical for South African coal mines with good roofs. Under certain conditions, the rock engineer may approve cutting distances of up to 16 m, but this is reviewed every 30 days. Where poor roof conditions are encountered, the bord width must be reduced to 6.5 m. The cutting distance may also be reduced in poor roof conditions and the rock engineer may dictate shorter cutting distances. Where the bord width or intersection span exceeds the maximum dimensions, longer support is required. If the maximum dimension is exceeded by more than two metres, then the area must be barricaded off and the rock engineering department must be consulted. This is also included in the TARP.

The pillar design can be based on either the “Salamon and Munro” (1967) or “Nielen van der Merwe” (2003) formulae. These formulae have been superseded by more recent research but are reasonably conservative. Corrections for different pillar shapes have been implemented. Both factor of safety and probability of failure are used for determining pillar sizes for different depths. Importantly, the routine monitoring and TARP systems, which have been implemented, aid in the identification of pillar damage and deviations from the design.

Some of the older No 2 Seam mining areas have pillar factors of safety less than 1.6. Mining above these areas on No 4 Seam was recently carried out with seismic monitoring to indicate potential pillar failure on the No. 2 Seam. All current and planned No. 4 Seam mining is reportedly above No. 2 Seam areas with factors of safety greater than 1.6 and this seismic monitoring is no longer required.

For good roof conditions, the bolt length is 1.8 m, with four bolts per row and a row spacing of 1.5 m. For hazardous roof conditions, the row spacing is reduced to 1.0 m. Standard support patterns for geological features and guttering, including ribside support are provided. Mesh, Osro straps and nets are used for areal support as required. The bolts are full column grouted resin bolts (20 mm diameter, ultimate tensile strength 552 MPa). Longer bolts (2.2 m long) and cable anchors (4.0 m cable anchors) are also specified. Detailed installed procedures and support specifications are provided, which are appropriate. Additional support is to be installed when triggered by the TARP system.

No shallow mining is currently taking place, but the planned shallow mining in the South East area, should be done in accordance with its comprehensive guidelines for shallow mining, minimising the impact on surface structures and topography. Minimum pillar factors of safety are specified for the protection of surface structures, which are based on subsidence literature.

Rock engineering input is incorporated into long, medium- and short-term planning. Reconciliation of the mining

layout (pillar dimensions, bord widths and intersection widths) is carried out after surveys and any deviations are noted and actioned. Subsidence protection is addressed in all phases of planning.

7.5. Observations During Site Visit

[SR5.2(vi)]

The underground visit took place in Section 1 on No. 4 Seam. In general, the roof and ribside conditions were good and good operational discipline was observed. Additional support was observed where brows and joints occurred. It was evident that mesh had been installed on the roof and ribsides, which was generally neat and effective, but in one area it had been damaged. Instructions were given to fix the mesh during the visit and were captured in the fireman's report. The roofbolters are equipped to install mesh in cycle if required.

7.6. Specific Geotechnical Risks

[12.10(h)(x)]

A rock related fatal injury occurred on Goedehoop in 2018 (AAC, 2018g) and four lost time injuries (**LTI**s) have occurred since 2014. Rockfall reports were provided for several rockfalls, which did not result in an injury. Slabbing of shale from the roof appears to be the most common type of rockfall. These incidents typically occur when geotechnical hazards are not properly identified, and TARP procedures are not followed. This is addressed through training at the scene of the incident and in planning.

Damage to equipment and production delays can occur due to rockfalls. There are suitable procedures for the safe retrieval of trapped CMs.

Surface infrastructure, including major roads, powerlines and buildings, as well as water bodies need to be protected. The procedures address the subsidence risk, and this is managed through input by rock engineering and survey into planning meetings.

7.7. Conclusions

Goedehoop has comprehensive procedures in place for managing rock engineering risks. The roof conditions are generally fairly good. The TARP system is generally effective and hazardous conditions appear to be identified and addressed. There are a few exceptions, but these are addressed through the systems.

The pillar design is reasonably conservative and the surveyed pillars and bord widths are reconciled each month to ensure compliance. Subsidence protection and undermining of surface structures appears to be well managed.

8. Mining

[12.10(h)(ix)] [SR4.3(ii), SR5.2, SR6.1(ii)]

A review of the mining operations was carried out by Mr N McGeorge of SRK, including a site visit on 23 June 2020. Discussions with mine personnel were conducted, data was reviewed, and the underground workings were visited.

8.1. Introduction

[SR5.2(i)(v), SR6.1(ii)]

Goedehoop is an underground colliery using mechanised bord and pillar mining in six sections to exploit the coal. The colliery is an amalgamation of two previously existing collieries: Goedehoop North (previously Bank Colliery) and Goedehoop South (previously Goedehoop Colliery); mining at Goedehoop South ceased in December 2019.

Mining at Goedehoop North mainly exploits the No 4 Seam, with some mining of the No 2 Seam occurring in localised areas.

The Bank No 2 plant produces an export-grade product that is sold through the RBCT. A domestic product is derived from recovering Goedehoop North MRD material and sold under short-term contract to a third party.

8.2. Colliery Organisation

[SR5.2(viii)] [ESG4.1]

Figure 8-1 illustrates the management organogram for Goedehoop. The structure allows for the legal appointments to be made as required by the Minerals Act and for the mine to run the operations on two shifts per day for ten days, with a third shift used for maintenance. The services and Human Resources functions on a 10-day fortnight basis.

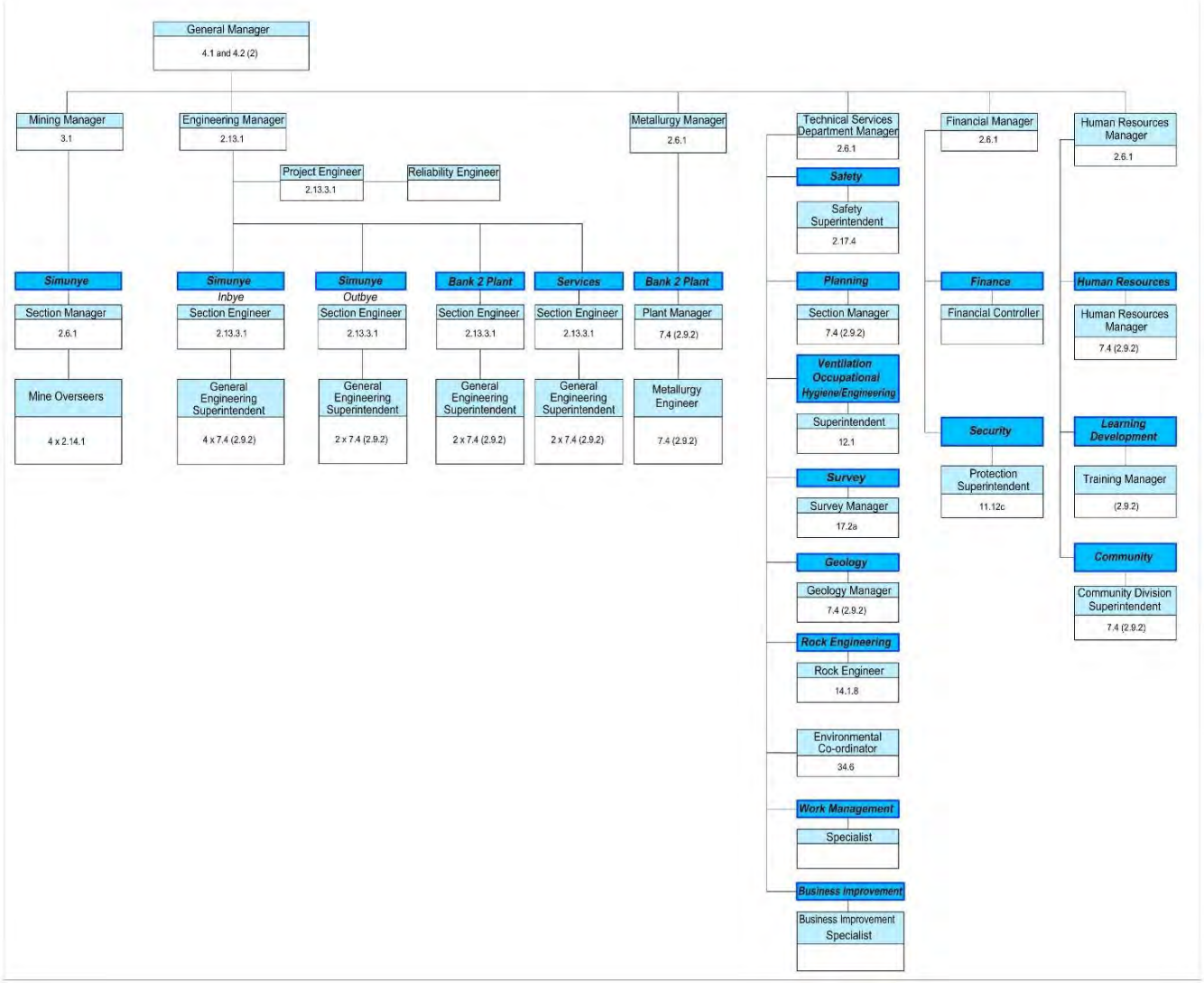
8.3. Mine Design and Scheduling

[SR4.2(iv), SR4.3(ii), SR5.2(i)(ii)(iv)(v)(vi)(viii)(ix)]

The Goedehoop Complex consists of two distinct mining areas namely, Goedehoop North and Goedehoop South. The Goedehoop North operation is an underground mine that extracts coal from the No 4 Seam at Simunye Shaft with access provided by the existing Simunye No 2 Seam decline. Similarly, coal from the No 2 Seam at the Brown 2 area is accessed by a decline from the No 4 Seam operations. The operations at Goedehoop South were completed in December 2019 and no Coal Reserves remain.

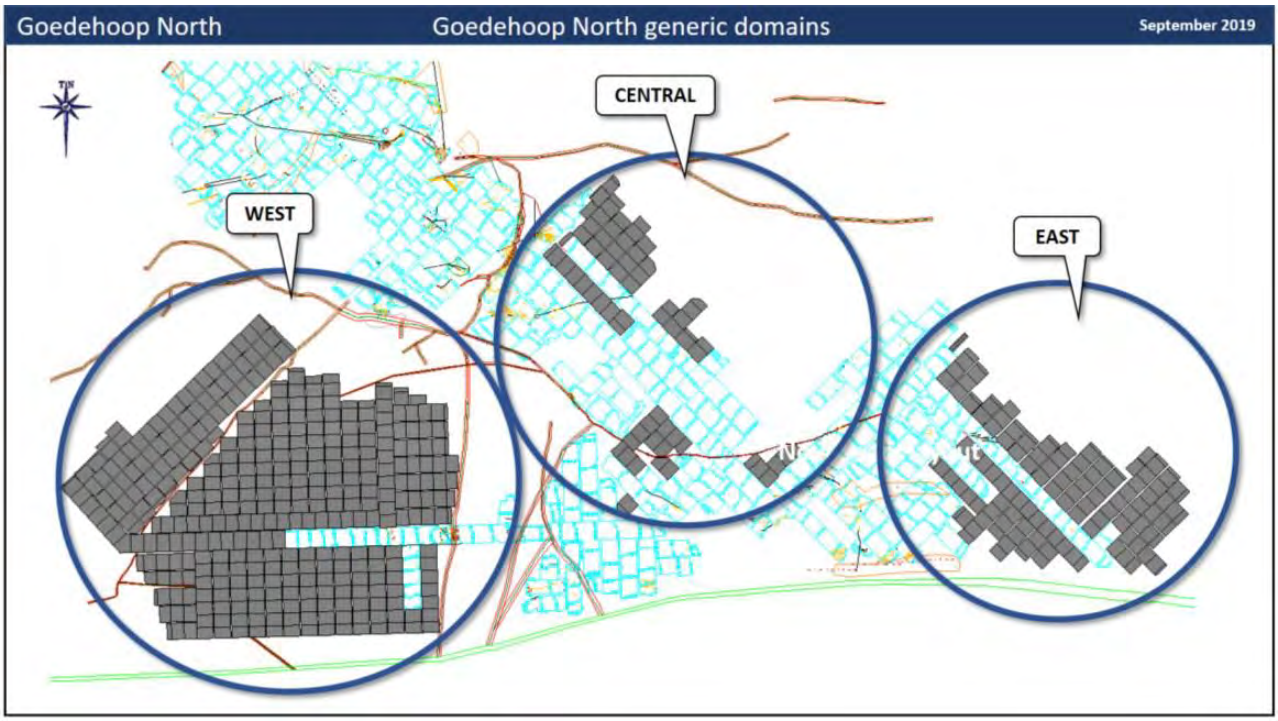
Historically, Goedehoop mined a range of coal seams that targeted the export market and in particular, the low ash export market from the No 2 Seam. When these Coal Resources were depleted, the focus moved to generating an export thermal coal from the remaining Coal Resources in the No 4 and No 2 Seams. The remaining Coal Resources in these seams in the areas north of the Oogies Dyke are the current focus of the mine and are accessed through the Simunye Shaft.

The mined out areas and remaining coal of the No 4 Seam and the No 2 Seam are illustrated in Figure 8-2 and Figure 8-3, respectively. The potential mining area is both north and south of the Ogies Dyke; however, only the remaining coal north of the Dyke are considered here, as the area south of the Dyke has been closed since the end of 2019. The Coal Resources remaining to the north and northwest are constrained by accessibility issues and are not considered in the current Mine Plan. The remaining coal deemed suitable for mining is restricted to the western portion of the property where it is classified internally by the Company in 2019 as “Low Potential”, due to the high frequency of geological features and mined out areas. Note that “Low Potential” is not a recognised SAMREC Code category. These areas have been reclassified as illustrated in figure 8.4 into SAMREC compliant definitions.



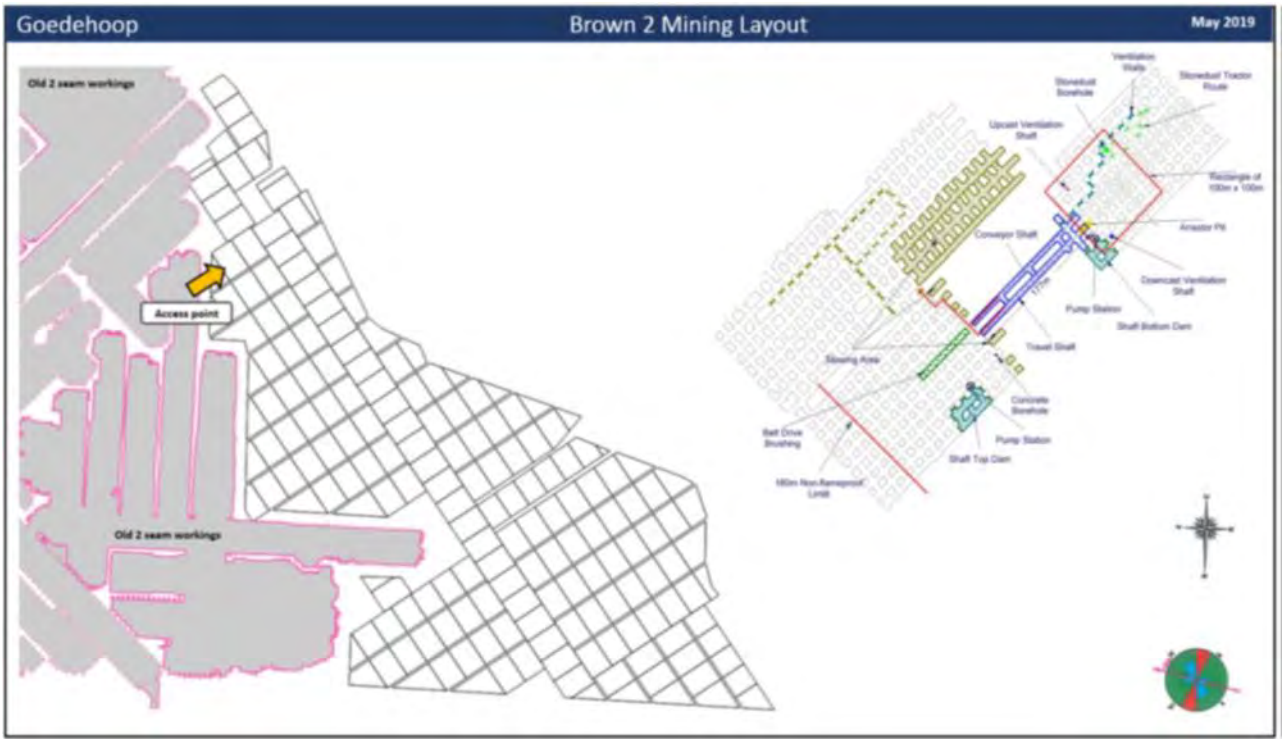
srk consulting	**GOEDEHOOP COLLIERY CPR** Management Organogram	Project No. 566657

Figure 8-1: Management Organogram



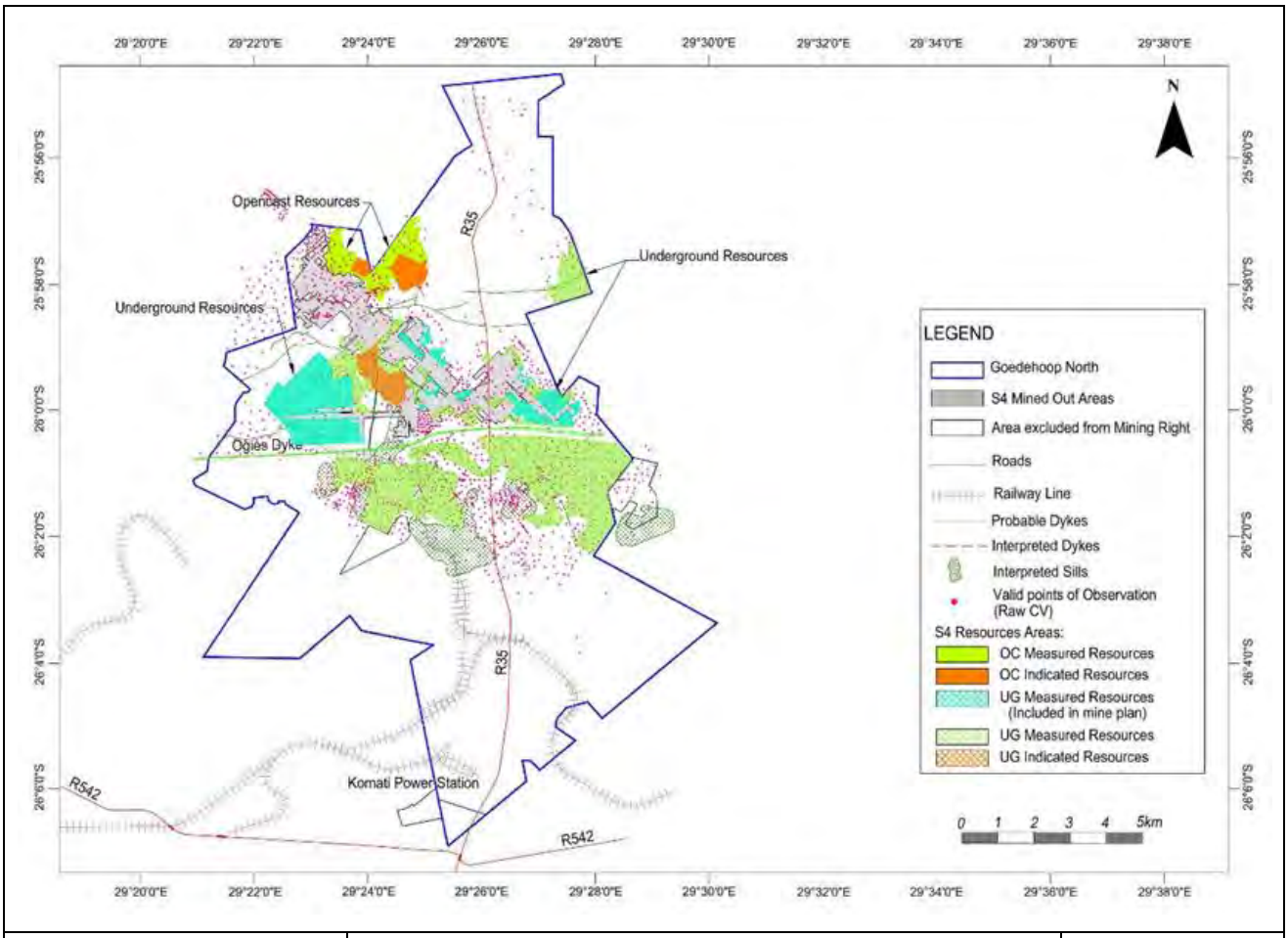
srk consulting	**GOEDEHOOP COLLIERY CPR** Goedehoop North: Potential No 4 Seam Mining Panels *(Source: AOPL Reserve CPR 2019)*	Project No. 566657

Figure 8-2: Goedehoop North: Potential No 4 Seam Mining Panels



srk consulting	**GOEDEHOOP COLLIERY CPR** Goedehoop North: No 2 Seam Mining Panels *(Source: Anglo American Group, 2019g)*	Project No. 566657

Figure 8-3: Goedehoop North: No 2 Seam Mining Panels (Brown 2)



srk consulting	**GOEDEHOOP COLLIERY CPR** Goedehoop North: Potential No 4 Seam Resources	Project No. 566657

Figure 8-4: Goedehoop North: Potential No 4 Seam Resources

The mining horizon for the No 4 Seam is characterised by thinner seams while the No 2 Seam is thicker and of better *in situ* quality. The heat of intrusion associated with dolerite dykes and sills has negatively altered the seam qualities in places. The No 4 Seam is prone to thinning out in areas and this has an impact in terms of the potential mining contamination (Figure 4-5).

The No 4 Seam – excluding the No 4 Upper and No 4 A sub-seams - is split into the No 4 Seam Select horizon (**S4S**) and the No 4 Seam Top (**S4T**) horizon. This is done using the proprietary Gradecon software, which recombines the selected sampled plies from the geological sampling and estimates the select mining height (**S4M**) to maximise the sales yield, depending on the product to be produced. The target product is export grade thermal coal (5 500 kcal/kg and higher). Gradecon also applies the mining equipment constraints to limit the selected mining horizon accordingly. The resultant mining horizon then forms the basis of where mining panels can be laid out and which coal will be scheduled to simulate the LoM plan. It also gives an indication as to what the geotechnical parameters are likely to be in the roof, so as to indicate the potential contamination and the required roof support regime. The discounts for the geological classification and the contamination are also applied in Gradecon to yield the final selected mining horizon. The maximum yield for the No 4 Seam is achieved when producing a 5 700 kcal/kg product; this is within the range of prospective yields and coal prices for the range of products tested. The maximum volumetric yield is achieved with a 5 500 kcal/kg product, but the estimated price regime for this product results in lower revenue. Similarly, the lower yields at the higher quality 6 000 kcal/kg product also lead to lower revenue.

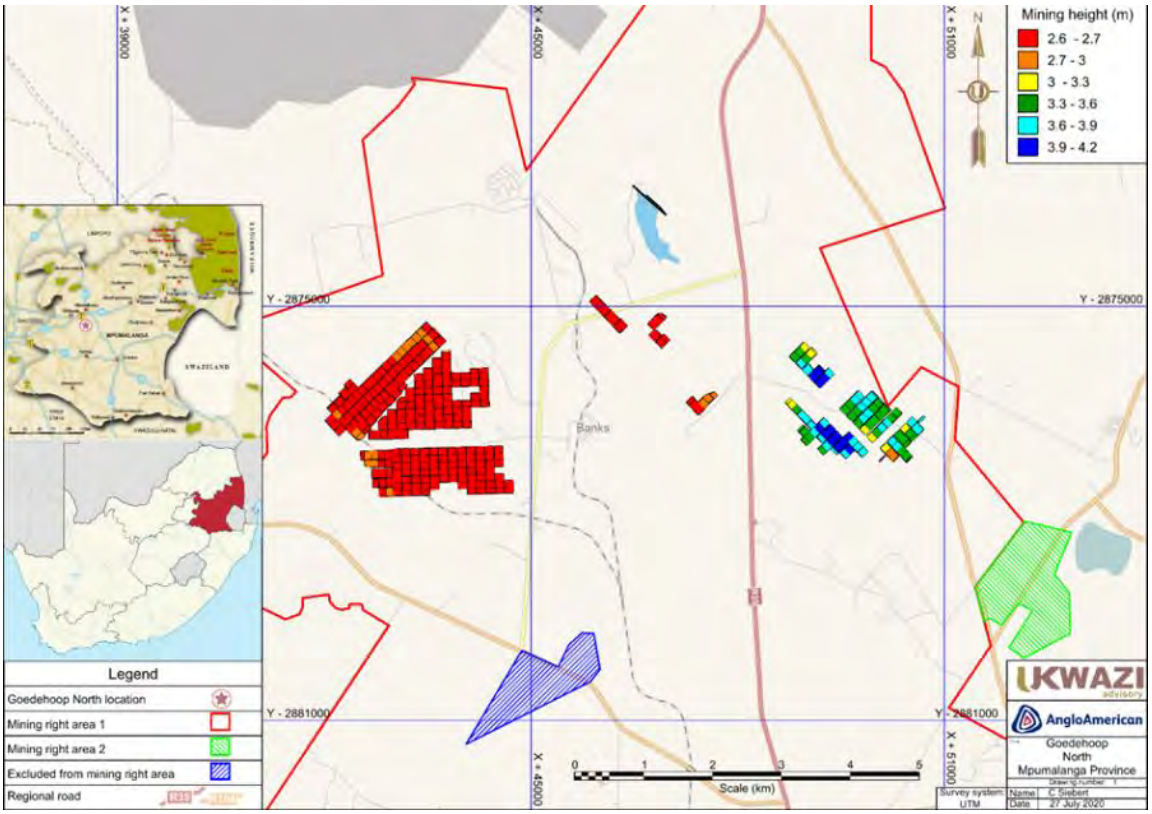
The No 4 Seam thickness is, on average, thinner than the minimum height for the mining fleet of 2.6 m; Gradecon thus includes dilution equal to the difference between the mining height and 2.6 m in the estimation of the mining horizon. This then reduced the overall yield of the saleable product.

The potential panels for the seam are then laid out, also considering the mining height limits and the shallow mining guidelines that are applicable in some areas where the overburden is less than 40 m thick.

Figure 8-4 illustrates the remaining Coal Resources according to SRK for No 4 Seam as of 2020. The mining panels have been laid out over those areas that fit within the minimum mining height constraints and other geological features (dykes, faults) illustrated in Figure 8-5; the reserve areas are separated by these geological features. The minimum mining height is a seam thickness of 2.0 m, leading to a maximum contamination of 0.6 m. The reserve areas are accessed through a primary development and secondary panels to minimise the need to traverse the geological features.

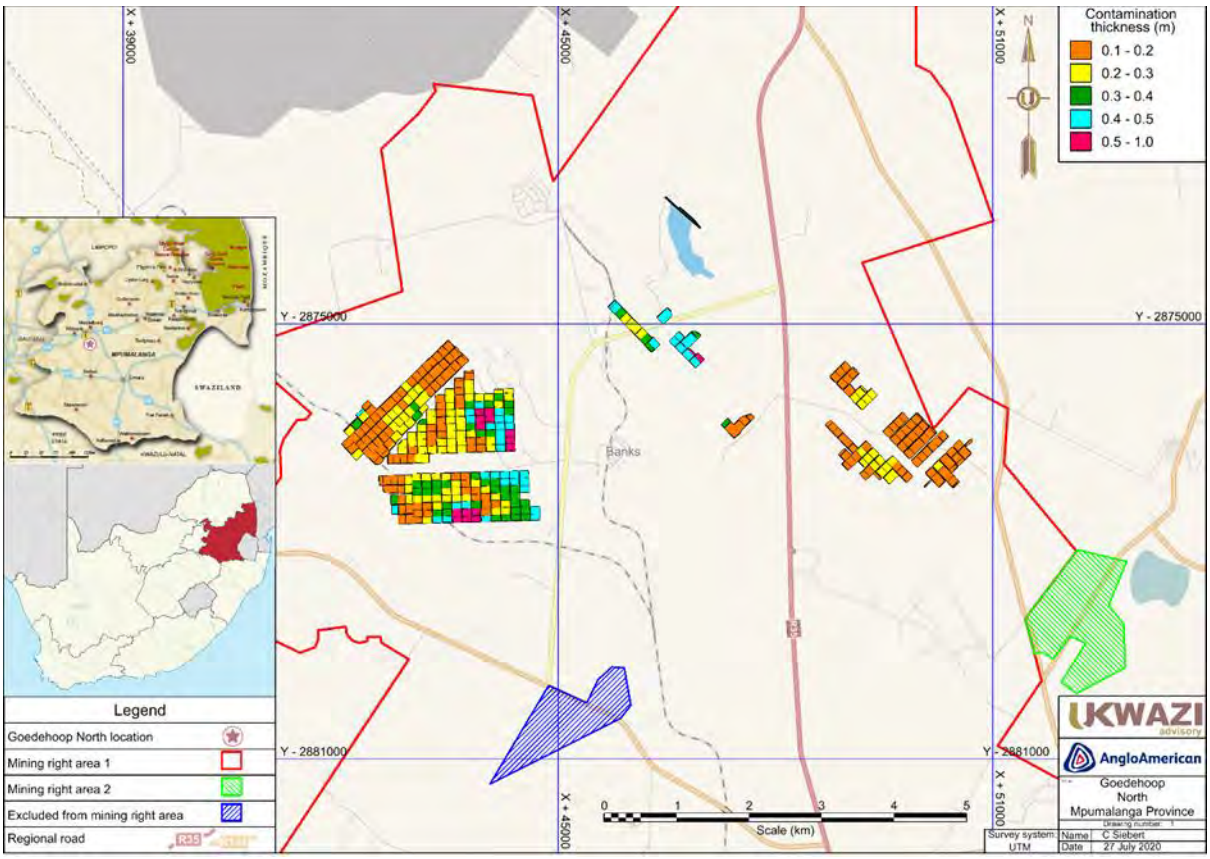
In addition, the overburden thickness is limited to 20 m to avoid subsidence. This is applicable to both the No 4 Seam and No 2 Seams in the eastern portion of the mining area. There are no other surface features governing the mining layout design other than the existing points of the Simunye Shaft and the primary access in the No 4 Seam.

The concern with the current mine design is that the No 4 Seam horizon with the included dilution could lead to the coal being described as uneconomic and thus would not be categorised as Coal Reserves. Further discussion on this topic can be found in Section 9. Figure 8-5 illustrates the thickness of the No 4 Seam mining horizon, as defined by the mine design constraints While Figure 8-6 illustrates the contamination thickness defined in the mining horizon.



srk consulting | **GOEDEHOOP COLLIERY CPR** Goedehoop North: No 4 Seam Mining Thickness *(Source: Ukwazi, 2020)* | Project No. 566657

Figure 8-5: Goedehoop North: No 4 Seam Mining Thickness (m)



srk consulting	**GOEDEHOOP COLLIERY CPR** Goedehoop North: No 4 Seam Mining Contamination Thickness (m) *(Source: Ukwazi, 2020)*	Project No. 566657

Figure 8-6: Goedehoop North: No 4 Seam Mining Contamination Thickness (m)

An access decline from the No 4 Seam workings to the No 2 Seam has been developed and will be equipped with a conveyor for clearance of the No 2 Seam coal via the No 4 Seam level. A separate ventilation circuit will be established for this reserve block. The No 2 Seam is thicker than the No 4 Seam and a more appropriate seam selection is possible with significantly less contamination. The reserve block is adjacent to old No 2 Seam workings in the west and is subject to shallow mining guidelines as it approaches the eastern boundary. Figure 8-3 illustrates the available mining layout.

Mechanised bord and pillar mining utilising CMs and shuttle cars is practised at Goedehoop. In bord and pillar mining, parallel roads are developed in the general mining direction. Perpendicular roads, called splits, are developed at predetermined intervals to the parallel roads. These roads interlink, creating pillars. The roads that are mined concurrently are determined by the size of the pillars required to support the overburden above the coal seam and the length of the production equipment's trailing cables. The pillar size is determined by the safety factor formula that results in the pillar strength divided by the pillar load.

The CM cuts coal from the mining face and loads it onto a shuttle car that hauls the coal to the feeder-breaker. From the feeder breaker, coal is transported by a conveyor belt system to the Run-of-Mine (**RoM)** coal stockpile located on surface.

Six production sections are currently planned at Goedehoop North, each typically consisting of a crew of 12 people, a CM, three shuttle cars and a roof bolter.

8.3.1. Underground Mining Limits

[SR6.1(iii)]

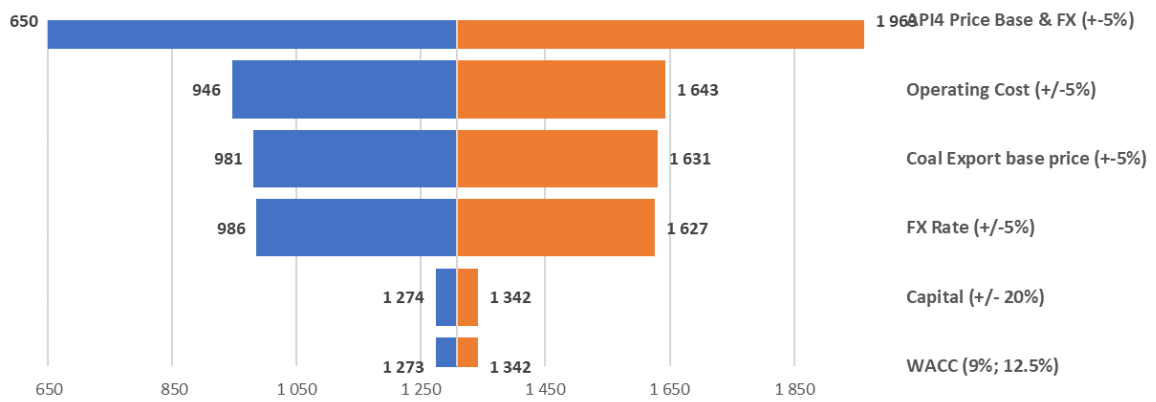
A margin ranking process was completed to estimate the value of the individual mining blocks and guide the LoM scheduling process. The mining blocks were evaluated and included in the mine design if a positive margin could be obtained. The margin ranking process included the following parameters, respectively:

- Mining height based on a minimum mining height of 2.6 m, dilution modelled between 2.0 and 2.6m;
- Block ranking conditions;
- All costs to mine the block;
- Possible product yields and qualities; and
- All revenue inputs.

The ranking was shown to be marginal in the No 4 Seam and is not a good guide for the potential economic gain and for determining which blocks should be included. Hence, for a first pass all the blocks have been included in the plan and the final valuation and the sensitivity charts will be a guide as to the potential for economic recovery of the Coal Reserves.

The 2019 financial reports illustrate the margin ranking to be very sensitive to the yields, coal price and exchange rate and the estimation of a cash margin will be difficult to use as a driver of the mining plan footprint. Hence, a decision has been taken to allow the footprint to include possible narrow margin blocks and demonstrate their suitability for inclusion in the plan through sensitivity analysis of the final mine valuation. This will then allow the reader to understand the planning and Coal Reserves against the financial valuation. In the reserve definition blocks, the primary developments are mostly complete; the exclusion of any panels on a cost basis can be done if necessary, and a move to potential positive margin coal is possible, particularly in the No 4 Seam where the margins are likely to be lower. The No 2 Seam area, being thicker with less contamination, is not as prone to economic restrictions.

From the financial valuation, the tornado plot of the parameters that drive the valuation (Figure 8-7) illustrates that the mining area as planned has the potential to be economically positive in value for the declaration of Coal Reserves.



srk consulting	GOEDEHOOP COLLIERY CPR Tornado Plot from Goedehoop cash flow model	Project No. 566657

Figure 8-7: Goedehoop Colliery Tornado Plot of Financial Valuation

8.3.2. Underground Panel Design Parameters

[SR6.1(iii)]

Geotechnical Parameters/Panel Design

From the main developments, the mining panels are laid out in consideration of the geotechnical and geological conditions. The ultimate extent of mining is determined with reference to the margin ranking results, which in this case have been extended to the point of the physical constraints, particularly in the No 4 Seam. Only portions that constitute positive margins should be included in the mining areas but in this case, this has been modified due to the sensitivity of the Mine Plan to the valuation parameters. There are exceptions where isolated blocks of no value occur within zones of positive margins. These blocks are included in the mining layout and ultimately, are scheduled in the mining sequence to enable access to positive margin areas. As the mine is limited in life and has been the result of a sequence of mothballing of some areas, the margin analysis of individual panels can be misleading. The first assumption is thus that the mining blocks will have a positive margin, which will be confirmed by the valuation results. This is based upon the current experience of the existing mining plan that has demonstrated that the valuation is very sensitive to the input coal prices and exchange rates; given the volatility of these parameters, the mining footprint is planned to the geological constraints of the mining thickness. The following general criteria were used to design the layouts:

- Primary developments: 9 - 10 roads per panel;
- Secondary developments: 9 - 10 roads per panel;
- 15 to 16 m centres for square bord and pillar sections– depending on safety factors and width-to-height ratios, a minimum 16 m centre is used. This suits the advance of the CM in terms of cutting depth without support and minimises the amount of tramming required in the section. At this minimum of 16 m, the extraction ratio is 70% but when the safety factor (**SF**) is estimated, it exceeds the 1.6 SF design criteria. Smaller pillars have been used elsewhere in the coalfield, which has led to subsidence in many of the shallow workings;
- Deeper areas are designed to maintain the required 1.6 SF, and thus have bigger centres and reduced roadways per panel; and
- Road widths of 7.2 m.

With the relatively small pillar sizes, panels can be nine to 10 roads wide, as CM and shuttle car cables are 200 m in length and will reach up until a three-pillar belt extension is required. Generally, two- pillar belt extensions are used and planned for. For main developments with smaller pillar centres, 10-road panels are considered. This allows more flexibility when a trunk belt needs to be installed while the section is mining on the current section belt; it also provides more space for the initial drive and belt installation of the secondary side panels.

In-panel pillars constitute primary support for the mining panels and these pillars are designed to comply with the following parameters:

- Primary developments: pillars with SF of more than 2.0;
- Secondary developments: pillars with SF more than 1.6;
- Production panels: pillars with SF more than 1.6;
- Minimum width-to-height ratio of 2.0 for depths below surface greater than 40 m (less than 40 m is considered shallow mining);
- Minimum width to height ratio of 2.2 for depth below surface less than 40 m; and
- Barrier pillars between panels to be the same width or wider than the largest dimension of the in-panel pillar.

Where the overburden thickness of the panel is less than 40 m, the following guidelines must be adhered to:

- Minimum width-to-height ratio of 2.2;

- Minimum safety factor of 2.1;
- Minimum pillar width of 6.5 m; and
- Percentage extraction less than 75%.

The panels are also limited to 16 m centres irrespective of the safety factor so that the minimum pillar size is 8.8 m. This is a maximum extraction of 70%.

As noted, there are some surface features that are to be protected namely; provincial roads, as well as some wetland areas in the east; however, these do not constrain the mining layout. No panels are laid out where the overburden depth is less than 20 m as the subsidence risk is not manageable and there is some likely weathering of the coal seam. The amount of coal that is below the 20 m depth cut off is negligible.

The interburden thickness between the No 4 Seam workings and the No 2 Seam shows a thickness of over 16 m. There is thus no need to superimpose the mining layouts over the existing mined out areas. On average the panels in the No 4 Seam are at the limits of the maximum extraction and cannot be further optimised; the No 2 Seam panels are in a similar position due to the pillar size limits under the shallow overburden conditions. The panels could include the extraction of the No 1 Seam with the No 2 Seam, if there is a limited height of the combined entity and the parting between the seams is thin so as to minimise contamination. The extended height can then be managed in the design by two-pass mining in the panel. However, these conditions do not exist in the Brown 2 area.

8.3.3. Mining Blocks

The mining blocks were designed to an average dimension of 100 m by 127 m based on the three major orientations:

- Westwards in the No 4 Seam; and
- Southeast in the No 2 Seam.

The following technical process was followed to aggregate coal and waste tonnes and qualities into the mine design blocks for modification and scheduling:

- Generate mining blocks through the ProgeCAD package within the RPMGlobal suite of software;
- Aggregate mining blocks by the geological services team within Minescape;
- The mining blocks were populated in Gradecon and parameters applied using PRODINT, a custom command prompt script; and
- The block attributes and mining block polygons were loaded into the mine planning and scheduling solution Xpac by RPMGlobal.

The important aspect in this process is to ensure that the contamination simulation in the No 4 Seam is correct with respect to the mining thickness and that the subsequent sales yields and raw qualities are adjusted accordingly to ensure the correct volumes to ultimately be mined, the time taken in cutting the additional material as well as the costs and the final yield/product estimation and its effects on the revenue.

The discounts applied during the Gradecon process are listed in Table 8-1:

- **Geological loss** (losses due to unknown geological complexities): 10%;
- **Mining Modifying Factors** (conversion of MTIS on an air-dried basis (**$MTIS_{adb}$**) to air-dried contaminated (**adc**)):
    - *Mining loss*: 2.5% mining losses have been applied to $MTIS_{adb}$ to derive RoM on an air-dried basis (**RoM_{adb}**);

- *Mining extraction*: The extraction percentage is part of the layout design and is calculated based on the safety factor of an area. The factors calculated and applied for the various areas are included in the in-panel design discussion in the LoM plan. In this case a number of 71.2% is applied based on the panel designs which all apply to the 16m centre design; and
- *Contamination*: contamination at 100% ash has been applied on $MTIS_{adb}$ to derive RoM on an adc basis (**RoM_{adc}**). Different levels of contamination have been applied to different areas within the Mine Plan: In the No 4 Seam this is as described to a minimum mining height of 2.6 m of high ash material and approximately 10 cm of roof contamination in the No 2 Seam panels. This is in addition to the 10 cm applied in the floor, giving all seams a minimum of 20 cm contamination.

Table 8-1: Discounts applied in Gradecon

Discount Factor	Unit	Value
Geological loss	(%)	10
Mining loss	(%)	3.0
Mining extraction	(%)	71.2
Contamination:		
No 4 Seam		As cut to minimum 2.6 m after 20 cm roof and floor contamination
No 2 Seam	(cm)	10 cm both roof and floor

8.4. Mining Fleet and Machinery

[SR5.2(viii)]

The underground mining fleet is based on five CM sections and supported with shuttle cars to clear the coal from the CM to the conveyor belt, which is equipped with a feeder breaker. The roof support is done with Fletcher roofbolters and the auxiliary equipment of front-end loaders, personnel carriers, stonedust machines, etc. is sufficient to ensure minimal delays in cutting time. Some of the sections will be designed as super sections i.e. multiple CM's to improve productivity.

The primary underground equipment deployed at Goedehoop is listed in Table 8-2.

Table 8-2: Mining Equipment

Type	Use	Number
Joy 12HM31 AAA	Continuous Miner	4
Joy 12HM31 B 3.3 MK2	Continuous Miner	1
Buffalo B500 CRW	Feeder Breaker	3
Buffalo M500	Feeder Breaker	2
HDDR 17 - 5.5	Roof Bolter	5
HDDR 17 – 5.5	Roof Bolter	2
Joy 10SC22 56B 14 ton	Shuttle Car	4
Joy 10SC32 C20 ton	Shuttle Car	9
Spare Machines		
Joy 12HM31 AAA	Continuous Miner	2
Joy 12HM31 B 3.3 MK2	Continuous Miner	2
Joy 12HM31 B	Continuous Miner	1
DBT CAT CM	Continuous Miner	2
Shuttle Car 10SC32	Shuttle Car	12
Fletcher Roof bolter		10

Most of the spare equipment exists as a result of the closing of the Goedehoop South area. Some of the equipment has been allocated to other Company underground operations and only sufficient for the existing sections remain.

8.5. Ventilation and Cooling

The focus of this section of the CPR was to evaluate the effectiveness of risk control measures with emphasis on workplace ventilation design. These are aimed at minimizing all occupational hygiene exposures to below occupational exposure limits (**OEL**s) as contemplated in all mandatory Codes of Practice and Regulation 9.2 of the MHSA.

The following methodology was applied:

- Ventilation designs to provide ventilation and cooling for the long-term business plan;
- Mine production plan aligned with ventilation and cooling supply;
- Emergency preparedness/second outlets;
- Flammable gas management;
- Prevention of mine fires;
- Critical spares; and
- Capital requirements.

The colliery can be classified as a shallow depth coal mine (<200 m below surface), where the design indicates ventilation with no cooling will be required for production.

8.5.1. Determining Ventilation Quantities

The overall airflow quantities should be assessed in terms of airflow provision for diesel emission dilution, provision of sufficient ventilation to maintain air speeds above 1.0 m/s in the last through roads, clearance of blasting fumes (if applicable) and provision of a ventilation rate per 1 000 t mined per month, whichever the greatest.

Current Ventilation System

The total air quantity requirement was dominated by the air quantity required to provide air speeds in all last through roads >1.0 m/s. At peak production (500 ktpm), a total quantity of 450 m^3/s including allowance for other commitments (workshops etc.) and leakage is available for the mine. Allowance was made for 20% overall system leakage.

Life of Mine Plans

The ventilation and cooling designs are outlined in Table 8-3.

SRK Comments

Although the mine only utilizes 52% of the available ventilation quantity, current air speeds in through roads at all the mining sections were above the minimum requirement of 1.0 m/s. However, in order to mitigate the risk of an accumulation of flammable gas and possible production delays, sufficient ventilation has to be supplied to the last through roads to maintain air speeds above 1.0 m/s. The timeous sealing of mined out areas is an essential requirement.

The high-risk gases (methane and carbon monoxide) were within the OELs.

The Life of Mine plans show the workings can be adequately ventilated, provided the new Brown 2 ventilation shafts are established as soon as possible (by end 2020) and the priority areas are sealed.

8.5.2. Flammable Gas and Coal Dust Explosion Management

Flammable gas (methane, CH_4) and coal dust explosions are one of the principle hazards in underground coal mines.

The controls include the following:

- Provision of sufficient ventilation to maintain air speeds in the last through roads above the critical minimum velocity of 1.0 m/s;
- A comprehensive Mandatory Flammable Gas and Coal Dust Explosion Code of Practice;
- A primary control against the coal dust explosion hazard by the application of stone dust (limestone) throughout the mine;
- Continuous electronic monitoring devices are installed throughout the mine and in in all through roads. The following is monitored:
    - Air speed;
    - Methane; and
    - Smoke/carbon monoxide (CO)

Table 8-3: Goedehoop Ventilation Designs for the Current and LoM Projects

Category	Current Status	LoM (2020 to 2025)	LoM (2020 to 2025)
Ventilation			
Tonnage (Target)	400 ktpm	400 ktpm	
Mining method	Bord & pillar (continuous miner)	Bord & pillar (continuous miner)	Bord & pillar (continuous miner)
Mining depth	< 200 m	< 200 m	< 200 m
Rock temperature	< 25.0 °C	< 25.0 °C	< 25.0 °C
Design air speeds in last through roads	> 1.0 m/s	> 1.5 m/s	> 1.5 m/s
Ventilation quantity provided by main fans	450 m³/s	380m³/s	150 m³/s
Leakage allowance	20% (80% utilization)	20% (80% utilization)	20% (80% utilization)
Actual leakage	48% (52% utilization)	NA	NA
Average air speeds in last through roads	1.60 m/s	NA	NA
Cooling			
Total cooling required	Not required	Not required	Not required
Infrastructure	**Simunye 4 Seam**	**Simunye 4 Seam**	**Brown 2 Seam**
Intake airways			
Decline	8.8 m x 3.3 m	8.8 m x 3.3 m	8.8 m x 3.3 m
R/B Shaft	5.0 m Ø	5.0 m Ø	3.5 m Ø
Rescue R/B hole	0.63 m Ø	0.63 m Ø	
Return airways			
R/B Shaft	7.44 m Ø	7.44 m Ø	3.5 m Ø
Main fans			
	2 of 3 fans: 450.0 m³/s	2 of 3 fans: 380 m³/s	2 of 3 fans:150 m³/s
Critical spares			
Main fans	One spare main fan	One spare main fan	One spare main fan
LoM Capital Requirements			
			2 x 3.5 m Ø Raise boreholes and main fans. Estimated cost: R8.0 million

Fire Prevention

Underground mine fires are also one of the main hazards in underground mines.

The controls include a comprehensive Mandatory Fire Prevention COP. In addition to the code of practice, the mine complies with the detailed Company fire prevention procedures.

Emergency Preparedness and Response

The procedures comply with a comprehensive Mandatory Emergency Preparedness and Response COP. The mine is well placed to handle emergencies.

Ventilation Risks

The ventilation leakage within the workings of the mine can result in reduced air speeds in the last through roads with resultant accumulations of flammable gas and production delays.

Priority areas have been identified by the mine for sealing to reduce the leakage.

8.6. Manpower Requirements

[SR1.1(ii)] [SR5.2(viii)]

The mine operates on a continuous operations basis as the equipment and the service departments work on a 10-day fortnight. The mine is structured under a General Manager into a mining division, the engineering divisions and a services division. The mining function is subdivided into waste and coal mining and the engineering split into electrical, mechanical and diesel engineering functions.

The total number of employees is approximately 1 770, of which 830 are direct employees and the balance of 940 are contractors. This has been on a declining trend as Goedehoop South has been closed. As of December 2019, the total complement was around 2 200 people while in December 2018 the total was approximately 2 230 people. The mine is owner-operated, with the appointment of contractors in specialised areas and for the service functions that are not the core business of the mine, such as security, etc.

The total mine labour requirement excluding the contractors is 368 people. The contractors consist of approximately another 500 people, performing services such as security, cleaning, dyke mining, explosives supply, tyre management, etc. This number is typical for the size of the mine.

8.6.1. Legal Appointments

The mine is operated as a fiery mine under the MPRDA and has appointments in place for all the required areas in mining, engineering and in the services and safety departments. The contractors on the mine are appointed as subordinate managers to the main appointments and there is good control of the fulfilment of the necessary positions. The legal appointments are to satisfy the MPRDA, as well as the MHSA and the Explosives Act (Act No 15 of 2003).

8.6.2. Recruitment and Training

The mine executes training for the staff where required in the operational processes and is part of a central training service for all the mines in the portfolio. The mine also has people as part of the learnership process whereby the engineering and mining skills are provided through the industry based institutions. The mine also provides other training as part of the social requirement which is detailed in the social and labour plan.

8.7. Blast Monitoring

The mining process does not require blasting, except in the stonework and development sections. The mine uses permitted explosives underground where required and is a minor part of the mining process. As the blasting is limited in scope there is no need to monitor the blasting process. At present there are no open pit operations on Goedehoop North so there is no requirement for opencast blasting.

8.8. Mining Costs

[SR4.3(vii), SR5.2(ii), SR5.6(iii)(ix)]

The mining cost model has been simulated in a series of process tasks that match the overall mining process of waste removal by draglines, shovels, followed by coal lining and loading and the pit services functions. Each of these has been split into a mining function and an engineering function and the respective costs in terms of labour, stores, diesel, explosives and contracts, etc, allocated in a ratio of fixed and variable costs. The fixed management and service function departments are simulated in a similar manner and incorporated into the model. This cost function has then been applied to the mine scheduled volumes over time to generate the overall mining costs. The validation of this cost model was a reconciliation against the 2019 actual costs which have been escalated to the current effective date. The forecasted costs for the 2021 year are shown in Table 8-4. The unit cost over the estimated LoM is shown in Figure 8-8:

Table 8-4: Forecast Costs for 2021

Description	Unit	2021
RoM Tonnes	(t)	4 646 915
Sales Tonnes - Exports	(t)	2 529 871
Sales Tonnes – Goedehoop North MRD	(t)	3 000 000
Labour	(ZAR)	599 956 438
Stores (mining, plant, diesel)	(ZAR)	156 176 551
Working Cost Suspense (maintenance)	(ZAR)	150 770 147
Sundry Debits	(ZAR)	609 102 823
Total Cash Cost (excluding Selling Costs) FOR	**(ZAR)**	**1 516 005 959**
Selected Illustrative Elements in Sundry Debits:		
Power and Water	(ZAR)	122 083 931
Hired Services	(ZAR)	214 724 674
Mine Services and Medical	(ZAR)	91 094 475
Mine Administration Overheads	(ZAR)	14 678 353
Selling Expenses - Rail	(ZAR)	458 960 483
Selling Expenses - Port	(ZAR)	83 716 026
Total Selling Expenses (ZAR213/Sales tonne) FOR	**(ZAR)**	**542 676 509**
Total Cash Cost FOB	**(ZAR)**	**2 058 682 468**

The historical costs are in actual terms and the costs from 2020 are based at the Effective Date. The historical costs are for both sections of the mine and include the tonnage from Goedehoop South. The current mine cost model has scaled down the labour complement to accommodate the Goedehoop North area only; in addition, the surface infrastructure footprint has been likewise reduced and the plant and offices at Goedehoop South have been mothballed.

The total cash cost for operation in 2019 excluding selling expenses was around ZAR 1 671m. A cost model has been constructed that is based on the principal contracts and existing labour complements and is used for the valuation. Table 8-4 is an example from the 2021 year, which is a full year of operation.

This cost profile is also reduced further in the later years due to the reduction in exploration costs and associated laboratory costs, etc. The Company fees are included in the model under sundry debits. The power cost has been escalated appropriately as there is expected to be above inflation cost escalations.

This cost profile is also reduced further in the later years due to the reduction in exploration costs and associated laboratory costs, etc. The Company fees are included in the model under sundry debits. The power cost has been escalated appropriately. The mine plan has been adjusted by 5% volume in the 2021 year to account for disruption caused by COVID-19. This lost volume is recovered in 2025.

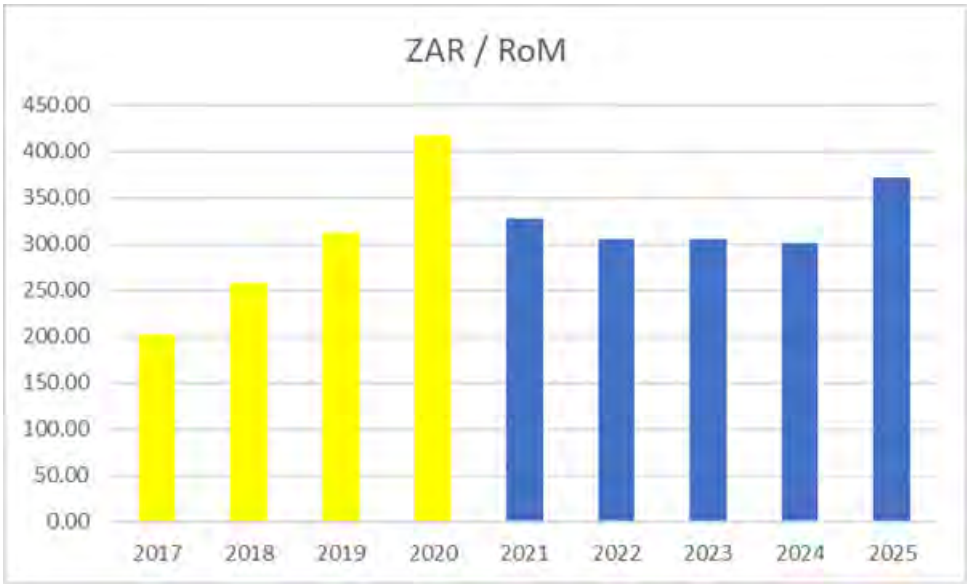


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Figure 8-8: Unit Cost Over the Estimated LoM

8.9. Life of Mine Plan

[SR5.1(i) SR5.2(i)(ii)]

The LoM production profile was developed considering the key design capacity constraints of mine-related infrastructure. The key production drivers included:

- Product profile;
- Processing capacities;
- Pit room constraints; and
- Geological aspects.

Historically, Goedehoop produced high quality products for the local and export markets, including a low ash product sourced from the No 2 Seam. Currently, Goedehoop produces lower quality products due to the depletion of the higher coal quality mining blocks.

The Goedehoop North plant has a capacity constraint of approximately 4.6 Mtpa based upon the two-shift operation. The mine RoM capacity was considered in the LoM production planning process as well as the pit room constraints that dictate the maximum number of CM sections that can be accommodated in each mining area. The net result is the deployment of six mining sections which decline to five sections with the introduction of super-sections to make up for the lower tonnage.

Geological factors such as geological features, complexity and seam thickness also impact on the scheduling process, with the application of appropriate discount factors to reflect the actual production performance for each mining area.

8.9.1. Mining Sections

The underground sections at the Goedehoop Complex comprise of six CM production sections, namely:

- Ngwenya;
- Mangwapa;

- Imvubu;
- Ubhejane;
- Isikhonyane; and
- Sizimisele.

The mining blocks and primary access is shown in Figure 8-3 and Figure 8-5 and the deployment is that all sections are currently used in the No 4 Seam reserve blocks; however, as soon as the Brown No 2 Seam development is complete, two sections will be deployed into the Brown 2 area. The overall number of sections is then reduced by one, due to the space constraints; the remaining sections are created as super-sections where possible.

8.9.2. Block Ranking

Block ranking pertains to the systematic ranking of each mining block as defined by the layout, based on the inherent physical ground conditions, as well as mining and long-delay activities planned for the area. For each condition or each mining block activity, a discount factor was applied relative to the benchmark mining rate, and the physical location thereof. The physical conditions were characterised from geological features such as dykes, slips, faults, sill transgressions, fissures and other geological anomalies.

The benchmark production rates utilised before the application of discount factors are shown in Table 8-5.

Table 8-5: Benchmark Production Rates

Mining eight (m)	Benchmark Production Rate (tphr)
2.0	204
2.5	296
3.0	333
3.5	355
4.0	370
4.5	370

The benchmark production rates were adjusted by the Condition Based Factor (**CBF**) to provide a benchmark production rate representative of the mining height and specific physical mining conditions. The CBF applied in the block ranking was based on the product of twelve pre-defined ground conditions, as outlined in Table 8-6.

Table 8-6: Condition Based Factor based on Block Ranking Ground Conditions

Number	Conditions	Condition Based Factor
1	Floor undulations (0 to 2 degrees)	1.0
2	Floor undulations (2 to 4 degrees)	0.9
3	Floor undulations (4 to 6 degrees)	0.6
4	Floor undulations (+6 degrees)	0.3
5	Dykes	0.9
6	Sills	1.0
7	Moves	1.0
8	Overmining lower safety factor area	0.8
9	Parting < 150 mm	1.0
10	Parting 150 to 250 mm	0.5
11	Parting > 250 mm	0.5
12	In-seam parting (to be determined)	Not applicable
CBF = Result (1x2x3x4x5x6x7x8x9x10x11x12)		

The CBF result was used to define a number of four distinct ground conditions for mining operations, namely A-rated ground (**A-ground**), B-rated ground (**B-ground**), C-rated ground (**C-ground**) and D-rated ground (**D-ground**). These ground conditions were used to determine the equipment availability (**EQA**) and the use of equipment availability (**UEA**).

The CBFs were aggregated, depending on the features or activities occurring in an area, and the overall factor applied to the benchmark rate. The ranking of an area was then allocated on the range level of the overall factor, with ranking ranging from A to D. The ranking is depicted in Table 8-7.

Table 8-7: Block Ranking of an Area

Range Level	Meaning	Ranking
1	100% of benchmark rate	A
Less than 1 but greater than 0.9	Less than 100% and greater than 90% of benchmark rate	B
Less than 0.9 but greater than 0.68	Less than 90% and greater than 68% of benchmark rate	C
Less than 0.68 but greater than 0	Less than 68% and greater than 0% of benchmark rate	D

8.9.3. Equipment Performance

The resultant rates per area were applied to the direct operating hours (**DOH**) in the production schedule. The DOH were determined with the application of appropriate benchmark EQA and UEA data. A curve was developed, based on the **CBF**, to refine the adjustment of the benchmark availabilities according to ground conditions. The benchmark EQA and UEA are shown in Figure 8-9 and Figure 8-10, respectively.

The DOH utilised is shown in Figure 8-11. The input availabilities were not adjusted for ground conditions and the results indicated that the scheduled DOH did not exceed the benchmark DOH.

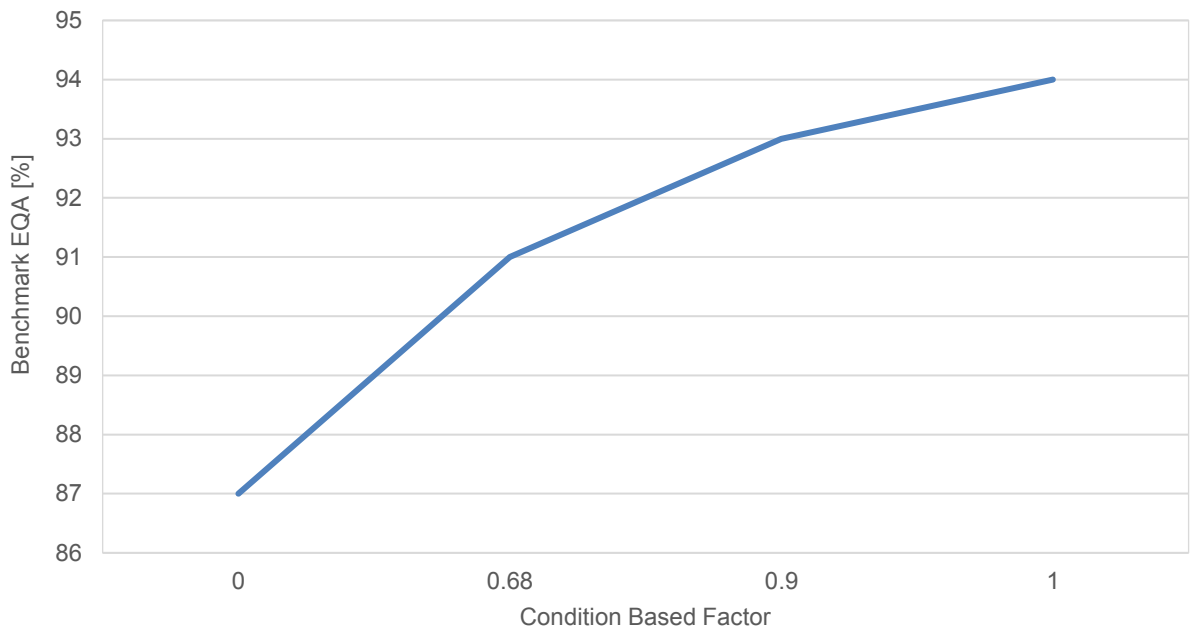

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Figure 8-9: Benchmark EQA

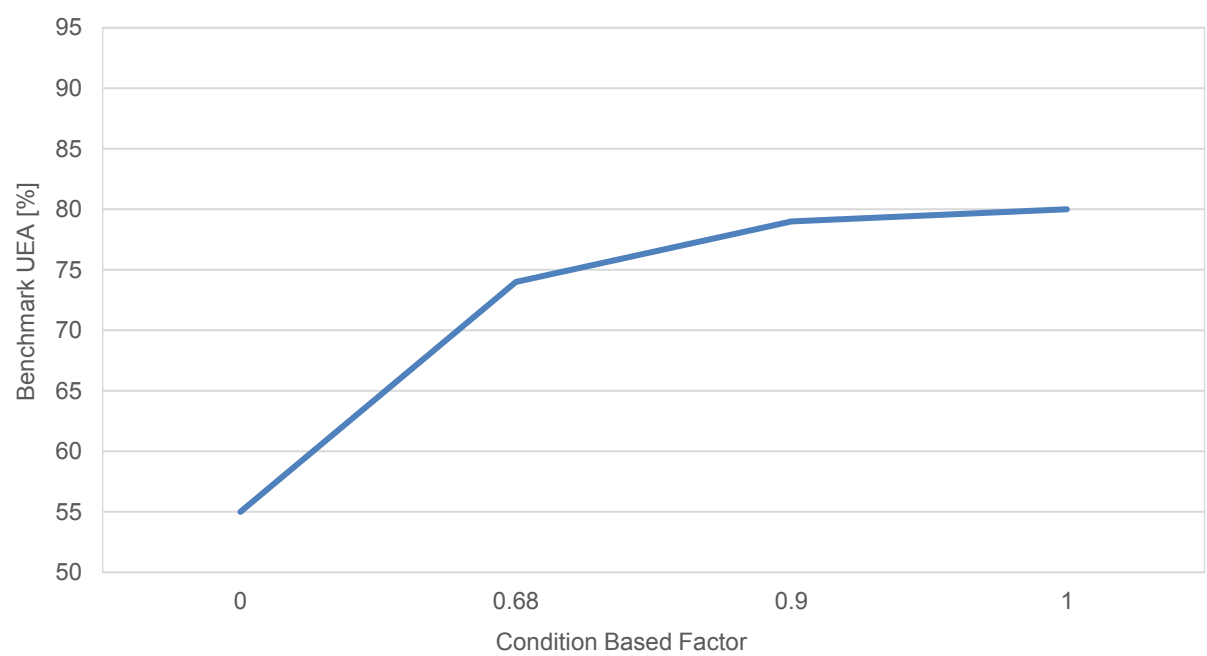

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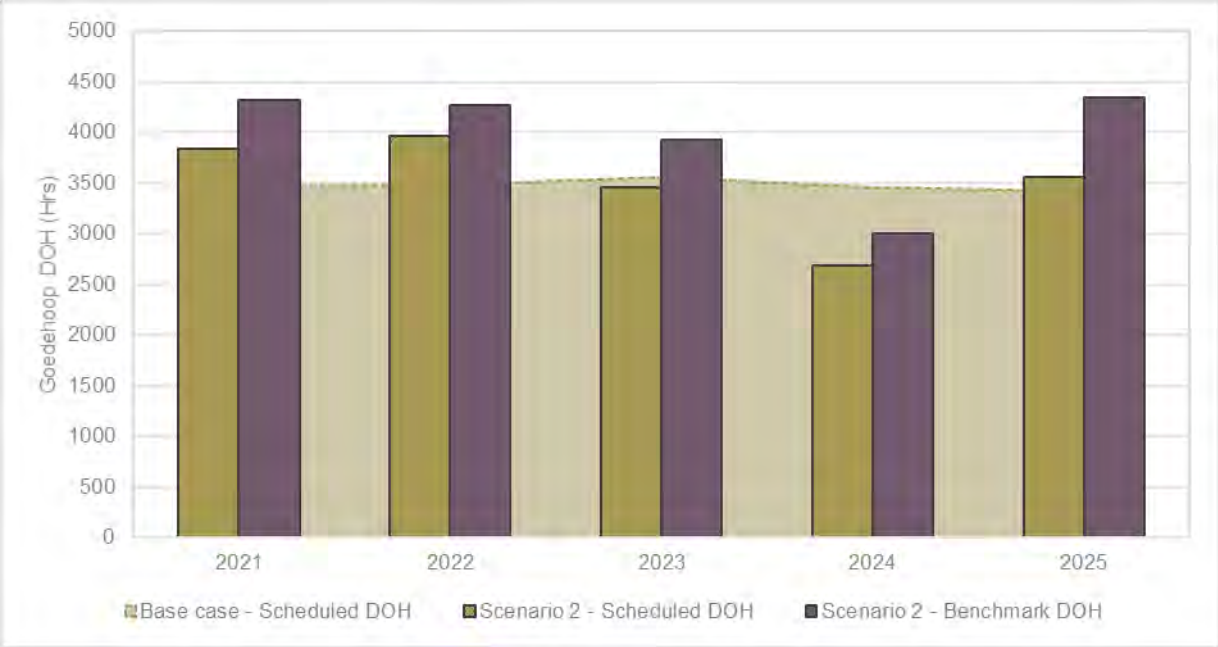
Figure 8-10: Benchmark UEA



srk consulting	**GOEDEHOOP COLLIERY CPR** Weighted Average DOH	Project No. 566657

Figure 8-11: Weighted Average DOH

The resultant rates per area are then applied together with the direct operating hours in the production scheduling. The DOH are determined from total hours available for mining operations, by removing the unproductive days. Unproductive days are a function of the shift pattern and public holidays. The total controllable time is then calculated using the following formula:

Production days (365) x 16.49 (target is 6 020 hours per annum cutting time)

The 16.49 factor is a function of travel time, shift swap time and the Sunday time and public holidays not worked as well as other factors leading to an estimate of cutting time available. The section DOH is then calculated as follows:

Controllable time x Availability x Utilization

The baseline production tonnage for each section before any block ranking is then calculated as follows:

Section DOH x Section Rate

8.9.4. Production Scheduling

Opportunity-based improvements based on actual production outputs were identified and incorporated in the production schedule. The scheduled improvements incorporated in the production schedule included:

- Production rate improvement of 3% for all sections in 2021;
- EQA improvement of 2% per annum from 2021 to 2025 for all sections, except for the Ubhejane and Isikhonyane sections, with improvements planned of 3% and 6% respectively for 2021; and

- UEA improvement of 2% per annum from 2021 to 2025 for all sections, except for the Ubhejane and Isikhonyane sections, with improvements planned of 10% and 30% respectively for 2021.

The demonstrated actual productivities (demonstrated actuals) for each of the mining actions were analysed and calibrated to represent A-ground conditions at a mining height of four metres as shown in Table 8-8. The calibrated rates and validated input parameters were applied in the LoM production schedule. These are then adjusted per block, based upon the mining heights and ground conditions. The LoM scheduling results from the underground operations at Goedehoop are shown in Table 8-9.

Table 8-8: Demonstrated Production Rates at A-Ground Conditions

Section	2019 Demonstrated (tph)	B-Ground Equivalent (tph)	Mining Height Factor	Mining Height (4 m) Equivalent (tph)	A-Ground Equivalent EQA (%)	A-Ground Equivalent UEA (%)
Ngwenya	217	241	0.8	295	84	64
Mangwapa	234	261	0.8	317	83	62
Imvubu	232	258	0.9	301	77	60
Ubhejane	226	252	0.8	320	83	69
Isikhonyane	273	303	0.9	327	80	58
Sizimisele	252	280	0.8	343	83	66

Table 8-9: 2021 LoM Scheduling Results

Description	Reporting Basis	Unit	2021	2022	2023	2024	2025
Underground No 2 and No 4 Seam RoM							
Mass	ar	(Mt)	4.6	5.0	4.9	4.8	1.9
Raw CV[1]	adc	(MJ/kg)	20.6	21.0	20.8	20.4	19.4
Raw Ash	adc	(%)	32.8	32.0	32.5	33.6	36.1
Saleable Product							
Mass	ar	(Mt)	2.5	2.8	2.7	2.5	0.9
CV[1]	adc	(MJ/kg)	26.4	26.4	26.4	26.4	26.4
Ash	adc	(%)	17.3	17.3	17.3	17.3	17.3

Note:
1. Numbers may not add up due to rounding.
2. ar = as received; adc = air-dried, contaminated.
3. COVID-19 5% adjustment applied

The schedule is run to the end of the available ground but will be truncated mid-2025, as the financial viability of mining the remaining periods of 2025 and 2026 is compromised due to the small throughput tonnage. This point is where the Brown No 2 Seam Coal Reserves are completed and any remaining No 4 Seam Coal Reserves are returned to Coal Resources.

The mine schedule was run under several scenarios, changing the rate of performance improvement of the equipment; the comparative data are included in the technical report *"Goedehoop SRK Report v9.pdf".* The final selected scenario was an expected performance rate improvement and a timed introduction of the super-section into the No 4 Seam area. In 2019 the sections produced an actual performance of 4.4 Mtpa and, with the introduction of the super-section and the productivity improvement, the Mine Plan will produce approximately 4.6 Mtpa. The mining conditions are getting progressively more difficult with time, as a greater portion of the coal will be mined in the thin seam areas of the No 4 Seam. Consequently, the capacity to achieve the benchmark tonnage is reduced and the tonnage declines over time (Figure 8-12). This is mitigated by the introduction of the super-section and the No 2 Seam sections, which operate at a greater mining height. This will allow a closer trend towards achieving the benchmark potential tonnage.

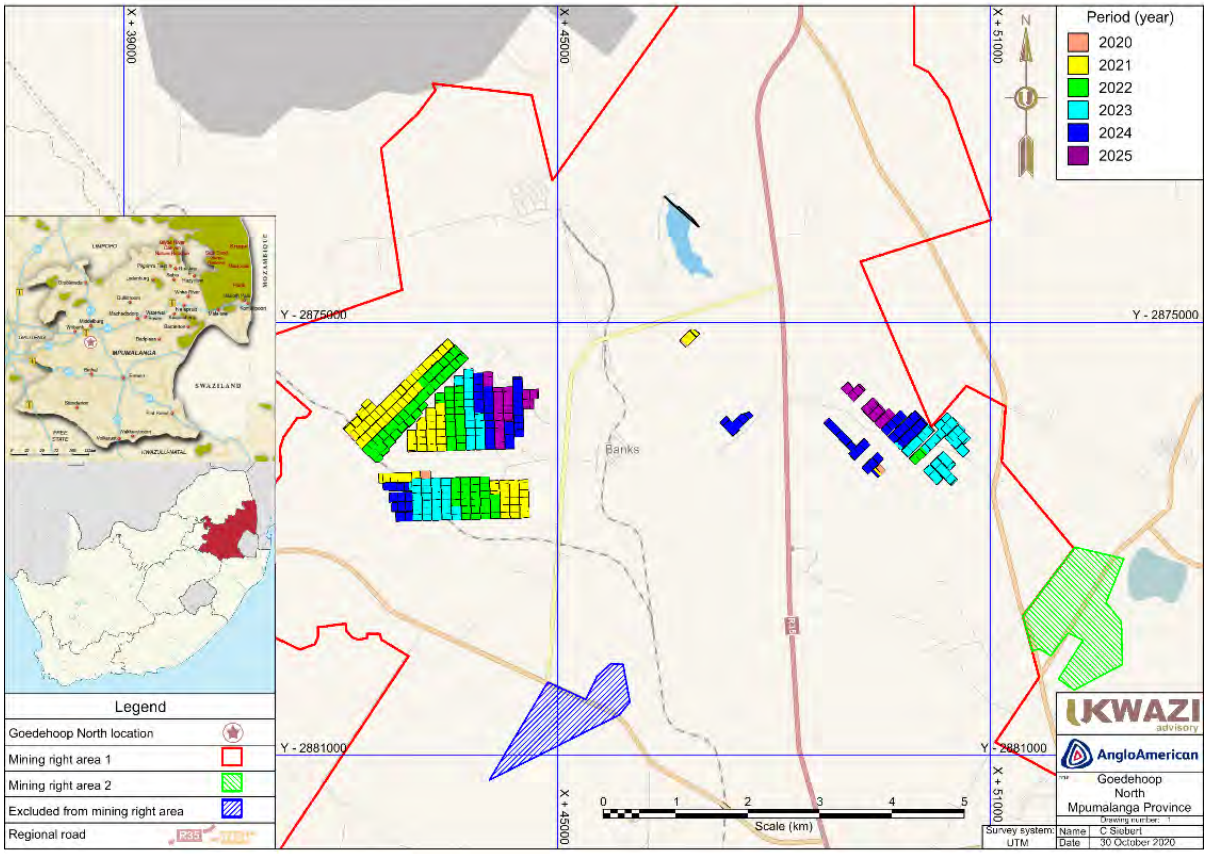
The net improvement of the mine performance is an average annual tonnage of 4.4 Mtpa from six sections or approximately 730 ktpa per section, to 4.6 Mtpa from five sections of which some are super-sections; i.e. 920 ktpa or 25% improvement. This is still an ambitious target but is considered possible. The majority of the improvement is achieved through the improved utilisation of the equipment in the super-section and the raising of the historical section utilisation from approximately to 65% to approximately 74%. In the period from January 2020 to June 2020, some sections had shown a one-month performance that achieves the required productivity. The super-section has also demonstrated the improved utilisation in comparison with the single section.

The underground performance can be compared with the achievements at the Greenside operation where the sections constantly perform in excess of an annual tonnage of 1 100 ktpa, which is well above the targeted increases required at Goedehoop.

The period progress plot for the No 4 Seam (Simunye Shaft) and the No 2 Seam (Brown 2 Shaft) is shown in Figure 8-13 and Figure 8-14, respectively. The potential schedule to achieve the sales tonnes for the target product of 5 700 kcal/kg is demonstrated in Table 8-10.

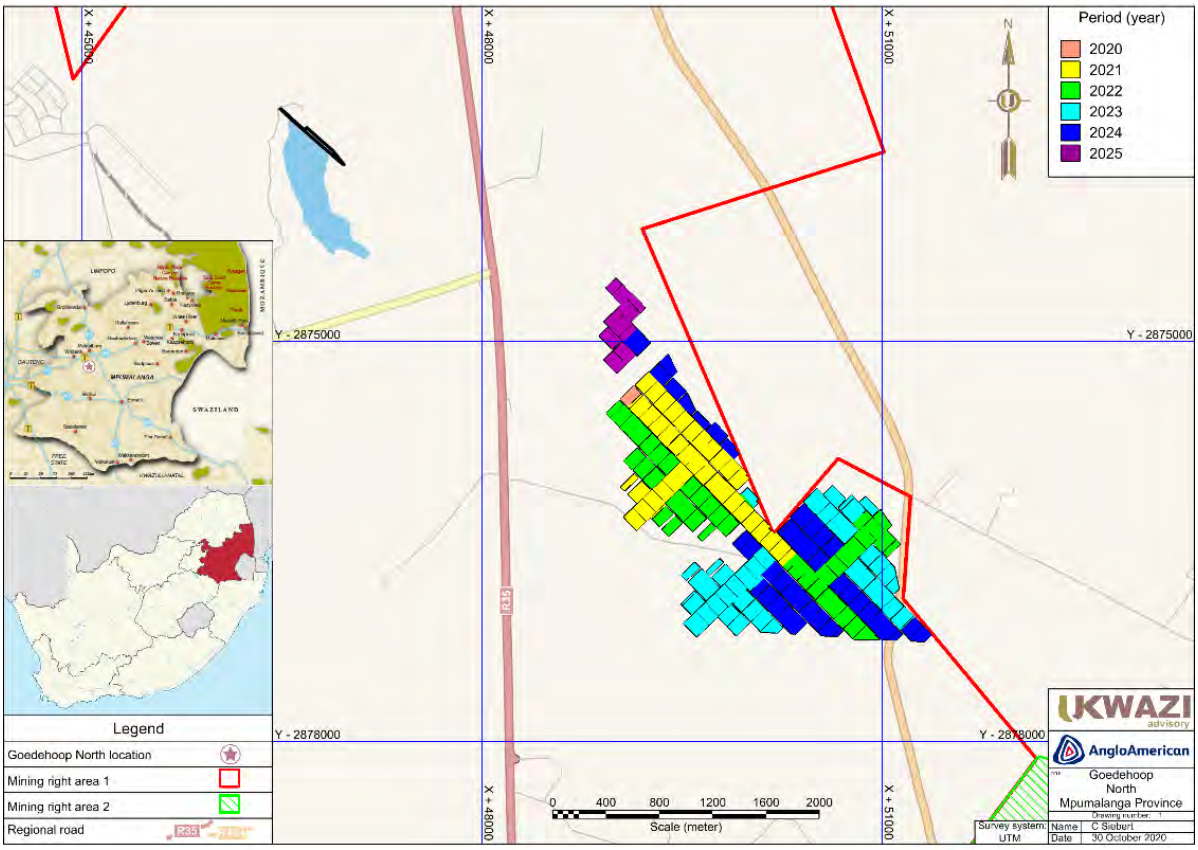
srk consulting	**GOEDEHOOP COLLIERY CPR** Scheduled Tonnage LoM 2021	Project No. 566657

Figure 8-12 Scheduled Tonnage LoM 2021



srk consulting	**GOEDEHOOP COLLIERY CPR** Period Progress Plot – No 4 Seam *(Source: Ukwazi, 2020)*	Project No. 566657

Figure 8-13: Period Progress Plot – No 4 Seam



srk consulting	**GOEDEHOOP COLLIERY CPR** Period Progress Plot – No 2 Seam *(Source: Ukwazi, 2020)*	Project No. 566657

Figure 8-14: Period Progress Plot – No 2 Seam

Table 8-10: Goedehoop North LoM Schedule Product Tonnes 5700 kcal/kg NAR

Description	Unit	2021	2022	2023	2024	2025
RoM No 4 Seam	(t)	2 865 344	2 990 705	2 940 689	2 800 035	1 417 553
RoM No 2 Seam	(t)	1 781 571	1 970 296	1 990 970	1 979 852	531 386
Yield No 4 Seam	(%)	51%	54%	49%	47%	43%
Yield No 2 Seam	(%)	60%	61%	63%	61%	59%
Sales No 4 Seam	(t)	1 461 325	1 611 350	1 431 628	1 319 711	609 547
Sales No 2 Seam	(t)	1 068 942	1 195 396	1 249 327	1 202 552	313 518

Note:
5% adjustment for COVID-19 in 2021.

9. Coal Reserve Estimates

[12.10(h)(vii)(ix)] [SR4.2(ii), SR4.5(i)(iii), SR5.1(i)(ii), SR5.2(ix), SR5.6(v), SR6.1(i)(ii)(iii), SR6.2(i), SR6.3(i)(vi)] [SV1.2, SV1.9, SV1.10]

9.1. Conversion of Coal Resources to Coal Reserves

9.1.1. Key Assumptions

[SR4.2(ii), SR4.5(iii), SR6.1(i)(iii)]

The estimation of the Coal Reserves from the Coal Resources is done by applying a series of Modifying Factors, production resources, physical and techno-economic constraints and assumptions to create a reasonable schedule of the forecast production performance on a RoM and saleable coal product basis. The aim of this process is to minimise the variance between actual and planned production metrics.

9.1.2. Key Parameters

[SR4.2(ii)(iv), SR4.3(ii), SR4.5(iii), SR6.1(i)]

The Coal Reserve estimate was based on the mining model, scheduled in XPAC V14. Appropriate Modifying Factors were applied to the mining layout that was designed to suit the available mining equipment. The layout was constrained by the infrastructure limits within the property and the Mine Plan. A mining schedule was created up to the economic mining limits of the mining layout. The Coal Reserves are an accumulation of the RoM coal tonnes and saleable coal products scheduled from the Effective Date to the end of the schedule, based on the techno-economic mining limits and not the mine design limits. The RoM Coal Reserve was stated at 5.7% total moisture on an as received (**ar**) basis while coal qualities were reported on an air-dried basis.

9.2. Impact of the Modifying Factors

[12.10(h)(vii)] [SR5.1(i)(ii), SR6.1(iii), SR6.2(i)] [SV1.10]

The following mining related Modifying Factors were applied in Gradecon and imported into the Xpac database:

- **Geological Loss:** Geological loss is a discount factor applied to account for unobserved geological features that can occur. A 10% geological loss factor was applied to both the No 4 Seam and the No 2 Seam tonnes.
- **Mining Modifying Factors**
  - *Mining loss*: a mining loss of 3.0% was applied to $MTIS_{adb}$ to derive RoM on an air-dried basis (**RoM_{adb}**);
  - *Mining extraction*: the extraction percentage is part of the layout design based on the safety factor of each mining area. The extraction for the No 4 Seam and No 2 Seam is 71% and 72% respectively;
  - *Mining recovery:* this accounts for losses due to mining equipment and mining method inefficiency; and
  - *Contamination*: contamination at 100% ash content was applied on $MTIS_{adb}$ to derive RoM on an adc basis (**RoM_{adc}**). The contamination applied was 13.2% and 7.6% for No 4 Seam and No 2 Seam, respectively and on a tonnage basis. The No 4 Seam being defined by the additional mining height and the No 2 Seam by a defined thickness.
- **Moisture Correction Factor** (conversion of the RoM_{adc} to **RoM_{ar}**): The average **RoM_{ar}** moisture was estimated at 5.65% and 5.69% for No 4 Seam and No 2 Seam, respectively, with a fixed 3.5% surface moisture applied. To derive the Saleable Coal Reserves, 6% total moisture was applied on the saleable tonnes (ar basis).

The mining-related Modifying Factors are summarised in Table 9-1:

Table 9-1: Mining-related Modifying Factors

Modifying Factor	Reporting Basis	No 4 Seam Value (%)	No 2 Seam Value (%)
Geological loss	MTIS	10.0	10.0
Mining loss	aduc	3.0	3.0
Mining extraction	aduc	74.0	73.8
Mining recovery	aduc	71.8	71.6
Contamination	ROM_{adc}	13.2	7.6
Surface moisture	ROM_{ar}	3.5	3.5

9.3. Coal Reserve Statement

[12.10(h)(ix] [SR5.2(ix), SR5.6(v), SR6.1(ii), SR6.3(ii)] [SV1.9]

9.3.1. Coal Reserve Category Definitions

[SR6.2(i)]

The Coal Reserves are classified into Proved and Probable Reserves dependent upon the geological classification of the Coal Resources included in the Coal Reserves, along with other factors of uncertainty pertaining to the mine design or coal quality. Typically, the Measured Coal Resources are the basis for the Proved Coal Reserves while the Indicated Coal Resources make up the Probable Coal Reserves. Where Inferred Coal Resources have been included in the mine planning in order to facilitate mining, they are included in the Probable Coal Reserves; the percentage of Inferred Coal Resources in the Mine Plan must be stated. At Goedehoop, all the Coal Resources are classified as Measured or Indicated Coal Resources, hence all the Coal Reserves are classified as Proved or Probable Coal Reserves. At Goedehoop, some of the resource blocks that are at a measured density of drilling are downrated to indicated status where there is a higher risk from other unknown factors such as geological conditions and other infrastructure issues. Figure 9-1 shows the relationship between Coal Resources and Coal Reserves, as per Figure 2 of the SAMREC Code.

9.3.2. Moisture Reporting Basis

Whereas the Coal Resources are modelled on an air-dried basis, (which includes the inherent moisture) the RoM Coal Reserves are reported at a total moisture of 5.7%. The Saleable Coal Reserve is reported at a total moisture content of 8.0%. The coal sales qualities are reported on an air-dried contaminated (adc) basis.

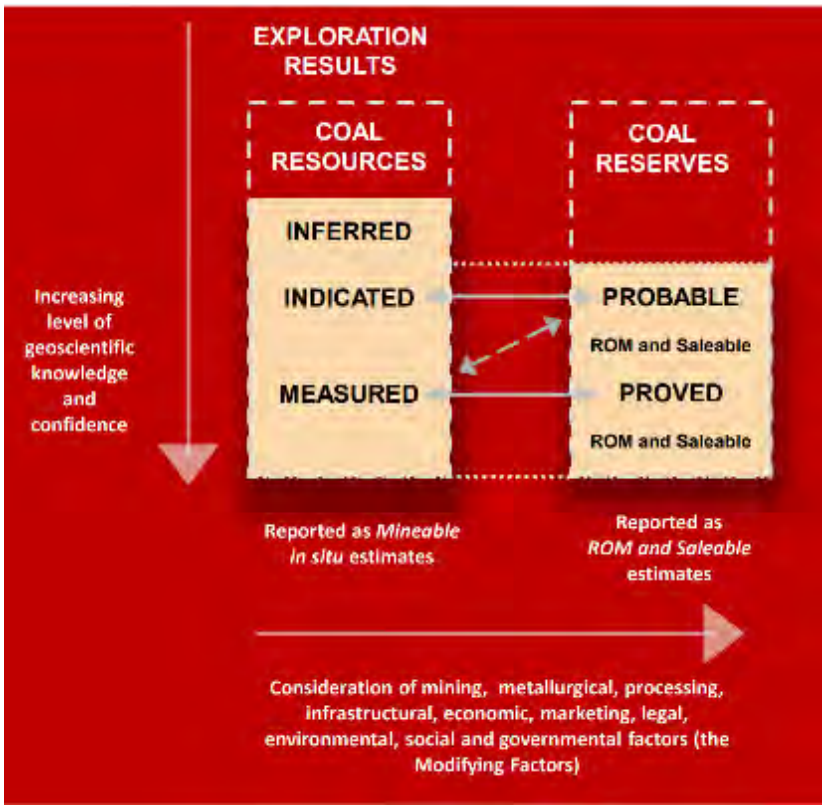
9.3.3. Coal Reserve Statement

[12.10(h)(ix] [SR1.4(iv), SR6.1(ii), SR6.3(i)(ii)(v)] [SV1.9]

The Coal Reserve estimates were conducted in accordance with the SAMREC Code, as well as SANS10320:2020.

The Coal Reserve estimate has been independently estimated and signed off by Mr. N. McGeorge of SRK, based on the mining model supplied by the Company and verified by SRK. The Coal Reserve estimate is declared as at 31 December 2020 and excludes surface stockpiles and discard material. The reference point of the RoM Coal Reserve is the delivery of RoM material to the respective RoM surface stockpiles and the reference point for the Saleable Coal Reserve is the delivery of on-specification washed coal to the saleable coal stockpile. The Coal Reserve is derived from the LoM Plan which terminates in 2025 when the No 2 Seam is complete, as scheduled production beyond this date will not be financially viable.

The Goedehoop Coal Reserves on a Run-of-Mine basis amounts to 19.3 Mt (RoM_{ar}). This estimate is made up of 20.0 Mt of Proved Coal Reserves (93%) and 1.3 Mt of Probable Coal Reserves (7%). The Coal Reserve estimate is stated on an as received basis and the coal qualities stated on an air-dried, contaminated basis. The sales tonnes qualities are stated on an air-dried contaminated basis.



srk consulting	**GOEDEHOOP COLLIERY CPR** Relationship between Coal Resources and Coal Reserves (*SAMREC Code, 2016*)	Project No. 566657

Figure 9-1: Relationship between Coal Resources and Coal Reserves according to the SAMREC Code

The Coal Reserves for Goedehoop on a total basis[10] (100% attributable to Goedehoop) at 31 December 2020 are summarised in Table 9-2.

Table 9-2: Goedehoop Coal Reserve Statement at 31 December 2020

Reserve Classification Category	RoM Coal Reserves			Saleable Coal Reserves (ad)			
	RoM_{ar} (Mt)	Total Moisture (%)	CV^1_{adc} (kcal/kg)	Sales (Mt)	Practical Yield (%)	Total Moisture (%)	CV^1_{adc} (kcal/kg)
Proved	20.0	5.7	4 996	10.8	54.0%	8	6 310
Probable	1.3	5.7	4 897	0.7	53.6%	8	6 310
Total	**21.3**	**5.7**	**4 990**	**11.5**	**54.0%**	**8**	**6 310**

Note:
1. Assumes coal supply until 2025.
2. RoM_{ar} = Run of Mine on an as received basis.
3. CV^1_{adc} = Calorific Value air-dried, contaminated.
4. Assumes positive valuation of Mine Plan.
5. There are no Inferred Resources in the Mine Plan.

The Coal Reserves are extracted from the mining schedule model and are from the Effective Date to the last period scheduled (mid-2025). The Coal Reserves are derived from the No 4 Seam and No 2 Seam.

[10] Note that "total basis" refers to 100% of the Coal Resources and/or Coal Reserves within the Goedehoop Mining Rights and is not necessarily the percentage attributable to the holder of the Mining Rights.

9.4. Reconciliation with Previous Coal Reserve Estimate

[SR1.4(iv), SR4.5(vi), SR6.3(vi)] [SV1.6]

The previous Coal Reserve estimate was completed with a base date of 31 December 2019. The comparison of the current Coal Reserve estimate with the 31 December 2019 Coal Reserve estimate is shown in Table 9-3.

Table 9-3: Comparison of the Coal Reserves at 31 December 2020 and 31 December 2019

Coal Reserve Classification	RoM Coal Reserves				Saleable Coal Reserves			
	Mass (Mt)		CV^1_{adc} (kcal/kg)		Mass (Mt)		CV^1_{adc} (kcal/kg)[2]	
	2020	2019[1]	2020	2019	2020	2019	2020[2]	2019
Proved	20.3	15.4	4 990	4 590	10.8	7.7	6 310	5 970
Probable (from Measured in 2019)	0	9.0	0	5 130	0	5.4	6 310	5 970
Probable from Indicated	1.3	0	4 897	0	0.7	0	0	0
Total	**21.3**	**24.4**	**4 990**	**4 790**	**11.5**	**13.1**	**6 310**	**5 970**
Inferred in LoM Plan	0	0	0	0	0	0	0	0
Total in Mine Plan	**21.3**	**24.4**	**4 990**	**4 790**	**11.5**	**13.1**	**6 310**	**5 970**

Note:
1. Reference Goedehoop North CPR 2019 (AAC, 2019m)
2. CV^1_{adc} = Calorific Value on an air-dried contaminated basis
3. CV^1s for 2020 are quoted Gross adc, which equates to 5 700 kcal/kg NAR

The variance in the 31 December 2020 Coal Reserve estimate relative to the 31 December 2019 estimate can be attributed to:

- Mining-related depletions for the period between 31 December 2019 and 31 December 2020 amounting to 4.5 Mt;
- 0.1 Mt was excluded from the updated schedule due to unclassified Coal Resource classifications within the mining schedule and
- Different end dates between the LoM plans.

9.5. Goedehoop North Mineral Residue Deposit Coal Reserve Estimate

[SR6.1(ii), SR6.3(ii)(iii)

The existing MRD adjacent to the coal processing plant is being recovered for sale to a third party, for use at a nearby Eskom Power Station. The mine has a current contract to sell approximately 3.0 Mtpa with a predicted end date of June 2021, with extension options for a further two years. The prices realised are dependent upon the yield achieved by the third party when the material is processed. Typically, a yield of approximately 30% has been achieved.

The original MRD contained discard material from the low ash coal product, which was high in yield for a typical Eskom Power Station product (22.5 MJ/kg). The material from the MRD is supplemented with as-arising material from the current plant, which has a somewhat lower yield, for sale to a third party. The overall volume of the MRD is in excess of 35 Mt; therefore, there is no potential shortage of material. Part of the MRD is still active with co-disposal of the fines from the plant; the two operations do not impact on each other. The recovery of the MRD is done in layers from the top and placed into a stockpile area from where it is recovered and transported to the third party's plant. The as-arising discards and slurry are managed in a separate portion of the MRD and the two activities are distinctly separate. Figure 9-2 illustrates the proximity of the MRD to the existing plant.

Table 9-4: Goedehoop North Reserve Statement for the Mineral Residue Deposit

RoM Coal Reserves				Saleable Coal Reserves				
Coal Reserve Classification	RoM_{ar} (Mt)	Total Moisture (%)	CV[1] (MJ/kg adc)	Coal Reserve Classification	$Sales_{ar}$ (Mt.)	Practical Yield (%)	Total Moisture (%)	CV[1] (MJ/kg adc)
Proved	7.5	5.7	12.64	Proved	7.5	100%	5.7	12.64
Probable				Probable				
Total	**7.5**	**5.7**	**12.64**	**Total**	**7.5**	**100%**	**5.7**	**12.64**

Note:
1. Assumes the extension to the third party contract is taken.
2. Tonnages are on an as received basis
3. CV assumed as adc as estimated from sample data.
4. Material beneficiates to a domestic power station quality at 30% yield by customer.

srk consulting	GOEDEHOOP COLLIERY CPR Goedehoop North Mineral Residue Deposit	Project No. 566657

Figure 9-2: Goedehoop North Mineral Residue Deposit

It must be noted that there is also a large MRD associated with Goedehoop South processing plant, but insufficient technical work prevents this being included.

9.6. Specific Coal Reserve Estimate Risks

[12.10(h)(x)] [SR5.7(i)]

The reader is referred to the risk assessment section (Section 20) of this CPR for further identified risks and their mitigations. The risks specific to the Coal Reserve estimates are presented in Table 9-5; one of these risks are classified as High Risk, apart from the coal sales price and exchange rate, which have a large influence of the mine valuation.

Table 9-5: Specific Coal Reserve Estimate Risks

Coal Reserve Risk	Residual Rating
Inability to mine at minimum mining height	Low
No 4 Seam coal thinner than predicted leading to higher contamination	Medium
Increased geological dyke frequency than forecast	Low
Equipment performance unable to achieve targets	Medium
Coal sales parameters impact profitability	High
Uncontrolled working cost	Low
Plant performance	Low

10. Coal Processing

[12.10(h)(vii)] [SR4.3(ii), SR5.2(viii), SR5.3]

10.1. Introduction

[SR5.2(viii), SR5.3(iii), SR5.4(iii), SR6.3(iii)]

The Goedehoop North plant (still known as Bank No 2 plant) is one of the original plants in the initial submission to the Japanese steel mills to produce low ash coal. A plant had been operating since 1972, producing coal for domestic consumption and was upgraded in 1976 in order to satisfy the Japanese contract. The plant then produced a Low Ash Coal (7.5% ash content) as the premium product, with a Power Station Smalls middlings coal with 15% ash content as a secondary product. In addition, there was a Bank No 5 Seam mine and plant which opened in 1947; however, this closed in 2005. In that same year, Goedehoop and Bank Collieries merged to form Goedehoop Colliery, with the South and North sections, respectively.

The Bank No 2 plant currently has a throughput of 3.8 Mtpa RoM supplied from six CM sections. The feed is mined from the Nos 1, 2 and 4 Seams and produces 2.1 Mtpa export product. The plant is supported by its own independent train-loading facilities. The design capacity of this plant is 5.3 Mtpa.

The coal discard stream is sent to a dedicated active co-disposal facility, namely Bank 2, via conveyor. The co-disposal facility was constructed on an area that was previously used for the disposal of coarse discard.

Discard may be double-staged, where the coal is crushed and more of the coal separated from the waste discard material. Consequently, the solid discards sent to the co-disposal facility are of a smaller size than that typically observed on discard facilities. Slurry from the thickeners is pumped from the plant to the fines paddocks via metal pipelines. A Pollution Control Dam (**PCD**) has been constructed to contain runoff from the co-disposal facility. The plant utilizes Dense Medium Separation technology and has a RoM feed rate of 932 tph to produce the desired product.

Figure 10-1 shows the general layout of Goedehoop, processing plant, product storage and load out station while the block coal flow diagrams for Goedehoop North and South plants are shown in Figure 10-2. Goedehoop North has treated both No 2 and 4 Seams over the years and only mined No 4 Seam since 2018. In December 2019, Goedehoop South, which began in 1983, was closed and the plant is currently being deconstructed. Goedehoop North consists of the underground mine, washing plant, load out facilities and an MRD, which is being used to dispose of the discard from the active coal preparation plant and is also being mined and sold to a third party.

10.2. Plant RoM Infrastructure

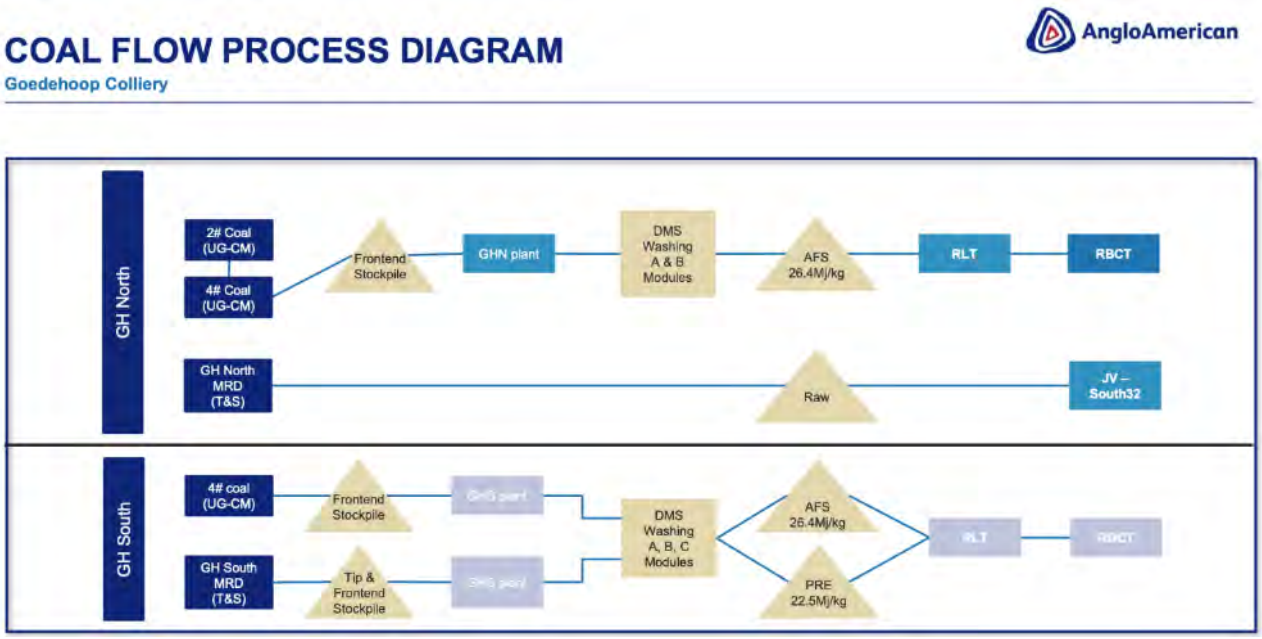
Coal is evacuated via the Simunye Shaft into a 2 000 t silo (Figure 10-1). The coal is fed into a feeder breaker from the face, which crushes to approximately 200 mm. From the 2 000 t silo, the coal is fed into a mineral sizer which breaks the coal to minus 100 mm. The coal is then delivered by three conveyors to the RoM stockpile.

This section from underground to the RoM stockpile is considered by the Company to be a bottleneck on the system. If the output from the silo could be increased, the RoM stockpile would completely disconnect the mine from the plant. The RoM stockpile (Figure 10-1) acts as a disconnect between mine and Coal Handling Preparation Plant (**CHPP**). Its nominal capacity is 50 000 t, but coal can be pushed out and reclaimed using mobile equipment. If the mine is able to increase its production, the stockpile would be used to feed the CHPP while the mine is not producing. The stockpile can also be fed from a separate shaft, which was traditionally from the No 2 Seam. The vibrating feeders under the RoM stockpile withdraw the coal to the crushing section. The crushing of the coal is as minimal as possible as the plant consists of separate coarse and small coal washing sections. The use of drums means that the coal does not have to be crushed such that it can be pumped into a cyclone. The RoM section consists of a 2 000 t capacity silo, which then feeds a rotary breaker. The rotary breaker (Figure 10-1) picks the coal up four to five times, the coal preferentially breaks and falls through 75 mm diameter holes. Some stone will not break, passes through the breaker and is rejected.

The coal then passes into silos, but only two of the four are now used. The coal is withdrawn from the silos for feeding to the coal preparation plant. The coal is then fed onto two sets of dry banana screens that cut at 10 mm. The screens (Figure 10-1) are relatively new, having replaced very old technology Rod Deck screens in the last year. One deck has 12 mm slotted apertures and the other has 20 mm slots. The oversize coal is fed to a bin ahead of the Wemco drum coarse plant and the undersize coal is fed to desliming screens that cut at 0.63 mm.

srk consulting	**GOEDEHOOP COLLIERY CPR** General Overview of Goedehoop Colliery Coal Preparation Plants	Project No. 566657

Figure 10-1: General Overview of Goedehoop Colliery Coal Preparation Plants



srk consulting	**GOEDEHOOP COLLIERY CPR** Block Flow Diagrams of Coal Washing Plants to end-2019 *(Source: AAC_R&R CP Peer Review_2019 – AAC, 2019z)*	Project No. 566657

Figure 10-2: Block Flow Diagrams of Coal Washing Plants to end 2019

10.3. Plant Design, Characteristics and Specification

[SR5.3(iii)(iv), SR5.6(ii), SR6.3(iii)]

The plant was originally fed No 2 Seam coal only but also began treating No 4 Seam coal in 2016.

Figure 10-3 shows the coal preparation plant flowsheet. This flowsheet has changed many times over the years; currently, it is the simplest it has ever been. From 1976, the plant was required to produce a 7.5% low ash coal and a 15% ash middling product.

The plant has always treated coarse and small coal separately in Wemco drums (Figure 10-4) and Dense Medium Cyclones (**DMC**), respectively. However, the coal was treated in two stages in each circuit to produce the two products. The plant could be simplified substantially when only a single product was required, so the high gravity Wemco plant and the high gravity DMC circuit could be removed, along with many conveyors.

The plant is controlled from the Central Control Room (**CCR**) situated next to the plant offices. The Wemco circuit consists of two modules, fed from a single feed bin. The feed bin is fed by a conveyor that takes the oversize coal from the dry screens. The coal is washed on a preparation screen to remove any adhering fines before being flushed into the drums. The floating product and the sinking discard material are treated on their own screens to recover magnetite, using a conventional medium circuit. The banana screens underflow coal is conveyed to the small washing section of the plant. Three desliming screens remove minus 0.63 mm coal. The desliming screen oversize coal is fed to mixing boxes, where medium (a mixture of magnetite and water) is added at the correct ratio from where the mix is pumped to four DMCs. The floating material is drained and magnetite removed on three product screens (Figure 10-5) and the sink material is drained and magnetite recovered on three discard drain and rinse screens. The small coal cyclone product is dewatered in VM 1400 centrifuges.

The desliming underflow, minus 0.63 mm material, passes into a fines tank and is pumped to classifying cyclones. The ultrafine material, nominally minus 150 microns, gravitates to two thickeners. The classifying cyclone underflow is fed to a spirals circuit (Figure 10-6). The spirals discards are dewatered on conventional high frequency dewatering screens and passes to the discard conveyor, where it is mixed with the coarse and small discards. The spirals product is dewatered in Malvern FC 1200 fine coal centrifuges (Figure 10-6). The dewatered smalls and fine products are then mixed with the coarse coal on a combined product conveyor belt. The centrifuges have been installed recently and have resulted in a major improvement in the product moisture.

The product coal is then conveyed to the product stockpiles and is sampled using an automatic sampler for plant control purposes (Figure 10-1).

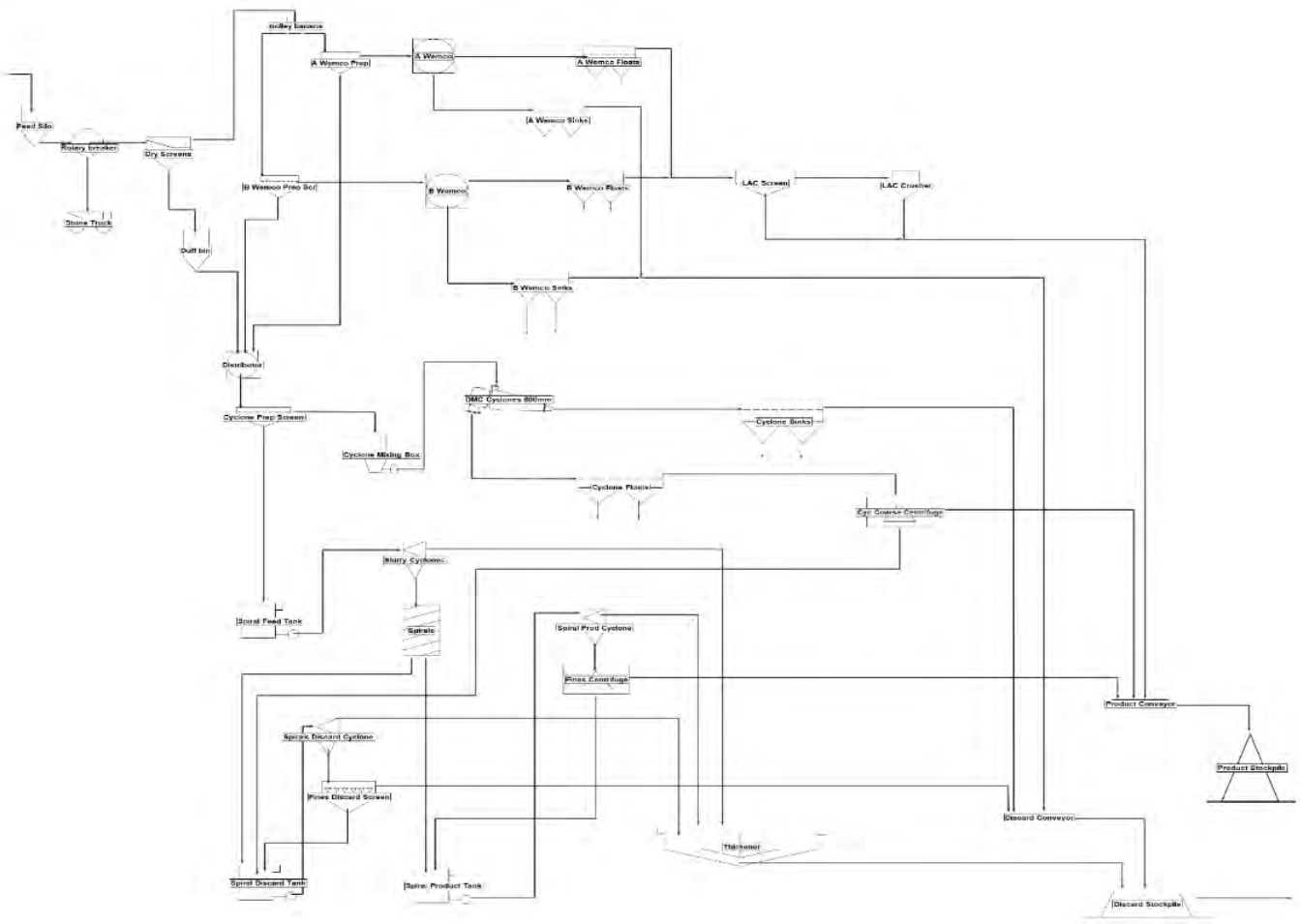
10.4. Product Handling

The product produced at Goedehoop North is Anglo Five Seven Hundred, or AFS, named after the principal quality: CV[1] of 5 700 kcal/kg NAR. The actual quality produced does change sometimes in response to the market, but generally the qualities are:

Export Product AFS (5 700 NAR kcal/kg) Qualities:

- CV[1] 26.40 MJ/kg;
- Ash 17.0%;
- Inherent Moisture 2.8%;
- Total Moisture 8.0%;
- Sulphur 0.50%;
- Volatile Matter 23.0%.

The coal is sampled using automatic samplers as the coal leaves the plant; the samples are analysed every two hours and are used as feedback for plant density control. The product is sent to either the product silos (Figure 10-7) or directly on to a stockpile adjacent to the silos where up to 100 000 t of coal can be stored using mobile equipment.



srk consulting	**GOEDEHOOP COLLIERY CPR** Goedehoop North Coal Processing Plant Flowsheet	Project No. 566657

Figure 10-3: Goedehoop North Coal Processing Plant Flowsheet

srk consulting	**GOEDEHOOP COLLIERY CPR** Bank 2 Wemco Drum Module	Project No. 566657

Figure 10-4: Bank 2 Wemco Drum Module

srk consulting	**GOEDEHOOP COLLIERY CPR** DMC Plant Product Screen	Project No. 566657

Figure 10-5: DMC Plant Product Screen

srk consulting	**GOEDEHOOP COLLIERY CPR** Fines Treatment – Spirals Plant (left) and VM 1400 Small Coal Basket Centrifuges (right)	Project No. 566657

Figure 10-6: Fines Treatment – Spirals Plant (left) and VM 1400 Small Coal Basket Centrifuges (right)

The coal is reclaimed using feeders and assisted by mobile equipment as necessary, via an automatic sampler, to the load out silo. The silo can store 7 000 t of coal above rail, ready for direct loading into the trains, so that only 1 400 t of coal has to be reclaimed in the two hours that it takes to load the one hundred truck, 84 t per truck train for dispatch to Richards Bay. Figure 10-8 shows the load out silo, part of the rail loop and the chute used to load into each truck. It reflects the fact that the system overall is in good condition, which is vital for the future operation of the mine.

srk consulting	**GOEDEHOOP COLLIERY CPR** Product Storage	Project No. 566657

Figure 10-7: Product Storage

srk consulting	**GOEDEHOOP COLLIERY CPR** Load Out Silo (left) and Load Out Station Chute (right)	Project No. 566657

Figure 10-8: Load Out Silo (left) and Load Out Station Chute (right)

10.5. Plant Operating Hours

The plant run-hours per month (Figure 10-9) are good; the 2018 period below budget coincided with lower mine tonnage rates.

10.6. Plant Throughput Capacity

Overall, the plant throughput (Figure 10-9) is close to budget, except for no coal feed. The plant is not a bottleneck; as the plant does not operate on Sundays, additional plant capacity is available when required., The plant has been upgraded to keep it up to date; for example, the fines centrifuges and dry screens. Also, the extraneous equipment that is no longer needed has been removed.

10.7. Plant Utilization

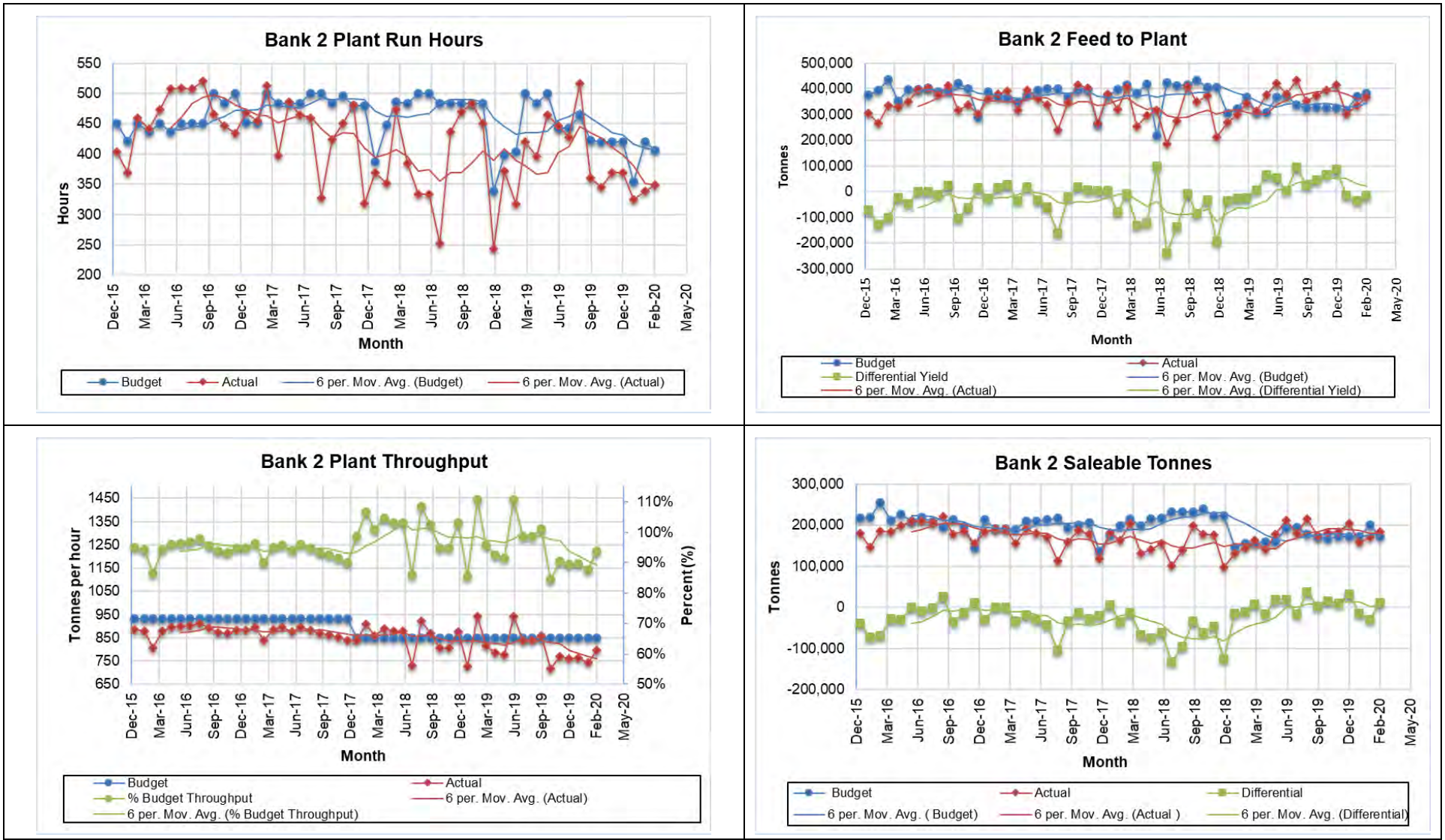
The percentage engineering availability and plant utilisation are shown (Figure 10-10). Generally, the plant performance is in line with budget. Some of the lower plant run-times coincide with plant modifications during mid-2018. In addition, the plant has had lower feed-to-plant tonnages than expected.

10.8. Manpower

[SR5.2(viii), SR5.3(iii)]

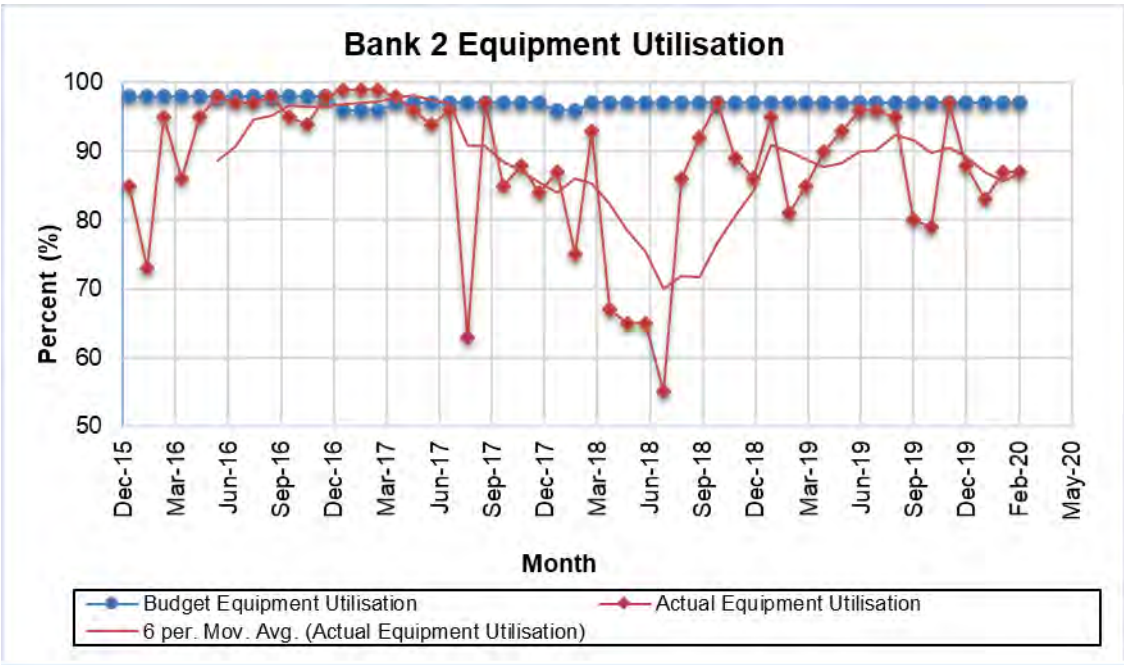
The plant complement is shown in Figure 10-11. The plant is run using a hybrid 12-hour shift system with the plant not operating on Sundays. The plant does not currently operate on Sundays; if this was the case, it could probably run four shifts with the same number of people, resulting in more operating hours and therefore treating more coal. The potential benefits from this could be:

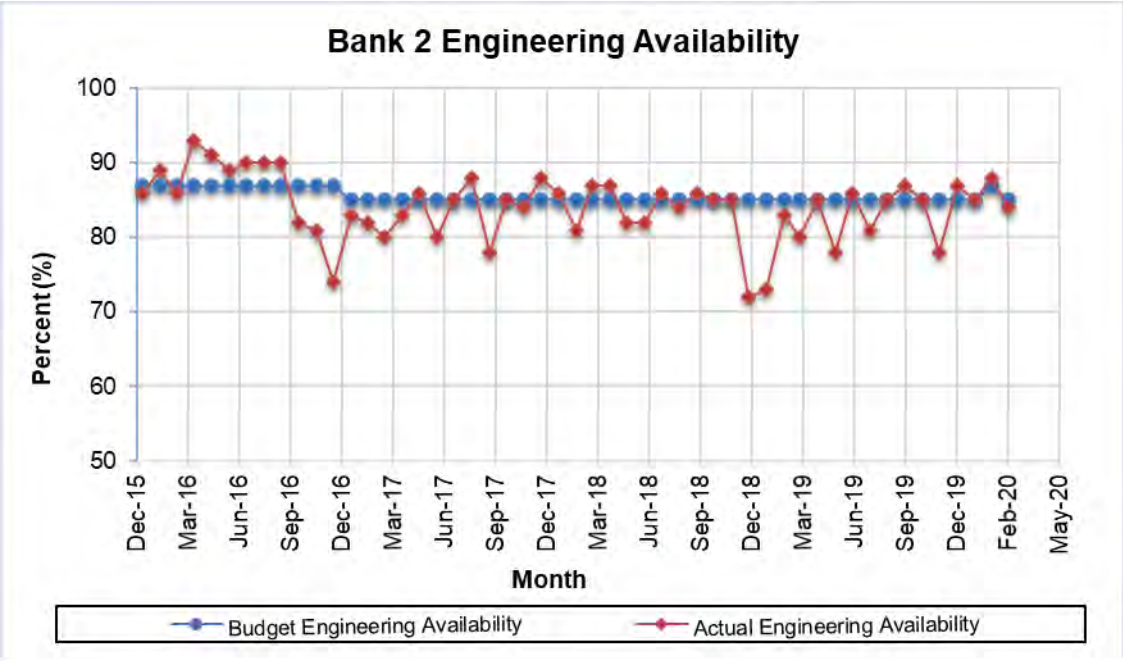
- Increased operating hours,
- Weekday maintenance would be possible;
- More rested operating and engineering staff;
- Possibly less overtime required ;and
- Probably result in a lower cost per tonne feed.



srk consulting	**GOEDEHOOP COLLIERY CPR** Bank 2: Plant Run Hours per Month (top left) and Tonnage Throughput per Month (top right); Feed Tonnes per Hour (bottom left) and Saleable Tonnes (bottom right)	Project No. 566657

Figure 10-9: Bank 2: Plant Run Hours, Feed to Plant and Saleable Tonnes per Month





srk consulting	**GOEDEHOOP COLLIERY CPR** Bank 2: Plant Utilisation and Availability	Project No. 566657

Figure 10-10: Bank 2: Plant Utilisation and Availability

BANK 2 PROCESS		BP2019				BP2020			
Position	**Grade**	**Officials**	**Snr Skilled**	**Skilled**	**Total**	**Officials**	**Snr Skilled**	**Skilled**	**Total**
Plant Manager	GBF 6	1			1	1			1
Metallurgical Engineer	GBF 6	1			1	1			1
Snr Plant Metallurgist	C4	2			2	2			2
Plant Foreman	C4	3			3	3			3
Asst Plant Foreman	C2	3			3	3			3
Snr Lab Analyst	B5	1			1	1			1
Washing Plant Operators			6		6		6		6
Plant Operators				34	34			34	34
Total		**11**	**6**	**34**	**51**	**11**	**6**	**34**	**51**

BANK 2 ENGINEERING		BP2019				BP2020			
Position	**Grade**	**Officials**	**Snr Skilled**	**Skilled**	**Total**	**Officials**	**Snr Skilled**	**Skilled**	**Total**
Section Engineer		1			1				1
GES		1			1	2			2
Engineering Foreman		5			5	5			5
Maintenance Coordinator		1			1	1			1
Technician		1			1	1			1
Planning Officer Assistant		1			1	1			1
RRT Foreman / Supervisor		1			1	1			1
Artisans:									
Boilermaker			9		9		9		9
Electricians			8		8		8		8
Fitters			9		9		9		9
Millwright			2		2		2		2
Instrument Mechanicians			5		5		5		5
Skilled:									
Plant Operators				20	20			20	20
Total		**11**	**33**	**20**	**64**	**12**	**33**	**20**	**65**

srk consulting	**GOEDEHOOP COLLIERY CPR** Plant Manpower	Project No. 566657

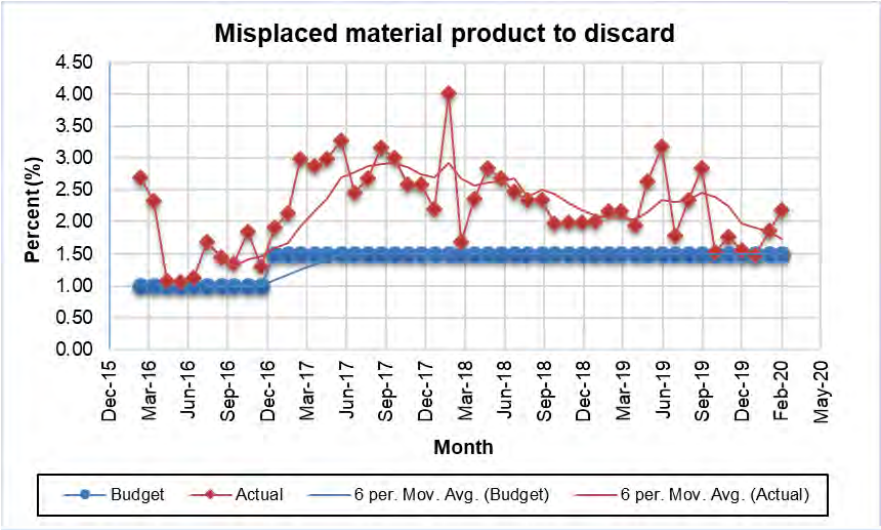
Figure 10-11: Plant Manpower

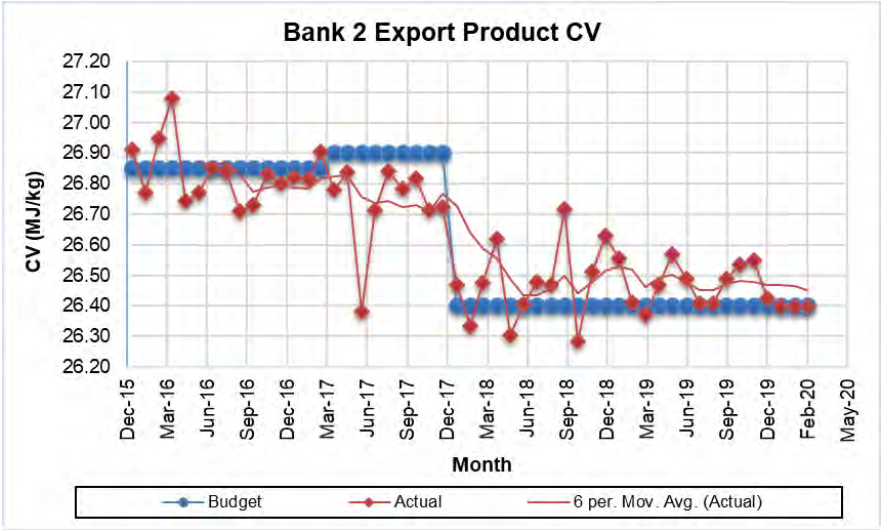
10.9. Quality Control

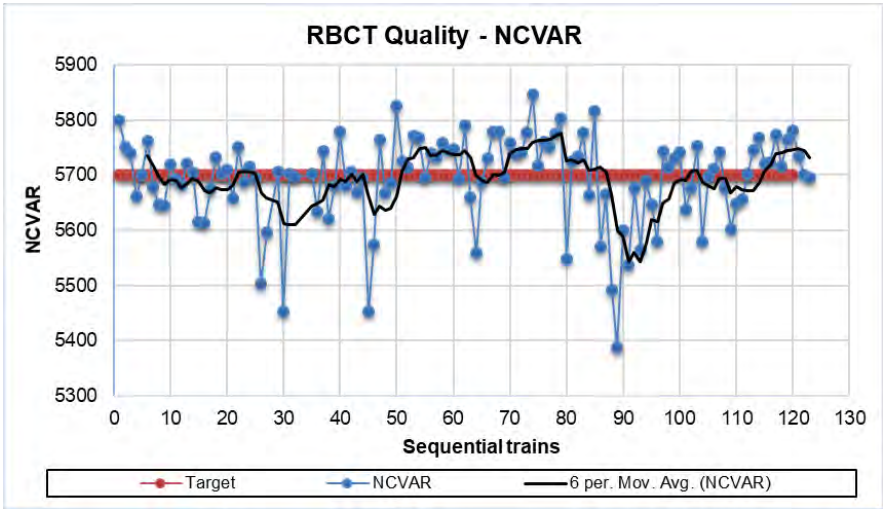
[SR6.3(iii)]

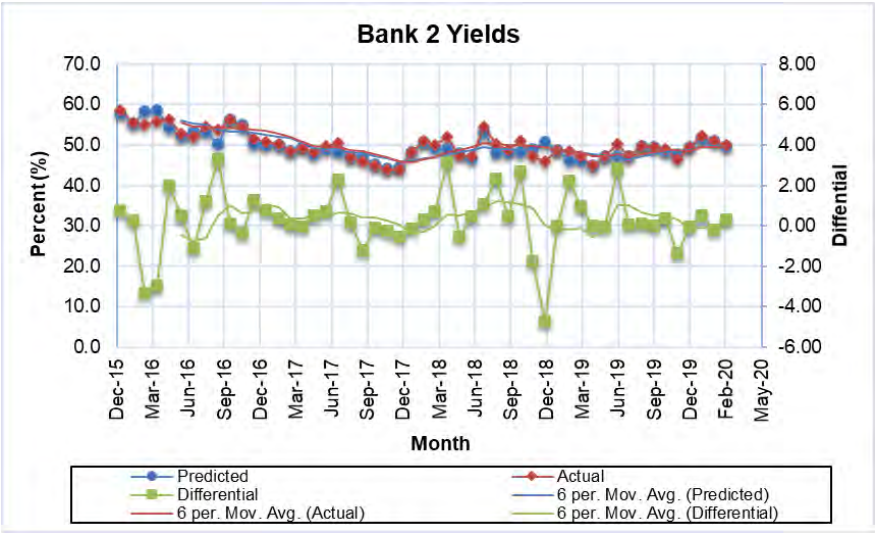
The plant has automatic samplers for the plant product and for the product as it is sent to the load out station. However, there is very little sampling of feed coal. This is unfortunate as a reported problem with the plant feed is that it has become finer over time. This is thought to be because of the reduction in No 2 Seam coal in the feed, so presumably this should improve in the future when mining of the No 2 Seam in the Brown areas commences. Samples are taken by hand from the coarse, small and fine product screens, as well as a combined discard sample. Plant efficiency tests are rare, but misplaced material tests are done each shift. The mine has on-site laboratory manned by its own personnel which does hourly, daily and train analyses.

The plant has misplaced material above a difficult target (Figure 10-12); in addition, moisture has been high but is seen to be recently trending down in the train results. The new centrifuges should aid in getting closer to the total moisture targets. The export product CV[1], as analysed by the mine, is shown in Figure 10-12. The step change in quality was due to the move from a 5 800 kcal/kg product to a 5 700 kcal/kg product. Generally, the CV[1]s are higher than target, which can result in a loss of yield. However, the product is actually sold on the basis of Net As Received Calorific Value (**NCVAR**), which means that any variance in moisture has to be allowed for. Export NCVAR for 2020 based on RBCT analyses is also shown in Figure 10-12, which shows the overall product CV[1] as being close to the target. All the other qualities are in-line or better than target.



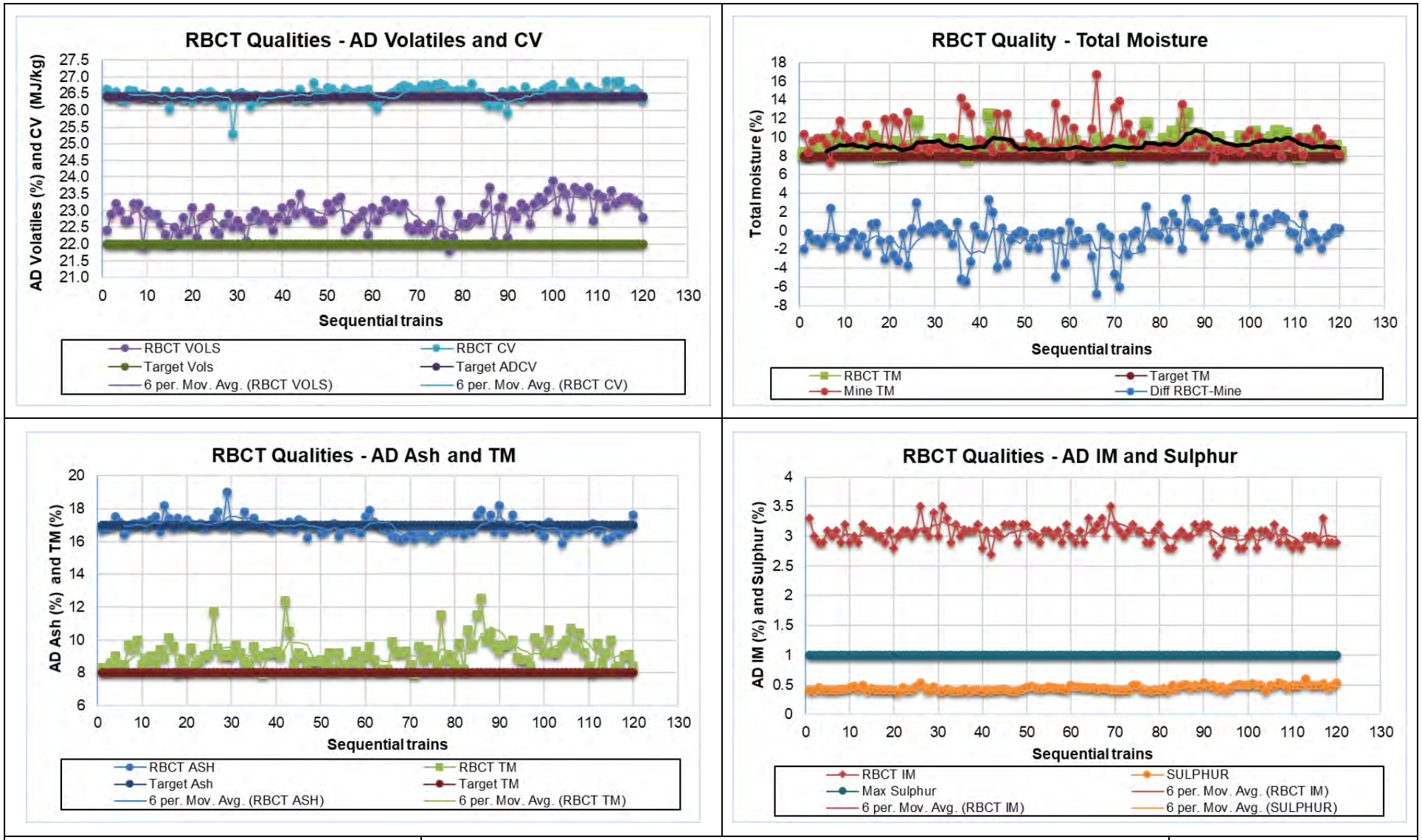






srk consulting	**GOEDEHOOP COLLIERY CPR** Misplaced Material (top left), Export Product CV[1] (air-dried (**ad**)) (top right), RBCT NCVAR 2020 (bottom left) and Monthly Plant Yields (bottom right)	Project No. 566657

Figure 10-12: Misplaced Material, Export Product CV[1] and NCVAR and Monthly Plant Yields



srk consulting	**GOEDEHOOP COLLIERY CPR** Quality Control – RBCT Qualities: Volatiles, CV[1] and TM (top); Ash, TM, IM and Sulphur (bottom)	Project No. 566657

Figure 10-13: Quality Control – RBCT Qualities: Volatiles, CV[1] and TM (top): Ash, TM, IM and Sulphur (bottom)

10.10. Plant Yields

The yield is in line, or slightly higher than that predicted from the Mine Plan (Figure 10-12).

10.11. Plant Accounting

The plant costs (Figure 10-14) are generally in line with budget except for those months where the feed to plant tonnage was slightly lower than planned. These also coincide with lower tonnages because of the TFR shutdown when extra maintenance can take place.

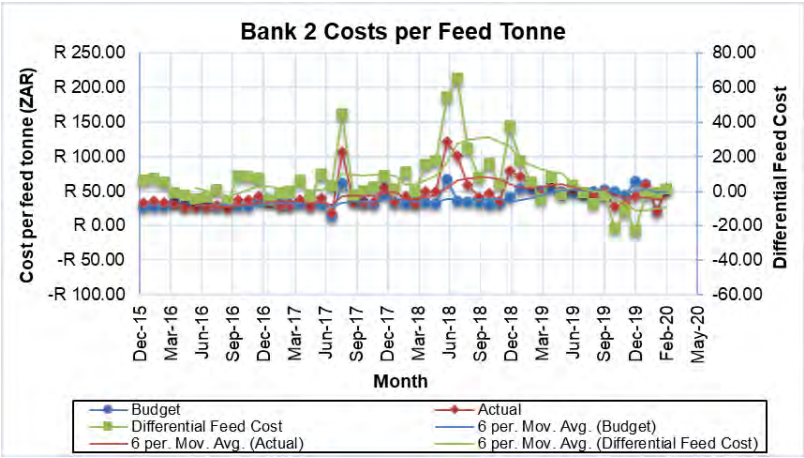
10.12. Plant Condition

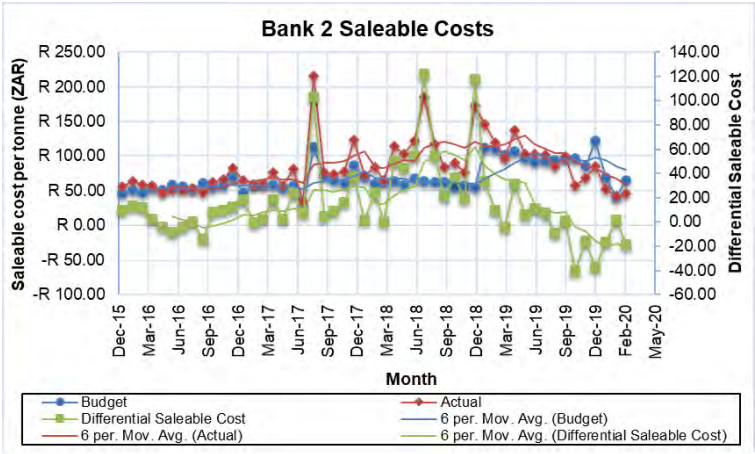
[SR5.2(viii), SR5.3(iii)]

The main plant was built in 1976 and is still in excellent condition, considering its age (see Figure 10-15). Similar care has been taken in other parts of the plant, as in the load out station, and all areas are is well maintained. Generally, plant maintenance is completed as planned and the plant has been upgraded in the required areas. For example, the rotary breaker internals have been changed out, dry screens and fine coal centrifuges have been updated to newer technology and old equipment has been stripped out.

10.13. Plant Capital Expenditure

With a nominal end of life in 2025, the capital planned is mainly stay in business capital. The Capex (Figure 10-16) is mostly screens and centrifuges. The recommencement of No 2 Seam feed will help with the plant balance between coarse and small circuits.



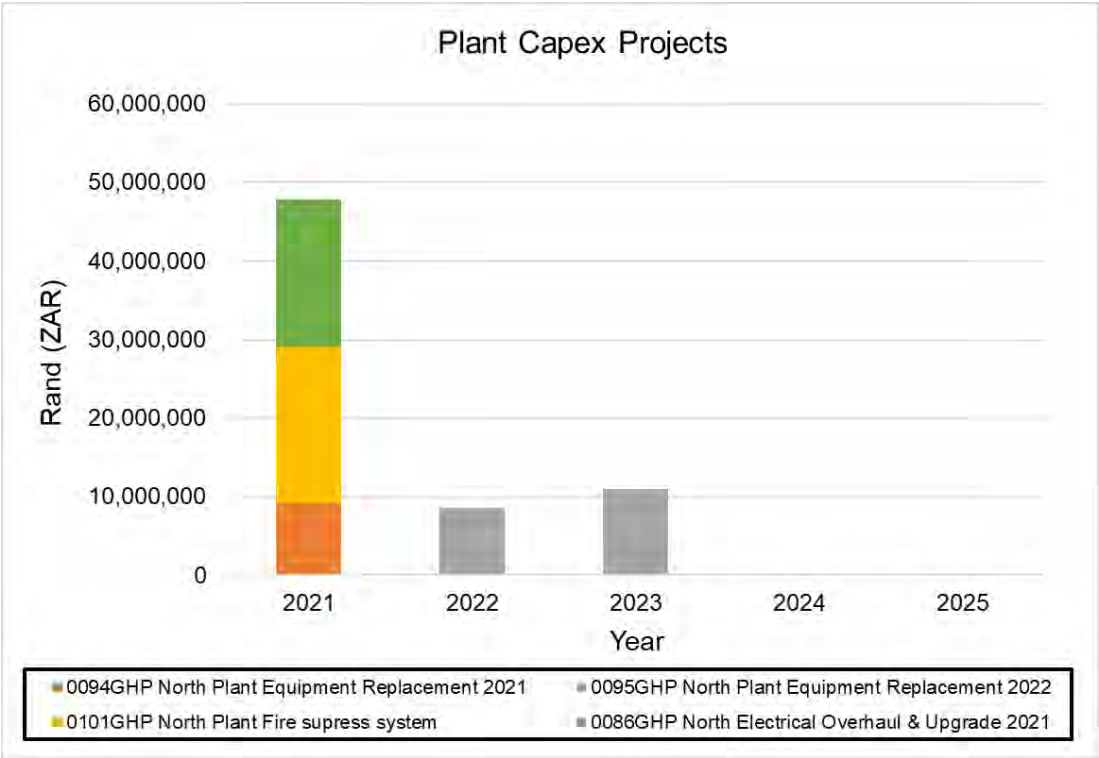


srk consulting	**GOEDEHOOP COLLIERY CPR** Unit Costs per Feed Tonne (top) and per Product Tonne (bottom)	Project No. 566657

Figure 10-14: Unit Costs per feed Tonne (left) and per Product Tonne (right)

srk consulting	**GOEDEHOOP COLLIERY CPR** Plant Ground Floor Condition	Project No. 566657

Figure 10-15: Plant Ground Floor Condition



srk consulting	**GOEDEHOOP COLLIERY CPR** Plant Capex	Project No. 566657

Figure 10-16: Plant Capex

10.14. Projected Requirements for Energy, Water and Process Materials

No specific plant power consumption is available, but this should have decreased with the reduction in electrical drives that has occurred over time.

Water is abundant and is of good quality.

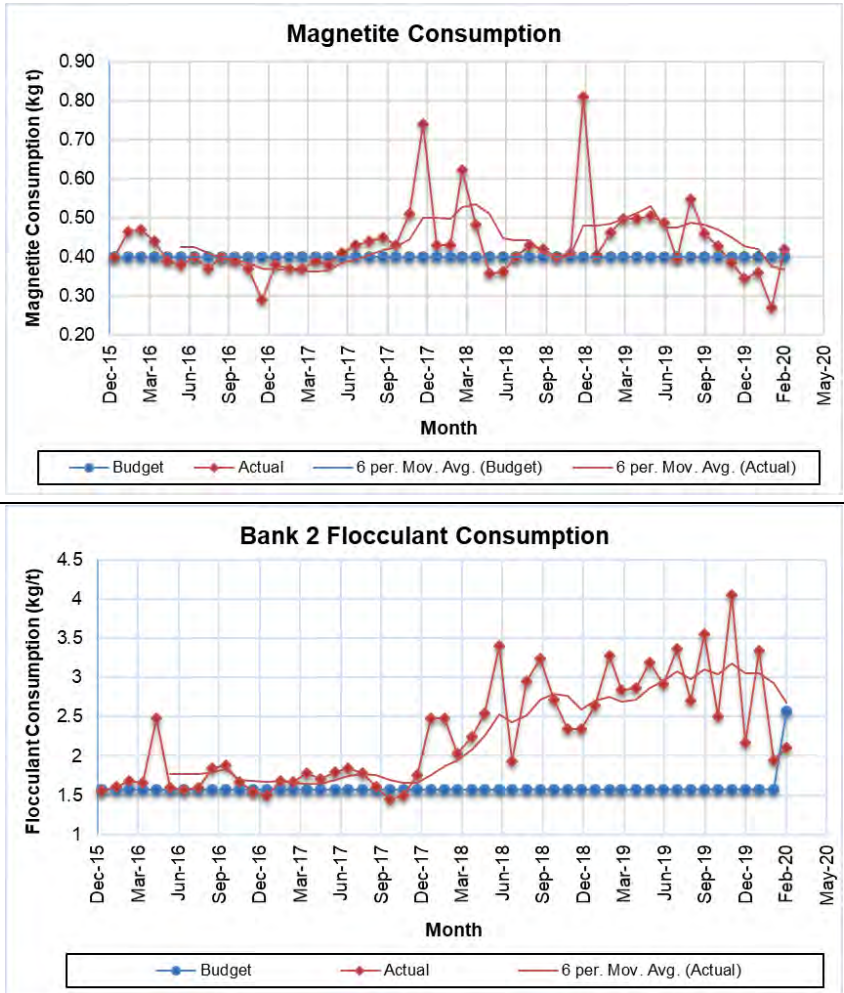
Magnetite is supplied by bulk trucks from Martin & Robson via Broodsnyersplaats siding; thus, supply is reliable under normal circumstances. The quality is standard, 90% -45 micron. The consumption is very good for a plant of this age, except for a few peaks which are still under 1 kg/t (Figure 10-17).

Flocculant consumption has increased since the beginning of 2018 as shown in Figure 10-17. This coincides with the No 4 Seam being fed to the plant on its own and reports that the plant feed has become finer. The reintroduction of No 2 Seam coal should see the consumption per tonne reduce.

10.15. Specific Coal Processing Risks

[12.10(h)(x)] [SR5.7(i)]

The primary risks associated with the plant are regarding sufficient coal feed with the correct economics, particularly in light of the potential mine closure. The plant bottlenecks have been substantially addressed and the plant is capable of processing more coal by changing the plant operational hours. Operating the plant on a Sunday would allow for better maintenance to be done during the week, less overtime and a potential cost reduction per tonne.



srk consulting	**GOEDEHOOP COLLIERY CPR** Total Magnetite Consumption (top) and Plant Flocculant Consumption (bottom)	Project No. 566657

Figure 10-17: Total Magnetite Consumption (top) and Plant Flocculant Consumption (bottom)

11. Coal Discard Storage Facilities

[SR1.1(ii), SR5.4(ii)]

11.1. Coal Discard Infrastructure

The current operational Goedehoop coal discard infrastructure consists of the following:

- Co-disposal Discard Facility consisting of coarse discard outer slopes that support an inner central slurry compartment;
- Penstock (original design) for current decanting supernatant water from the slurry pool;
- New elevated penstock planned for operations from 2020 until the end LoM (2025);
- Both penstocks decant into dissipators, toe trenches and silt traps, with excess water overflowing into the Return Water Dam complex; and
- Bankfontein Dam – earth-fill dam that caters for clean runoff from upstream of the processing plant.

Dormant and rehabilitated structures consist of the following:

- Bank 5 Discard Facility; and
- Schoongezicht Discard Facility.

11.2. Goedehoop Coal Co-Disposal Discard Facility Infrastructure and Operations

11.2.1. Co-Disposal Discard Facility Infrastructure

The Co-disposal Discard Facility consists of the following infrastructure:

- Coarse discard outer slopes that support the slurry compartment. Coarse discard is transported from the process plant via a conveyor belt into a discard bin thereafter haul trucks deliver to the facility. A coarse discard emergency by-pass chute is fitted to the discard bin, used when Andru Mining (the Discard Facility operator) cannot keep up with discard production;
- Central slurry compartment. Slurry is delivered hydraulically by two 200NB High-density polyethylene (**HDPE**) delivery pipes placed either side of the compartment;
- Penstock (original design) for decanting supernatant water from the slurry pool;
- New elevated penstock planned for operations from 2020 until the end LoM (2025) designed with standard concrete interlocking penstock rings. The outfall consists a single 450 NB spigot and socket reinforced concrete pipeline, Class 100 D, installed on Class A bedding;
- Both penstocks decant into dissipators, toe trenches and the silt trap/s, with excess water overflowing into the Return Water Dam complex; and
- The primary storm water runoff containment facility for the Bank 2 Discard Facility complex is the Return Water Dam.

Water from the Bankfontein Dam occasionally supplements the process plant water when the Return Water Dam water levels are low. The Bankfontein Dam is registered as a Category II dam.

11.2.2. Co-Disposal Discard Facility Management

The Goedehoop operation and management of the Goedehoop Discard Facility is conducted by both Goedehoop and Andru Mining. The Engineer of Record (**EoR**) is Isithelo Mining Products and Services (Isithelo). Andru Mining is responsible for day to day running and operation of the Discard Facility, and is contracted by Goedehoop to operate the Discard Facility and ensure the primary following objectives:

- Deposition of mine waste in accordance with LoM and greater design objectives;
- Deposition of mine waste in a safe manner as per Mine, Health and Safety Act and other mine safety objectives; and
- Cost effective methods are employed for the operation and development of the Discard Facility.

11.2.3. Co-Disposal Discard Facility Dirty Water Management

Dirty water management is controlled by:

- Dirty water exiting the penstock outfall pipelines flow into separate dissipators, then into the pollution control toe drains that direct the decanted water into the silt trap complex. The silt trap comprises two compartments, each fitted with pumps to deliver silted water back onto the slurry compartment. Cleaning of the silt traps is done mechanically with a front-end loader when the pumps are not operational. Excess water gravitates into the Return Water Dam complex; and
- Dirty stormwater runoff originating from the Discard Facility complex reports to the Return Water Dam.

11.3. Current Legal Requirements/Obligations

11.3.1. Legal Appointments

The Engineer of Record is Isithelo Technical Solutions (Pty) Ltd. The Contractor responsible for the Coal Discard Disposal is Andru Mining.

11.3.2. Monitoring

The following monthly discard monitoring is undertaken:

- Discard gas emissions, temperature, density and void ratio testing is conducted. Reviewed records indicate all historical test results are generally within pre-set acceptable limits.

The following monthly monitoring reports summarise the following:

- Topsoil stripping and cladding;
- Coarse discards / mixed discards deposition area and elevations;
- Deposition areas being developed;
- Freeboard;
- Elevation of discards around slurry compartment.; and
- Penstock and water levels.

Monthly topographical surveys are conducted of the Discard Facility.

Bi-annual surveys are conducted to monitor the following:

- Development and elevation of the coarse coal discards containment walls at the slurry compartment;
- Rate of rise of the slurry compartment.;
- Current Penstock elevation; and
- Remaining airspace capacity compared to the design.

11.3.3. Quarterly Audits

Quarterly audit inspections are held by Isithelo, with Andru Mining and relevant mine management personnel in attendance. The results are discussed in a formal meeting where minutes are taken, and actions and due dates recorded for corrective action. Findings and corrective actions from previous meetings are generally also addressed.

11.3.4. Annual Audit and Current Inspection

The annual 2019 audit inspection report prepared by Isithelo (Isithelo, 2019) was reviewed, which includes design and operation criteria information and covers visual inspections and surveillance. Pertinent SRK review comments from this annual audit and the SRK site inspection conducted on 23 June 2020, are presented below. The following findings were made in the 2019 audit inspection:

- "*Minimal concurrent rehabilitation has been carried out on the Discard Facility as remining activities are being conducted. After remining is completed and final side slope shapes have been developed, topsoil placement will be carried out. Erosion gullies have developed on some slopes".* This was recorded as a non-conformance.

  SRK: Some erosion gullies are present on the north-eastern slopes in the older grassed sections.

- "*The penstock tower is considered too high by Isithelo, and recommend it should be limited to 1.5 m. The concern is wind loading of the structure*". This was recorded as a non-conformance.

  SRK: The tower has not been reduced in height.

- "*A low spot observed lying against the discards wall due to the spigot discharge pipes installed too far apart. Spigot pipes should be installed every 50 m and rotated as required to ensure a central decant slurry pool"*. This was recorded as a non-conformance.

  SRK: At the time of the SRK audit, deposition was taking place along a short section of the south-western side of the slurry compartment. Ponding of water with a significant depth (estimate 0.5 m) was located in the centre of the slurry compartment with no obvious means of removal.

- "*Discharge pipes are too short and need to be extended further into the slurry compartment to stop erosion of the coarse discards wall edge and limit toe seepage"*. This was recorded as a non-conformance.

  SRK: Short platforms have been constructed at intervals along the berms to mitigate this erosion.

- *"Piezometers were installed on the outer walls in November 2019; however, readings have not yet been received from the Discard Facility Operator. Therefore, monitoring of the phreatic surface as (sic) not yet commenced".* This was recorded as not applicable by Isithelo in terms of compliance status.

  SRK: Vibrating wire piezometers have been installed (as per June 2020 quarterly meeting minutes, viz. AAC, 2020d). Contractor (Osimo) to meet with Operator for handover. Phreatic surface monitoring of all piezometers must be implemented so that this information can be used for slope stability analysis.

- "*The minimum required freeboard was determined by Isithelo in accordance with the National Water Act, Act No. 36 of 1998, Government Notice No. 704. The December 2019 survey indicates an available freeboard of 0.35 m which is unacceptable*". This was recorded as a non-conformance.

  SRK: The minutes of the June 2020 quarterly meeting indicate no concerns with freeboard.

- "*Coarse coal discards compaction satisfactory and meets target requirements*". Recorded as satisfactory in terms of compliance status.

  SRK: Monitoring reports indicate compliance.

- "*The minimum crest width of the coarse discards wall around the slimes compartment for the upstream section is required to be 55 m"*. This was recorded as a non-conformance.

  SRK: Updated information requested from the Company by SRK has not been received to confirm compliance with requirement. At the time of the audit, isolated sections of crest were being

widened to 55 m.

- "*Access roads were in good condition and meet requirements*". Recorded as satisfactory in terms of compliance status.

  SRK: From site observations the roads are in good condition and appear compliant.

- "*It is a requirement that the Discard Facility and other water containment facilities have a fence around them for access control*". This was recorded as a non-conformance.

  SRK: Isolated areas of fencing did not meet requirements.

- "*Toe trenches or drains for pollution control and diversion of dirty water to the RWD are being kept clear of silt*". Recorded as satisfactory in terms of compliance status.

  SRK: There was significant build-up of silt in the toe trenches observed during the SRK inspect, that reduces their effectiveness. Toe trenches desilting, using a TLB was observed during the SRK audit.

- "*The RWD silt trap comprising two compartments that operate alternately. One of the compartments has been full of reeds throughout 2019 and the outlet from this compartment is full of reeds*". This was recorded as a non-conformance.

  SRK: Northern silt trap compartment is silted up and covered with vegetation to the extent that it is not recognisable as a compartment. The second compartment is also silted up and needs cleaning out. This issue is recorded in various quarterly meeting minutes and more recently in the 11 June 2020 minutes for actioning by Andru Mining by 26 June 2020 .

- "*The RWD contains excess silt which has settled, and reeds are now growing over the silt. Cleaning has not been conducted for a long time (>10 years). A plan to remove the silt in the RWD is still required. Silt in the dam compromises it's designed storm water retention capacity*". This was recorded as a non-conformance

  SRK: RWD contains silt as a result of the silt traps not being cleaned out. This provides a medium for vegetation (reeds) to grow in, and the RWD design volume is therefore compromised

- "*Toe seepage is observed in the southeast and northeast toe areas. The seepage has maintained a consistent flow for the last 10 years with very little increase or reduction in the flow rate. The correct management of the slurry decant pool limits the amount of toe seepage generated*". Recorded as satisfactory in terms of compliance status.

  SRK: Importance of monitoring the phreatic surface is stressed, and this must be implemented. A monitoring programme must be designed. These results to be used for input into the stability analyses.

- *"General housekeeping was recorded as satisfactory in terms of compliance status*".

  SRK: Generally acceptable housekeeping practices, however issues have been raised in the Isithelo (2019) annual audit that must be addressed.

The following additional comments are made from the current inspection:

- Re-mined areas provide additional air space on the co-disposal discard dump for the planned LoM. A reduction in the demand for coal discard can potentially reduce this airspace. A study must be conducted to confirm sufficient airspace at the co-disposal discard dump for planned LoM.
- Coarse discard compaction specification requires minimum target dry density of 1 600 kg/m^3, where this is not achieved there is a risk of spontaneous combustion. No obvious areas were observed during the SRK site visit.
- Re-mining areas berms are constructed to a height of 1.6 m to 1.9 m as a safety measure to prevent the current dump trucks being used with a larger wheel size, from reaching the crest of slopes.

11.3.5. Consequence Classification of Structure

The Goedehoop Discard Facility and associated structures were classified with a Consequence Classification of Structure (**CCS**) rating of Major during a workshop held on 06 February 2017 (Isithelo, 2017a, 2017b, and 2017c). A risk rating was also conducted for comparison with the CCS rating, to assess the likelihood of a failure mode occurring. When the likelihood of failure (slope failure) is incorporated, a Major CCS rating still shows significant risk. According to the information made available to SRK, the following studies are still required for evaluating the Discard Facility and associated structures:

- Dam break analyses; and
- Stability analyses:
  - Static analyses;
  - Pseudo-static analyses; and
  - Dynamic analyses.

In addition to the above requirements, structures with CCS ratings of Major (Table 11-1) must have a suitably qualified competent person permanently on site. SRK is not aware of such a person at Goedehoop appointed for this specific purpose.

Table 11-1: CCS Rating for Goedehoop Structures

Structure	CCS Rating
Operational Structures:	
Bank 2 Discard Facility	Major
Bank 2 RWD	Major
Bankfontein Dam	Major
Dormant and Rehabilitated Structures:	
Bank 5 Discard Facility	High
Schoongezicht Discard Facility	Insignificant

11.3.6. Slope Stability Assessments

Discard Facility slope stability assessments were completed in February 2017 (Isithelo, 2017d), for the Co-Disposal Discard Facility. Critical cross sections on the north and east of the facility were identified based on width, height and the consequences of failure. The analysis showed that at the current elevation (in 2017) there is a very low risk of catastrophic failure where drained conditions are considered. It was found that the slimes are potentially liquefiable. Undrained scenarios indicated low factors of safety and potential failure due to rapid changes in loading conditions (for example, seismic events). However, due to the low rate of rise (±1.7 m per year) loading the discard is unlikely to be become undrained. Due to the low risk of earthquakes or underground collapse, liquefaction is also unlikely.

11.4. Legal Requirements/Obligations

The future legal requirements/obligations for the Discard Facility are to continue with the current requirements:

- Legal Appointments;
- Monthly Monitoring:
  - Gas, temperature, density and void ratio testing;
  - Topographical survey monitoring of the following:
    - Coarse discards / mixed discards deposition area and elevations;

    - Minimum 55 m crest width of outer coarse discard area;
    - Topsoil stripping and cladding;
    - Elevation of discards around slurry compartment;
    - Freeboard;
- Penstock and water levels;
- Quarterly Audits;
- Annual Audits; and
- Slope stability assessments.

11.5. Current and Future Coal Discard Production

The total volume of coarse and fine coal discards placed on the Goedehoop Discard Facility to the end of 2019 was 24 063 249 m^3 and 7 238 421 m^3, respectively. The Goedehoop North Colliery is currently placing, reclaiming and selling coarse coal discards while in parallel placing/depositing new discard material.

The average monthly tonnage of coarse discard deposited on the Discard Facility during 2019 was 147 467 tpm, totalling 1 769 604 t for the 2019 calendar year.

The average monthly tonnage of fine discard deposited on the Discard Facility during 2019 was 27 511 tpm, totalling 330 140 t for the 2019 calendar year.

The forecast production of coarse coal and fine coal discards is 9.2 Mt (5.7 Mcm) and 2.03 Mt (2.03 Mcm) respectively, to the end of LoM in 2025.

The design capacity of the coarse discard deposition area was reached in 2017 and a revised LoM plan has been developed, the Goedehoop North Expansion Project. Re-mining is providing additional airspace.

11.6. Future Co-Disposal Discard Facility Infrastructure Requirements

The forecast production of coarse coal and fine coal discards is 9.2 Mt (5.7 Mm^3) and 2.03 Mt (2.03 Mm^3) respectively, to the end of LoM in 2025.

The required 55 m crest width of the coarse discard dump outer slopes and continuing slopes stacking at the present slope angle, may result in a reduction of available volume for deposition in the central slurry compartment. This must be modelled to confirm sufficient planned LoM deposition air-space.

The revised LoM plan must be reviewed to confirm sufficient airspace for coarse and fine coal discard deposition capacity.

If there is a future reduction in re-mining of the coarse discards, the available air space for deposition will be reduced.

11.7. Coal Discard Disposal Closure Plans

The Mine closure objectives are outlined in the Goedehoop Colliery Bank 2 Mineral Residue Facility OMS Manual Edition 4, dated 11 November 2018 (AAC, 2018e). The objective at closure for the Bank 2 Discard Facility is that it has:

- A stable vegetation cover;
- Reduced infiltration through its discards;
- Optimised evapotranspiration by the peripheral trees around the Discard Facility perimeter and grasses on the top and sides of the Discard Facility;
- No dust pollution; and
- Must be smokeless (achieved through compaction).

11.8. Summary of Risks and Opportunities

[12.10(h)(x)] [SR5.7(i)]

The summary of risks identified by SRK during the inspection of the Discard Facility is provided:

- The Co-Disposal Discard Facility is an unlined facility (no HDPE liner) and can potentially attract significant financial requirements. Therefore, consideration should also be given to lining the proposed expansion of the Co-Disposal Discard Facility;
- The required 55 m crest width of the coarse discard outer slopes and keeping the slopes at the present slope angle, may result in a reduction of available volume for deposition in the central slurry compartment. This must be modelled to confirm sufficient deposition space;
- There is a risk of depleting the airspace of the facility before the LoM period is reached. The revised LoM plan must be reviewed to confirm sufficient airspace for coarse and fine tailings deposition capacity is available, when considering the planned extension;
- There is a risk of slope failure which can interrupt deposition onto the facility and plant production. A programme should be formulated for ongoing recording of phreatic surface in piezometers. Additional regular slope stability analyses should be conducted using actual phreatic surface information recorded;
- Reduction in airspace will create a risk of depleting the airspace before the LoM period is reached, where future sales reduction or termination of re-mined coarse discards occur;
- Where coarse discard compaction fails to achieve the minimum target dry density of 1 600 kg/m^3, spontaneous combustion of discard may occur;
- Discard Facility toe trenches effectiveness reduced due to silt and debris build-up and vegetation growth. This may potentially affect the stability of the toe and slope and contribute a potential pollution plume development;
- Silt traps effectiveness reduced due to silting up and vegetation growth. All compartments require desilting and kept clean to ensure effectiveness of this structure and minimise suspended solids entering the return water dam complex;
- RWD design storage capacity potentially compromised due to ineffective silt trap operations. Excessive siltation of the return water dam complex could make this facility non-compliant with Regulation 704., potentially resulting in dirty water spillage under major storm events;
- Risk of future return water not meeting the process plant's requirements due to high suspended solids increases the silt trap complex is operated incorrectly;
- Fencing around structures to be maintained to reduce potential public liability risks from injury or drowning;
- As the CCS ratings of the Discard Facility, RWD and Bankfontein Dam classify as Major, dam break analyses need to be conducted; and
- The hydrogeological study associated with the Discard Facility footprint extension suggests the extension does not require lining. Until this alternative risk-based approach for the extension is approved in writing by DWS, the Stay in Business (**SIB**) capital projected for the unlined extension could be significantly underestimated.

12. Infrastructure and Engineering

[SR1.1(ii), SR4.3(ii), SR5.4(i)(ii), SR5.6(viii)] [SV1.5]

12.1. Introduction and Background

SRK mechanical and electrical engineers held an MS Teams™ meeting with Goedehoop's Engineering Manager, Mr Adolph Nhlapo, and Reliability Engineer, Mr Moses Maredi, on the 17 June 2020.

SRK was required to restrict site visits, where possible, due to COVID-19 restrictions. The mine personnel indicated that the site visit be cancelled, so no on-site inspection of the engineering infrastructure was made. The information in this section of the CPR is based on the review of data received from the mine and information gained during discussions with the mine personnel.

Goedehoop has two operations:

- Goedehoop South (**GHS**), which was closed/decommissioned at the end of 2019, and
- Goedehoop North (**GHN**), which is fully operational.

At GHS, electrical infrastructure, primarily associated with security and access control operations, remains in operation. Serviceable underground machines and equipment at GHS were removed after operations ceased and reallocated, mostly to GHN. Serviceable surface plant and equipment will be reallocated. The surface operation will be demolished and auctioned. The first footprint reduction at Vlaklaagte has been completed.

Where applicable, these processes have been included in the budget and business plans.

With mining operations now scheduled to cease in 2024, there may be opportunities to reduce SIB capital, by reducing scheduled replacement and/ or overhauls. There would be an increase in operating cost, associated with additional spares and maintenance, but this would be offset by the reduced SIB capital. An analysis and review are currently in progress.

The surface infrastructure is shown in Figure 12-1 and Figure 12-2.

12.2. Mechanical Infrastructure

GHN is a well-developed, mature coal mining operation, with plant, equipment, machines, and infrastructure to support the operational requirements.

Infrastructure includes substations and electrical reticulation, ventilation plant, mine access, underground mining machines, conveyors and associated underground infrastructure, surface infrastructure including coal handling and processing plant, stockpiles, bunkers, silos, bins and MRD, with associated water reticulation, pumping, service dams and water treatment; changing facilities, offices, engineering workshops and stores.

The Colliery personnel stated that the current budget and business plan provides for current and planned installed infrastructure to meet operational requirements. All accommodation is off site. SRK noted the following:

- The Goedehoop North MRD is being managed, in part, by the sale of some coal to a third party;
- SIB capital for the expansion of underground fire suppression systems has been deferred to 2021 and 2022;
- Operational control is decentralised. A programme is underway to centralise overall operational control;
- Bulk supplies, fuel, and water are secure, and contracts are in place;
- Back-up generators for shafts, control room, and essential services are in place;
- Proximity detection systems are being implemented for mobile machines and pedestrians;
- Ventilation redundancy for Simunye 4 will be addressed as part of the Brown 2 expansion;
- The budget and business plans have all the required support infrastructure in place to sustain budgeted and planned production;
- The colliery reports no current issues with the Inspectorate of the DMRE; and

- Plant and equipment are reported to be in good working order, and housekeeping in accordance with accepted good practice.

No material issues or significant inherent risks were identified, indicated, or reported in terms of infrastructure, machines, plant, and equipment.

12.2.1. Main Offices, Training Centre and Stores

GHN has a complete office complex, training centre, stores, change rooms, security facilities and infrastructure.

12.2.2. Workshops

GHN has complete and fully equipped engineering workshop facilities and infrastructure.

12.2.3. Coal Processing Plant

GHN has a complete coal handling and processing plant and associated plant, equipment, and infrastructure.

12.2.4. Mining Equipment

[SR1.1(ii)]

Mining is from six sections with mining equipment comprising continuous miners, shuttle cars, feeder breakers, LHDs, conveyors, roof bolters, service vehicles and associated plant and infrastructure.

12.3. Electrical Infrastructure

[12.10(h)(x)] [SR1.1(ii), SR4.3(iii), SR5.4(ii)]

12.3.1. Bulk Power Supply

The Goedehoop operations are supplied with bulk power from Eskom, at various PODs. The completion of mining at Goedehoop South has led to reduction of power consumption at certain take-off points, with either termination of the power supply agreements or reductions in the required Notified Maximum Demand (NMD) being implemented. Table 12-1 provides an overview of the current PODs to the Goedehoop operation, including the current and future requested maximum demands, and approximate six-month historical averages of the measured peak demands from October 2019 through to March 2020.

Table 12-1: Goedehoop Colliery – Bulk Power Supply Points

Bulk Power Supply Points of Delivery	Current NMD (MVA)	Future Requested NMD (MVA)	Historical Six-Month Peak Demand (MVA)
Goedehoop North:			
New Schoongezicht	5.5	2	0.8
Bank Colliery	10	10	5
Blesbok 1	1	0.1	0.05
Simunye	8	10	7
Goedehoop South:			
Water Pumps	0.12	0.12	0.08
Slope	7.5	0.5	0.2
Springbok 2	0.65	0.65	0.15
Export Substation	29	16	1.5[1]
Anglo Workshops	1.5	1.5	0.6

Note:
1. The peak demand measured at the Export Substation over the past six months has dropped significantly from around 12 MVA in November 2019 to 1.5 MVA during March 2020.

The GH consumer substations have two 10 MVA transformers, which provide a redundant/ firm supply.

No material issues were identified with the PODs feeding the Goedehoop operation, which would be expected to have an adverse effect in meeting the production and operational plans.

No anomalies were identified with the review of the Eskom bills provided for the period of August 2019 to March 2020. The power consumption for the bulk supply points is in line with the production focus at the North mining area, and the Southern mining area power requirements tapering off. An opportunity exists to further reduce the NMD of the Export Substation which has the potential to achieve cost savings. It was noted on the power utility bills over the high demand season, that reactive power charges have been incurred; these costs could be reduced/eliminated with improvement of power factors at the sites.

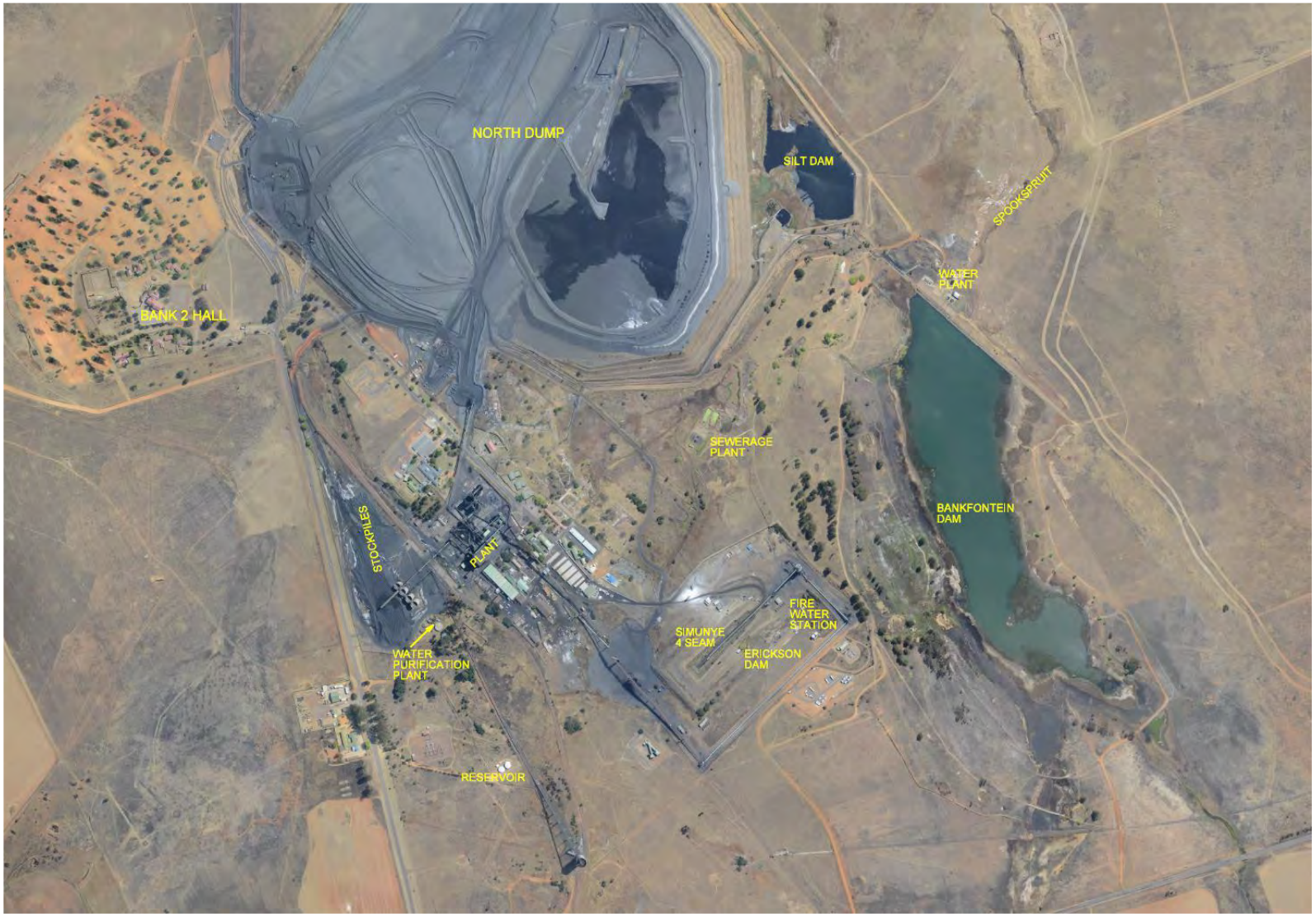
A power supply risk to the Goedehoop operation is the effect of outages/ load curtailment on the production of the mine, with Eskom having recently implemented national load shedding. The shortfall in the national grid generation availability is not expected to improve within the short term with intermittent power outages due to load shedding expected.

12.3.2. Electrical Reticulation

Site medium voltage reticulation is at 11 kV and 6.6 kV, with information provided that the installed equipment is suitable to support the operational requirements. No issues were identified.

The Company has an energy and carbon dioxide management policy in place (ECO_2MAN) driving the required energy efficiency improvements and carbon emission reductions across its operations (AAG, 2018). The policy is implemented in all new projects, upgrades, and renovations. Typical electrical requirements include the specification of high efficiency equipment, power reduction through process control optimisation, time of use consideration and installation of power factor correction equipment.

Back-up power generators are provided on site to cater for the offices, control and IT infrastructure requirements. There are backup batteries on the essential systems such as gas monitoring and telephones. No mining loads are supplied with emergency power, with personnel able to exit the underground operations, on foot, via the decline shafts. There is sufficient ventilation available for this.



srk consulting	**GOEDEHOOP COLLIERY CPR** Goedehoop North Surface Infrastructure Overview	Project No. 566657

Figure 12-1: Goedehoop North Surface Infrastructure Overview

srk consulting	**GOEDEHOOP COLLIERY CPR** Goedehoop North Surface Infrastructure Layout	Project No. 566657

Figure 12-2: Goedehoop North Surface Infrastructure Layout

12.4. Communications and Control

The Goedehoop operation has a comprehensive IT system installed, consisting of a surface and underground fibre optic network providing the data connection between the control room, mining areas, substations and offices. Server systems operating the production management, asset management, maintenance and finance systems are installed with connection to the remote stations via the fibre network.

Production voice communication is primarily achieved with Voice over Internet Protocol (**VoIP**) telephones, both fixed and wireless. A radio system is installed as back-up with a leaky feeder providing the underground radio link.

Programmable Logic Controller (**PLC**) and Supervisory Control and Data Acquisition (**SCADA**)-based control system are installed for environmental monitoring, equipment control, monitoring and protection purposes.

No concerns were identified with the communications and control systems in place at Goedehoop, with the current setup adequately supporting the mining operation.

12.5. Security and Access Control

Fully equipped, functional, and staffed security and access control systems are in place.

Increased security has been implemented at higher risk areas such as cable yards, and includes clear-view fencing, long-range infrared cameras, drone monitoring and armoured response vehicles.

12.6. Maintenance Management Systems

Maintenance management is applied in accordance with organisational policies, procedures, and standards. The Company's Structural Inspection and Maintenance Management System (SIMMS) is applied across all operations, including Goedehoop. The mine currently operates the computerised Ellipse Maintenance Management System. However, this will be replaced by the SAP system during the current year. Training in the new system is in progress. Some issues associated with roll-out of the SAP system are anticipated in terms of the potential inexperience on the new system.

Condition monitoring and inspection process and procedures are in place, both internally and by contractors. There are also external maintenance contracts, such as injection tests on medium voltage switchgear and oil analysis on transformers, as per the Company's wide procedures.

The maintenance team comprises: Section Engineers; Reliability Engineer; Senior Engineering Planning Officers; General Engineering Superintendents; Assistants, Foremen; Chargehands; Condition Monitors; and Artisans.

12.7. Engineering Capital and Operating Costs

[SR4.3(vii), SR5.6(iii)]

12.7.1. Capital Costs

[SR5.6(iii)]

The SIB and Expansion capital requirements for the budget and plan years is shown in Table 12-2[11] (AAC, 2020c). In 2018 and 2019, SIB was ZAR220m and ZAR351m, respectively[12] (AAC, 2018f and AAC, 2019u, respectively). On the basis that mining operations cease during 2025, there appear to be opportunities to reduce SIB capital.

[11] Goedehoop Capital Budget 2021 -2024 - Received 20200723.xlsx
[12] Profit Forecast Master 2018.xlsx, and Profit Forecast Master 2019.xlsx

Table 12-2: Goedehoop Capital Cash Flow

Item	Units	2021	2022	2023	2024	2025	Total
Brown 2 Development	(ZARm)	12.5	0.0	0.0	0.0	0.0	**12.5**
Mining Machine Overhauls	(ZARm)	78.7	87.9	28.9	0.0	0.0	**195.5**
Occupational Health and Safety Programmes	(ZARm)	19.5	6.0	6.3	0.0	0.0	**31.8**
Electrical, Control and Instrumentation Infrastructure	(ZARm)	16.7	0.0	0.0	0.0	0.0	**16.7**
Infrastructure, plant and equipment replacement	(ZARm)	19	3.0	2.1	0.0	0.0	**24.1**
Desilting of the return water dam and storm water management	(ZARm)	16.0	0	0	0	0	**16.00**
Total SIB and Expansion Capital	**(ZARm)**	**162.4**	**96.9**	**37.3**	**0.00**	**0.00**	**296.6**

12.7.2. Operating Costs

[SR5.6(iii)]

Table 12-3 is a summary of the historical operating costs based on the historical production as indicated[13] (AAC, 2020g), while Table 12-4 is the forecast operating cost over the next five years[14] (AAC, 2019f and AAC, 2020f), modified by coal production, Scenario 2[15] (Ukwazi, 2020b).

It may be noted that unit costs, for RoM production, increase on average by 15% for 2018 - 2019, but reduce by 9% for the same period for saleable tonnes, mainly due to the sale of domestic coal from the Goedehoop North MRD.

RoM production reduces by 1.4 Mt, 24%, in 2020, mainly due to the closure of GHN (Vlaklaagte). Production cost per RoM tonne reduces by a similar percentage. There are nominal increases for 2012 - 2023, but substantial increases in 2024, when production falls by 45%.

The expense levels indicate sufficient funding to support the Business Plan.

The factors that have an influence on operating costs at Goedehoop (and most other mines) are:

- The cost of electricity and fuel. Except for efficiency improvements, these are for the most part beyond the control of the mine;
- Salaries and wages, which should increase approximately in line with the Business Plan and inflation;
- Machinery repairs and maintenance. Major overhauls and replacements are provided for in the SIB and Expansion capital;
- Mining or other contractors' expenses may be controlled by firm contracts; and
- Other expenditure such as explosives and consumables are generally sourced locally and are not affected significantly by foreign currency exchange rate fluctuations.

[13] Refer 555880-Goedehoop Historical Results.xlsx
[14] Refer Budget 2020-2024 Goedehoop - Technical Assurance V1.0.ppt and 00 Profit Forecast Master 2020.xlsx
[15] Refer Ukwazi Scenario 2 - Goedehoop North.xlsx

Table 12-3: Goedehoop Historical Engineering Operating Costs

Item	Units	2017	2018	2019	2020
Labour	(ZARm)	355	316	442	498
Stores - Maintenance	(ZARm)	55	53	70	39
Working Cost Suspense (**WCS**)	(ZARm)	301	305	335	151
Power and water	(ZARm)	173	167	180	113
Sundry	(ZARm)	339	366	430	371
Total Engineering Operating Cost	**(ZARm)**	**1 224**	**1 208**	**1 457**	**1 172**
Total Engineering Operating Cost	**(ZARm/t)**	**168**	**186**	**247**	**260**

Note:
1. The figures for 2020 are based on actual data for January – August and forecast estimates for September – December.
2. Historical tonnes for 2020 are the sales tonnes estimate.
3. For the labour, stores and sundries items, 2019 costs were used and escalated to arrive to the 2020 costs.

Table 12-4: Goedehoop Forecast Operating Costs

Item	Units	2021	2022	2023	2024	2025
Labour	(ZARm)	510	538	570	516	184
Stores - Maintenance	(ZARm)	39	40	38	27	10
WCS	(ZARm)	157	162	150	108	38
Power and water	(ZARm)	106	97	89	91	32
Sundry	(ZARm)	430	426	429	418	149
Total Engineering Operating Cost	**(ZARm)**	**1 242**	**1 263**	**1 277**	**1 160**	**413**
Total Engineering Operating Cost	**(ZARm/t)**	**254**	**255**	**259**	**243**	**243**

Note:
1. Table as per cost model "ISI LoM cost model 2021.xls".
2. Base date January 2021 real costs.
3. Cost forecast 2025 is pro rata, based on LoM forecast ROM.

It is noted that pending legal action by Eskom against NERSA may result in additional increases in future power costs, impacting the forecast operating costs. Eskom is known for requesting tariff increases that are significantly above inflation. It is in the public domain that Eskom has taken NERSA to court over the ZAR69 billion bailout that the government of South Africa gave to Eskom, which NERSA deducted from Eskom's approved revenue for the current tariff period, which ends in March 2022. The Johannesburg High Court has on 28 July 2020 found that NERSA acted unlawfully in doing this, and that the money must now be reinstated to Eskom's revenue in a phased manner over a period of three years. This may lead to tariff hikes of about 15%, which may take effect as early as April 2021. NERSA indicated at the time that they will appeal against a High Court ruling judgement on its Eskom tariff decisions. NERSA was granted leave to appeal the High Court ruling in October 2020, with NERSA indicating that the appeal will be heard by the Supreme Court of Appeal. The matter is important for the country as a whole, as higher tariff increases will put more financial strain on the customers, especially high consumption customers such as the mines.

12.8. Risks

[12.10(h)(x)] [SR5.7(i)]

The reader is referred to the risk assessment section (Section 20) of this CPR for further identified risks and their mitigations.

12.9. Conclusions

The mine's infrastructure is substantial and appears adequate to provide for operational requirements.

The agreed NMD is sufficient to supply the power requirements of the mine.

Budgeted and planned capital appears sufficient to meet operational requirements.

With mining operations now scheduled to cease in 2025, there may be opportunities to reduce SIB, by reducing scheduled replacement and/or overhauls. There would be an increase in operating cost, associated with additional spares and maintenance, but this would be offset by the reduced SIB capital. An Analysis and Review has been done by SRK, and proposed reductions have been reflected in Table 12-2 above.

No material infrastructure maintenance or housekeeping issues were reported or discussed.

13. Logistics

[SR5.4(iii)]

Goedehoop supplies coal to the export market through the RBCT. Coal is first extracted from the four CM underground mining sections at Simunye Shaft then through the feeder breakers before being transported by shuttle cars to the trunk conveyors. From the trunk conveyors, coal is transferred to the incline conveyor which in turn delivers it to the surface RoM silo. From the RoM silo, the coal is fed into the mineral sizer for breaking the coal to minus 100 mm. The coal is then delivered by three conveyors to the RoM stockpile.

Coal is reclaimed from the RoM stockpile by means of vibrating feeders and through the coal processing plant for washing and preparation. Reference should be made to the coal processing section of this CPR for more information on the coal washing and preparation. The product coal is then conveyed to either the product silos or directly to a stockpile adjacent to the silos. The product coal is reclaimed from the silos or stockpile using feeders and assisted by mobile equipment where necessary, via an automatic sampler, to the load-out silo at the RLT, for direct loading onto trains for dispatch to RBCT.

13.1. Risks and Opportunities

[12.10(h)(x)] [SR5.7(i)]

Evacuation from underground is a system bottleneck as currently there is only a single belt removing coal to surface. This may be mitigated once mining the No 2 Seam commences, as this coal will be evacuated via a different belt.

The mineral sizer immediately out of the silo and the belts to the RoM stockpile cannot clear the tonnage if all underground sections are running. A possible solution is to speed up the belts from the sizer, or even to stage maintenance in the underground sections to reduce peak loading.

14. Occupational Health and Safety

[12.10(h)(viii)] [SR5.2(viii)]

14.1. Introduction

Due to the nature of mining operations, exposure to various hazards exists that may cause harm to employees and contractors. The prime responsibility for health and safety rests with the mine management.

The MHSA requires that the employer must be able to prove risk reduction and risk control using various forms of risk assessments (baseline risk, issue-based risk, continuous risk assessments etc.).

The consensus in the South African mining industry is that zero harm is achievable.

While significant progress has been made in improving safety performance in the South African Coal Mine industry in recent years, additional safety improvement plans are required to achieve an environment of zero harm.

14.2. Occupational Hygiene and Health

Occupational health is aimed at the protection and promotion of the health of workers by preventing and controlling occupational diseases and accidents by eliminating conditions hazardous to health at work. The aim is to minimize all occupational hygiene exposures to below OELs as contemplated in all mandatory CoPs and Regulation 9.2 of the MHSA.

The working environment for the Company is similar to all opencast and underground collieries and the identified occupational health risks are also similar. Identified occupational health risks include airborne pollutants (dust), noise-induced hearing loss (**NIHL**) and heat-related illnesses.

14.2.1. Occupational Risk Management and Controls

Health, Safety and Environment (**HSE**) risk assessment processes are applied equally to matters of occupational hygiene and health. In addition to the risk assessment procedures, the Company has all the HSE management system documentation in place with respect to:

- Hazards to health to which employees may be exposed to be identified and recorded;
- The risks to health to be identified and assessed;
- Control measures are required to eliminate or control any recorded risks at the source;
- As far as the risk remains, the following should be in place;
    - Where possible personal protective equipment is provided; and
    - A programme to monitor the risk to which employees may be exposed has been instituted.

14.2.2. Occupational Hygiene and Health System for Mines

The Company has implemented occupational health control systems as set out in Table 14-1 and complies with the requirements in all material aspects.

Occupational health risks to which employees at the mine may be exposed are summarised in Table 14-2.

Table 14-1: Summary of Occupational Hygiene/Health Legal Aspects for the Company

Aspect	Requirements	Status
Pollution Sources: drilling, blasting, cutting, loading, hauling, crushing and process plant.	MHSA Section 11 (1) requires: Hazards to health to which employees may be exposed to be identified and recorded; The risks to health to be identified and assessed; Control measures are required to eliminate or control any recorded risks at the source; and as far as the risk remains, the following is required: Where possible personal protective equipment to be provided; and A programme to monitor the risk to which employees may be exposed has to be instituted.	Employees continuously exposed to dust containing Silica concentration in excess of 18% are at risk of contracting the lung disease silicosis. Coal seam Silica content: 3 to 5%. The Occupational Hygiene Baseline Risk Assessment will have to be reviewed for the proposed underground operations and the required controls identified.
Irrespirable Atmospheres	MHSA Section 16.2 (2) If the risk assessment in terms of Section 11 shows that there is a significant risk that employees may be exposed to irrespirable atmospheres at any area of the mine, the employer must ensure that no person goes into such area without a body-worn self-contained self-rescuer which complies with the SABS 1737 specifications.	No surface operations identified with irrespirable atmospheres. All underground employees are issued with approved self-contained self-rescuers.
Occupational Hygiene Measurements	MHSA Section 12 (1-3) The manager must engage the part-time or full time services of a person qualified in occupational hygiene techniques to measure exposure of health hazards at the mine.	The mine has an appointed Ventilation/Occupational Hygienist.
Mandatory Reports to the Regional Principal Inspector (DMRE)	MHSA Section 9.2 (7) The employer must submit to the Regional Principal Inspector of Mines the following reports on occupational measurement results: 21.9 (2) (a) – Airborne pollutants personal exposure; 21.9 (2) (b) – Heat stress exposure; 21.9 (2) (c) – Cold stress exposure; and 21.9 (2) (d) – Personal noise exposure.	These reports are compiled and submitted to the Principal Inspector on a quarterly basis.
System of Medical Surveillance	MHSA Section 13 (1-8) The manager must establish and maintain a system of medical surveillance of employees exposed to health hazards. A record of medical surveillance for each employee exposed to health hazards must be kept; The records are to be retained until the mine closes; The medical surveillance programme should ensure that the baseline health of every employee entering the workforce is recorded, that their state of health is monitored throughout the duration of their employment. The program should diagnose early signs of ill health, which have to be treated and investigated; All diagnosed cases are thoroughly investigated to determine if the illnesses are worked related or inherited cases before the cases are certified; and Certified cases are referred to the certification board for possible compensation.	The Mine makes use of the Witbank Mine Hospital to conduct medical surveillance of employees.
Annual Medical Report	MHSA Section 16 (1) (2) Every occupational medical practitioner at a mine must compile an annual report covering employees at that mine, giving an analysis of the employees' health based on the employees' records of medical surveillance, without disclosing the names of the employees.	Annual reports are compiled by the Witbank Hospital occupational medical practitioner (OMP).

Table 14-2: Identified Occupational Health Risks

Source	Health Hazard	Occupational Exposure Limit (OEL)	Risk
Coal Dust	Inhalable ≥10 µm Respirable ≤10 µm	10 mg/m³ 2.0 mg/m³	Upper respiratory diseases Coal miners Pneumoconiosis, Chronic Bronchitis, Emphysema. Compensation claims
Coal Dust	Crystalline Silica	0.10 mg/m³ (New milestone 0.05 mg/m³)	Silicosis Compensation claims
Welding	Metal fumes	5.0mg/m³	Lung diseases Kidney damage
Diesel exhaust emissions (Enclosed areas, workshops etc.)	Gases		
	Carbon Monoxide	30 ppm	Poisonous
	Nitrogen Oxide	25 ppm	Poisonous
	Nitrogen Dioxide	3 ppm	Poisonous
	Particulate Matter		
	Diesel Particulate Matter (**DPM**)	DMRE milestone: 0.16 mg/m³	Carcinogenic (Cancer) Compensation claims
Mine fires	Gases		
	Carbon Dioxide	5 000 ppm	Asphyxiation/toxic
	Carbon Monoxide	30 ppm	Poisonous
Thermal	Heat Cold	WB> 27.5°C DB > 37.0°C ECT ≤ 5.0 > - 30	Heat stress Heat stress Cold stress
Noise	>85 dB for duration of 8 hours	85 dB	Noise induced hearing loss Compensation claims
Radiation (weightometers)	Ionizing radiation	20 mSv per annum	Cancer
UV radiation (environment)	Sun burn	-	Skin disorders
Power tools and Trackless Mechanised Mining (**TMM**) vehicles	Vibration	-	Musculoskeletal disorders and neurological effects
TMM vehicles	Ergonomics	-	Discomfort, fatigue and musculoskeletal disorders
Coal Dust	Inhalable ≥ 10 µm Respirable ≤ 10 µm	10 mg/m³ 2.0 mg/m³	Upper respiratory diseases Coal miners Pneumoconiosis, Chronic Bronchitis, Emphysema. Compensation claims
Coal Dust	Crystalline Silica	0.10 mg/m³ (New milestone 0.05 mg/m³)	Silicosis Compensation claims
Welding	Metal fumes	5.0 mg/m³	Lung diseases Kidney damage
Diesel exhaust emissions (Enclosed areas, workshops etc.)	Gases		
	Carbon Monoxide	30 ppm	Poisonous
	Nitrogen Oxide	25 ppm	Poisonous
	Nitrogen Dioxide	3 ppm	Poisonous
	Particulate Matter		
	Diesel Particulate Matter (DPM)	DMRE milestone: 0.16 mg/m³	Carcinogenic (Cancer) Compensation claims
Mine fires	Gases		
	Carbon Dioxide	5 000 ppm	Asphyxiation/toxic
	Carbon Monoxide	30 ppm	Poisonous
Thermal	Heat Cold	WB> 27.5 °C DB > 37.0 °C ECT ≤ 5.0 > - 30	Heat stress Heat stress Cold stress
Noise	>85 dB for duration of 8 hours	85 dB	Noise induced hearing loss Compensation claims
Radiation (weightometers)	Ionizing radiation	20 mSv per annum	Cancer
UV radiation (environment)	Sun burn	-	Skin disorders
Power tools and TMM vehicles	Vibration	-	Musculoskeletal disorders and neurological effects
TMM vehicles	Ergonomics	-	Discomfort, fatigue and musculoskeletal disorders

Note:
WB: wet bulb temperature; DB: dry bulb temperature; ECT: equivalent chill temperature.

14.2.3. Occupational Hygiene Measurements

Airborne Pollutants – Dust

Coal dust is the main airborne pollutant in Coal Mines and the cause of the Occupational Diseases such as Coal Workers Pneumoconiosis (**CWP**) and Chronic Obstructive Airway Disease (**COAD**).

The main sources of coal dust at underground and opencast operations are CMs cable handling activities, shuttle cars, stone dust tractors, removal of overburden, drilling, blasting, crushing and transport of ore via roadways. The dust measurement results for 2017 to 2020 for the Company (surface and underground) are set out in Table 14-3.

Table 14-3: Goedehoop Dust Measurement Results

Reporting Area	2017	2018	2019	2020
Coal Dust				
Total samples	223	135	451	307
Total samples > OEL (OEL: 2.0 mg/m³)	10 (4.5%)	33 (24%)	133 (29%)	136 (44%)
Silica Dust				
Total samples	223	135	451	288
Total samples > OEL (OEL:0.10 mg/m³)	6	9	23	12 (4.0%)

Note:
1. Individual measurements exceeding the OEL.
2. The reason for the increase in dust samples in 2019 was as a result of changes to the DMRE sampling guidelines.
3. The figures were consolidated for 2020.

SRK Comments

There has been an increase in samples exceeding the OELs from 2017 to 2020. Most of the measurements exceeding the OELs were measured at the CM areas. Compared with gold mine dust, the silica content in coal mine dust is regarded as a low health hazard (no silicosis cases were recorded for the Goedehoop operations).

Dust Management Plan

The proposed dust prevention programmes include the following:

- Ventilation (dilution);
- Continues miners fitted with water sprays;
- Dust suppression in haul roads (Dust-A-Side);
- PPE: face masks for COVID-19 virus also prevent dust inhalation;
- Entry examinations are followed by watering down of all access roads;
- Tipping points equipped with water sprays; and
- Extraction fans in specific areas.

Airborne Pollutants - Diesel Particulate Matter (DPM)

On 12 June 2012, the World Health Organization (WHO) classified diesel exhaust emissions as a Class 1 Carcinogen (WHO IARC, 2012). Employees exposed to airborne Diesel Particulate Matter (**DPM**) in excess of the OEL are susceptible to contracting DPM-related cancers. Underground trackless mining areas are considered a prevalent source for the emission of DPM. Exposure above the defined OEL can result in employees contracting certain types of cancer.

The DPM measurement results for 2017 to a consolidated 2020 for the Company operations (surface and underground) are set out in Table 14-4.

Table 14-4: Diesel Particulate Measurement Results

Reporting Area	2017	2018	2019	2020
Total samples	0	2	0	2
Number of samples exceeding OEL (OEL: Target 0.16 mg/m³) Total Carbon	0	0	0	0

Note:

1. The figures were consolidated for 2020.

SRK Comments

In terms of the annual results, the two measurement results in 2018 and 2020 did not exceed the OEL. No measurements were taken in 2017 and 2019.

The DPM quantities must be monitored against the defined OELs on a regular basis and recorded in the monthly and annual management reports. Where the measurements are found to exceed the defined OELs, supplementary ventilation via booster fans or replacement of diesel engines with the latest low emission Euro specification engines may be required.

Airborne Pollutants – Welding fumes

Although welding fumes have been identified as a health hazard, measurement results are below OEL of 5.0 mg/m³.

Noise Exposure

The Company routinely monitors noise exposure at the Goedehoop operations. Most underground employees are exposed to noise levels between 85 and 105 dB(A) over an eight-hour time weighted average (**TWA**). In terms of the 2019 quarterly reports, the highest recorded instantaneous noise level did not exceed 103 dB(A). This is the protection level [103 dB(A)] of the current hearing protection devices (HPDs).

The following controls are in place to prevent employees from contracting NIHL:

- All areas with noise levels in excess of 85 dB(A), have been demarcated as noise zones;
- Employees must wear hearing protection devices (**HPD**) in noise zones. The HPDs can reduce noise levels from a maximum of 103 dB(A) to below 85 dB(A); and
- All mining equipment noise levels will not exceed the DMRE milestone limit of 107 dB(A).

Radiation

The weightometers (Scale, Troxler gauge, etc.) in the process operations are nuclear-sourced. In terms of the Occupational Hygiene reports, radiation is not included in the measurement results nor is it recorded in the annual medical reports. Although weightometer radiation does not pose a significant hazard, radiation levels should be monitored on a quarterly basis. Radiation levels should not exceed the maximum permissible level of 20 mSv per annum.

Heat and Cold Stress

In terms of the average surface mid-summer temperatures in the eMalahleni area which average between 25.0˚C and 30.0˚C dry bulb and the shallow mining depths (+-100m) in the underground collieries (average rock temperatures: 22.0˚C), there is no risk of heat disorders for the surface and underground operations.

The mid-winter surface temperatures of 1.0˚C can cause cold stress. Thermal clothing is provided to employees when the temperature approaches the action level of 6.0˚C.

14.2.4. Occupational Health Surveillance

The Company compiles annual health surveillance statistics as shown in Table 14-2.

Although the number of diagnosed CWP cases has decreased from 2017 to 2020, the dust measurement samples exceeding the OELs have increased from 2017 to 2020. This can be ascribed to occupational diseases having long lagging periods before there are any symptoms of a disease. Despite having a very good NIHL Management

Programme, the increase in diagnosed NIHL cases from 2017 to 2019 is an example of the long lead time before the presentation of symptoms.

Table 14-5: Occupational Health Surveillance Statistics

Item	2017	2018	2019	2020
NIHL Diagnosed cases	1	Results not available	5	1
Silicosis Diagnosed cases	0		0	0
COAD	4		2	0
CWP diagnosed	24		5	1
Occupational Cardio-respiratory Tuberculosis (**TB**)	5		1	0

It is possible to record occupational tuberculosis cases in the health surveillance statistics. However, from an occupational health point of view, tuberculosis should not be classified as an occupational health illness. Pulmonary tuberculosis is caused by bacteria and therefore coal dust, or any dust for that matter, cannot cause tuberculosis. Many employees contract Tuberculosis when they have low immune systems, due to underlying illnesses such as HIV/Acquired immunodeficiency syndrome (**AIDS**) and/or silicosis. Due to the low silica content in coal seams (3 to 5%), there should be no risk of any silicosis-related tuberculosis cases.

All diagnosed occupational health disease cases are thoroughly investigated to determine if the illnesses are work related, inherited or non-occupational illnesses before the cases are submitted for certification and compensation.

14.3. Safety

14.3.1. Health and Safety Policy

The Company has a Safety, Health, Environment and Quality (SHEQ) policy in place (updated February 2020) (AAC, 2020e) and gained OSHAS 18001 and ISO 14001 certification.

SRK understands that the Company has embraced all the key aspects that would be needed to ensure that the operations are operated and managed effectively in these areas.

14.3.2. Safety Requirements

The safety aspects and requirements are for the Company are summarised in Table 14-6; the table shows that the Company complies with all safety requirements.

14.3.3. Safety Performance Monitoring

This section sets out the current and planned safety targets as well as control/mitigation measures.

Safety Statistics

In terms of the available statistics since 2016, there was one fatality in 2017 and one in 2018.

The number of LTIs and Lost-Time Injury Frequency Rate (**LTIFR**) per million man-hours (2016 to 2020) is set out in Table 14-7. The LTIFR decreased from 1.90 in 2017 to a consolidated 0.42 in 2020, a commendable achievement (Figure 14-1).

The fatalities reported in 2017 and 2018 arose as follows:

- 2017 - caused by a Load Haul Dump vehicle (**LHD**) striking an employee; and
- 2018 - one caused by a fall of ground; the second when a proto team member was engulfed by coal while cleaning a silo.

The main causes of the LTIs reported from 2017 to 2019 were:

- Struck by tools and equipment (mostly finger injuries);
- Gravitational objects;

- Falls of ground; and
- Slip and fall.

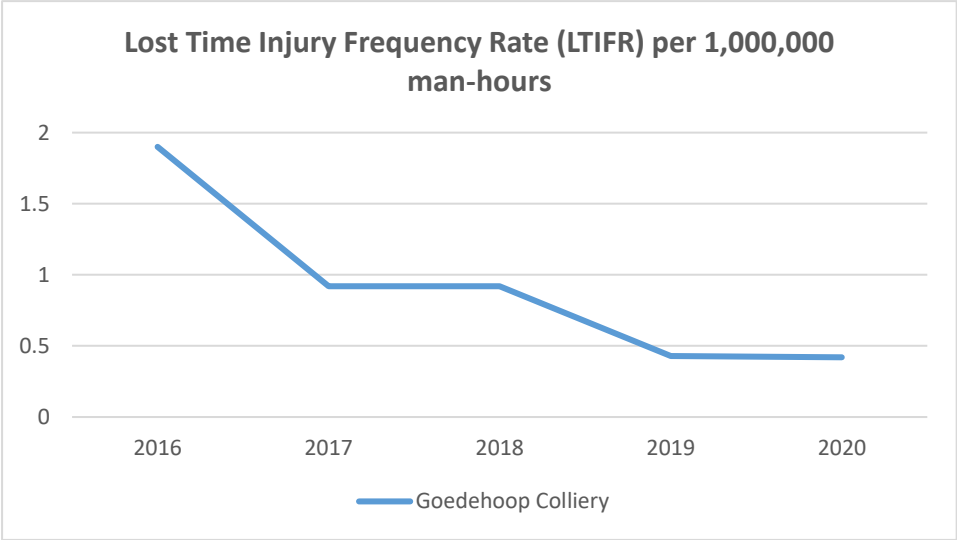
Table 14-6: Summary of Safety Aspects for the Company

Aspect	Requirements	Status
Regulatory Requirements	Legal compliance necessary for managing risk, developing trust with government and other stakeholders Mine Manager is responsible for observance and enforcement of all safety and health regulations. Non-compliance can result in Section 54 temporary closure, penalties or loss of licence.	The Company complies with the minimum legal requirements.
Legal Appointments	In terms of the MHSA, the following main legal appointments should be in place: Sect. 2A(1) - CEO; Sect. 4(1) and 2A(2) - General Manager; Sect. 3(1) - Mine/Operational Manager; Sect 2.17.4 - Chief Safety Officer; Sect. 2.13.1- Engineer; Sect. 2.6.1- Site Manager; Sect. 2.6.1- Plant Manager; Sect. 17.2 - Chief Surveyor; Sect. 2.9.2 - Chief Geologist; Sect. 14.1(8) - Rock Engineer; Sect. 12(1) - Occupational Hygienist; Sect. 5.1(a) & (b) - Occ. Hygienist; Sect. 16.1(1) - Occ. Hygienist; and Sect. 13 (3) - Occ. Medical Practitioner	The required legal appointments for the Company are in place.
Health and Safety Policy	MHSA Section 8(1)(a-d) Every manager must prepare a document that describes the organization of work, establishes a policy concerning the protection of employees' health and safety at work, establishes a policy concerning the protection of persons who are not employees but who are directly affected by mining activities and outline the arrangements for carrying out and reviewing policies. Management's commitment towards zero harm.	A Health and Safety policy is in place.
Health and Safety Committee	MHSA Section 8(2) and 8(3)(b) The manager must consult with the health and safety committee on the preparation or revision of the document and policies referred to in Section 8(1), prominently and conspicuously display a copy of the document referred to in Section 8(1) for employees to read. Each Health and Safety representative has to be supplied with a copy of the document	The Company has the required health and safety committee in place.
Risk Management, Identification and Controls	MHSA Section 11(1-4) The employer must be able to prove risk reduction and risk control. The risk management standard should determine how risks are identified and managed	Baseline, issue based and continues risk assessments have been compiled; From the baseline risk assessments, risk registers are created whereby risks are listed in order of severity; <u>Additional Controls</u>: Workshop risk assessment and control; A stop, look, assess and manage (SLAM) document has to be completed before a task commences; Examination and making safe of working places; Occupational Hygiene risk assessment; Fire and Explosion risk assessment; Irrespirable Atmospheres risk assessment. Self - Contained Self Rescuers are issued to all underground employees; Incident reporting and investigations; Risk and change management procedures; Job safety analysis (JSA); Safety improvement plans; Internal audits; Hawcroft fire audits (external); OSHAS 18001 audits (external); ISO 14001 and 18001 audits (external); Monitoring audits and review; An excellent system of group and individual mine

Aspect	Requirements	Status
		procedures are in place at all operations; All documents controlled by document controllers.
Mandatory Codes of Practice	MHSA Section 9(1-6)(7a and b) A manager must prepare and implement a code of practice on any matter affecting the health and safety of employees and other persons who may be directly affected by activities at the mine if the Chief Inspector requires it. Required CoPs: The prevention of mine fires; Emergency preparedness and response; Occupational health programme on personal exposure to airborne pollutants; Thermal stress; Fatigue Management; Noise exposure; Medical incapacitation to work; Combat rock falls and slope instability in surface mines; Right to refuse unsafe work; Minimum standard for fitness to perform work at a mine; Women in mining PPE; Trackless mobile machinery; Safe use of conveyor belt installations; Safe operation of draw and tipping points; Isolation, lockout and clearance to work; and Mine residue deposits	The required mandatory CoPs are in place.
Safety Training	MHSA Section 10(1-3) An employer must provide employees with any information, instruction, training or supervision that is necessary to enable them to perform their work safely and without risk to health.	A comprehensive training procedure is provided for all new appointments. Refresher training will be provided annually.

Table 14-7: Goedehoop Safety Statistics

Category	2016	2017	2018	2019	2020
LTIs	8	4	4	2	1
LTIFR / million man-hours	1. 90	0.92	0,92	0.43	0.42
Fatalities	0	1	2	0	0



srk consulting	**GOEDEHOOP COLLIERY CPR** LTIFR per 1 000 000 manhours: 2017 - 2020	Project No. 566657

Figure 14-1: LTIFR per Million Manhours: 2017 – 2020

DMRE Safety Stoppages

Table 14-8 sets out the number of stoppages imposed by the DMRE on the Company from 2017 to 2020. These Section 54 stoppages are generally implemented for fatalities and where, in the opinion of the DMRE, there is non-compliance with the MHSA and mine procedures.

Table 14-8: Goedehoop DMRE Stoppages (2017 – 2020)

Category	2017	2018	2019	2020
Number	2	2	0	0
Total production days lost	10	8	0	0

Note:
1. The figures were consolidated for 2020.

The Section 54 notices were uplifted by the DMRE after corrective action was taken by the mine.

Safety Improvement Plan

In the quest towards zero harm, the Company identified focal areas to reduce the LTIFR and work-related incidents and accidents.

14.4. Safety and Health Risks

14.4.1. Falls of Ground

The potential for FoG through rockfalls is seen to have a medium inherent risk status for underground operations. The reader is referred to the discussion in Section 7 for rock engineering aspects related to the probability and extent of potential FoGs.

If not managed adequately, the consequences of this risk could be:

- Section 54 work stoppage orders from DMRE;
- Production delays;
- Injuries and/or fatalities; and
- Damage to surface structures depending on the severity and extensiveness of the collapses.

Adherence to legislation, approved Codes of Practice and standard procedures, validation of the designs by industry experts and active training and development of staff is required to mitigate this risk.

14.4.2. Lost Time Injuries

Although the number of LTIs have decreased, continued harm to employees can have the following implications:

- Impact on production and profits;
- Increased involvement of DMRE with the possibility of additional Section 54 stoppages; and
- Revenue losses.

14.4.3. Flammable Gas

Flammable gas (Methane) and Coal dust explosions are one of the principle hazards in underground Coal Mines. Most flammable gas intersections are associated with dykes in the area.

14.4.4. Mine Fires

Major mine fires with multiple fatalities occur in the order of one major incident every ten years at South African mines (the most recent, the underground conveyor belt fire at Impala Platinum with four fatalities in 2016). Underground fires and specifically vehicle, conveyor belt and spontaneous combustion fires, can lead to a rapid increase in toxic gases, which has the potential to result in multiple fatalities.

14.4.5. Airborne Pollutants

Employee exposure to respirable dust levels exceeding the occupational exposure limits in the mining operations can cause compensable occupational diseases such as CWP.

14.5. Risk Management

[SR5.7(i)] [ESG4.1]

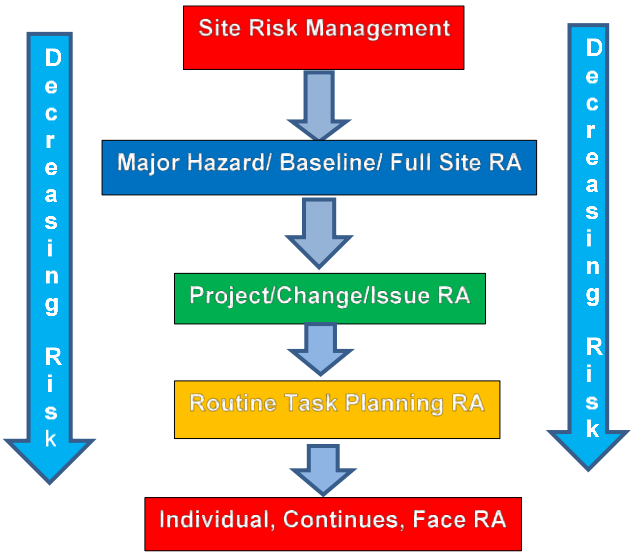
The purpose of applying a risk management process is to proactively and systematically reduce losses. The basic rationale for safety risk management continues to be the need to improve safety performance through improved decision making.

14.5.1. Overall Function, Site Major Hazard, Baseline or Full Site Risk Assessment

The objective is to look across an entire site, find potential major incidents and analyse, establish controls, document and apply approaches so related risks are as low as reasonably practicable.

All the Company mines make use of the comprehensive “Safety Risk Management Process”.

An example of a flow chart for the systematic approach to risk management is shown in Figure 14-2:



srk consulting	GOEDEHOOP COLLIERY CPR Systematic Approach to Risk Management	Project No. 566657

Figure 14-2: Systematic Approach to Risk Management

15. Environmental and Social Compliance

[12.10(h)(viii)[SR5.5(i)(ii)(iii)] [SV1.2] [ESG4.3, ESG4.4]

15.1. Environmental Authorisations and Licenses

[SR1.5(ii)(v), SR5.5(ii)(iii)] [ESG4.3]

15.1.1. Mining Rights

The reader is referred to the discussion in Section 3.3.1.

15.1.2. Prospecting Rights

The reader is referred to the discussion in Section 3.3.1.

15.1.3. Environmental Management Programme

The reader is referred to the discussion in Section 3.4.2.

15.1.4. Water Use Licence

The reader is referred to the discussion in Section 3.4.1 for details; the WULs are summarised below (Table 15-1).

Table 15-1: Summary of Water Use Licences, General Authorisations and GN704 Exemptions

Licence Number	Description	Approval Date	Comments
04/B11B/ACFGIJ/1754	Amended Goedehoop South WUL	04/03/2020	Original WUL approved on 2 August 2013
03/B11B/CGI/4702	Dump expansion and Briquetting Plant Water Use Licence	08/08/2016	
06/B11B/ACGIJ/5269	Hope 4 Seam Water Use Licence	18/05/2017	
04/B11B/ACGIJ/411	Block 20 Water Use Licence	05/06/2017	Original WUL approved on 1 April 2011 but expired
27/2/2/B11G/254	Goedehoop South GNR 704 exemption	05/07/2018	
04/B11H/AFGJ/633	Goedehoop North Water Use Licence	08/07/2011	
04/B11H/ACGIJ/4329	Amended Brown Shaft 2 Water Use Licence	31/05/2019	Originally approved on 29 March 2016
27/2/2/B11G/257	Goedehoop North GNR 704 exemption	05/07/2018	
27/2/2/B811/3/3	Goedehoop Colliery General Authorisation for the proposed construction of a contractor's laydown/camp area for section 21(c) and (i) water uses	17/01/2019	

15.1.5. Mine Waste Disposal

The reader is referred to the discussion in Section 3.4.1.

15.1.6. Social and Labour Plan

The reader is referred to the discussion in Section 3.4.2.

15.1.7. Mining Charter

The Company promotes home ownership with the long-term goal of meeting the Mining Charter's requirement that all employees live in sustainable human settlements (AAC, 2015). The Mining Charter requires the following:

- Convert and upgrade hostels into family units;
- Attain an occupancy rate of one person per room; and
- Facilitate home ownership options for all mine employees in consultation with organised labour.

A transition away from housing provision at operations to full homeownership was initiated by the Company in 2007 (AAC, 2015). Accordingly, housing allowances are aligned with market conditions to encourage employees to relocate to sustainable residential settlements in established areas. The Company further supports bulk infrastructure development within the host communities in order to fast-track housing delivery.

Goedehoop Colliery works in partnership with the Central Housing Service of Coal SA in the planning and implementation of the bulk infrastructure and housing projects in the greater eMalahleni urban area. The Company has also initiated a training and development scheme for all employees interested in buying or renting-to-buy property in urban areas. Approximately 94% of employees live in accommodation not provided by the mine, thus reducing the dependence of employees on the mine for accommodation. The last remaining village on the mine was closed on 21 December 2018 (AAC, 2020a). During a clarification meeting with the Goedehoop HR manager and Social Performance team on 23 June 2020 it was confirmed that the remaining number of staff occupy mine owned housing within the Middelburg and eMalahleni area.

15.2. Environmental Aspects

15.2.1. Environmental Profile

The reader is referred to the discussion in Section 2.6.1.

15.2.2. Environmental Management at Goedehoop Colliery

[SR5.5(i), SR7.1] [ESG4.1] [ESG4.7]

Environmental management at GHS and GHN is undertaken by the Environmental Department, which includes an Environmental Coordinator (Kgaowelo Moshokwa) and Environmental Officer (Langanani Nemugavhini). The Environmental Department has until recently, fallen under the Metallurgy Department, but has since been reallocated to the Technical Services Department on the mine. There are also external resources who are involved in the environmental management of Goedehoop, namely Anglo Coal Environmental Services (ACES) and Head Office Management.

Goedehoop Colliery has an approved SHE (Safety, Health and Environment) Policy (Document No: AATC015970) (AAC, 2020e). The SHE Policy is also communicated through the mine's induction training programme.

The Colliery makes use of an Environmental Management System (**EMS**) to collect, manage and validate environmental information. The EMS is saved on the Company's SHE Management System (Enablon). As part of the EMS, environmental staff at Goedehoop Colliery capture all environmental-related issues, risks and opportunities on an EMS register. Risks are rated, assigned management options and then tracked to ensure that the effectiveness of the risk mitigation is achieving the objective.

Goedehoop is ISO 14001:EMS:2015 accredited and as such is committed to continual improvement of environmental management at Goedehoop. The mine undertakes annual internal and external ISO 14001 audits.

Two notices of intention for environmental non-compliances were issued to Goedehoop Colliery by the DMRE in June 2019. Following discussions with the Environmental Coordinator, it was confirmed that both of the following notices have been addressed and closed out with the DMRE:

- A notice of intention to issue a compliance notice was issued on 28 June 2019 following a site audit/inspection carried out at GHN by the DMRE on 31 May 2019. The notice was issued for contraventions to the NEM:WA for the disposal of hazardous waste at the Simunye scrap yard area without a Waste Management Licence. The auditor noticed that flooring in the Bank 2 plant and wash bay area at Simunye was badly cracked and therefore did not serve to prevent polluted water from seeping into the ground. The oil/water separator at the wash bay was full and the contents were overflowing to the environment. Dirty water channels to the PCDs were blocked and presented as a hazard;
- A notice of intention to issue a compliance notice was issued on 28 June 2019 following a site audit/inspection carried out at GHS by the DMRE on 31 May 2019 and 5 June 2019. The notice was issued for contraventions to the EMPr in terms of poor housekeeping, hydrocarbon spillages and poor management of waste at the South Plant and Block 7. The auditor noted the absence of pollution control measures around the rehabilitated dumps of Springbok and Hope Dump where there was evidence of seepage. Seepage was detected below the co-disposal facility and trenches were not maintained around the South plant.

As part of the EMS, Goedehoop Colliery has several internal environmental procedures as listed in Table 15-2. This list may not be exhaustive, but the procedures included in Table 15-2 were the only documents provided to SRK as part of the review.

The procedures listed in Table 15-2 have been prepared by the Environmental Coordinator and reviewed by designated members of Goedehoop technical staff and approved by the General Manager.

15.2.3. Environmental Monitoring

[ESG4.1, ESG4.7]

Environmental impacts associated with mining activities at Goedehoop are managed under the Minerals and Petroleum Resources Development Act, 2002. The Act stipulates that each mine must be in possession of an approved EMPr (refer to Section 3.1.7). The colliery's EMPrs outline the auditing process that includes monitoring and reporting requirements. Section 26(1) of the National Water Act, 1998 (Act 36 of 1998) provides for the development of regulations to, amongst others, monitor, measure and record the use of water from a water resource, as per the WULs.

Goedehoop Colliery undertakes surface water, groundwater, biomonitoring, air quality and blast and vibration monitoring and reports on meteorological conditions. Table 15-3 indicates the type and frequency of monitoring as well as the name of sub-consultants presently appointed to conduct monitoring.

Table 15-2: Internal Environmental Procedures

Description	Summary of Purpose	Date of latest revision	Revision Number
Goedehoop Colliery coal and slurry spillage clean-up procedure	The purpose of the procedure is to ensure that monitoring and inspection of the conveyor belts and slurry lines is undertaking on a regular basis in order to identify, eliminate and/or reduce the risks associated with coal and slurry spillages. In addition to this the procedure clarifies the monitoring and reporting procedure and ensure that all incidents are immediately and correctly reported with the full details of the incident and measures taken to correct the situation	21 June 2019	09
Goedehoop environmental containment facilities procedure	The aim of this procedure is to provide a system of containment for all liquid potential pollutants; to clarify what chemicals/liquids should be stored in contained areas and to set up the standard for containment facilities on the mine for surface and underground and to minimise the impact of hazardous materials on the environment	25 June 2019	09
Goedehoop Colliery conveyor belt coal spillage cleaning procedure	The aim of this procedure is to monitor and inspect the conveyor belts on a regular basis for coal spillage; to clarify the monitoring, cleaning and reporting procedure and ensure that all coal spillage incidents are immediately and correctly reported with the measures taken to ameliorate the situation and to identify, eliminate and / or reduce the risks associated with the activity of coal transport using conveyors	25 June 2019	09
Goedehoop Colliery petroleum and chemical product spill and control procedure	The purpose of this procedure is to outline the required necessary action when a spillage occurs. The procedure also includes the arrangements required for cleaning and disposing of the products described. The procedure also refers to the control and maintenance of storage (bunded) areas on the mine	21 June 2019	08
Radioactive sources procedure	The aim of this procedure is to describes the correct methods of handling and disposing of radioactive source material to avoid greater environmental impacts by these kinds of materials	25 June 2019	05
Site rehabilitation, topsoil stripping and management procedure	The procedure aims to ensure that the risks associated with soil stockpiling and placement are minimized	25 June 2019	09
Goedehoop Colliery trench, soil and oil trap maintenance and clean up procedure	The aim of this procedure are to monitor and inspect all the drains, trenches, silt- and oil traps (water management systems) that fall within the respective areas of responsibility; to clarify the monitoring and reporting procedure and ensure that all incidents are immediately and correctly reported with the full details of the incident and measures taken to ameliorate the situation and to minimise the risk of water contamination due to the blocking up of trenches, silt- and oil traps, resulting in dirty water overflows into clean water systems	21 June 2019	09
Goedehoop Colliery vegetation establishment, maintenance and monitoring procedure	The aim of the procedure is to guide vegetation establishment, maintenance and monitoring such that the risks associated with rehabilitation stability are minimised	25 June 2019	09
Goedehoop Colliery waste management procedure	The aim of this procedure is to ensure that waste generated at Goedehoop Colliery is managed accordingly in order to comply with legal and other Requirements	11 June 2019	03
Goedehoop Colliery water management procedure	The aim of this procedure is to explain the areas requiring some form of water management by the mine, to provide a structure for water management at Goedehoop Colliery, to ensure all aspects of water management are attended to by the Colliery and to ensure that the Colliery mitigates its impact in a manner that adheres to legislative requirements	25 June 2019	04

Table 15-3: Environmental Monitoring at Goedehoop

Monitoring	Sub-consultant	Frequency
Air quality: $PM_{2.5}$ and PM_{10}	WSP Global Inc.	Continuous monitoring with monthly reporting
Air quality: Dust	WSP Global Inc.	Monthly reporting
Noise and Vibration	Blast Management and Consulting (Pty) Ltd	Monitored per blast event with monthly reporting
Meteorological conditions	WSP Global Inc.	Monthly reporting
Surface water	Aquatico Scientific (Pty) Ltd	Monthly monitoring and quarterly reporting
Groundwater	Groundwater Complete (contracted by Aquatico Scientific)	Quarterly monitoring and reporting
Biomonitoring	The Biodiversity Company (Pty) Ltd	Bi-annual sampling and reporting

- **Air Quality: $PM_{2.5}$ and PM_{10}**

  $PM_{2.5}$ and PM_{10} is sampled at one locality, namely the Bank 2 Village (situated at GHN), utilising an e-sampler. According to the most recent air quality monitoring report (September 2020), PM_{10} concentrations are currently non-compliant as eight exceedances have been recorded to date in 2020 and only four exceedances of the 24-hour average standards are permitted per calendar year (WSP, 2020). No exceedances of the 24-hour average standard for $PM_{2.5}$ were recorded. PM_{10} and $PM_{2.5}$ running annual averages are however currently compliant with the annual averages permitted. The PM_{10} running annual average is currently 32.68 µg/m³ as of the September 2020 report and the permitted running annual average is 40 µg/m³.

- **Air Quality: Dust**

  Dust fallout is currently monitored at locations (one at GHN and three at GHS). According to the September 2020 Air Quality Report, four exceedances of the residential standard have been recorded at the Mahlathini monitoring location resulting in non-compliance with the National Dust Control Regulations. Such regulations allow for two non-sequential exceedances over a rolling twelve-month period. The remaining dust fallout monitoring locations are compliant with National Dust Control Regulations.

- **Surface Water**

  Goedehoop Colliery currently monitors surface water quality (physical and chemical properties) at both the North and South operations at approximately 33 surface water points within and around the two Mining Rights areas (12 localities at GHN and 11 localities at GHS). These points have been located along various rivers, streams and spruits near the operations as well as near the old brick works. Surface water monitoring is conducted in several various localities and at the various mine dams. In general, according to the latest annual water assessment report prepared by Aquatico Scientific (December 2018-November 2019), all sampled surface water localities show exceedances in several parameters when compared to the Integrated Water Use Licence (IWUL) limits, domestic guidelines and aquatic ecosystems guidelines at both operations. Of particular concern is the S4 sampling point (located downstream of the Bank 5 Discard Dump at Goedehoop North), which is showing an acidic water condition coupled with high concentrations of SO_4, Al, Fe and Mn (indicates acid rock drainage). A similar situation is observed at monitoring point WH04 on Goedehoop South, which indicates seepage from the rehabilitated Hope Dump.

  According to the most recent Quarterly Water Quality Assessment Report (Aquatico, June 2020 - August 2020), the surface water quality at Goedehoop recorded high salinity with average electrical conductivity, Ca, Mg, Na, SO_4, NO_3-N, NH_4-N, suspended solids, dissolved oxygen, turbidity and faecal coliforms exceeding the applicable guidelines at various localities. The organic parameters tested at all surface

water sampling points were mostly below detection limits. The north surface water sampling points show increasing trends of pH for the past five months whereas the south surface water sampling points show long term increasing trends for pH, SO_4 and electrical conductivity.

- **Groundwater**

  Groundwater Complete is contracted by Aquatico to evaluate the groundwater quality and water level trends at the operations. For the period January to December 2019, groundwater monitoring was conducted at 12 localities/boreholes. According to the monitoring report (Groundwater Complete, 2019)), groundwater is generally of good to poor quality with the main contaminant being sulphate. At GHN, the most severely impacted on borehole was BH22, with elevated Total Dissolved Solids (**TDS**), sulphate, manganese, aluminium, iron and ammonia concentrations and also an acidic pH. As with the surface water results, the groundwater monitoring results for this locality indicated that the Bank 5 Discard Dump is the main source of contamination. At GHS, the monitoring results indicated that the water quality in the majority of the boreholes is good and suitable for human consumption. It was noted, however, that more contaminated boreholes are no longer being monitored and therefore the results for the monitoring period may not be a true reflection of the status of groundwater quality in the GHS area. There were indications of sulphate domination in some boreholes such as WM13 and WM22. The Environmental Coordinator has confirmed that a study was conducted in 2019 by Delta H to determine if the current groundwater monitoring network was adequate. The study has indicated that additional boreholes need to be drilled at various levels both at GHN and GHS. The drilling programme will commence in 2020 and will continue up until the end of the life of mine in 2024. According to the most recent Quarterly Water Quality Assessment Report (Aquatico, June 2020-August 2020), the physical groundwater quality for the GHN boreholes is generally described as neutral, non-saline to extremely saline and soft to extremely hard. The physical groundwater quality for most localities at GHS can be described as neutral, non-saline and moderately soft to moderately hard. Groundwater quality also recorded high salinity with pH, electrical conductivity, Ca, Mg, Na, Cl, SO4 and NO3-N exceeding the applicable guidelines at various locations. The organic parameters tested indicated that all groundwater samples were, in the majority, below detection limit for this quarterly period.

- **Biomonitoring**

  Bi-annual biomonitoring is undertaken at GHN and GHS by The Biodiversity Company (Pty) Ltd ("the Biodiversity Company"). Biomonitoring is undertaken in the Bankspruit and Spookspruit for GHN and in the Olifants River, Koringspruit and Spingbokspruit for GHS. Results from the recent monitoring report (the Biodiversity Company, 2019), indicate that mining activities are impacting on the aquatic ecosystems being monitored.

- **Blasting and Vibration**

  The mine has appointed an external contractor (Blast Management & Consulting (Pty) Ltd) to conduct monthly air blast and ground vibration monitoring at GHN (as no mining activities are currently taking place at GHS). Based on a review of the available reports (Blast Management & Consulting, 2020a, 2020b2020c, 2020d, 2020e, 2020f, 2020g and 2020h), only six events were recorded during this period however these were within set limits.

Goedehoop Colliery manages weeds, alien plants and invasive vegetation according to the Alien Invasive Plan. Each division within the mine is responsible for managing alien invasive in the mining areas within which they operate. According to the Environmental Coordinator, the Biodiversity Action Plan (**BAP**) for the Anglo Coal Group (not seen by SRK) is currently being revised.

15.2.4. Environmental Performance

[SR7.1] [ESG4.1, ESG4.7]

In order to comply with South African legislation and good international industry practice, it is necessary to regularly assess environmental performance and progress against the EA and EMPr commitments, other environmental permit requirements and relevant corporate policies. In terms of the MPRDA, NEMA and NWA, a

mine is required to regularly conduct audits to ascertain compliance with the requirements of the approved EMPrs and WULs.

The Environmental Coordinator at Goedehoop Colliery confirmed that the following environmental internal and external audits are carried out by Goedehoop:

- Internal audits:
  - WUL audits – annual;
  - ISO14001 EMS audit – annual;
- External audits:
  - WUL audits – annual;
  - Environmental performance audits/legal compliance audits (EMPr Performance Assessment Review (**PAR**) and EA) – every second year;
  - ISO14001 EMS audit – annual; and
  - GN704 water audit – every five years.

Audit Findings

The findings are based on a review of available documentation, notably the most recent reports arising from the audits listed above. SRK has not had sight of the external ISO14001 EMS audit; however, the non-conformance report (NCR) indicating where non-conformances have been addressed has been reviewed.

A summary of the main findings of internal and external audits is provided below.

Internal Audits

A summary of the main findings from each type of internal audit conducted for Goedehoop Colliery are summarised below:

- **Internal ISO 14001:2015 Audit**: The most recent EMS audit was conducted in May 2019. These audits are conducted by Environmental Officers from other Anglo Collieries on an annual basis. The audit identified several areas of good performance however there were 14 minor non-conformances and five major non-conformances which indicate that performance can be improved. The minor non-conformances raised included inadequate documentary proof that environmental impacts identified were addressed, matters pertaining to inadequate planning for the environmental objectives, incorrect storage of waste tyres and lack of signage in areas where this is required. Major non-compliances included poor hydrocarbon management in the workshop areas, lack of Material Safety Data Sheets (MSDS) for any chemical stored in various areas and no explanations on how environmental risks are determined in the environmental Workplace Risk Assessment and Control (WRAC). Goedehoop was advised to regularly check its conformance and implement corrective measures, where required, to ensure that the EMS is improved upon and the objectives of an EMS are achieved.
- **Internal Water Use Licence Audit**: The latest internal water use licence audit was conducted in June 2019. Internal water use licences are conducted by environmental counterparts from the neighbouring Company collieries on a rotational basis. The internal audit indicated that Goedehoop Colliery is largely complying with the conditions stipulated in the six WULs and two GNR704 exemptions. The main non-compliances noted the following: lack of adherence to authorised abstraction volumes; inadequate handling and storage of hazardous waste; contaminated water being discharged into the surrounding environment (mainly due to seepage issues at the various discard facilities/MRDs); exceedances in water quality parameters (at the various discard facilities/MRDs); inadequate sampling of certain water quality parameters (or lack of sampling for some parameters) and poor record keeping. The Environmental Coordinator indicated that Goedehoop is in the process of amending its WULs to address some of the non-compliances noted, specifically relating to the water quality monitoring parameters. In addition, Goedehoop is conducting studies and attempting to mitigate the seepage impacts from the various MRDs.

External Audits

A summary of the main findings from each type of external audit conducted for Goedehoop Colliery is presented below:

- **External ISO 14001:2015 audit**: The latest external EMS audit was conducted by Bureau Veritas Certification (**BVC**) in July 2020. Three minor non-conformities were noted with no major nonconformities recorded during the audit. The minor nonconformities were issued with respect to not adhering to version control of documents correctly (absence of a revision status on some documents); outdated legal register (last updated in March 2018) and for Internal ISO audits not being conducted in 2020. The auditor indicated that the Colliery would maintain its certification after satisfactory corrective action is completed.
- **Environmental Performance Audits/Legal Compliance Audits conducted for GHN**: The latest Environmental Audit Report (dated November 2019) was conducted by Shangoni Management Services (**Shangoni**) for the audit review period 01 April 2018 to 31 March 2019. The audit was conducted on all the approved EMPrs and EAs for the GHN operations at the time. The mine was found to demonstrate a high level of compliance against the various management commitments. There were, however, several areas of non-compliance relating to commitments made in the various EMPr documents. The most notable concerns are related to outdated rehabilitation strategies or inadequate description in the EMPrs of mitigating measures associated with wetlands that have been impacted by mining and associated activities, as well as for seepage emanating from the old dumps. According to the Environmental Coordinator, Goedehoop is in the process of submitting an amendment to the aligned EMPr to address any shortcomings and make it more practical for the current mining operations. The auditors have, however, recommended that, rather than updating the respective EMPrs, all current shortcomings with respect to the relevant EMPrs should be included the final closure plan, which is being developed as Goedehoop is nearing closure. In addition, the auditors noted that Goedehoop must demonstrate duty of care and short-term measures to effectively contain any seepage arising from the various dumps (e.g. Bank 5).
- **Environmental Performance Audits/Legal Compliance Audits conducted for GHS**: The latest Environmental Audit Report (dated November 2019) was conducted by Shangoni for the audit review period 01 April 2018 to 31 March 2019. The audit was conducted on all the approved EMPrs and EAs for the GHS operations at the time. Since mining activities have largely ceased at GHS, many of the EMPr and EA conditions are no longer applicable and have therefore not been audited. In terms of the remaining auditable conditions, the mine was found to demonstrate a high level of compliance against the various management commitments. There were, however, several areas of non-compliance relating to water management commitments which have also been highlighted in the internal and external WUL audits. As in the case of the external GHN compliance audit, the auditors also highlighted concerns around outdated rehabilitation strategies or inadequate description of mitigating measures within the EMPrs associated with wetlands which have been impacted by mining and associated activities as well as seepage emanating from the old dumps are outdated or not sufficiently described in the current EMPrs. According to the Environmental Coordinator, Goedehoop is in the process of submitting an amendment to the aligned EMPr to address any shortcomings and make it more practical for the current mining operations. The auditors have, however, recommended that rather than updating the respective EMPrs, all current shortcomings with respect to the relevant EMPrs should be included the final closure plan, which is being developed as Goedehoop is nearing closure. In addition, the auditors noted that Goedehoop must demonstrate duty of care and short-term measures to effectively contain any seepage arising from the various dumps with such measures to be implemented.
- **Water Use Licence Audit**: The external WUL audit was conducted by Shangoni for the assessment period January 2018 to March 2019. Based on the external audit, and in overall agreement with the internal WUL audit, several non-compliances were noted including: not calibrating flow meters every two years; not adhering to abstraction volumes authorised or abstraction of water without authorisation (at Simunye Shaft); inadequate handling and storage of hazardous waste; contaminated water being discharged into the surrounding environment (mainly due to seepage issues at the various discard facilities/MRDs); exceedances in water quality parameters (at the various discard facilities/MRDs); inadequate sampling of certain water quality parameters (or lack of sampling for some parameters;

exceeding authorised discard and slurry disposal volumes on the Bank 2 co-disposal dump; conducting activities which have not been licenced; and poor record keeping. The Environmental Coordinator indicated that Goedehoop is in the process of amending its WULs and applying for a new WUL (where the DHSWS have indicated that this is required) to address some of the non-compliances noted, specifically relating to the water quality monitoring parameters and licencing of existing lawful water uses. In addition, Goedehoop is conducting studies and attempting to mitigate the seepage impacts from the various MRDs.

- **GN704 Water Audit:** The last GN704 audit was conducted by Golder Associates Africa (Pty) Ltd (**Golder Associates Africa**) in June 2015. The Environmental Coordinator indicated that these audits take place every five years, but due to the current national COVID-19 lockdown restrictions, the 2020 GN704 audit will be rescheduled. Several GN704 non-compliances have been highlighted in the WUL audits and in the EA/EMPr audits (based on the 2015 GN704 audit), These include the inadequacy of current containment and other pollution intervention measures to prevent seepages from the MRDs (specifically the Goedehoop North MRD as well as Hope Dump and Springbok 1 and 2 Dumps at GHS); inadequate infrastructure in place to divert dirty water away from mining areas (GHN and GHS) and poor silt trap maintenance at various areas around the GHS site.

15.2.5. Environmental Risks

[12.10(h)(x)] [SR5.7(i)] [ESG4.9]

The following environmental risks have been highlighted as being of material relevance:

- **Non-conformances to the Conditions contained within the Various Environmental Licences**: Non-conformances can result in pre-directives and directives being issued, which may result in a reputational risk or, depending on the nature of the directive, cessation of certain activities until the condition is complied with or until the relevant environmental authority is satisfied that the risk has been mitigated. Several non-conformances have been noted in the internal and external audits of the approved EMPrs, EAs and WULs. The colliery has, however, according to the various auditors, either partially rectified the non-conformances or have compiled action plans to address these areas of non-compliance. Based on SRK's discussions with the Environmental Coordinator at Goedehoop Colliery, many of the non-compliances raised will be addressed through the amendment of the EMPrs and WULs. These amendment processes are currently in progress (either submitted and awaiting approval or planning to be submitted in 2020). However, until such time that the amended EMPrs and WULs are authorised, Goedehoop remains non-compliant. It is recommended that colliery continuously follow up with the relevant authorities. In addition, it is recommended that the additional permits, which are pending submission, are completed by the relevant parties and submitted to the authorities as a matter of priority.
- **Pollution to the Environment as a Result of Seepage:** Water monitoring results as well as findings from the environmental audits conducted at GHN and GHS have indicated that the MRDs are polluting water resource due to seepage. The colliery has conducted additional studies in order to understand the extent of the pollution as this will need to be managed and included in the closure planning process. The reader is referred to Sections 16.1.7 and 16.2.4 for further discussion on the risks associated with pollution as a result of seepage to surface and groundwater resources.

15.3. Social Aspects

[SR4.3(v), SR5.5(iv)(v)] [ESG4.1, ESG4.5, ESG4.8]

Goedehoop is situated in the STLM. The town of eMalahleni is situated 25 km north west of Goedehoop and acts as the service centre for the region. Limited numbers of mine village residents, farmers, farm workers and trading store complexes are present in the immediate vicinity of the site (Geovicon Environmental (Pty) Limited, 2014). The Goedehoop SEP notes that the primary labour sending areas include those within a 50 km radius from the operation (AAC, 2019a).

As confirmed during a clarification meeting on 23 July 2020, Goedehoop's workforce in 2020 comprised 815 permanent employees and approximately 500 contractors. Goedehoop draws only a small number of employees

(15) from outside South Africa. The major labour sending areas include Mpumalanga followed by Limpopo. The closest community is Komati.

15.3.1. Stakeholder Relations and Supplier Management

[SR7.1]

Goedehoop's Social Performance team services five disciplines to ensure the implementation of the Company's Socio-Economic Assessment Toolbox (**SEAT**). The SEAT process has been designed to understand the positive and negative impacts of the operations on host communities. The SEAT aims to facilitate more structured dialogue with stakeholders through the implementation of management responses. Goedehoop's Social Performance function also implements the Anglo American Social Way (**AASW**). AASW audits take place on an annual basis (AAC, 2019b) to measure progress against the SEAT. Outputs are incorporated into Goedehoop's Community Engagement Plans which is updated on an annual basis. Based on the 2019 Social Performance Organogram, the Social Performance team reports to the General Manager via the HR manager. The HR manager is supported by a Social Performance Specialist. In light of new changes that are required in terms of AASW3, it appears that the Social Performance team does not have sufficient capacity to undertake both the reporting and implementation requirements. It was confirmed during the clarification meeting that a new position was advertised to support the social performance functions, however, due to the COVID-19 pandemic, this vacancy has been placed on hold. It was further noted that Goedehoop requires a dedicated closure team to address closure planning and implementation requirements.

Goedehoop has a Grievance and Social Incidents Management Procedure, Social Management Plan and SEP that provides guidance in terms of stakeholder engagement. Stakeholder engagement also takes place as part of the local municipality's Integrated Development and Local Economic Development (**LED**) forums and other government departments. Goedehoop has a complaints and grievance procedure which clearly outlines where and how complaints can be lodged and the process of handling such. All matters arising are categorised, investigated and dealt with according to the Enablon system.

The main stakeholder concerns relate to local procurement opportunities from both Goedehoop and the appointed contractors, perceived lack of local employment opportunities and, perceived lack of skills development opportunities from contractors (AAC, 2020b).

During a clarification meeting with the Goedehoop HR manager and Social Performance team on 23 June 2020 it was indicated that community meetings take place on a regular basis and focus mainly on enterprise development and LED opportunities from Goedehoop. It was confirmed during the clarification meeting that there are several pressure groups that insist on being included in the Community Engagement Forum (**CEF**). However, Goedehoop only engages them on a case by case basis to avoid legitimizing pressure groups.

The AASW audit (AAC, 2019b) confirmed that Goedehoop has an effective Grievance and Incident process in place. The incident and grievance management procedure allows for a range of methods for reporting of incidents and grievances. The site captures and loads all incidents on Enablon, with improved ability to enforce self-reporting. The site has loaded eight social incidents in 2019, compared to four in 2018 and five in 2017. The 2019 incidents were largely related to jobs and procurement, land claims and water supply (AAC, 2019c). The site uses a range of mechanisms to communicate the grievance procedure, including the Company website, CEF, other stakeholder engagement forums and internal communication sessions such as induction (AAC, 2018b). The AASW audit (AAC, 2019b) noted that the grievance mechanism was communicated to security guards at the gate and they are equipped to receive and communicate community complainants, with no evidence of any barriers faced by external stakeholders.

Timeframes for the acknowledgement of incidents has been set (within 48 hours) with incident close out and responses set (30 days, unless communicated otherwise).

Goedehoop has an inclusive procurement and skills development programme with an implementation plan. The Company aligns their procurement processes to the following focus areas: (1) Mining Charter related aspects, (2) ringfencing procurement opportunities, (3) alignment of internal departmental spend and contractor management. According to the Company's Inclusive Procurement Policy, preference will be given to BEE, host community BEE and Historically Disadvantaged Persons (**HDP**) suppliers that meet the required safety, quality, cost and delivery requirements. Goedehoop further complies with the Company's Supply Chain Policy (AAC, 2018a) which

emphasises its drive towards preferential procurement and supplier development.

15.3.2. Social Transition Towards Mine Closure

[ESG4.6]

Social Obligations

Based on a review of the AASW audit (AAC, 2019b) Goedehoop is scheduled to complete a Social Closure Plan in 2020, as required by the Anglo Closure Toolkit. It was confirmed during the clarification meeting that Goedehoop North has an expected life of mine until 2024. The development of the Social Closure Plan is done at Business Unit level; however, this process has not yet been completed.

Based on the information presented in the 2020 – 2024 SLP (AAC, 2020h), Goedehoop will support three LED projects to the value of ZAR10 million (Table 15-4).

Table 15-4: Current Social Obligations as Part of the SLP

Project (SLP)	Budget (ZARm)	YTD Actual[1] (ZARm)	Due Date
Community scholarships	3	0.55	2024
Water supply sustainability (boreholes and tanks)	4		2023
Mobile clinic for Ward 4	3		2023
Total	**10**	**0.55**	

Goedehoop runs the Springbok Combined School, located on the mine property, for employee and local community children. The Environmental Management Programme Report (before 8/12/2014, under the MPRDA; now called EMPr) amendment for Goedehoop (Geovicon Environmental (Pty) Limited, 2014) indicated that Goedehoop provides the facilities, maintenance, supplies and stationary as well as the salaries for the teachers whilst the Department of Education supply the teachers. The school is currently a closure liability with engagement on the future plans for the school still having not commenced with the Department of Education. In addition, Goedehoop supports the Teddy Bear crèche and an ABET learning centre which will not continue after closure (AAC, 2014.).

There has been a reliance on Goedehoop in the past to provide basic services, primarily relating to water, sanitation, community services and electricity. Since Goedehoop has been perceived as a potential catalyst to providing water and electricity, a need to engage the STLM on more sustainable alternatives for affected communities has arisen. There is an opportunity to provide a solution (either a mobile tanker, installation of water tanks or boreholes) through Goedehoop's integrated detailed closure plan (AAC, 2020b). These projects have now been included in the 2020 – 2024 SLP (AAC, 2020h). The Goedehoop commitments register shows that ZAR17 million has been allocated to restore access to water resources which have been disturbed by mining activities. A further ZAR930 000 has been allocated towards the monitoring of water quality, quantity and supply.

Goedehoop is also supporting external capacity building through the Anglo Group led Municipal Capacity Building Programme. The STLM is supported with capacity for asset handover and continued service provision post mine closure (AAC, 2020b).

Housing

[ESG4.6]

As reported in the SLP Draft Close Out Report for 2019 (AAC, 2020a), the Company's vision for housing is long-term home ownership and is in the process of moving away from housing provision. The aim is for employees to be accommodated in their own formal accommodation located within the municipal context of its operations.

The Company's plan to transition from housing provision at its operations to full home ownership relies on four factors, including: the adjustment of housing allowances in line with market conditions to encourage employees

to relocate to sustainable residential settlements in established areas; supporting bulk infrastructure development within the local municipal spatial framework with funding and technical expertise to fast-track the delivery of housing and contain house prices within acceptable levels; source and support housing delivery within metropolitan urban areas that will be sustainable in the longer term; and facilitate and market home ownership to employees.

A 2014 report (Geovicon Environmental (Pty) Limited, 2014) indicated that Goedehoop provided employee accommodation on site and neighbouring towns such as eMalahleni and Middelburg. Housing included Single Quarters, Hope Village, Springbok Village, and Witbank (mine and employee owned) housing. More recently, Goedehoop has embarked on a strategy of reducing the provision of village housing to employees, in order to promote housing ownership and accommodation independence for employees. Subsequently, all Goedehoop's mine villages with the exception of Bank 2 village have been closed (AAC, 2020b).

Goedehoop provides housing allowances to its employees based on employee grades, with the lowest grade qualifying for a ZAR9 000 housing allowance per month. Goedehoop works in partnership with the Central Housing Service of the Company in the planning and implementation of the bulk infrastructure and housing projects in the greater eMalahleni urban area. They have also initiated a training and development scheme for all employees interested in buying or renting-to-buy property in urban areas. This is an ongoing process and is being run in parallel with the marketing programmes underway for the other developments (AAC, 2020a).

Future Forum

[ESG4.6]

Goedehoop established a Future Forum in June 2018, comprising both employer and employee representatives (AAC, 2019d). This forum meets on an annual basis with the last meeting having taken place on 19 September 2019. The purpose of these discussions is to: identify challenges affecting the mine and to come up with solutions to them; implement solutions agreed upon by both employer and employee representatives; effectively consult, communicate, discuss and develop strategies on matters that affect and/or are of interest to stakeholders; facilitate sustainable socio-economic development of communities around the Company's operations; enhance the promotion of harmonious relations and unity between Goedehoop and all its stakeholders; and create communication channels and partnerships between the mine and the communities as well as with other stakeholders (locally, nationally and internationally) in order to build meaningful engagements and trust.

The minutes of the 2019 Future Forum meeting shows that during 2019, headcount reductions occurred due to the closure of two sections at Vlaklaagte shaft. Although no retrenchments took place, surplus staff were released through natural attrition and absorbed through other workforce planning strategies.

During the clarification meeting it was verbally confirmed that Goedehoop implemented a section 189 process in terms of the Labour Relations Act, (Act 66 of 1995) (**LRA**). On 19 November 2019 the process was initiated for all GHS staff, totalling 522. The process was completed in the beginning of March 2020 with all but seven employees finding suitable alternative employment.

Mechanisms To Avoid Job Losses and a Decline in Employment

[ESG4.6]

According to the SLP Annual Draft Close Out Report (AAC, 2020a), should prevailing economic conditions cause the profit revenue ratio of any operation to be less than an average of six percent for a continuous period of 12 months, the Company and Goedehoop would initiate a consultation process, including the implementation of section 189 of the LRA. The Minerals and Mining Development Board will also be informed.

Should Goedehoop's operations be downscaled or cease with the possible effect of job losses, a consultation process will be implemented, including specifications of the LRA (AAC, 2020a).

Where retrenchments or closure of the operation is imminent, Goedehoop would put in place the following process to ameliorate the social and economic impact on individuals, regions and economies (AAC, 2020a):

- Assessment and counselling services for affected employees;
- Comprehensive self-employment training programmes;

- Comprehensive training (non-mining skills) and re-employment programmes;
- Creation of jobs for local economies;
- Regeneration of local economies; and
- Accessing the Social Plan Fund.

Anglo Zimele

According to ACC (2003), Anglo Zimele was launched as a small business hub at some of its operations to stimulate the development of small enterprises in the communities that surround its operations. The initiative aims to create sustainable businesses towards sustainable social transition after mine closure. The Zimele hubs facilitate loans through the Anglo Zimele Small Business Start-up Fund and provide entrepreneurs with free hands-on advice on the day-to-day running of their businesses. Goedehoop has allocated ZAR26m towards the establishment of the STLM Middelburg Zimele Hub and is set to be completed in 2021. During the clarification meeting it was indicated that a stronger focus on enterprise development opportunities outside of the mining industry are being encouraged to avoid creating a dependency on mining.

Contractor Management

Section 4B of the AASW3 (AA, 2020) makes provision for contractor management as part of the closure process, stating that contractors will report to Business Unit level. A limited view of social transition is taken, only considering the actual closure activities (e.g. rehabilitation) and not the post-closure impact on the loss of business. Provision is included for reviewing contract terms to align with social transition requirements; however, no further mitigation is suggested.

Illegal Mining and Vandalism

A rise in criminal activities triggered by the Goedehoop Village closure and demolition has been reported (AAC, 2020b). During a meeting with the Goedehoop social representatives on 23 June 2020, it was confirmed that cases of vandalism and theft have been taking place on site, especially around Goedehoop South. The minutes of the 2019 Future Forum meeting also allude to increased criminal incidents (particularly theft of cables, scrap metal, and rubble). Due to the size of the site, it is difficult to secure and monitor the entire area. The site is currently making use of various methods (e.g. thermal cameras, dog patrols, security patrols, access control, partial fencing, community engagement) to monitor illegal access to the site. Goedehoop anticipates that once closure activities have commenced, and infrastructure has been removed or demolished, it would be easier to mitigate this risk.

15.3.3. Social Risks

[12.10(h)(x)] [SR5.7(i)] [ESG4.9]

The following risks have been identified:

- There are high expectations from local communities to benefit from LED and enterprise development projects. Due to unrealistic expectations from the community, this aspect may become contentious and a challenge for Goedehoop to manage. If unmanaged, there is a risk of work stoppages, property damage and loss of productivity, which could result in financial loss, reputational damage and community discontent;
- Although Goedehoop is currently managing incidents of vandalism and theft, this poses a risk for post-closure rehabilitation of the site;
- The lease agreements entered into with farmers have not been adequately documented. Expectations from farmers regarding lease agreements and servitude agreements need to be carefully managed;
- There are several land claims on farm portions where GHN and GHS have an interest, either because of land use or mineral rights. Even though the Company attends the Joint Land Claims Working Committee meetings, these land claims have not been resolved (i.e. gazetted or dismissed). Should this issue remain unresolved, it could lead to a loss in surface right access;
- There is a public school on the Goedehoop premises, which is currently a closure liability. Goedehoop

furthermore faces reputational and other cost impacts should the school not meet the requirements of the Department of Education; and

- According to the Environmental and Social Risks Assessment (AAC, n.d.), the Mthimunye family has raised grievances regarding the grave relocation process and alleged promise of resettlement.

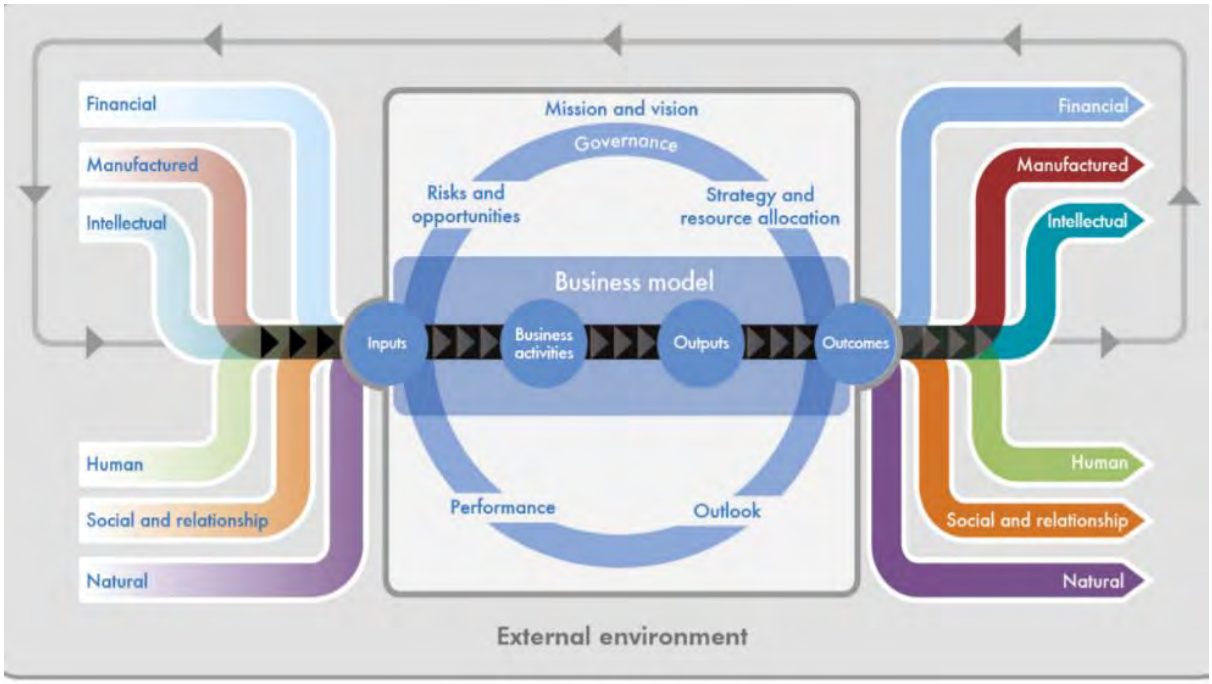
15.4. Sustainability

15.4.1. Introduction

This section reviews the sustainability of the Company according to the six-capital model of sustainable development and correlates it to SAMESG and other reporting tools recommended by SAMESG. The six-capital model is used by the International Integrated Reporting Framework (**IIRF**) (2013) to view the value created by business activities based on all aspects that contribute to a sustainable business, not only on financial value. The model recognises that, in order to be sustainable and create present and future value, each of the foundational capitals must be considered and be in balance throughout the life of the operation. Figure 15-1 provides an overview of the IIRF sustainability reporting framework.

As evident in Figure 15-1 using the IIRF value creation framework, careful consideration is given to how business activities strengthen (creates value) in each capital area. This framework provides a standardized and internationally recognized manner in which to view the sustainability of operations. The six capitals and a short definition of each are provided below:

- **Financial capital** – refers to the pool of funds available to an organization either through making profits or through debt financing, equity, grants or investments;
- **Manufactured capital** – refers to the physical assets that are available to an organisation for conducting business. These include both physical objects like buildings and equipment and infrastructure such as roads, ports, bridges, water services and electricity;
- **Intellectual capital** – refers to knowledge-based intangibles such as intellectual property and organizational capital imbedded in systems, procedures and protocols;
- **Human capital** – refers to people's competencies, capabilities and experience and the organisation's ability to create a healthy, safe and growth-oriented work environment;
- **Social and relational capital** – refers to organizations' focus on building strong relationships with various stakeholder groups to obtain and maintain social licence to operate as well as to create shared value with host communities; and
- **Natural capital** refers to all renewable and non-renewable environmental resources that supports the current and future viability of operations. These include air, water, land, minerals, biodiversity.



srk consulting	**GOEDEHOOP COLLIERY CPR** Value creation through the six-capital model of sustainable development (*IIRF, 2013*)	Project No. 566657

Figure 15-1: Value Creation through the Six-Capital Model of Sustainable Development

Within this broad framework of sustainable development and based on SAMESG, an assessment of the sustainability of the Company is done within three areas:

- External factors impacting sustainability (socio-political);
- Sustainability reporting practices; and
- Internal factors impacting sustainability (according to the six-capital model).

The sources of information used to compile this section include:

- Information provided by the Company regarding overarching sustainability matters (referenced);
- Information gathered from social media (regarding stakeholder sentiment), reputable news agencies and analyst reviews; and
- The results reported in each of the competent persons' sections completed by other specialists (referenced).

In addition to the documentation review, the following interviews also informed the results presented in this section:

- Interview with Stephen Ross, Business Improvement Manager, Goedehoop Colliery; and
- Interview with Nicki Fisher, the Company's Coal Stewardship and Carbon Footprint Manager.

15.4.2. External Factors Potentially Impacting Thermal Coal Mining Sustainability

[ESG 3.5, ESG 3.7]

Several external factors could potentially impact the sustainability of thermal coal mining in South Africa. These

range from macro-economic, global factors to pressure from coal mining labour unions to keep unskilled workers employed in the sector. A short description of some of these factors are provided below.

COVID-19 and Global Macro-economic Environment

The global COVID-19 pandemic and the resulting macro- and micro economic volatility across markets influence both the current demand for thermal coal and the market price for coal due to Rand/Dollar value fluctuations. This volatility creates general uncertainty in world markets and has temporarily delayed calls to transition from coal to more environmentally friendly energy production methods. Most recently, a movement towards building back economies with renewable energy sources and more sustainable ways of doing business have emerged. In the short term, the thermal coal industry in South Africa was able to continue production during the COVID-19 lockdown period which helped absorb the economic impact of the pandemic. The long-term implications of these macro-economic factors for collieries in South Africa are still uncertain but could contribute to higher expectations and pressure from local mining stakeholder groups as local economies struggle as well as a larger thrust to discontinue the use of coal as countries globally rebuild themselves post-COVID-19.

Impact of Climate Change on Coal Production

Both the extraction of coal and the downstream uses of coal contribute to greenhouse gas emissions in South Africa. In turn, increased greenhouse gas emissions are a causative factor for climate change and the resulting extreme weather events. Eskom (South Africa's state-owned electricity utility) and Sasol (South Africa's largest coal to-to-chemical producer) together account for more than 50% of South Africa's greenhouse gas emissions and 85% of the coal used in the local market by volume. Over the last decade, increased understanding of the impact of fossil fuels on the global environment, and more specifically air quality, climate change and extreme weather events led to more pressure for countries to transition to renewable energy sources. South Africa has an ageing fleet of thermal coal power stations that have to be decommissioned over the next 20 years. If these power stations are replaced with renewable energy power sources, the demand for coal in the domestic market will be lowered. South Africa's electricity roadmap to 2030 was recently ratified (The Integrated Resource Plan (**IRP**, 2019)). This plan commits the country to a decarbonation pathway depending strongly on the decommissioning of coal-fired power stations and accompanying deployment of renewable energy infrastructure. The implementation of this plan is wrought with challenges such as how to replace the livelihoods of approximately 82 000 coal miners in the Mpumalanga province.

A 'Just Transition' for Coal Mining

The conundrum of a 'just transition' for vulnerable workers and communities from coal-fired energy to renewable energy is compounded by pre-existing socio-economic factors such as low skills levels in mining areas, unemployment, inequality and poverty. Coal mining employment numbers in South Africa peaked in 1981 and has been in decline ever since. In addition, the skill levels of coal miners have been on the rise as more mechanised mining methods are increasingly used. Currently, approximately half of coal workers are unskilled. Within the larger South African mining context, there is already an employment crisis that requires intervention from various parties to resolve. Against this backdrop, implementing a 'just transition' in coal mining in South Africa might prove to be very challenging. Several scenarios for the transition from coal-fired power to renewable energy have been proposed (Burton, Caetano, McCall, 2018). The conclusion of these studies, evidence from coal transitioning in other countries and recent coal mining trends in South Africa show that South Africa is already facing a coal transition, and that specific coal regions will need support with provincial economic diversification to help lessen the impact of transitioning to a low carbon economy. Currently, instead of focus on wider spread economic diversification, the coal workers trade unions are placing increased pressure on the regulators to delay the eventual demise of the coal industry in South Africa through regulatory measures.

Social Transitioning during Closure and/or Care and Maintenance

In recent years industry bodies such as the International Council of Minerals and Metals (**ICMM**) have been issuing integrated mine closure good practice guidelines with sections on the importance of assisting employees and host communities of mines to transition during mine closure to other types of livelihoods (ICMM, 2019). Communities in mining footprints, like in Mpumalanga province, are often overly reliant on direct and indirect income from the mines. This leads to overdependence and a devastated local economy when the mine closes or goes onto care and maintenance. The recent restriction on mining during the COVID-19 lockdown is a good example of how deep socio-economic turmoil is felt in mining communities during care and maintenance. Within the South African mining closure regulatory framework, some mines prolong a care and maintenance status quo in order to avoid

immediate decision making regarding permanent closure. Care and maintenance and the resulting job losses and decrease in secondary spend in mining communities can have the same devastating effect as closure, without the legal provisioning associated with closure.

Social and labor legacy issues during mergers and acquisitions

In recent years, the coal industry in South Africa has been characterized by increased mergers, acquisitions and restructuring activities. The corporate turmoil and uncertainty often accompanying mergers, acquisitions and restructuring can contribute to labour and community unrest (Botchway, 2010). This destabilizing factor is compounded in the current South African context with pre-existing legacy challenges in the coal industry and the economic consequences of the global COVID-19 pandemic. Ernst & Young's (**EY**'s) top two risks for the mining industry in 2020 are social license to operate and the future of the workforce, whereas reducing carbon footprint is new to the top ten risks at number four (EY, 2020). This analysis indicates that mines whose social license to operate and workforce are threatened and who are unable to reduce their carbon footprint are at increased risk and management plans should be formulated to address these risks in a systematic manner.

This list of external factors that could influence the sustainability of a colliery in South Africa is not exhaustive, but rather indicative of the current context in which coal mining in South Africa is conducted.

15.4.3. Sustainability Reporting Practices

A high-level review of the Company's sustainability reporting practices was undertaken. Corporate sustainability reporting practices give stakeholders the assurance that the reporting entity reports its ESG practices against international good practice standards. This review is significant in the current report as it indicates what level of corporate support Goedehoop Colliery receives from the Company. The data underlying these corporate sustainability reporting practices are collected on site level through environmental, social, human resources, health and safety management systems and the compilation and interpretation of the data is managed at corporate level. A summary of the review is presented in Table 15-5 and indicates which sustainability reporting initiatives the Company partakes in and if the information disclosed is aggregated for The Company's operations or if standalone information for Goedehoop Colliery is available.

Table 15-5: Anglo Coal's Corporate Sustainability Reporting Practices

Reporting Standard	Does the Company participate?	Aggregated/ Standalone	Reference
Carbon Disclosure Project (**CDP**) – Climate Change	No	Not applicable	www.cdp.com
CDP – Water Stewardship	No	Not applicable	www.cdp.com
Sustainability reporting in line with Global Reporting Initiative Requirements	Yes	Aggregated	https://www.angloamerican.com/~/media/Files/A/Anglo-American-Group/PLC/investors/annual-reporting/2020/aa-sustainability-report-2019-v1.pdf
Extractive Industries Transparency Initiative (EITI)	Yes	Aggregated	https://eiti.org/supporter/anglo-american
Public policies and governance	Yes	Aggregated	https://www.angloamerican.com/sustainability/approach-and-policies
Alignment with the Sustainable Development Goals	Yes	Aggregated	https://www.angloamerican.com/sustainability/approach-and-policies
United Nations Global Compact	Yes	Aggregated	https://www.angloamerican.com/sustainability/approach-and-policies
Voluntary Principles on Security and Human Rights	Yes	Aggregated	https://www.angloamerican.com/sustainability/approach-and-policies
UN Guiding Principles on Business and Human Rights	Yes	Aggregated	https://www.angloamerican.com/sustainability/approach-and-policies
UK Modern Slavery Act Statement	Yes	Aggregated	https://www.angloamerican.com/sustainability/approach-and-policies

As evident from Table 15-5, the Company aggregates its sustainability reporting practices into the reports of the larger group. This practice has two implications for Goedehoop Colliery as a standalone entity – the onsite staff

does not have the skills and capacity to perform the tasks associated with public sustainability reporting and there might be a disconnect between public reporting and governance standards and practices at individual operations.

15.4.4. Internal Factors Impacting Sustainability at Goedehoop Colliery

The results of the sustainability review indicate that the following indicative sustainability risks are present. For a full review of LoM risks and the keys to risk classification used in this CPR, see Section 20:

- High risks are present in manufactured and social and relational capitals;
- Moderate risks are present in human capital, external sustainability risks and sustainability reporting practices; and
- Insignificant risks are present in intellectual capital.

The issues identified that could potentially affect the sustainability of Goedehoop Colliery are presented in Table 15-6.

Table 15-6: Identified Issues that could potentially affect the sustainability of Goedehoop Colliery

	Sustainability Area	Identified Sustainability Risks
Internal Factors	Financial Capital	See Section 19 for economic valuation and risks
	Manufactured Capital	Well established access and water for operations and routes for marketing Infrastructure provisioning for closure may not be sufficient Unreliable bulk power supply due to load shedding and load curtailment Illegal mining, vandalism and theft are post-closure risks if the current closure plan remains unchanged
	Intellectual Capital	Efficient environmental and social on-site management systems, policies, procedures and protocols in place Sufficient corporate human rights, climate change, sustainability, water stewardship and employment equity policies in place as guidance for sites Lack of on-site knowledge of sustainability reporting and strategy; should Goedehoop Colliery become a standalone entity, senior staff with additional skills will have to be recruited
	Human Capital	Employment equity targets not fully met Lack of local employment opportunities is one of the topics identified in grievances Section 189 process was implemented in November 2019 and concluded in March 2020 with 522 GHS staff – all but seven found suitable alternative employment Three fatalities during 2017 and 2019 indicate ongoing need for improved control measures 26% of the Coal dust measurement results between 2018 and 2019 exceeded the OEL, most of which were measured in the Continues Miner areas
	Social and Relational Capital	Perceived lack of procurement and employment opportunities reflected in recorded grievances Several pressure groups active in the area who are lobbying for official recognition in the CEF Lack of prior planning for social transitioning during mine closure a concern considering the remaining LoM is approximately seven years (especially the Springbok combined School) Cases of vandalism and theft increasing in the Goedehoop village, especially around GHS High expectations from communities to benefit from ESD and local procurement initiatives Lease agreements with farmers were not adequately documented leading to high expectations from farmers There are several unresolved land claims on farm portions where GHN and GHS either have mineral rights or land use rights The Mthimuney family has raised grievances regarding a grave relocation process and alleged promise of resettlement
	Natural Capital	Exceedances in monitoring parameters for surface water and groundwater parameters have been observed on an ongoing basis Mining activities impacting on aquatic ecosystems Several non-conformances noted in internal and external audits are addressed, but not officially approved in amended EMPrs and WULs Risk of post-closure water discharge into the environment at both GHN and GHS Post-closure risk of subsidence not adequately addressed in current closure plan Post-closure planning underestimates liability associated with discard facilities Current and future (post-closure) sedimentation of Bankfontein Dam
External Factors	Other Sustainability Considerations	Reliance of host communities on income from colliery a risk considering current LoM of seven years No specific community self-sustainability plans in place to prepare for closure in seven years Governance systems well developed and in place on corporate level, but will require on-site specialist skills should Goedehoop Colliery be a standalone operation Social licence to operate and labour legacy challenges might resurface and/or intensify during mergers and acquisitions
	Sustainability Reporting Practices	No CDP reporting found on public platform No Water Stewardship (CDP) reporting found on public platform No human rights due diligence information supplied by site or corporate Public sustainability reporting aggregated into the Company's corporate reporting Confirmation of materiality workshops with local stakeholders at site level not found

15.5. Mine Closure, Planning and Financial Provision

[SR1.7, SR5.2(ii)]

15.5.1. Data Review

SRK made use of the following documents below to provide the opinion:

- Closure Planning Reports for Goedehoop Colliery, as Aligned to the NEMA Financial Provisioning Regulations, 2018. Golder Associates Africa;
- Update of Goedehoop Colliery Unscheduled and Scheduled Closure Costs Using Third Party Contractor Rates, as at December 2019. Golder Associates Africa;
- Update of Goedehoop Colliery Unscheduled Closure Costs Using DMRE Master Rates, as at December 2019. Golder Associates Africa;
- 19121496 Goedehoop_DMR_Unshed_Final_Dec2019;
- 19121496 Goedehoop_NEMA_Unshed_Final_Dec2019_RevA;
- Annual Rehabilitation Plan_GNR 1228 Goedehoop Colliery; and
- Note for the Record-Annual Financial Statement 18 February 2020 indicating financial position.

15.5.2. Regulatory Environment

[SR1.5(v), SR1.7(i)]

Prior to November 2015, the determination of the expected closure liability and the provisioning of funds for closure was regulated by the MPRDA. On 20 November 2015, regulations under NEMA , Financial Provisioning Regulations, 2015 GNR. 1147 (**GN1147**) were promulgated and replaced certain sections of the MPRDA. The intent of the GN1147 was to require mining operations to adopt a strategic approach to closure planning and financial provisioning. The intention is to require operations to undertake focussed closure planning and then actively implement rehabilitation measures during operations, to reduce the liability at the end of the life of the mine. When GN1147 was promulgated, compliance with GN1147 was required by February 2017. However, as there are several technical issues with the regulations, various proposed amendments to the regulations have been published for comment, although no substantial amendments have yet been promulgated. Because of the technical issues related to GN1147, an extension of the Transitional Arrangements to June 2021 (as promulgated in GN24 Amendment to Financial Provision Regulations, 2015 in terms of NEMA) is in effect. Although various amendments have been published for comment, there is no definition as to the final version of the regulations and how they will differ from GN1147.

Although compliance to GN1147 is not required until June 2021, mines are still required to make provision for the liability and assess the quantum of the liability under Regulations 53 and 54 of Regulation 527 under the MPRDA.

15.5.3. Closure Cost Estimates

[SR1.7(i), SR5.6(ix] [ESG4.1]

SRK understands that the liability for Goedehoop is assessed annually by a third party and that this assessment is used as the basis of the provision that the Company negotiates with the DMRE. The approach that is used to assess this liability is based on the 2005 DMR Guideline Document for the Evaluation of the Quantum of Closure Related Financial Provision Provided by a Mine. The 2019 assessment for Goedehoop indicated that the unscheduled closure liability for Goedehoop was ZAR586 million (adjusted to ZAR610 million for end December 2020), which includes a 10% contingency, a 6% Preliminary and General and a 15% VAT provision. The Company has provisions to the value of ZAR852 million, as of 31 December 2019 with the DMRE as illustrated in Table 15-7. As the Company has an overprovision of ZAR266 million, SRK is of the opinion that Goedehoop complies with its legal requirements to make provision to the DMRE.

Table 15-7: The Company's Provision to the DMRE for Goedehoop Liability on 31 December 2019

Item	2019 Provision (ZARm)
Balance in Trust	678.21
Bank Guarantees	174.02
Total	**852.23**

Although Goedehoop has assessed the liability using the DMRE 2005 Guideline approach, there is a general recognition in the industry that the DMRE Guideline may not be an accurate reflection of the closure liability for an operation. This is because the DMRE Guideline adopts a generic approach to closure activities and the costing thereof, with this shortcoming being recognised in GN1147. As there is the potential inaccuracy in the DMRE Guideline approach, Goedehoop has undertaken an assessment based on the GN1147 approach where commercial rates are applied to the actual closure activities. The estimate that has been calculated using the GN1147 approach at Goedehoop is ZAR606 million (excluding VAT) (adjusted to ZAR631 million for end December 2020) for unscheduled closure and ZAR493 million for scheduled closure (adjusted to ZAR513 million for end December 2020). This estimate does not include a provision for post-closure water management, with it being SRK's understanding that post-closure water management will be required to collect and treat the anticipated 10.8 Ml/d of decant (4.5 Ml/d from Goedehoop North and 6.3 Ml/d from Goedehoop South) that will be generated from the various blocks at the two collieries. The provision of ZAR606 million also does not include any provision to manage the impact that the various residue deposits have had on the aquifers associated with the residue deposits (South and North Co Disposal, Hope, Springbok 1 and 2, Bank 5 and Schoongezicht Dumps).

SRK has identified what in our opinion are inaccuracies in the GN1147 estimate particularly related to lime application on discard dumps, which potentially amounts to ZAR20 - 30 million of liability, that has not been included in the ZAR606 million estimate.

Based on the fact that detailed closure engineering has not yet been undertaken, nor have engagements been undertaken with authorities around the closure of Goedehoop, SRK is of the opinion that the liability of ZAR636 million (ZAR606 million, plus an additional ZAR30 million for the inaccuracy identified above) and excluding water treatment requirements, is a fair reflection of the liability, based on the level of planning completed, and has an accuracy of -50% to +50%.

SRK understands that the Company is currently undertaking updates to the closure cost estimates in order to reflect liability as at December 2020. Once the 2020 assessments are complete and have received the necessary internal approvals, these figures will be reported to the DMRE and changes to the closure provision will be made where necessary. SRK has not interrogated the 2020 figures and has instead escalated the 2019 figures to represent a liability at the end of December 2020.

15.5.4. Risks and Opportunities

[12.10(h)(x)] [SR5.7(i)] [ESG4.9]

- **Theft and Vandalism of Closure Structures**: SRK is of the opinion that there is a risk that potential artisanal miners may damage the closure covers placed on the discard facilities in an attempt to recover material that they may consider have economic value. There is also a risk that the various shaft plugs are damaged by miners attempting to illegally access underground working after closure. SRK is of the opinion that there is also a risk that post-closure water management infrastructure could be interfered with and potentially stolen. There may be a requirement to install a pump and treat system to manage the groundwater impacted by the discarded facilities. Should one or more of these risks manifest, there is the potential that Goedehoop may not achieve their closure relinquishment criteria and that additional work may be required. This could increase the closure liability and could extend the period for which the Company is still liable for the property.
- **Post-Closure Water Management**: The work completed by Delta H (2017) indicates that the workings at both Goedehoop North and Goedehoop South will flood with the elevation of the recovered water levels being above natural ground level in a number of locations (ten decant positions at the North and fifteen decant positions at the South). This may result in the workings decanting to the surrounding environment, with decant either manifesting as surface flows or seepage into the shallow aquifer, which in turn may discharge into the

surface environment. The models indicate that the water level recovery and decant is predicted to occur ten years after closure at Goedehoop North and fifteen years after closure at Goedehoop South. Although post-closure water treatment costs are not included in either the DMRE or GN1147 estimate, the Company does estimate treatment liability, but does not report this to the DMRE. Currently the Company envisages that a passive treatment option will be sufficient to manage the post-closure decant from Goedehoop. The Company has estimated that the Capex for the passive treatment is ZAR277 million for planned closure and ZAR188 million for unplanned closure and the Opex is ZAR13.1 million per annum for planned closure and ZAR8.6 million per annum for unplanned closure. SRK is of the opinion that while the Company is investing in research and development related to passive treatment, this is currently unproven technology and still requires significant development to get the technology operational at scale. Although SRK recognises that the technology is still under development, SRK is of the opinion that the volume requiring treatment post-closure, is unlikely to be compatible with a passive treatment approach. Furthermore, as there is likely to be Acid Rock Drainage and Metal Leaching (**ARDML**) associated with the decant, manifest as high sulphate concentration water, removal of the sulphate in a passive treatment is unlikely to occur to a level that will meet relinquishment criteria. SRK is of the opinion that it is likely that at closure, a more active treatment option will be required, for the volume and quality associated with the decant. There may be opportunity to pipe the decant to the existing eMalahleni Water Treatment Plant, although this will require installation of a reticulation system to transfer the water to the plant. However, if a plant at Goedehoop is required, SRK is of the opinion that the Capex would be in the ZAR400 to ZAR500 million range and the Opex ZAR40 to ZAR60 million per annum, to treat the 10 Ml/day that will ultimately decant. Capex includes the construction of the water treatment plant, as well as the reticulation system required to collect decant at the 25 decant points and pipe it to a centralised treatment facility. The Capex is based on SRK's understanding that the construction costs are in the order of ZAR40 to ZAR50 million per Ml of treatment capacity, which excludes Capex associated with construction of the required reticulation.

- **Liability associated with Subsidence.** SRK understands that there is a risk of subsidence of the underground area at a yet undefined point in time post-closure, particularly where multiple seam mining has occurred within a coal block. The extent of this has not yet been defined for either the North or South sections and while a nominal amount of ZAR2.6 million has been included in the Financial Provision Regulation estimate for subsidence at Goedehoop South, the current estimate is only for 5 ha at Vlaklaagte. Should more extensive subsidence and sinkhole formation occur across Goedehoop, the liability to remediate the area disturbed on surface could be materially higher than ZAR2.6 million.

- **Underestimate of Liability associated with Discard Facilities**: The Springbok 1 and 2, Hope, Bank 5 and Schoongezicht Dumps have historically been rehabilitated. This has been undertaken by placing a lime barrier followed by a compacted lateritic layer and soil and vegetation cover. The success of this approach has been varied and, while vegetation has been established on these dumps, it is SRK's opinion that this approach to closure has not necessarily reduced post-closure risks, associated with the dumps, to a level that would allow Goedehoop to achieve the closure relinquishment criteria. SRK is aware that ongoing groundwater impacts continue and that there is still seepage that is impacting on the soils at the toe line of these dumps. As the abovementioned closure approach has been utilised at Goedehoop, this is the approach that is currently planned for the two existing co-disposal facilities at Goedehoop. It is SRK's opinion that as this approach has not been completely successful at the rehabilitated dumps, there is a risk that more intensive closure actions will be required at the two co-disposal facilities, potentially increasing the closure costs for these two facilities. Although the above closure approach has been approved in the various EMPr for Goedehoop, there is also a risk that once Goedehoop applies for closure authorisation, the authorities may require that the principles included in the Regulations (Regulations Regarding the Planning and Management of Residue Stockpiles and Residue Deposits) and Regulation Amendments, associated with NEM:WA may be applied to the closure designs. This may require Goedehoop to implement more complex barrier systems in the closure covers, which may include a HDPE component. This may increase the closure liability by ZAR500 to ZAR600 million, which is based on a combined footprint area of 280 ha for the two co-disposal facilities with SRK estimating that the additional cost of a complex cover is ZAR175 to ZAR200/m^3.

- **Remediation of Aquifers impacted by Discard Facilities**: Historical groundwater monitoring indicates that there is an impact on the aquifers associated with the various discard facilities, both the active as well as those that have historically been remediated. No provision is included in the liability assessments or in the

Company's water treatment estimate to mitigate the impact that the discard has had on the aquifers. SRK understands that the approach the Company adopts is to remediate the source and allow natural attenuation in the aquifer to dilute contaminants to the anticipated relinquishment criteria. This may not meet authority requirements, who are mandated to protect water resources, with the result that at closure, additional mitigation measures may be required by the authorities. There is a risk that the authorities may require Goedehoop to implement an interception and abstraction system in the aquifer associated with the dumps, with the water abstracted requiring treating before being released to the environment. As the impact and aquifer properties are not yet adequality defined, it is not possible to quantify potential remediation costs. A further risk is associated with the Goedehoop South co-disposal facility. As this is proximate to the neighbour co-disposal facility (the eastern toe of Goedehoop's facility is within 50 m of the western toe of the neighbour's facility) apportioning impact on groundwater and therefore apportioning costs will be complex and will likely require a negotiated outcome, rather than a purely scientific outcome.

- **Sedimentation of the Bankfontein Dam.** SRK understands that carbonaceous sediments have accumulated in the Bankfontein Dam. An allowance is included in the Financial Provision Regulations estimate for the excavation of contaminated sediment from the beach in the headwaters of Bankfontein Dam to 350 mm. SRK is of the opinion that there is a potential that, once a detailed assessment of the sediment in the dam is complete and a risk assessment undertaken, a risk will be identified that significantly more desilting of the dam may be required, particularly if hydrology conditions change and sediments currently covered by water are exposed. In this scenario, the sediment may oxidise generating ARDML. This risk cannot be currently quantified.

Based on SRK'S assessment of the risks, SRK has summarised our interpretation of the closure quantum in Table 15-8. This table includes an inflationary adjustment to both the DMRE and NEMA assessment to the end of December 2020.

Table 15-8: SRK Summary of Goedehoop Liability

Item	Related Financial Closure Provision (ZARm)	
	As at December 2019	**Adjusted to December 2020**
DMRE Assessment		
Unscheduled	586	610
NEMA Assessment*		
Unscheduled	606*	630
Scheduled	493	513
Provision to DMRE (2019 data)		
Balance in Trust	678	678
Bank Guarantees	174	174
Total Provision	**852**	**852**
Surplus/difference between provision and DMRE assessment	266	242
Additional Liability arising from Risk Items		
Illegal/artisanal post-closure activity	Unquantified	Unquantified
Water Treatment (Capex)	188 - 500	188 - 500
Subsidence	Unquantified	Unquantified
Dump covers	500 - 600	500 - 600
Impact of discard on aquifers	Unquantified	Unquantified
Bankfontein Dam remediation	Unquantified	Unquantified

Note:
* The NEMA Assessment does not include the ZAR30 million inaccuracy in the assessment.

16. Water Management

[12.10(h)viii] [SR3.1(i), SR4.3(ii), SR5.2(viii)]

16.1. Surface Water Management

[12.10(h)viii] [SR3.1(i), SR5.2(ii)]

16.1.1. Site Layout

The detailed layout of Goedehoop North is indicated in Figure 16-1, while that of Goedehoop South is indicated in Figure 16-2. The colliery is located within the 1:100-year floodline of the Naauwpoortspruit. There are numerous wetlands in the immediate vicinity of Goedehoop.

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Goedehoop North Infrastructure | Project No. 566657

Figure 16-1: Goedehoop North Infrastructure

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Figure 16-2: Goedehoop South Infrastructure

16.1.2. Stormwater Management Systems and Controls

[ESG4.2, ESG4.4]

Each shaft at Goedehoop South has a Return Water Dam (**RWD**), which collects portions of both dirty water, generated at the associated underground workings, and surface runoff, generated at the shaft surface infrastructure. Where the storage of dirty water in underground sections is not currently possible, any excess dirty water generated underground is either pumped out and directed to the appropriate RWD or stored in preselected

compartments underground. It is preferred to store water in the underground compartments rather than the RWDs due to the limitations in size of the RWDs.

At Goedehoop North, the mine water generated at the Simunye No 2 and No 4 Seam underground workings is either collected at the RWD or stored in underground compartments. RoM coal is brought to the surface at the Simunye No 2 and No 4 Seam Shafts and is deposited at the RoM stockpile, which feeds the beneficiation Plant. From the Plant, processed coal is placed on the product stockpile, from where it is dispatched to the local and international markets. The discard and slurry fractions generated in the beneficiation process are discarded at the Goedehoop North Co-disposal Dump, also known as the Bank 2 Co-disposal Facility (Jones and Wagener, 2017). Currently, a single RWD, located to the east of the existing Co-disposal Facility, collects dirty stormwater runoff from the Plant and shaft infrastructure areas, as well as return water from the Co-disposal Facility. Recharge water to the underground workings is generally left underground and only water required for coal processing or for the CM sections is pumped to surface.

A GN704 audit was undertaken by Golder Associates Africa (2015) and the following major non-conformances that carry a material risk were highlighted as follows:

- Failure to intercept seepage and prevent erosion at Bank 5 Discard Dump, resulting in an impact to the riparian and in-stream habitats. Similar findings related to the Hope and Springbok Dumps occur; and
- Dirty water runoff from Bank 5 is not collected and contained in a pollution control dam.

Further to the audit there has been additional work done to implement controls to deal with the pollution from the Bank 5 Discard Dump. The phytoremediation project at Bank 5 commenced in August 2020, and the mine has appointed a contractor who is currently drilling boreholes at Springbok 1 and 2 Discard Dumps for passive treatment system. The Phytoremediation project for Hope Dump will also commence by end November 2020. Proposal have been received from Wits and will be loaded on SAP for order number. (The mine presented documents to this effect).

There is a further WUL audit scheduled for the 24 November 2020

Surface water monitoring is conducted on a monthly basis. Delta-H Water System Modelling (Pty) Ltd (**Delta-H**) has been appointed by the Company to update the existing groundwater flow model to inform the monitoring strategy going forward (Delta-H, 2019). Monitoring boreholes in close proximity of the discard dumps, especially Bank 2 and Bank 5 are of poor quality with high salinity, as indicated from TDS concentration. The salinity is mainly derived from high concentrations of sulphate. Based on more detailed studies by Delta-H (2017), sulphate concentrations generally increase with time in all existing discard monitoring boreholes, which suggests the arrival of a plume of contaminated groundwater from the discard.

16.1.3. Potable Water

Potable water is supplied to various farms in the area, as well as to the coal preparation plant at Goedehoop North. The aim is to replace the water supply to the farmers with local water resources. This is likely to be from boreholes. Until a new source of water is available to the farmers and third parties, they will continue to get water from the Company's operations. The water that is used by the various parties since January 2019 is listed in Table 16-1, Table 16-2 and Table 16-3 .

16.1.4. Process Water

Shaft water is recycled via the Shaft Erickson Dams and dirty stormwater is recycled from the PCDs, via the Plant Erickson Dams.

16.1.5. Sewage

The Goedehoop North Colliery has two sewage treatment plants; namely, Schoongezicht and Bank 2 Sewage Plant. These plants are registered with the DHSWS and managed by an external third party, who conducts monthly water sampling and reports back to Goedehoop regarding the water quality and provides recommendations for improvements, where necessary.

Table 16-1: Farmers Receiving Water From Goedehoop South

Groundwater Abstraction/Recycling - Simunye																	
Year	**2019**												**2020**				**Average**
Month	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**	**Jan**	**Feb**	**Mar**	**Apr**	
Van Niekerk Farm	1 000	1 400	1 800	1 800	1 400	700	800	900	1 800	2 000	1 900	1 800	1 400	1 300	1 400	1 500	1 431
Van Dyk 2 and Bloem	22 000	23 000	24 000	25 000	26 000	30 000	31 000	35 000	35 000	38 000	39 000	40 000	41 500	43 000	45 000	500	31 125
Van Dyk Farm 1	1 000	1 400	1 800	1 800	1 400	700	800	900	1 800	2 000	1 900	1 800	1 400	1 300	1 400	1 500	1 431
Van Dyk Farm 2	1 000	1 500	1 800	1 800	1 800	700	800	900	1 800	2 000	1 900	1 800	1 400	1 300	1 400	1 500	1 463
Springbok Village (Sarie Moll/Church/KwaJuma)	23 000	24 000	25 000	26 000	30 000	32 000	33 000	36 000	38 000	39 000	39 500	40 000	42 000	43 000	45 000	500	32 250
Du Toit and Swart Farm	17 000	17 500	17 500	17 500	18 000	18 500	18 600	19 000	19 000	19 500	500	500	1 000	2 000	2 000	2 000	11 881
Britztown	1 000	1 200	1 800	1 900	1 800	1 500	1 600	1 660	1 800	2 000	2 200	2 000	1 800	1 850	1 900	2 000	1 751
Indian Shop	500	400	400	400	420	390	380	390	400	410	500	500	550	500	500	500	446
Dairy Farm	9 000	9 100	9 500	9 500	9 000	7 000	8 000	8 000	1 500	17 000	4 000	9 000	8 000	9 000	100 000	30 000	15 475
Honeybourne-Bella Farm	1 000	1 500	1 800	1 800	1 800	1 500	1 000	1 000	1 800	2 000	500	500	500	500	1 000	2 000	1 263
Valkraans Garage	10 000	10 000	10 000	10 000	10 000	10 000	9 000	9 000	8 500	8 000	8 500	8 500	8 500	8 000	5 000	5 000	8 625
Total	86 500	91 000	95 400	97 500	101 620	102 990	104 980	112 750	111 400	131 910	100 400	106 400	108 050	111 750	204 600	47 000	107 141

Table 16-2: Farmers Receiving Water from Goedehoop North

Groundwater Abstraction/Recycling - Simunye																	
Year	**2019**												**2020**				**Average**
Month	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**	**Jan**	**Feb**	**Mar**	**Apr**	
Steyn Farm	291	266	127	83	85	120	116	146	118	305	306	307	307	307	308	318	219
Steenkamp Farm	531	266	381	461	228	319	737	142	113	6 011	6 116	6 128	6 750	1 769	1 604	1 473	2 064
Schoeman and Farm Dwellers	5 724	1 168	5 229	4 159	4 117	3 843	4 251	4 278	3 871	4 503	4 117	3 423	3 957	4 041	5 087	9 750	4 470

Table 16-3 : Plant Water Use

Water Consumption Bank 2 Plant																	
Year	**2019**												**2020**				**Average**
Month	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**	**Jan**	**Feb**	**Mar**	**Apr**	
Bank 2 Plant Actual Consumption (feed)	57 000	57 500	57 800	58 000	58 100	58 200	58 300	5 000	18 000	59 000	59 500	59 500	4 000	4 000	6 000	0	38 744
Bank 2 Plant Recycled Volume	1 850	750	1 600	800	2 600	1 550	1 800	1 400	2 250	2 150	1 100	1 100	2 600	2 800	3 200	2 800	1 897
Bank 2 Plant IWUL	1 400	1 400	1 400	1 400	1 400	1 400	1 400	1 400	1 400	1 400	1 400	1 400	1 400	1 400	1 400	1 400	1 400

The quarterly results indicated that between December 2017 and February 2018, there was no flow of water at the Schoongezicht Sewage Plant, whereas the Bank 2 Sewage Water Treatment

had non-compliances regarding TDS, conductivity and sulphate.

The Goedehoop South Colliery has three sewage treatment plants namely: Vlaklaagte Biodisk, Springbok Main and Hope Biodisk. All these plants are registered with DWS and managed by external contractor. These plants are not in use now as Goedehoop South is under care and maintenance.

16.1.6. Water Balance

The water balance modelled various rainfall scenarios and calculated resultant spillage. The main results from the water balances at each section is outlined below.

Goedehoop North

A water balance was undertaken for Goedehoop by Jones and Wagener (2017) and based on the information received and assumptions made, the following key conclusions can be drawn from the water balance modelling carried out for Goedehoop North:

- The total mine water make, including all historical mining, is expected to increase from 2 360 m^3/d to 3 380 m^3/d at the end of the LoM in 2027 for average rainfall;
- The average water make over the LoM is estimated at 2 890 m^3/d;
- Goedehoop is expected to have sufficient storage capacity to accommodate the water make over the LoM (i.e. 2015 to 2027) provided the assumed 15 million m^3 of storage capacity becomes available as per the Hodgson (2011) report;
- A preliminary estimate of the additional storage that would become available in the No1 Seam workings (not included in the Hodgson report) is 2.76 and 3.24 million m^3 becoming available in 2020 and 2027, at Simunye and Brown respectively;
- Post-closure, the total mine storage capacity is expected to be exceeded at the current recharge rates and the bord-and-pillar mining strategy, by approximately 2036;
- The average post-closure water make is estimated at around 3 380 m^3/d; and
- Post-closure the water make will need to be actively managed at a safe level below decant level.

Goedehoop South

Based on the information received and assumptions made, the following key conclusions can be drawn from the water balance modelling carried out for Goedehoop South:

- A daily groundwater interflow rate of 3 300 m^3/d was included in the modelling, with this inclusion and at the current recharge rates and bord-and-pillar mining strategy, the total mine storage capacity may be exceeded in approximately 2037;
- The water make (for both the underground and opencast sections) is anticipated to increase from the current average of 7 640 m^3/d to a maximum of 7 750 m^3/d at the end of the LoM;
- Net water make up, which Goedehoop will need to actively manage throughout the LoM, is anticipated to equate to approximately 7 690 m^3/d (i.e. that is 4 340 m^3/d together with the groundwater interflow rate of 3 300 m^3/d) on average, over the LoM. These are volumes that Goedehoop will need to prevent spilling from the site; and
- Post-closure water make is anticipated to average 7 750 m^3/d.

16.1.7. Key Issues and Risks

[12.10(h)(x)] [SR5.7(i)] [ESG4.9]

Key Issues

The specific surface water material risks are as follows:

- Failure to intercept seepage and prevent erosion at Bank 5 Discard Dump, resulting in an impact to the riparian habitat and in-stream habitat. Similar findings related to the Hope Dump and Springbok Dump occur;
- No collection of water containing waste was contained for the polluted water at Bank 5; and
- Discharge of dirty water directly to the environment especially after closure. This water will need to be managed but is not included in the closure costs as water, management is excluded.

The work that is occurring to address the issues is as follows:

- Capping and rehabilitation of inactive discard dumps;
- Trials with Vetiver grass at Bank 5 Dump 2013 - not successful;
- Communication with DWS to trial a sustainable solution on one of the old dumps at the Bank Colliery and implement at all the dumps;
- Geochemical and Acid Base Accounting studies completed May 2019;
- Ground Water Pollution Plume completed 2019;
- Geohydrological studies underway with proposed drilling of additional boreholes;
- Reclamation of the discard dump for re-processing; and
- Dust suppression of the discard dump with excess water to relieve the dams.

The cost estimate for the upgrading of the surface water aspects is based on similar costs for similar items that have been implemented and costed on other mines. The items that are included where taken from the non-compliance audits done on the mine. There has been no design or investigation work to identify the best solution so this will give an indication of costs required to make the mine compliant. The main items that were highlighted are as follows:

- Inadequate diversion of clean runoff water from the Vlaklaagte and North East Shafts. SRK has allowed for 1 000 m of canals at the shafts;
- Ineffective rehabilitation of the Springbok 1 and 2 and Hope Dumps due to seepage observed and recommendations from the investigation conducted at Springbok 1 and 2 and Hope Dump have not been implemented. We have included stormwater and seepage collection that will be required on the closed dumps;
- Seepage containment within the South Plant Return Water Dam is not effective. We have included for seepage collection facilities and reticulation the potential closure works;
- No rehabilitation of wetlands has been undertaken where required or committed to do so. We have included costs for wetland rehabilitation;
- No sumps have been constructed to contain seepages from the dumps. We have included the construction of sumps as well as the infrastructure required to pump the water to the treatment works;
- Contamination of stormwater leaving the site originating from seepage from the Bank 5 Dump. This seepage is also not collected in a Pollution Control Dam as required according to the condition. We have included cut off drains, sumps, reticulation, stormwater dams; and

- Contamination of stormwater leaving the property as a result of raw sewage spillage from the Springbok Main Sewage Treatment Plant. An upgrade of the sewage works is included.

The cost of water treatment and management is included in the closure section as the high risk elements are primarily for closure.

16.2. Groundwater Management

[12.10(h)(viii)] [SR5.2(viii)]

16.2.1. Aquifer Characteristics

The area is characterised by three key hydrostratigraphic units (Delta H, 2017):

- Shallow primary aquifers comprised of alluvium, weathered Karoo material and backfilled spoil (artificial mine aquifer). The shallow aquifer thickness ranges from 6 - 18 m and is considered the dominant aquifer at Goedehoop North. Reported airlift yields average at 0.16 l/s and hydraulic conductivity ranges between 0.017 and 0.185 m/d.
- Deeper fractured Karoo aquifers and aquiclude made up of fractured siltstone, shale, sandstone. The fractured Karoo aquifer is considered a semi-confined aquifer. These aquifers have an overall low hydraulic conductivity (0.03 m/d) but are known to be highly heterogeneous as shown by the yields which ranges from 0.5 - 2 l/s. depending on the prevailing sedimentary succession. The mine voids are essentially an artificial high porosity and permeability network superimposed on the natural fractured Karoo rocks, with effective porosities and permeabilities dependent on the deployed mining method and extraction factors.
- Pre-Karoo aquifer and aquiclude are comprised of pre-Karoo rocks of the Lebowa Granite Suite and Rashoop Granophyre suite of the Bushveld Complex and the Rooiberg Group which underlie the Karoo rocks and outcrop in the northern parts of the area of interest. They host a secondary fractured aquifer with limited conductivity and storativity.

Groundwater occurrence is usually associated with faults, fractures, joints, bedding planes or other geological contacts (including coal seams), while the rock matrix itself is considered impermeable. Groundwater level monitoring data suggests there is limited hydraulic connection between the shallow-weathered and the deeper fractured aquifers.

16.2.2. Baseline Hydrogeological Setting

The regional groundwater levels vary from 0.8 m below ground level (**mbgl**) to 33.9 mbgl and the groundwater flow directions mimic the topography. The groundwater discharges are to surface drainage systems and pans, as well as a few springs which occur within the area.

Groundwater level monitoring shows no seasonal water level trends, suggesting limited influence of rainfall recharge on observed water levels but an overriding effect of seepage from the discard facilities, which is reflected as a rise in water levels. There has been regional lowering of the groundwater level at Goedehoop South due to past mining activities, but little change is evident at Goedehoop North (SRK, 2014).

The main groundwater sources in the wider area of interest are:

- Direct rainfall recharge of the shallow primary aquifer with limited vertical leakage to the fractured Karoo hydrostratigraphic, zone including mine voids;
- Vertical seepage from all unlined dams and MRDs (such as discard and ash dumps); and
- Regional groundwater through-flow.

The main groundwater sinks in the wider area of interest are:

- Groundwater seepage towards streams and pans (groundwater baseflow);

- Groundwater inflows into underground and the SAEC opencast mine workings; and
- Regional groundwater outflow.

The main source of recharge into the shallow primary aquifers and backfilled pits is direct rainfall recharge that infiltrates the aquifer through the overlying unsaturated zone. Recharge of the deep Karoo aquifer as limited seepage from the shallow Karoo aquifer through permeable fracture systems or open exploration boreholes that hydraulically link the two aquifers. Groundwater recharge is estimated at 3-8% of mean annual precipitation. Higher recharge rates are expected where the natural permeability is increased due to mining activities, i.e. in backfilled or rehabilitated spoils (especially if inward draining), stripped areas or areas of increased fracturing associated with mining activities (Delta H, 2017).

An assessment of the local groundwater chemistry shows that sulphate levels are elevated in the groundwater, with a number of sites showing acid mine drainage with pH of less than 4. This water quality data is consistent with pyrite oxidation being the main source of sulphate contamination.

The following facilities are potential sources of contamination into the groundwater:

- Underground workings;
- Seepage from discard dumps; and
- Seepage from backfill/overburden spoiling rehabilitated open cast pits.

The groundwater and surface water monitoring shows that the chemical signatures of samples from boreholes suggest that they have been influenced by acid mine drainage over time. The acidic water conditions at a number of sampling points, coupled with high concentrations of SO_4, Al, Fe and Mn, indicates acid rock drainage. Most of the localities (both surface water and groundwater) in the Goedehoop South area have been identified where the levels of nitrogen (N) in the water was high, which may affect the suitability of the groundwater for domestic consumption or industrial use.

16.2.3. Mine Inflows

At Goedehoop North, groundwater level measurements show that the Simunye No 2 Seam workings are fully flooded with a piezometric head between one and seven metres above the No 2 Seam workings. Similarly, the No 5 Seam workings at Goedehoop North appear to be fully flooded, with a piezometric head of 0.5 to 7 m above the seam roof. Some of the areas, however, may be partially flooded.

At Goedehoop South, groundwater levels measured suggest that the No 2 Seam workings in the Haasfontein section of the mine are fully flooded with a piezometric surface of at least four metres above the workings. The No 2 Seam workings at Hope Shaft are partially flooded in the north and fully flooded in the south. The No 2 Seam workings of the North East Shaft are assumed to be partially flooded. Based on measured water levels, all No 5 Seam workings at Goedehoop South appear to be fully flooded, with a piezometric head which is six metres above the No 5 Seam roof.

Based on the mine water balance model by Jones and Wagner (2018) the estimated underground mine inflows amount to 2.4 Ml/d for Goedehoop North and 7.6 Ml/d for Goedehoop South, respectively. The 2017 numerical model by Delta H estimates current inflows of 3.3 Ml/d at Goedehoop North and 3.6 Ml/d at Goedehoop South.

Pumping figures for the abovementioned operations were not available as the mine does not monitor the abstraction rates. However, the 2018 mine water balance estimates that 0.7 Ml/d is pumped from Goedehoop South and 1.3 Ml/d from Goedehoop North (Golder Associates Africa, 2019).

The 2017 Delta H model predicts peak mine inflows of 7.2 Ml/d in 2024 for Goedehoop North and 12.1 Ml/d in 2029 at Goedehoop South. Estimates from hydrogeological studies at Goedehoop indicate that water will fill the workings completely within 15 years after closure.

16.2.4. Hydrogeological Risk Assessment

[12.10(h)(x)] [SR5.7(i)] [ESG4.9]

Risks to the groundwater systems in the area have been identified as follows:

- Groundwater quality monitoring indicates that groundwater within the area has been impacted by mining, with elevated concentrations of sulphates;
- Generation of acid rock drainage from mine voids and discard dumps;
- The shallow weathered zone aquifer is extremely vulnerable to surface-induced activities and impacts. The active Bank 2 discard Dump is impacting on the groundwater to the north of Goedehoop. Intensive groundwater monitoring is being done on the dump in order to determine the extent of the impact from the dump and mitigation measures thereof;
- Dewatering of existing pans and dams caused by damage to the integrity of underlying geological formations. The impacts of underground mining on larger pans will be minimal unless dyke intrusions underlie the pan and intersect the mine workings. Smaller pans that dry up seasonally may dry up permanently;
- Decant of contaminated water from underground workings into surface and/or groundwater resource. The model estimates that, approximately three years after closure, 4.5 Ml/d and 6.3 Ml/d of decant will be produced by the Goedehoop North and Goedehoop South operations, respectively; and
- Post-closure, the total mine storage capacity is expected be exceeded at the current recharge rates and bord-and-pillar mining strategy, by approximately 2036.

The above risks, their rating and mitigations are discussed in detail in Section 20 of this CPR.

16.2.5. SRK Comments

It is SRK's opinion that the groundwater management strategy (dewatering) for the underground operations is effective for the safe mining of the current No 2 and 4 Seam workings. However, the water pressures in the overlying No 5 Seam and underlying and No 2 Seam workings present a risk of driving water into active working areas. There is a risk of flooding in operational areas if the dewatering system is dormant for extended periods. Elevated concentrations of sulphate are of great concern and the water management strategy must ensure that the affected water is not released into the receiving environment through discharge, decant or even plume movement. The main concern relates to the post-mining decant of contaminated water, which may need treatment and management into perpetuity. Decanting has been predicted to occur very soon after mining ceases and pumping of water from the workings to a treatment plant will be required after cessation of mining. Post-closure, the mine water will need to be actively managed at a safe level to prevent decanting.

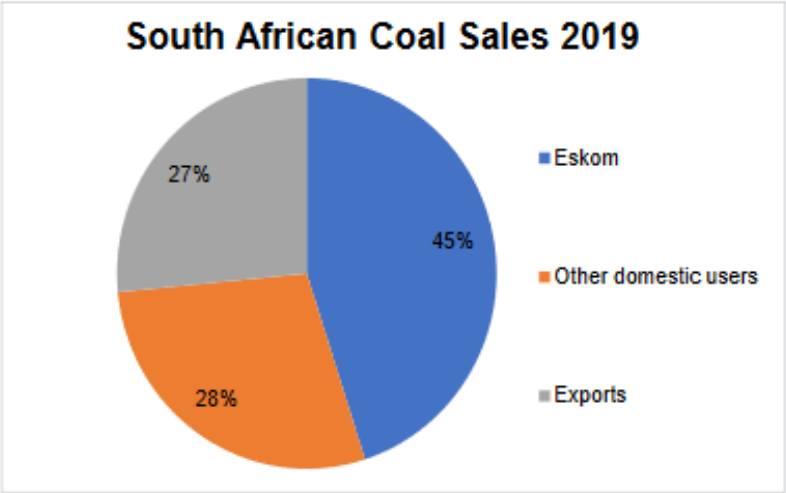
17. Utilisation and Marketing Overview

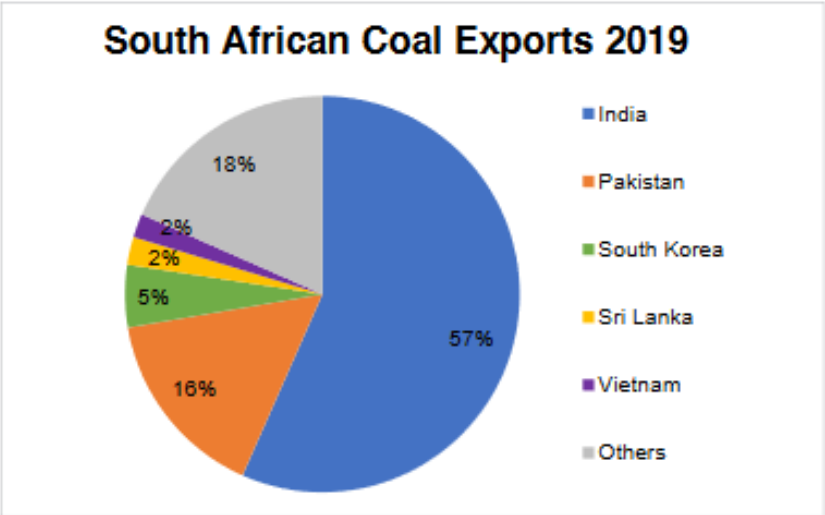
[SR4.3(vi), SR5.6(i)(ii)(vi)] [SV1.14]

17.1. Introduction

The benchmark for South African export prices is the "RB1" Richards Bay free-on-board (**FoB**) price for a 6 000 kcal/kg product (minimum of 5 850 kcal/kg). This category is only a small part of South Africa's total thermal coal exports, but it is quoted the most often. Prices for lower quality coals largely follow the RB1 trend. Other coals commonly exported are the RB2 specification (minimum of 5 700 kcal/kg) and the RB3 specification (5 500 kcal/kg, minimum of 5 300 kcal/kg).

Exports made up 27% of South African coal sales in 2019, much lower than the 45% sold to Eskom (Figure 17-1, top) (Afriforesight, 2020). Coals destined for use by Eskom generally have CVs around 4 800 kcal/kg of 20 MJ/kg. India is South Africa's main export market, accounting for about 57% of 2019 exports, with Pakistan a distant second as shown in Figure 17-1 (bottom).





srk consulting	**GOEDEHOOP COLLIERY CPR** South African Coal Sales and Exports 2019 (*source: Afriforesight, 2020*)	Project No. 566657

Figure 17-1: South African Coal Sales and Exports 2019

Historical coal prices for thermal coal FoB out of Richards Bay for 2013 to Quarter 2 2020 varied between USD50/t

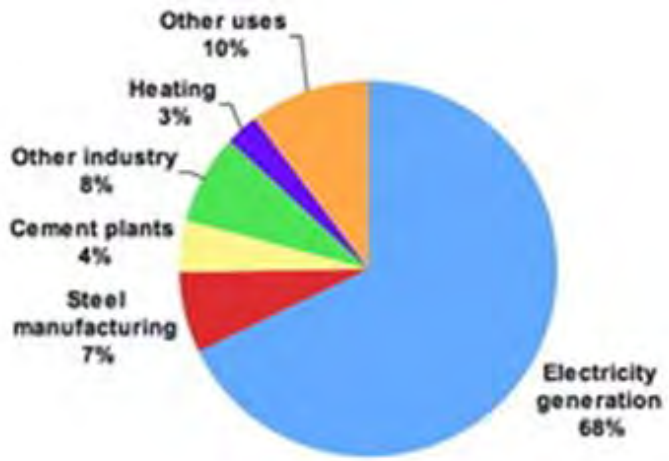
(Quarter 1 2016) and USD100/t (Quarter 3 2018) (Afriforesight, 2020). Domestic coal prices for 2014 to Quarter 2 2020 have varied between ZAR440/t (Quarter 2 2015, Quarter 2 2020) and ZAR620/t (Quarter 44 2018) (Afriforesight, 2020).

17.2. Coal Uses

Different types of coal have different uses:

- Steam coal - also known as thermal coal - is mainly used in power generation; and
- Coking coal - also known as metallurgical coal - is mainly used in steel production (World Coal Organisation, 2020).

Coal has a wide range of uses and is used in several different industries and applications, as shown in Figure 17-2.



srk consulting	**GOEDEHOOP COLLIERY CPR** Uses of coal *(source: coalfacts.weebly.com, 2020)*	Project No. 566657

Figure 17-2: Uses of Coal

According to the Minerals Council South Africa (2020) and the World Coal Organisation (2020), the uses of coal are:

- Thermal coal is used in power stations to generate electricity;
- The steel industry is the second largest user of coal. Coking coal is used as a fuel to melt iron in furnaces to produce cast iron which in turn is further refined to produce steel;
- Energy-intensive industries such as cement, paper and aluminium use coal as the most cost-effective source of energy;
- By-products generated from burning coal, typically fly ash, are also used in production of concrete and cement bricks;
- Many chemical products are manufactured from the by-products of coal. Refined coal tar is used to make chemicals such as creosote oil, naphthalene, phenol and benzene. Soap, aspirins, solvents, dyes, plastics and fibres, such as rayon and nylon, use coal or coal by-products as components;
- Coal is converted into gas and liquid which can be used to fuel cars, motorcycles and ships;
- Coal can be turned into ammonia fertiliser. Ammonia gas recovered from coke ovens is used to manufacture ammonia salts, nitric acid and agricultural fertilisers;

- Coal is also an essential ingredient in the production of specialist products:
  - Activated carbon - used in filters for water and air purification and in kidney dialysis machines;
  - Carbon fibre - an extremely strong but light weight reinforcement material used in construction, mountain bikes and tennis rackets; and
  - Silicon metal - used to produce silicones and silanes, which are in turn used to make lubricants, water repellents, resins, cosmetics, hair shampoos and toothpastes.

17.3. Coal Market Report

The summary set out below is adapted from a report prepared for the Company by Wood Mackenzie Ltd (2021), a leading research and consultancy business for the global energy industry.

Demand for thermal coal in 2020 has been negatively impacted by the COVID-19 pandemic, declining to 6.6 Bt. It is expected that demand will rebound from 2021, growing to a peak of 7.2 Bt in 2026 and declining again by 2030 to 7.0 Bt as sources of renewable power generation increase. Demand for thermal coal will increase rapidly in the short term at 2.1% compound annual growth rate (**CAGR**), while in the long-term demand will flatten to 0.0% CAGR. In 2020, 79% of global coal-fired power generation was from Asia, up from 75% in 2019. While global coal generated power is not expected to increase significantly in the coming decade, Asia's share of the coal power generation market is expected to grow further to 86% by 2030 when coal generation in Asia will reach around 8 910 TWh. Thermal coal is still a highly competitive source for electricity generation in sizeable markets that matter for thermal trade including China, India and the traditional markets of Japan, South Korea and Taiwan.

After sustained growth over several decades, demand for seaborne thermal coal peaked in 2019 at 1 009 Mt, before dipping to 933 Mt in 2020. This disruption is expected to be followed by recovery of demand, reaching a lower peak of 1 001 Mt in 2023 before softening to 956 Mt in 2030. South and Southeast Asia are expected to be the key growth regions through the forecast, offsetting declines in other regions including Japan, South Korea and Taiwan, Europe and China. India, the largest export market for South African thermal coal, is expected to overtake China as the largest demand centre for seaborne thermal coal in 2023.

South Africa is the world's fourth largest export thermal coal producer. Total marketable thermal coal production was 243 Mt in 2020. South African thermal coal supply has declined over the last decade as many existing mines have reached end of life and domestic demand has declined slightly as renewable power generation capacity has been developed. Production from existing mines is expected to fall to 186 Mt by 2030 and additional projects and expansions will need to be developed to maintain supply and meet demand. South Africa produces good quality thermal coal for the export market with an average energy content of 5 594 kcal/kg NAR, which is above the global weighted average. South African coal is valued for its low levels of moisture, volatile matter and sulphur. India is the largest destination for exported South African thermal coal accounting for 50% of South Africa's thermal coal exports in 2020 and is expected to continue at current levels through to 2030.

The South African benchmark FoB Richards Bay 6 000 kcal/kg NAR average annual price in real USD terms is expected to rebound from its 2020 low of USD66/t to USD85/t in 2021, then plateau at USD81/t by 2023 to finish the forecast period at USD82/t in 2030. Forecast ZAR:USD exchange rates and API 4 export prices as provided by Wood Mackenzie are set out in Table 17-1.

Table 17-1: Forecast Exchange Rate and API Export Price (Real Terms)

Item	Units	2021	2022	2023	2024	2025	2026	2027	2028
Exchange Rate	(ZAR/USD)	16.24	15.58	14.99	13.75	13.75	13.75	13.75	13.75
API 4 Price	(USD/t)	85.2	82.4	80.7	79	79.3	79.4	79.5	81.1

Source: Wood Mackenzie (2021)

18. Material Contracts

[SR5.6(i)(ii)(vi)]

18.1. Introduction

This section discusses material contracts which govern the allocation, transportation and shipping of export coal.

Some examples of short-term contracts for the purchase and/or sale of coal are presented. The Company advised SRK that it does from time to time lease additional capacity for the transportation and shipping of export coal.

18.2. Transnet Freight Rail

The Company signed an agreement with Transnet SOC Limited acting through its Transnet Freight Rail Division (**TFR**) for the transportation of coal to RBCT. The agreement commenced on 1 April 2014 and runs for ten years to 31 March 2024. The agreement can be extended by mutual agreement.

In terms of the contract, the contracted tonnage allocated to the Company is 19.08 Mtpa, being 23.56% of the stated rail capacity of 81 Mtpa. Of this contracted tonnage, 18.13 Mtpa is referred to as committed tonnage, with the balance of 0.95 Mtpa allocated to emerging miners (uncommitted tonnage, at 5% of contracted tonnage). To the extent that the uncommitted tonnage is not used in any given year, the Company can utilise that capacity.

The contract operates on a “take or pay” basis, except where the transport services offered by TFR exceed the contracted tonnage. If the volume of coal railed on behalf of the Company is less than 95% of the contracted tonnage in a contract year, the Company is liable to pay an unutilised capacity charge according to a formula.

The Company will be liable for certain additional charges, where:

- Overloading – the mass of coal on a wagon exceeds its maximum carrying capacity by 2 t;
- Underloading – the mass of coal on a wagon is more than 10 t below its maximum carrying capacity; and
- Train handling time (**THT**) for each site – the time taken to handle a train, i.e. from the time the train is delivered by TFR until the time it is collected again, exceeds the agreed THT for a given site per the lower of the THT agreed in the service level agreement (**SLA**) or four hours. This is a charge per hour or part thereof.

Per Annexure B of the agreement, the Company specified five loading sites at which its export tonnage will be loaded (Table 18-1). The Company reviews the distribution of capacity to each nominated loading site annually based on the business plan and the capacity at each loading site.

Table 18-1: Specified Loading Sites

Loading Site	Coal Allocation (Mtpa)	Tonnage (%)
Phola – 743345	4.96	26.0
South African Coal Estates – 750735	8.29	43.5
Bank – 751405	2.21	11.6
Goedehoop – 754986	2.53	13.3
Mafube – 749907	1.06	5.6
Total	**19.05**	**100**

A different rail tariff was specified for the first contract year for each site. The annual rail tariff price escalation is based on:

- An index escalation based on a formula comprising the producer price index (PPI), labour, steel price, electricity and diesel; plus

- A capital related tariff adjustment (an adjustment based on the increase or decrease in actual Capex spent relative to the projections set out in TFR's feasibility study done at the time the agreement was signed).

18.2.1. Leased TFR allocation

The Company leases TFR capacity from time to time from third parties, dependent on opportunities in the market.

18.2.2. TFR Entitlement Agreements

A third party leased up to 5 Mtpa of TFR entitlement from the Company.

18.3. Richards Bay Coal Terminal

The Company was one of seven coal exporting companies that were involved in Phase 1 of the development of the RBCT. The Company participated in each phase up to and including the Quattro Optimisation Project (Table 18-2), in the process securing a linked entitlement of 20.88 Mtpa. This entitlement grants the Company six allocated grades of coal it can export and 16 allocated stockpiles. In terms of RBCT rules, there has to be a minimum of two stockpiles per grade of coal exported, with each stockpile being a minimum of 30 000 t and a maximum of 120 000 t.

Table 18-2: Phased Development of RBCT

Phase	Commissioning Date	Design Capacity Increase (Mtpa)	Total Design Capacity (Mtpa)	Number of Coal Grades	Company Participation
	April 1976	12.0	12.0		Yes
Phase II	September 1978	12.0	24.0		Yes
Phase III	October 1984	20.0	44.0		Yes
Phase III Upgrade	August 1993	19.0	63.0		Yes
Brownfields expansion	April 2000	9.0	72.0	30	Yes
Quattro Optimisation Project	January 2009	4.0	76.0	34	Yes
Phase V expansion	May 2010	15.0	91.0	38	No

RBCT operates on a commercial breakeven basis whereby it recovers its operating costs from the shareholders based on tonnages of coal exported. In terms of the shareholders' agreement, each shareholder is required on a "use or pay" basis to export a minimum annual tonnage of coal through the terminal based on its linked entitlement and committed annual tonnage usage (**CATU**).

RBCT recovers its costs via a wharfage fee, which comprises:

- **An operating charge:** a cost per tonne loaded into ships, calculated as the total actual cost incurred by RBCT to operate the terminal divided by the greater of the actual tonnage loaded into ships and the aggregate CATU for that year;
- **An interest charge:** the interest and costs incurred in connection with loans raised by RBCT to finance the respective development phases. The total interest charge for each year shall be allocated to the applicable participating shareholders in relation to the applicable phase pro rata according to the applicable participation ratios;
- **A capital charge:** participating shareholders in any development phase incur a capital charge in respect thereof pro rata to their respective participation ratios.

All shareholders incur a capital charge equal to the cost of amortising assets in proportion to the amounts contributed by shareholders; and

- **A usage surcharge:** an additional charge that arises where one or more users do not achieve their respective CATUs.

A shareholders' agreement was signed by all shareholders in RBCT on 24 July 2013 to amend and restate the prior versions of the shareholders agreement with effect from the effective date of 12 April 2013, without prejudice to any accrued rights or obligations under any of the prior versions of this Shareholders' Agreement except where dealt with in the current agreement. The June 2013 agreement also sought to align a revised memorandum of incorporation for RBCT with the Companies Act and prior shareholders' agreements.

18.3.1. Leased RBCT Allocation

The Company leases RBCT capacity from time to time from third parties, dependent on opportunities in the market.

18.3.2. RBCT Entitlement Agreements

The Company signed two RBCT entitlement agreements with a third party, which entitle the third party to use up to 5 Mtpa of the Company's RBCT entitlement. The third party pays a rental charge which comprises the RBCT operating charge (as ZAR/t) and an annual fixed non-operational charge.

18.4. Volume Allocations

Given the TFR and RBCT capacities to which the Company is entitled, the volumes of production, railings and sales for the respective collieries have to be carefully managed and allocated.

This, however, gives the Company the flexibility to modify the production mix from the collieries to take advantage of changes in market demand for different coal product qualities.

18.4.1. Production

Historical production volumes by colliery and product type for 2017 to 2019 and projected volumes for 2020are set out in Table 18-3.

Table 18-3: Historical Production Volumes per Colliery

Colliery / Product	Units	2017	2018	2019	2020
Goedehoop Primary Export	(Mt)	4.65	3.45	3.05	2.13
Goedehoop Secondary Export	(Mt)			0.90	
Goedehoop Domestic	(Mt)		1.99	2.12	3.82
Goedehoop Total	(Mt)	4.65	5.44	6.07	5.96
Greenside Primary Export	(Mt)	3.23	3.41	3.40	3.07
Greenside Secondary Export	(Mt)			0.13	0.54
Greenside Domestic	(Mt)	0.60	1.04	1.32	0.97
Greenside Total	(Mt)	3.83	4.45	4.85	4.58
Zibulo Primary Export	(Mt)	4.69	4.34	3.52	3.30
Zibulo Secondary Export	(Mt)			1.81	2.15
Zibulo Domestic	(Mt)	1.55	2.04	0.03	
Zibulo Total	(Mt)	6.23	6.38	5.36	5.45
Khwezela Primary Export	(Mt)	2.86	2.33	1.64	2.61
Khwezela Secondary Export	(Mt)			1.00	0.79
Khwezela Domestic	(Mt)	2.85	3.20	3.12	3.11
Khwezela/Landau Total	(Mt)	5.71	5.53	5.76	6.51
Mafube Primary Export	(Mt)	1.56	0.78	1.15	1.19
Mafube Secondary Export	(Mt)				0.63
Mafube Domestic	(Mt)		0.37	0.65	
Mafube Total	(Mt)	1.56	1.15	1.80	1.82
Total Company Production	**(Mt)**	**21.98**	**22.95**	**23.84**	**24.32**

Note:
The figures for 2020 are based on actual data for January – September and forecast estimates for October – December.

18.4.2. Rail Shipments

The historical railed coal volumes by colliery for 2017 to 2019 and projected volumes for 2020 are set out in Table 18-4. SRK notes that the railed volumes for Zibulo comprise both primary and secondary export coal. The 5 Mtpa TFR entitlement granted for Zibulo per the agreements in section 19.3.2 relates only to the primary export quality coal.

In each of the periods in Table 18.4, the TFR entitlement available to the Company was not fully utilised.

Table 18-4: Historical Railed Sales Volumes by Colliery

Railed	Units	2017	2018	2019	2020
Goedehoop Total	(Mt)	4.65	4.15	3.94	2.26
Kleinkopje Total	(Mt)	1.15	1.42	1.94	2.01
Greenside Total	(Mt)	3.37	3.14	3.73	3.55
Zibulo Total	(Mt)	6.01	5.87	5.60	5.26
Khwezela/Landau Total	(Mt)	2.03	1.34	0.84	1.46
Mafube Total	(Mt)	1.77	1.03	1.86	1.90
Sub-total - Company Railed	(Mt)	18.97	16.96	17.91	16.43
Third-party					
Third-party railed	(Mt)	0.27	0.92	1.69	1.62
Total - railed	(Mt)	19.24	17.87	19.61	18.06
Company entitlement	(Mt)	19.10	19.10	19.10	19.10
Additional entitlement	(Mt)			1.12	1.50
Third-party entitlement	(Mt)	0.41	0.29		
Third-party leased	(Mt)				0.20
TFR entitlement not used	(Mt)	0.27	1.52	0.61	2.74

Note:
The figures for 2020 are based on actual data for January – September and forecast estimates for October – December.

18.4.3. RBCT Sales

The historical export coal sales by colliery via RBCT for 2017 to 2019 and projected volumes for 2020 are set out in Table 18-5. The total sales in each period in Table 18.5 did not fully utilise the entitlement available to the Company

Table 18-5: Historical Sales Volumes by Colliery (ex RBCT)

Sales	Units	2017	2018	2019	2020
Goedehoop Total	(Mt)	4.45	4.37	3.92	2.30
Kleinkopje Total	(Mt)	1.17	1.40	1.90	1.98
Greenside Total	(Mt)	3.31	3.3	3.75	3.45
Zibulo Total	(Mt)	4.63	4.34	3.65	3.14
Khwezela/Landau Total	(Mt)	2.01	1.38	0.87	1.45
Mafube Total	(Mt)	1.76	1.17	1.79	1.86
Sub-total - Company sales	(Mt)	17.34	15.97	15.89	14.17
Third-party purchases	(Mt)	0.23	0.94	1.63	1.59
AOL Marketing	(Mt)	1.33	1.70	1.90	2.03
Sub-total - third-party sales	(Mt)	1.56	2.64	3.53	3.62
Total - sales	(Mt)	18.90	18.61	19.43	17.80
Company RBCT entitlement	(Mt)	19.80	19.80	19.80	19.80
Additional RBCT Optimum entitlement	(Mt)			3.16	3.16
South32 entitlement	(Mt)	0.41	0.29		
SACMH entitlement	(Mt)				0.20
RBCT capacity used / (available)	(Mt)	-1.30	-1.49	-3.53	-5.36

Note:
The figures for 2020 are based on actual data for January – September and forecast estimates for October – December.

18.5. Short-term Contracts

The Company uses two forms of short-term contracts, viz. coal purchase agreements and domestic coal sales agreements.

18.5.1. Coal Purchase Agreements

Examples of short-term coal purchase agreements in Table 18-6 show the type of coal, contract duration, contracted volume, selected coal specifications, selected price adjustment criteria and the delivery point.

As coal purchases are linked to the export price, the Company uses short-term contracts to mitigate the volatility in the export coal prices.

Table 18-6: Examples of Coal Purchase Agreements

Coal Type and Basis	Contract		Selected Specifications			Price Adjustments	Delivered To
	Duration	Volume (kt)	Size (mm)	Minimum CV[1] (kcal/kg)	Maximum TM (%)		
4 800 kcal/kg (NAR)	Feb'20 - Apr'20 (completed)	51	<30% -3 <10% -0.5	4 600	12%	CV[1]: <4 600 TM: 1% of price per 1% >12% S: variable, sliding scale	Woestalleen Siding
RB3 5 500 kcal/kg	Feb'20 – Jul'20 (completed)	102	<25% -3 <10% -0.5	5 300	12%	CV[1]: <5 300 TM: 1% of price per 1% >12% S: 1% of price per 0.1% above 1%	Woestalleen Siding
5 500 kcal/kg (NAR)	Oct'19- Mar'20 (completed)	72	<30% -3 <10% -0.5	5 300	14%	CV[1]: <5 300 TM: 1% of price per 1% >14% S: 1% of price per 0.1% above 1%	Richards Bay
4 800 kcal/kg (NAR)	Dec'19- May'20 (completed)	72	<30% -3 <10% -0.5	4 600	12%	CV[1]: <4 600 TM: 1% of price per 1% >12% S: 1% of price per 0.1% above 1%	Richards Bay
4 800 kcal/kg (NAR)	Mar'20 – Aug'20 (completed)	102	<25% -3 <10% -0.5	4 600	12%	CV[1]: <4 600 TM: 1% of price per 1% >12% S: 1% of price per 0.1% above 1%	Blinkpan Siding
RB3 5 500 kcal/kg	Feb'20– Jan'21	144	<25% -3 <10% -0.5	5 300	14%	CV[1]: <5 300 TM: 1% of price per 1% >12% S: variable, sliding scale	Blinkpan Siding
4 800 kcal/kg (NAR)	Dec'19- Nov'20	144	<30% -3 <10% -0.5	4 600	12%	CV[1]: <4 600 TM: 1% of price per 1% >12% S: variable, sliding scale	Highveld Siding & RLT
5 500 kcal/kg	Jan'20 - Dec'20	144	<30% -3 <10% -0.5	5 300	12%	CV[1]: <5 300 TM: 1% of price per 1% >12% S: variable, sliding scale	Highveld Siding
4 800 kcal/kg (NAR)	Jan'20 - Dec'20	216	<30% -3 <10% -0.5	4 600	12%	CV[1]: <4 600 TM: 1% of price per 1% >12% S: variable, sliding scale	Highveld Siding
4 800 kcal/kg (NAR)	Feb'20- Jan'21	144	<30% -3 <10% -0.5	4 600	14%	CV[1]: <4 600 TM: 1% of price per 1% >14% S: variable, sliding scale	Blinkpan Siding/Derwent Siding

Note:
1. TM = Total Moisture
2. S = Sulphur

18.5.2. Domestic Coal Sales Agreements

Examples of short-term domestic coal sales agreements in

Table 18-7 show the type of coal, contract duration, contracted volume, selected coal specifications, selected price adjustment criteria and the delivery point. The Company uses short-term sales contracts to cater for flexibility in pricing and balance security of demand.

Table 18-7: Examples of Domestic Coal Sales Agreements

Colliery (Coal Type)	Contract		Selected Specifications			Price Adjustments	Delivery Basis
	Duration	Volumes (kt)	Size (mm)	CV[1] (MJ/kg)	TM (%)		
Khwezela (Umlalazi A grade duff)	Jan'19-Dec'20	168	<10% +12 <12.5% -0.5	27.2 (26.5 – 27.6)	7.0 (5.0 – 8.5)	CV[1]: <26.5 or >27.8 TM: <5% or >8.5%	On rail truck at Hayford Siding
Khwezela (Umlalazi A small nuts)	Jan'20 – Mar'20 (completed)	3	<10% +50 <12.5% -25	27.0 (26.5 – 27.6)	7.0 (5.0 – 9.0)	Size: >12.5% -25 CV[1]: <26.5 or >27.2	On rail truck at Hayford Siding
Khwezela (Umlalazi RoM 4-Seam top coal uncrushed)	Jan'20 – Mar'20 (completed)	45	-	18	8.0	-	On road truck at mine site
Greenside (PRE Middling)	Jan'20 – Mar'20 (completed)	15	<12.5% -3 <10% -0.5	21.7 Minimum 21.5	10	Size: >12.5% -3 CV[1]: <26.5 or >27.2	On road truck at mine site
Khwezela (Landau 3 MRD, either or both Goedehoop North (Bank) MRD) Untreated, unwashed	Sep'18-Aug'19 (completed)	1 440	- -	14.25 13.65	4.7 8.0	-	On road truck at mine site
Greenside filter cake	Feb '20– Mar'20 (completed)	1.5	-	19.5	21.0	-	On road truck at mine site
Khwezela (Umlalazi A grade peas)	Oct'19-Dec'20	105	<10% +35 <12.5% +10	27.2 (26.5 – 27.8)	7.0 (5.0 – 8.0)	TM: <5.0% or >8.0% CV[1]: <26.5 or >27.8 Size: >12.5% -10	On rail truck at Hayford Siding
Khwezela (Umlalazi M3 middling)	21-29 Feb'20 (completed)	2.5	-	22.5 (21.5 – 23.5)	7.0 (5.0 – 8.5)	CV[1]: <21.5 or >23.5	On road truck at mine site
Khwezela (Umlalazi A grade duff)	Jan - Dec'20	30	<10% +12 <12.5% -0.5	27.2 (26.5 – 27.6)	7.0 (5.0 – 8.5)	CV[1]: <26.5 or >27.8 TM: <5% or >8.5%	On rail truck at Hayford Siding, or on road truck at mine site
Khwezela (Landau 3 MRD) Unwashed, untreated	Feb – Mar'20 (completed)	40	-	Main 16.25 Bottom 14.10 Lens 10.82	-	-	On road truck at mine site
Greenside MRD Unwashed, untreated	Aug'19– Jul'20 (completed)	180	-	18.15	3.2	-	On road truck at mine site

Note:
1. TM = Total Moisture

18.6. Coal Marketing

There is a coal supply agreement in force for the supply of unwashed, untreated Goedehoop North MRD coal to a third party, which continues to 30 June 2021, or until the tonnage is completed. The third party has the right of first refusal post this period for an additional two years of coal supply, at prices to be re-negotiated.

The coal is loaded on to road trucks at the mine site, with ownership and risk in the coal transferring as the truck leaves the mine loading site.

Coal to be supplied will be raw MRD material (including both as-arising material and the coarse fraction material) with typical coal qualities, as shown in Table 18-8.

Table 18-8: Typical Coal Qualities for Goedehoop North MRD Coal

Parameter	Units	Typical	Basis
Gross Calorific Value RAW	(MJ/kg)	13.65	AD
Total moisture	(%)	8	As received
Inherent moisture	(%)	2.3	As received
Ash	(%)	42.7	AD
Vol	(%)	20.9	AD
sulphur	(%)	2.5	AD

The price to be paid for the coal is based on achieving a 4 800 kcal/kg product from the washing of the MRD coal. The price (in ZAR/t) is on a sliding scale, dependent on the yield achieved.

The Company plans to enter into an exclusive offtake agreement with a third party who will purchase all saleable export coal produced by the Company and market all domestic production.

The agreement will be for an initial term of three years, calculated with effect from the listing date of the Company.

The marketing fee payable to the third party will be a percentage of the realised price of the coal. In the case of the export coal, the price realised will be the ruling price for API4 coal less an adjustment for the actual CV[1] of the exported coal and a discount (typically a USD/t amount) for the Ash content.

The current marketing arrangements used by the Company are essentially the same as what are envisaged above.

18.7. Provision of Services

Goedehoop Colliery is run exclusively with CMs and the appropriate support equipment such as shuttle cars, roofbolters, loaders, etc. The equipment is mostly electrical-drive equipment, apart from some of the back bye support equipment, which is diesel driven. The plant is a dense medium beneficiation plant using magnetite and the export products are dispatched via TFR. Goedehoop is an owner-operated colliery with limited use of contractors for the non-core services. Certain services, such as training, medical, etc. are provided by the Company from a central services department with the relevant charges split between the various Company collieries.

The colliery provides most of its own engineering services for the remaining assets on surface, as well as for the beneficiation plant, and only reverts to contractors where major overhaul of equipment is required. In terms of product generation and quality control, this is a mine-managed process through to delivery into the rail system.

18.7.1. Goedehoop Maintenance Contract

Goedehoop has a service contract with Joy Manufacturing for the maintenance of equipment underground, which covers the supply of stores, sub-assemblies, etc., as well as some labour. The overall planned maintenance is done by the mine using the Ellipse system. Some of the major overhauls are done at the central workshops and this covers mostly the CMs, shuttle cars and roofbolters, all supplied by Joy Manufacturing.

18.7.2. Electrical Supply

The mine has a large electrical demand, managed through an Eskom contract that governs the demand usage and consumption tariffs. The yearly expenditure on power is approximately ZAR112 million. The internal distribution and maintenance of the power is a function of the mine engineering services.

18.7.3. Ventilation Support and Other Services

The mine runs and maintains is own ventilation systems and system monitoring, as well as for occupational health items such as dust monitoring and medical examinations. The mine also provides for its own rescue services and safety and risk management services. Some use of contractors is made for construction of ventilation walls. Contractors are used for one-off raisebore ventilation holes where the current Brown Shaft development requires

tunnelling between seams.

The mine support system is installed by the mine and done as per standards developed on the mine. The provision of roofbolts, netting, resin, etc. for the roofbolt system is procured by the mine. Other roof support monitoring and quality control is done by the mine. Similarly, the stonedusting system for explosion control is also procured and applied by mine staff.

Coal conveying is done by the mine operating and maintaining its own system from the CMs through to the beneficiation plant.

Other sundry items that the mine purchases through Central Services are magnetite for the beneficiation plant, security services, and sundry financial services.

18.7.4. Equipment Hire

Some equipment is hired for items such as surface transportation and management of stockpiles around the plant area. The discard management and transport from the MRD at Goedehoop North is managed by a contractor. Approximately ZAR12 million per annum is spent on this contract.

18.8. Risks and Opportunities

[12.10(h)(x)] [SR5.7(i)]

18.8.1. Risks

Potential risks associated with the TFR and RBCT contracts are the “take or pay” basis of the contracts. If the Company does not use the full contracted volume per year, the TFR logistics cost and the RBCT charge incorporated into the cash flow model for each export colliery may be understated.

The CPR reflects the proposed principles to be incorporated into the coal marketing agreement, which has not yet been concluded. The marketing fee included into the cash flow model for each export colliery may be understated.

The mine has the ability to reduce the supply quality over the LoM to a 5 500 kcal/kg product to counter the potential declining yield of the coal but needs to do so with a clear understanding of the discounts applied to the lower grade products. The current plan has allowed a move in the last three years of the life of Mine Plan. This risk can be controlled by having sufficient planning to allow the trade-off between yield and price to be continually evaluated. The mine schedule does not have enough pit space to allow mining sections to high-grade the sequence to adapt to price variations. The mine is currently a high-productivity mine and is designed to maximise throughput to maintain profitability. There is some risk that, as the lower mining heights are encountered, there may be some loss of productivity, affecting the overall economic viability of the mine. This risk is countered by ensuring that the support services of coal clearance, beneficiation, ventilation, etc. are maintained at a high standard to ensure maximised cutting time.

The mine costs are optimised for the level of throughput achieved but are largely fixed costs; thus, the maximization of the mining tonnage is the key strategy to ensure the mine profitability is not impacted by the costs. In the short term, the power costs will be subject to tariff increases but not to the extent that they will affect the mine significantly and the security of supply of power, which is also a risk, is currently managed effectively.

The services and supplies are common for underground mining, despite there being a limited number of equipment suppliers for the mining equipment. Joy Manufacturing is a long-established brand based in the United States of America and has had local support for many years through their own service workshops and facilities. The technology is up to date and supply should be easily available for the next five years, posing little risk to Goedehoop. The alternatives to this mining fleet have been proven in South Africa (for example, the Caterpillar, (an Operational Equipment Manufacturer (**CAT**)) CM and the JAE system), offering no opportunities in that regard. The main risk in the commodities is the availability of magnetite as there is a limited available local supply. This has, however, been secured by contract, mitigating the risk. If necessary, magnetite can be imported.

The mine is very dependent upon electricity and has addressed the security of supply risk through the Eskom contract and the ongoing relationship with the supplier. There is some risk in the costs of Company-supplied Central Services becoming higher in the future if the number of Company collieries is reduced, but given the short

LoM, this is unlikely to impact Goedehoop.

18.8.2. Opportunities

The Company purchases export quality coal from other producers from time to time to enable it to fulfil its obligations per the TFR and RBCT contracts.

Domestic coal sale agreements are generally done on an opportunistic basis and are of short duration. Such opportunistic sales have not been considered in the cash flow model for each colliery.

The mine has recently used the Goedehoop North MRD to create additional value streams; the vast resource of MRD material should be investigated for producing ongoing domestic sales. Similarly, while the mine has been extensively mined out, there are areas that may still be shallow enough that a potential opencast pillar recovery option can be investigated for mine life extension.

A potential opportunity is to fit some of the smaller-height equipment into areas where the contamination is a result of limitations on the existing equipment. The same is true for the specialised support equipment such as stone dusters. The remaining support equipment is not at risk of obsolescence, but the main opportunity is to maximise its use, given the limited current LoM.

The discard dump is sufficient for the next five years, provided sales to third parties continue. Expansion and extension of this supply would contribute to reducing the closure liabilities of Goedehoop and maximise the potential revenue.

19. Material Asset Valuation

[12.9(a)(i), [12.10(f), 12.10(h)(xii)] [SR5.6 (iii)(iv), SR5.8] [SV1.2, SV1.4, SV1.7, SV1.9, SV1.11, SV1.12, SV1.13, SV1.14, SV1.15, SV1.17, SV1.18, SV1.19]

The valuation of Goedehoop and the contained coal deposits has been prepared in accordance with the SAMVAL Code (2016) and is reported at the Valuation Date of this CPR, viz. 31 December 2020.

The TEM has been independently constructed by Ms V. Snyman of Cornerstone Infrastructure Advisors using the TEPs as provided by Mr N McGeorge of SRK, which commence on 1 January 2021. The transactions have been identified and reviewed by Mr A van Zyl of SRK. Mr A McDonald has checked the TEPs used in the TEM and, based on the outputs of the TEM and the interpretation of the transactions used for the Market Approach, developed an opinion on the value of the assets and signed off on the valuation.

19.1. Valuation Approaches and Methods

[12.10(a)] [SR5.6(iv)] [SV1.12]

19.1.1. Valuation Approaches

There are three main and generally accepted analytical valuation approaches that are in common use for determining the "Fair Market Value" of mineral assets, each of which is described below, and which largely rely on the principle of substitution, using market derived data. The three generally accepted approaches to mineral asset valuation, as given in Section 3.3 of the SAMVAL Code are:

- Income Approach - The Income Approach relies on the 'value-in-use' principle and requires determination of the present value of future cash flows over the useful life of the Mineral Asset;
- Market Approach - The Market Approach relies on the 'willing buyer, willing seller' principle and requires that the monetary value obtainable from the sale of the Mineral Asset is determined as if in an arm's-length transaction. The application of certain logic in Mineral Asset Valuation, such as 'gross in-situ value' simply determined from the product of the estimate of mineral content and commodity price(s), is considered unacceptable and inappropriate; and
- Cost Approach - The Cost Approach relies on historic and/or future amounts spent on the Mineral Asset, and is a valuation approach based on the economic principle that a buyer will pay no more for an asset than the cost to obtain an asset of equal utility, whether by purchase or by construction.

The applicability of the three valuation approaches to the different property types as set out in the SAMVAL Code is shown in Table 19-1.

Table 19-1: Applicability of Valuation Approaches to Property Types

Valuation Approach	Early Stage Exploration	Advanced Stage Exploration	Development Properties	Production Properties	Dormant Properties		Defunct Properties
					Economically Viable	Economically Not Viable	
Income	Not generally used	Not generally used	Widely used	Widely used	Widely used	Not generally used	Not generally used
Market	Widely used	Widely used	Less widely used	Quite widely used	Quite widely used	Widely used	Widely used
Cost	Widely used	Widely used	Not generally used	Not generally used	Not generally used	Less widely used	Quite widely used

The SAMVAL Code requires that at least two valuation approaches must be applied and the results from the valuation approaches and methods must be weighed and reconciled into a concluding opinion on value. SRK has determined the Technical Value for Goedehoop utilizing the Market Approach and Income Approach.

The Market Approach or "Fair Market Value" in respect of a Mineral Asset is defined as the amount of money (or

the cash equivalent of some other consideration) determined by the relevant expert for which the Mineral Asset or Security should change hands on the Valuation Date in an open and unrestricted market between a willing buyer and a willing seller in an "arm's length" transaction, with each party acting knowledgeably, prudently and without compulsion. The "fair market value" of a mineral asset usually comprises two components: the underlying or "technical value" of the assets and a premium or discount relating to market, strategic and other considerations. The fair market value is therefore more likely to fluctuate with time.

The Income Approach or "Technical Value'" in respect of a Mineral Asset is derived from the future net economic benefit at the Valuation Date under a set of assumptions deemed most appropriate by an Expert or Specialist, excluding any premium or discount to account for factors such as market or strategic considerations. The Income Approach relies on the 'value-in-use' principle and requires determination of the present value of future cash flows over the useful life of the Mineral Asset.

The currency of valuation used in this CPR is South African Rand (ZAR). As this CPR will be used for both the JSE and LSE, the USD equivalent is also provided.

19.1.2. Materiality

[SV1.10]

The SAMVAL Code definition for materiality requires that a public report contains all the relevant information that investors and their professional advisors would reasonably require, and expect to find, for the purpose of making a reasoned and balanced judgement regarding the mineral asset valuation.

The determination of what may be material depends on both qualitative and quantitative factors. Something may be material in the qualitative sense because of its very nature, e.g., country risk. In the case of quantitative issues in this CPR, SRK considers that if omission or inclusion of an item could change the value or post-tax pre-finance annual operating cash flow by more than ten per cent (10%), the item is material and would have to be included.

19.1.3. Transparency

In terms of the SAMVAL Code, the reader of a Public Report (this CPR) must be provided with sufficient information, the presentation of which is clear and unambiguous, to understand the report and not be misled.

19.2. Valuation – Income Approach

[SR5.6(iv), SR5.8(ii)(iii)(iv)] [SV1.12, SV1.14]

The most widely used valuation method for pre-development, development and operating mines is the discounted cash flow (**DCF**).

This method considers the majority of factors that can influence the value of a business enterprise, including expected changes in the mineral asset or property's operating activity. Under this approach, it is necessary to utilize projections of revenues, Opex, depreciation, income taxes, Capex and working capital requirements. The present value of the resulting cash flows provides an indicated value of the operating business enterprise.

In order to eliminate the impact on value of the different long-term financing arrangements that have been or could be implemented, analysis is generally done on a debt-free basis. The net present value (**NPV**) of the projected post-tax pre-finance cash flows, using either mid-year or end-year discounting, provides an indication of the value for the mineral asset or property appraised. This NPV is then adjusted to take into account any debt or cash at the Valuation Date to derive the net value of the property or asset.

SRK compiled a TEM for Goedehoop which incorporates LoM production schedules for the mine within the licence areas. The technical and economic parameters in the TEM have been compiled by SRK as outlined in this CPR. The TEM parameters and Modifying Factors were used to construct an independent cash flow model in constant money terms.

19.2.1. Summary of the TEPs

[SR1.6(i)]

The key TEPs and output from the Goedehoop TEM are summarised in Table 19-2, for the period 2021 to 2025 which represents the LoM. As the mine is in South Africa, the TEPs are presented in ZAR to enable the MPRDA

royalty and company tax for Goedehoop to be calculated correctly.

The TEM is presented on a 100% equity basis in constant-money terms, so that interest and debt-servicing is not considered in the cash flows.

Royalties in terms of the Royalty Act are based on the unrefined minerals formula.

For the working capital movement calculation, SRK has taken accounts receivable and accounts payable to be 30 days and 60 days respectively. Inventories have been excluded from this calculation. The opening working capital balance as at the Valuation Date is ZAR181 million (or USD12.3 million) based on accounts receivable and accounts payable at 31 December 2020.

The Company provided the following inputs as at 31 December 2020, which were used in the tax calculation:

- Accumulated tax loss of ZAR329 million (USD22.4 million);
- Unredeemed capital of ZAR643 million (USD43.7 million); and
- Unredeemed Capex in terms of calculating the Royalty Tax of ZAR700 million (USD47.6 million).

Provision for mine closure has been made as follows:

- Estimated Scheduled Mine Closure Cost ZAR513 million (USD34.9 million) plus provision for stormwater control cost of ZAR500 million (USD35.6 million) plus provision for dump covers ZAR500 million (USD35.6 million) less the balance in Trust Account as at the Valuation Date is ZAR667 million (USD47.5 million). This has been provided for annually on a ZAR/t RoM basis over the remaining period of the LoM;
- The Capex of ZAR600 million (USD40.8 million) for post closure water treatment is projected to be spent in the ratio of 40% and 60% ten years and fifteen years after the end of the LoM. The annual water treatment Opex is set at ZAR50 million (USD3.4 million) per annum, with five years at 40% of the annual cost and a further ten years at 100% of the annual cost. This is excluded from the TEM and the NPV of these cash flows post closure is included as an adjustment in the summary valuation; and.
- Separation Benefit of ZAR173 million (USD11.8 million) provided for based on one week's benefit for every year of service assuming an average of 15 years' service. This has been provided for equally in the last two years of operation.

The forecast API4 coal prices and ZAR:USD exchange rates used in the Goedehoop TEM are as provided by Wood Mackenzie (2021) in Table 17-1.

A heat adjustment was made and a discount of 8% has been applied to the 5 700 kcal/kg product. In addition, provision of USD1 per saleable tonne was deducted from the sales price to account for an ash discount.

A marketing fee of 1% has been applied to total revenue for evaluation purposes.

SRK has reviewed the historical operating costs and production statistics to confirm that the projections in the TEM are reasonable (refer to Table 2-4 and Figure 8-8). The summary operating costs are provided in Table 19-2.

The resultant post-tax pre-finance cash flows are then converted to USD according to the spot exchange rate of ZAR14.703 = USD1.00 ruling at the Valuation Date.

Table 19-2: Summary of the Techno Economic and Cash Flow Model

Parameter	Units	LoM	2021	2022	2023	2024	2025
Mining (RoM)	(Mt)	21.3	4.6	5.0	4.9	4.8	1.9
Sales	(Mt)	19.0	5.5	5.8	4.2	2.5	0.9
5700 product	(Mt)	11.5	2.5	2.8	2.7	2.5	0.9
MRD product	(Mt)	7.5	3.0	3.0	1.5	-	-
Sales Prices							
RB1 Base coal price	(USD/t)	-	85.2	82.4	80.7	79.0	79.3
5700 product	(USD/t)	-	75.2	72.7	71.1	69.6	69.9
MRD product	(ZAR/t)	-	49.2	49.2	49.2	49.2	49.2
Exchange Rate	(USD1:ZAR)	-	16.2	15.6	15.0	13.8	13.8
Capital Costs							
SIB	(ZARm)	(297)	(162)	(97)	(37)	-	-
Operating Cost							
Labour	(ZARm)	(2 700)	(600)	(600)	(600)	(600)	(300)
Stores	(ZARm)	(696)	(156)	(156)	(156)	(156)	(71)
Sundries	(ZARm)	(2 605)	(606)	(596)	(589)	(522)	(293)
WCS	(ZARm)	(568)	(132)	(132)	(132)	(132)	(42)
Processing	(ZARm)	(90)	(19)	(19)	(19)	(19)	(13)
Total Operating Cost	(ZARm)	(6 659)	(1 513)	(1 503)	(1 495)	(1 429)	(719)
Cost ex Royalty per ROM tonne	(ZAR/t)		326	303	303	299	369
Rail, RBCT Wharfage and Other	(ZAR/t)		213	213	213	213	213
Cash Flow							
Revenue	(ZARm)	12 809	3 236	3 324	2 934	2 415	900
Marketing Fee	(ZARm)	(128)	(32)	(33)	(29)	(24)	(9)
Rail, RBCT Wharfage and Other	(ZARm)	(2 445)	(539)	(598)	(571)	(537)	(200)
Royalty tax	(ZARm)	(207)	(24)	(95)	(65)	(19)	(3)
Carbon Tax	(ZARm)	(24)	(2)	(2)	(8)	(8)	(4)
Operating Cost	(ZARm)	(6 659)	(1 513)	(1 503)	(1 495)	(1 429)	(719)
Capital expenditure	(ZARm)	(297)	(162)	(97)	(37)	-	-
Change in working capital	(ZARm)	(181)	(197)	(9)	38	31	(44)
Company Tax	(ZARm)	(355)	-	(176)	(152)	(27)	-
Closure cost	(ZARm)	(795)	(174)	(185)	(184)	(179)	(73)
Separation Benefit	(ZARm)	(173)	-	-	-	(121)	(52)
Cashflow	(ZARm)	1 545	594	627	428	101	(204)

19.2.2. Weighted Average Cost of Capital

The weighted average cost of capital (**WACC**) for the Company has been derived according to the parameters set out in Table 19-3. As the Company intends to have its primary listing on the JSE, the WACC has been calculated according to parameters ruling in the Republic of South Africa.

Table 19-3: Goedehoop – derivation of the ZAR-denominated WACC for the Company

Parameter	Value	Source / Comment
Un-levered (asset) beta	1.004	Median of selected peer producers
Re-levered beta	1.314	Unlevered beta x [1+[(debt/Mkt equity value) x (1 – tax rate)]]
Equity risk premium	7.90%	SA Risk equity premium from: http://www.market-risk-premia.com/za.html and https://www.statista.com/statistics/664880/average-market-risk-premium-south-africa/
Risk free rate	9.26%	RSA 10-yr bond from: http://www.worldgovernmentbonds.com/country/south-africa/
Cost of equity	19.64%	Risk free rate + [(levered beta) x (market risk premium)]
Base rate	3.88%	3-month JIBAR from: https://www.resbank.co.za/Research/Rates/Pages/CurrentMarketRates.aspx
Credit spread	3.50%	Assumed to be less than bond spread. 10 Years vs 2 Years bond spread is 433 basis points from: http://www.worldgovernmentbonds.com/country/south-africa/
Pre-tax cost of debt	7.38%	Base rate + Credit spread
Tax rate (RSA)	28.00%	SA corporate tax rate
After tax cost of debt	5.31%	
Equity	70%	
Debt	30%	Company targeted leverage
WACC (nominal)	15.34%	
WACC (real)	**10.70%**	Forecast CPI to average 4.2% for 2020, from: https://www.focus-economics.com/country-indicator/south-africa/inflation

The real WACC to apply to the ZAR-denominated cash flows for Goedehoop is therefore 10.7%.

19.2.3. Sensitivities

[SR5.8(iii)(iv)] [SV1.14]

The following tables present the NPVs of the constant money post-tax pre-finance cash flows as determined from the TEM. In summary they include the following:

- The variation in constant money NPV with discount rates (Table 19-4);
- The variation in constant money NPV at the WACC with twin API4 price and foreign exchange rate sensitivities (Table 19-5); and
- The variation in constant money NPV at the WACC with twin revenue and operating expenditure sensitivities (Table 19-6).

Table 19-4: Variation of Constant-Money NPV with Discount Rates

Discount Rate	NPV (ZARm)	NPV (USDm)
9.0%	1 342	91.3
10.0%	1 322	89.9
10.7% (WACC)	1 308	89.0
11.5%	1 292	87.9
12.5%	1 273	86.6
13.5%	1 255	85.4

Table 19-5: Variation of Constant Money NPV (ZARm) at the 10.7% WACC based on Twin Sensitivities (API4 Price and Foreign Exchange Rate)

			Long Term average API 4 Price							
			68	72	76	80	84	88	92	96
			-15.0%	-10.0%	-5.0%	0.0%	5.0%	10.0%	15.0%	20.0%
Average Long Term Exchange Rate	12.38	-10.0%	(530)	(100)	310	637	955	1 253	1 544	1 834
	13.06	-5.0%	(130)	304	650	986	1 296	1 604	1 908	2 211
	13.75	0.0%	254	629	981	**1 308**	1 631	1 951	2 270	2 585
	14.44	5.0%	572	942	1 288	1 627	1 963	2 297	2 626	2 950
	15.13	10.0%	868	1 235	1 591	1 943	2 293	2 637	2 977	3 315
	15.81	15.0%	1 151	1 522	1 891	2 257	2 618	2 972	3 326	3 680
	16.50	20.0%	1 422	1 808	2 190	2 568	2 938	3 307	3 676	4 045

Table 19-6: Variation of Constant Money NPV (ZARm) at the 10.7% WACC based on Twin Sensitivities (Revenue and Operating Expenditure)

		Revenue Sensitivity				
		-10.0%	-5.0%	0.0%	5.0%	10.0%
Operating Cost Sensitivity	-10.0%	1 303	1 633	1 960	2 280	2 595
	-5.0%	984	1 314	1 643	1 969	2 294
	0.0%	617	976	**1 308**	1 637	1 962
	+5.0%	203	588	946	1 284	1 613
	+10.0%	(320)	152	540	898	1 244

In the range of ±5% for the Revenue and Opex sensitivity, the following is seen from Table 19-6:

- Revenue: The NPV at 10.7% varies between ZAR976 million to ZAR1 637 million; and
- Opex: The NPV at 10.7% varies between ZAR946 million and ZAR1 643 million.

In aggregate, this suggests a range in values per the Income Approach of ZAR960 million to ZAR1 640 million.

The NPV at the Company's WACC of the post-tax pre-finance cash flows provides the preferred value for Goedehoop. It is noted that the Goedehoop operation yields a positive NPV although it is very sensitive to coal prices. This result must consider three important factors of Goedehoop's contribution to Company performance:

- Covering part of the Company's take or pay obligations with TFR and RBCT;
- Picking up its share of Company overheads and corporate costs; and

- Funding the mine's closure liabilities over the remaining LoM.

If Goedehoop was to cease operations, the TFR/RBCT obligations and corporate overheads would have to be re-allocated to the other collieries.

SRK has evaluated the cash flows for Goedehoop in two further ways:

- A "Tornado" plot of the impact of changes to key TEPs (Figure 19-1); and
- A Monte-Carlo simulation of probability distributions on key TEPs using the @Risk software program.

A basic @Risk component was added to the Goedehoop TEM as the modelling showed a marginal operation under certain macro-economic scenarios. Currently only Opex and Revenue components have been incorporated. The Mine has a relatively short life and Capex is not a major component of the rest of the LoM.

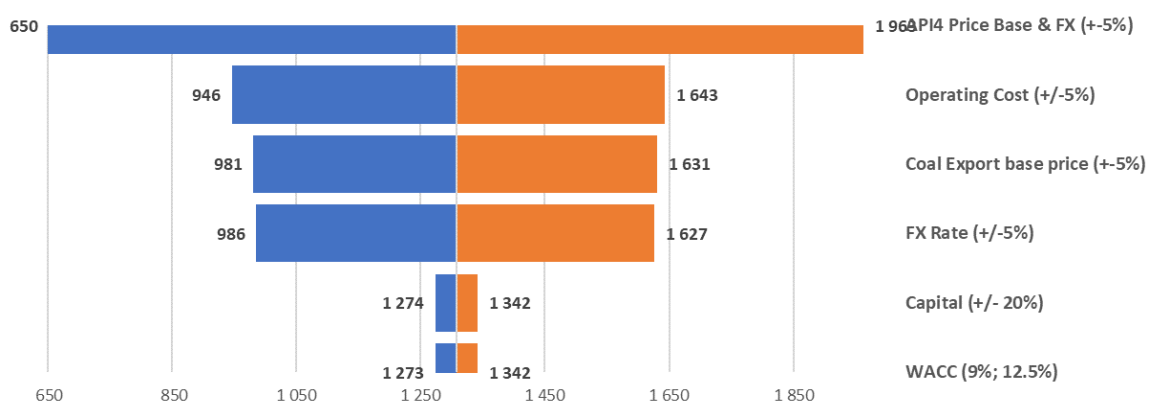
SRK considers that there is some risk of higher operating costs (either through above-inflation power and labour costs or through inefficiency where tonnage targets are not met, and fixed costs increase on a per tonne basis). A lognormal distribution was selected as lower costs are considered very unlikely, while the possibility for higher costs are possible with this distribution.

Revenue is highly uncertain. There is limited confidence in the USD price forecast. SRK has used the Wood Mackenzie forecast and then allowed for a lower limit of USD58/t from Consensus Economics lower range of analyst interview and an upper limit of USD93/t. There is further uncertainty around the exchange rate, which has historically been volatile. A bell-type distribution was developed to generate a median similar to the base case assumption of a long-term price of USD80/t and allow for the range described above.

The NPV probability distribution generated by @Risk is given in Figure 19-2.

From these two diagrams, the following conclusions are drawn:

- Using the 9% and 12.5% discount rates (Table 19-4), the value varies from ZAR1 273 million to ZAR1 342 million;
- Varying the exchange rate by ±5% generates a value range of ZAR986 million to ZAR1 627 million (this is also evident in Table 19-5);
- Varying the coal price by ±5% generates a value range of ZAR981 million to ZAR1 631 million (this is also evident in Table 19-5);
- The NPV is equally sensitive to changes in operating cost and revenue (see also Table 19-6);
- The NPV probability plot shows that for 91% of the time, the NPV of the cash flows should be positive.



srk consulting	**GOEDEHOOP COLLIERY CPR** Tornado Plot from Goedehoop Cash Flow Model	Project No. 566657

Figure 19-1: Tornado Plot from Goedehoop Cash Flow Model

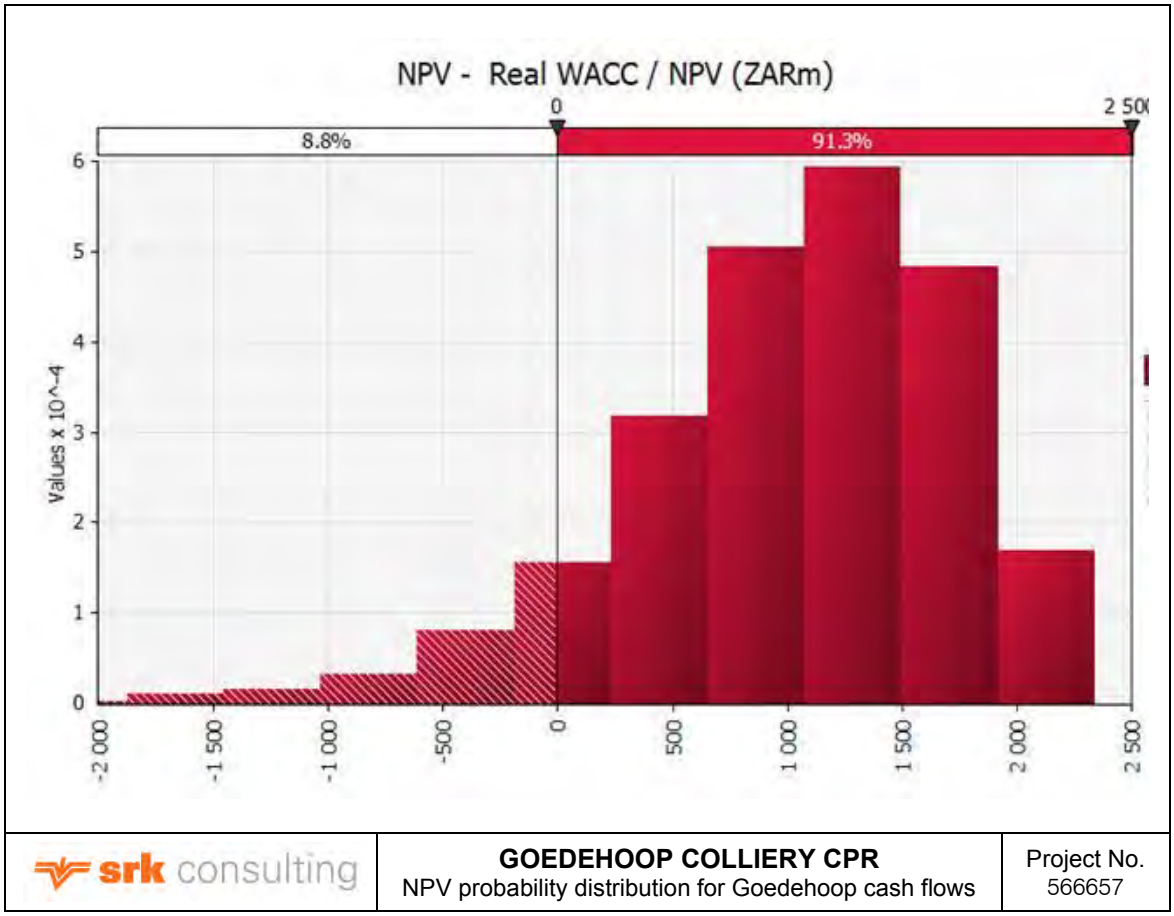


Figure 19-2: NPV Probability Distribution for Goedehoop Cash Flows

Thus, the value for Goedehoop per the Income Approach is shown to be ZAR1 308 million (USD89.0 million) in the range of ZAR960 million (USD65.3 million) to ZAR1 640 million (USD111.5 million).

The values presented here are derived from cash flows in a TEM which are of a forward-looking nature. These forward-looking statements are estimates and involve several risks and uncertainties that may cause the actual results to differ materially from those anticipated in the CPR.

19.2.4. SRK Comments

Although the Goedehoop operation yields a positive NPV, it does cover part of the Company's take or pay TFR/RBCT obligations and Company overheads/corporate costs. If Goedehoop was to cease operations, the TFR/RBCT obligations and corporate overheads would have to be re-allocated to the other collieries which may in turn affect their viability.

The NPV probability plot shows that for 91% of the time, the NPV of the cash flows should be positive.

SRK is satisfied that Coal Reserves can be declared for Goedehoop for the reasons set out above.

19.3. Valuation - Market Approach

[SV1.12, SV1.18]

The Market Approach attempts to determine the market value of the asset in a third-party, arms-length transaction. The value is not intended to represent the value to a specific purchaser and, as such, does not consider any strategic or sentimental value nor any unique synergies.

19.3.1. Sources of Information

A list of all transactions in South Africa over the past ten years was compiled. This was then filtered by removing the following:

- Any transactions where the primary commodity was not coal;
- Properties where no Reserve or Resource information was available (to infer a value per Resource or Reserve tonne); and
- Transactions where no deal value is given; and
- Transactions where the price paid was not available.

Table 19-7 shows the metals and mining company and property deals.

It should be noted that the Price/R&R and Price/Rsv values shown as percent in Table 19-7 have been normalised by the ruling coal price at the time of the transaction. As such, they are not time dependent and can be applied directly to the coal price and Coal Resources and Coal Reserves at the Valuation Date.

SRK is aware that the transactions span a period of some ten years during which there was considerable variability in the export coal prices. Adjusting the ZAR/t metrics to the Valuation Date showed that the upper range limit increased but the lower limit remained the same. As the unadjusted value range from the Market Approach supports the values derived from the Income Approach, SRK decided that use of the raw ZAR/t metrics was sufficient for valuation purposes.

Table 19-7: Metals and Mining Company and Property Deals

Completion Date	Target	Buyer	Seller	Percent Acquired (%)	Announced Transaction Value (USDm)	R&R Value (ZAR/t)	Price/R&R Value (%)	Rsv Value (ZAR/t)	Price/Rsv Value (%)
Coal Company Deals*									
30/06/2017	Eloff Mining Company (Pty) Ltd	Universal Coal Development IV (Pty) Ltd	Canyon Springs Investments 80 (Pty) Ltd	29.00	3.35	0.315	0.03		
20/06/2017	Keaton Energy Holdings Ltd	Wescoal Holdings Ltd	NA	100.00	67.08	1.83	0.20	7.06	0.76
01/12/2016	Exxaro Resources Ltd	Undisclosed buyers	Dreamvision Investments (Pty) Ltd	4.85	107.53				
01/12/2016	Exxaro Resources Ltd	Undisclosed buyers	Anglo American plc	9.70	216.74				
08/06/2017	Leeuw Mining & Exploration (Pty) Ltd/Amalahle Exploration (Pty) Ltd	Bayete Energy Resources (Pty) Ltd	Keaton Energy Holdings Ltd	100.00	0.02	0.027	0.003	0.481	0.05
15/02/2016	Leeuw Mining and Exploration (Pty) Ltd	Keaton Energy Holdings Ltd	JPI Leeuw and Associates (Pty) Ltd	8.00	0.90	2.02	0.26	68.75	8.74
20/08/2015	Total Coal South Africa Ltd	Exxaro Resources Ltd	Total S.A.	100.00	467.50	252.41	29.26		
30/09/2015	Leeuw Mining and Exploration (Pty) Ltd	Keaton Energy Holdings Ltd	JPI Leeuw and Associates (Pty) Ltd	18.00	2.44	1.48	0.17	6.53	0.73
Coal Property Deals*									
31/10/2018	North Block Complex	Investor group	Exxaro Resources Ltd	100.00	14.28	8.63	0.90	44.737	4.65
01/08/2018	New Largo project	Investor group	Anglo American plc	100.00	71.63	1.45	0.16		
27/11/2017	Eloff Project	Universal Coal Development IV (Pty) Ltd	Exxaro Resources Ltd	51.00	6.49	0.33	0.04		
02/11/2017	Mooiplaats Colliery	Mooiplaats Coal Holdings (Pty) Ltd	Investor group	100.00	13.29	2.10	0.23	9.135	0.99
01/03/2018	Eskom-tied coal operations	Seriti Resources (Pty) Ltd	Anglo American plc	100.00	166.52	3.94	0.43	6.475	0.70
26/06/2017	Uitkomst Colliery	Coal of Africa Ltd	Pan African Resources plc	91.00	19.62	12.49	1.35	23.10	2.49
14/04/2016	Assets of Optimum Holdings	Tegeta Exploration and Resources (Pty) Ltd	Glencore plc	67.58	141.24	3.25	0.41	11.24	1.43
27/08/2015	Rietkuil project	Anglo African Capital Ltd	Sable Mining Africa Ltd	63.50	1.28	0.16	0.02		
12/11/2015	Somkhele mine	Business Venture Investments No 1770 (RF) (Pty) Ltd	Petmin Ltd	20.00	28.07	16.56	2.11	53.21	6.77
01/04/2016	Uitkomst colliery	Pan African Resources plc	Investor group	100.00	15.91	7.78	0.99		
30/07/2015	New Clydesdale Colliery	Universal Coal Development VIII (Pty) Ltd	Exxaro Resources Ltd	100.00	14.94	3.09	0.33	61.70	6.51
31/01/2014	Woestalleen Complex	Blue Falcon 212 Trading (Pty) Ltd	Coal of Africa Ltd	100.00	7.90	1.61	0.17	56.93	5.94
30/07/2013	Kendal property	Joe Singh Group of Companies (Pty) Ltd.	Homeland Energy Group Ltd	100.00	25.15	4.92	0.56	14.24	1.61
31/12/2011	Mpumalanga assets	Imbawula Group	Xstrata plc	100.00	43.00	0.74	0.07	13.67	1.30
					Average	**16.26**	**1.88**	**26.95**	**3.05**
					Median	**2.06**	**0.25**	**13.96**	**1.52**
					Minimum	**0.03**	**0.00**	**0.48**	**0.05**
					Maximum	**252.41**	**29.26**	**68.75**	**8.74**

Note:

R&R – Coal Reserves and Coal Resources inclusive

Rsv – Coal Reserves only

*Sourced from Standard and Poors © S&P Global Market Intelligence

SRK considers that the acquisitions of Leeuw Mining by Bayete Energy and Total Coal by Exxaro represent outliers in the dataset in Table 19-7 and have been excluded in the derivation of the metrics to apply to Goedehoop. Similarly, the Somkhele transaction relates to an anthracite mine, which has different market dynamics to steam coal and should also be excluded. The resultant set of metrics to be used is shown in Table 19-8.

Table 19-8: Metrics from Transaction Data, excluding Outliers and Somkhele

Statistic	R&R Value (ZAR/t)	Price/R&R Value (%)	Rsv Value (ZAR/t)	Price/Rsv Value (%)
Median	2.02	0.23	13.96	1.52
Minimum	0.16	0.02	6.48	0.70
Maximum	12.49	1.35	68.75	8.74

From Table 19-7, SRK determined that there were nine transactions that were directly comparable to Goedehoop (these have been highlighted). The statistics from these nine transactions have been extracted to provide the filtered set shown in Table 19-9.

Table 19-9: Filtered Set of Metrics from Transaction Data applicable to Goedehoop

Statistic	R&R Value (ZAR/t)	Price/R&R Value (%)	Rsv Value (ZAR/t)	Price/Rsv Value (%)
Median	3.09	0.33	18.39	1.96
Minimum	0.74	0.07	6.53	0.73
Maximum	12.49	1.35	68.75	8.74

19.3.2. Market Valuation Metrics

The coal CV[1]s for Goedehoop vary considerably between the Coal Resources and RoM/Saleable Coal Reserves so that a constant coal price cannot be applied. Using the spot values for a price of USD87.25/t for a 6 000 kcal/kg coal and an exchange rate of ZAR14.703=USD1.00 at the Valuation Date, the equivalent price for coal of different CVs is determined.

Applying the metrics (median, minimum and maximum in ZAR/t and % terms) from Table 19-8 to the Coal Resources and Coal Reserves for Goedehoop give the values presented in Table 19-10. The process is repeated using the filtered set of metrics from Table 19-9 with the results shown in Table 19-11.

Table 19-10: Value Ranges from Market Assessment for Goedehoop

Item/Description	Units	Goedehoop North OP & UG			Goedehoop South OP & UG			Goedehoop North MRD		
		Sale Rsv	RoM Rsv	R&R	Sale Rsv	RoM Rsv	R&R	Sale Rsv	RoM Rsv	R&R
Saleable Reserve	(Mt)	11.50			0.00			7.50		
Saleable CV[1]	(kcal/kg)	5 700			0			3 432		
Saleable Price	(ZAR/t)	1 276			0			49		
RoM Reserve	(Mt)		21.30			0.00			7.50	
RoM CV[1]	(kcal/kg)		4 790			0			3 432	
RoM Price	(ZAR/t)		942			0			49	
MTIS Resource	(Mt)			121.75			91.27			68.80
MTIS CV[1]	(kcal/kg)			5 284			5 220			3 432
MTIS Price	(ZAR/t)			1 039			1 027			49
In situ Value	(ZARm)	14 679	20 069	126 553	0	0	93 712	369	369	3 385
Median (ZAR/t)	(ZAR/t)	13.96	13.96	2.02	13.96	13.96	2.02	13.96	13.96	2.02
Median (%)	(%)	1.52	1.52	0.23	1.52	1.52	0.23	1.52	1.52	0.23
Min (ZAR/t)	(ZAR/t)	6.48	6.48	0.16	6.48	6.48	0.16	6.48	6.48	0.16
Min (%)	(%)	0.70	0.70	0.02	0.70	0.70	0.02	0.70	0.70	0.02
Max (ZAR/t)	(ZAR/t)	68.75	68.75	12.49	68.75	68.75	12.49	68.75	68.75	12.49
Max (%)	(%)	8.74	8.74	1.35	8.74	8.74	1.35	8.74	8.74	1.35
Median based on ZAR/t	(ZARm)	160	297	246	0	0	184	105	105	139
Median based on % *in situ*	(ZARm)	223	305	291	0	0	216	6	6	8
Minimum based on ZAR/t	(ZARm)	74	138	19	0	0	15	49	49	11
Minimum based on % *in situ*	(ZARm)	103	140	25	0	0	19	3	3	1
Maximum based on ZAR/t	(ZARm)	791	1 464	1 521	0	0	1 140	516	516	859
Maximum based on % *in situ*	(ZARm)	1 283	1 754	1 708	0	0	1 265	32	32	46

Note:
1 OP = Open Pit.
2 UG = Underground.
3 MRD = Mineral Residue Deposit.
4 Sale Rsv = Saleable Coal Reserves.
5 RoM Rsv = RoM Coal Reserves.
6 R&R = Coal Resources inclusive of Coal Reserves.
7 In-situ Value is merely tonnes times price, which is not acceptable as a measure of value.

Table 19-11: Value Ranges from Filtered Market Assessment for Goedehoop

Item/Description	Units	Goedehoop North OP & UG			Goedehoop South OP & UG			Goedehoop North MRD		
		Sale Rsv	RoM Rsv	R&R	Sale Rsv	RoM Rsv	R&R	Sale Rsv	RoM Rsv	R&R
Saleable Reserve	(Mt)	11.50			0.00			7.50		
Saleable CV[1]	(kcal/kg)	5 700			0			3 432		
Saleable Price	(ZAR/t)	1 276			0			49		
RoM Reserve	(Mt)		21.30			0.00			7.50	
RoM CV[1]	(kcal/kg)		4 790			0			3 432	
RoM Price	(ZAR/t)		942			0			49	
MTIS Resource	(Mt)			121.75			91.27			68.80
MTIS CV[1]	(kcal/kg)			5 284			5 220			3 432
MTIS Price	(ZAR/t)			1 039			1 027			49
In situ value	(ZARm)	14 679	20 069	126 553	0	0	93 712	369	369	3 385
Median (ZAR/t)	(ZAR/t)	18.39	18.39	3.09	18.39	18.39	3.09	18.39	18.39	3.09
Median (%)	(%)	1.96	1.96	0.33	1.96	1.96	0.33	1.96	1.96	0.33
Min (ZAR/t)	(ZAR/t)	6.53	6.53	0.74	6.53	6.53	0.74	6.53	6.53	0.74
Min (%)	(%)	0.73	0.73	0.07	0.73	0.73	0.07	0.73	0.73	0.07
Max (ZAR/t)	(ZAR/t)	68.75	68.75	12.49	68.75	68.75	12.49	68.75	68.75	12.49
Max (%)	(%)	8.74	8.74	1.35	8.74	8.74	1.35	8.74	8.74	1.35
Median based on ZAR/t	(ZARm)	211	392	376	0	0	282	138	138	213
Median based on % *in situ*	(ZARm)	288	393	418	0	0	309	7	7	11
Minimum based on ZAR/t	(ZARm)	75	139	90	0	0	68	49	49	51
Minimum based on % *in situ*	(ZARm)	107	147	89	0	0	66	3	3	2
Maximum based on ZAR/t	(ZARm)	791	1 464	1 521	0	0	1 140	516	516	859
Maximum based on % *in situ*	(ZARm)	1 283	1 754	1 708	0	0	1 265	32	32	46

Note:
1 OP = Open Pit.
2 UG = Underground.
3 MRD = Mineral Residue Deposit.
4 Sale Rsv = Saleable Coal Reserves.
5 RoM Rsv = RoM Coal Reserves.
6 R&R = Coal Resources inclusive of Coal Reserves.
7 In-situ Value is merely tonnes times price, which is not acceptable as a measure of value.

19.3.3. Derivation of Market Values

The previous transactions reflect a wide range of values paid and relate to a variety of assets. Applying the range to the Coal Resources and Coal Reserves (on inclusive and exclusive basis) for Goedehoop North, South and GHN MRD and adding the results together (Table 19-11), gives a range of ZAR114 million to ZAR1 310 million, ZAR165 million to ZAR1 883 million and ZAR45 million to ZAR3 270 million for Saleable Reserves, RoM Reserves and Resources respectively. The median price would imply a value of ZAR247 million and ZAR356 million for Saleable and RoM Coal Reserves respectively, whereas for Coal Resources on an inclusive basis it would be ZAR540 million. This suggests a value for the Coal Reserves in the LoM plan of ZAR300 million in the range of ZAR139 million to ZAR1 597 million.

Applying the filtered metrics to Goedehoop and adding the results from Table 19-11, and following a similar argument as above, a suggested value for Goedehoop from the filtered data of ZAR395 million in the range of ZAR140 million to ZAR1 597 million is obtained.

The selected range for Goedehoop from the Market Approach is thus ZAR140 million to ZAR1 597 million (Table 19-12), with a median value of ZAR350 million.

The Yardstick Method is a method of technical valuation that involves the application of a heavy discount to the value of the in-situ coal contained within the resource. Discount factors for coal are typically in the range of 0.5% to 3%. Applying these discounts to the In-situ Values in Table 19-10, a range in values of ZAR75 million to ZAR450 million and ZAR102 million to ZAR613 million for Saleable and RoM Coal Reserves respectively is obtained. These support the lower limit of the range and the median value for Goedehoop derived above.

The resultant value range for Goedehoop per the market valuation method is shown in Table 19-12.

Table 19-12: Market Valuation for Goedehoop

Units	Minimum	Maximum
Value (ZARm)	140	1 597
Value (USDm)	9.5	108.6

19.4. Derivation of Value

The preferred, minimum and maximum values per the Income and Market Valuation approaches are compared in Table 19-13, and shown diagrammatically in Figure 19-3.

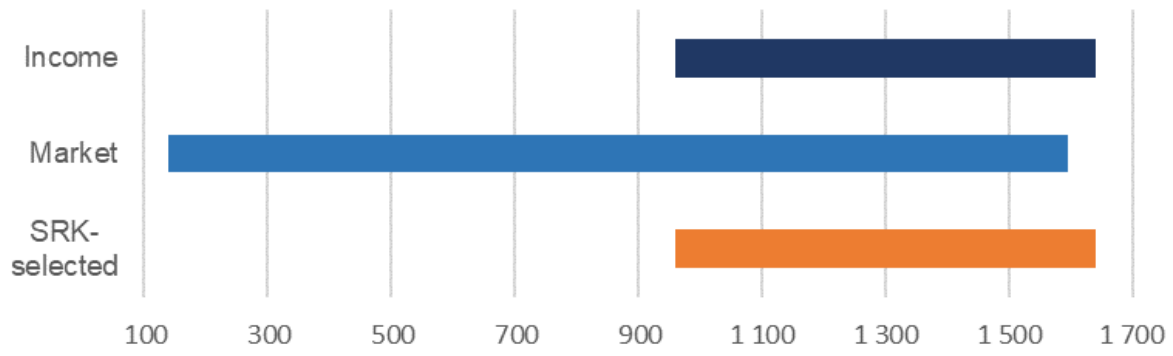
Table 19-13: Comparison of Income and Market Valuations for Goedehoop

Valuation Approach	Units	Minimum	SRK-preferred	Maximum
Income	(ZARm)	960	1 308	1 640
Market	(ZARm)	140	350	1 597
SRK-selected	(ZARm)	960	1 308	1 640
Income	(USDm)	65.3	89.0	111.5
Market	(USDm)	9.5	23.8	108.6
SRK-selected	(USDm)	65.3	89.0	111.5

SRK considers the values derived from the Income approach to be more appropriate given that they are based on cash flows derived from a LoM production schedule and costs that are well understood. The value range from the Market Approach supports the selected values for Goedehoop.

The SRK-selected values in Table 19-13 relate to the Coal Reserves in the LoM plan only and exclude the

value of the out of Mine Plan Coal Resources which is discussed below. These are adjusted for projected balance sheet items (e.g. inventories, debt and cash on hand) at 31 December 2020 below. Projected accounts receivable and accounts payable at 31 December 2020 were taken into account in modelling the working capital movements in the TEM.



srk consulting	GOEDEHOOP COLLIERY CPR Comparison of Income and Market Valuations	Project No. 566657

Figure 19-3: Comparison of Income and Market Valuations

19.5. Valuation of Coal Resources outside of the LoM Plan

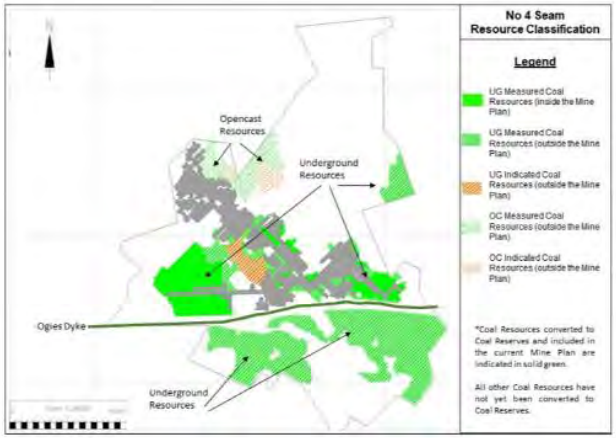
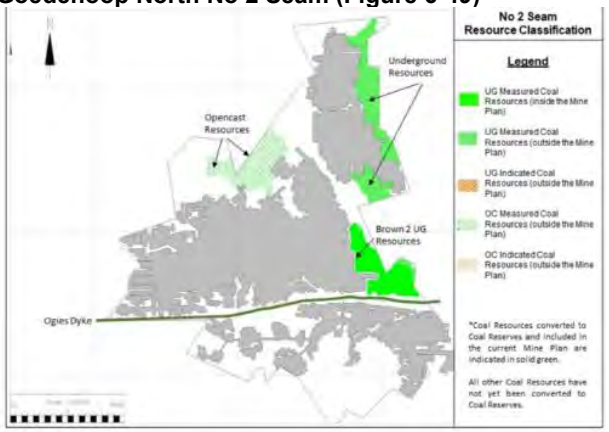
SRK has declared Coal Resources that fall outside of the LoM Plan for Goedehoop North and Goedehoop South in Table 6-10 and Table 6-13, respectively.

There are various technical and economic factors which govern the extent to which these Coal Resources are currently exploitable (Table 19-14). Table 19-14 includes the respective resource classification diagrams from Section 6.5 so that these factors can be placed in context.

Where these factors support exploitation, the median Coal Resources and Coal Reserves (**R&R**) values from Tables 19-10 and 19-11 of ZAR2/t and ZAR3/t are applied as lower and upper metrics, respectively, to the relevant Coal Resource tonnages.

The value ranges developed in Table 19-14 for the various declared Coal Resources are summarised in Table 19-15.

Table 19-14: Valuation of Goedehoop Coal Resources outside of the LoM Plan

Coal Resource Diagram	Technical Factors affecting Exploitation	Coal Resources Valuation
	GOEDEHOOP NORTH	
Goedehoop North No 4 Seam (Figure 6-49)  	**North of Ogies Dyke No 4 Seam:** • Isolated blocks at edge of Mining Right (north); • Possibly exploitable from SAEC operations on adjoining properties, either via underground or open pit. Potential access from existing layout or an inter-seam decline; • Possibly economically viable in conjunction with No 2 and No 1 Seams; • Pillar areas currently excluded; and • The current underground mining fleet could be replaced with machines capable of accessing the lower mining height with less contamination in Simunye South.	**Coal Resources (**Table 6-10, Table 6-11**)** Simunye OC 10.38 Mt 21.8 MJ/kg Brown 14.65 Mt 22.1 MJ/kg Total 25.03 Mt 22.0 MJ/kg Valuation Median: ZAR2/t to ZAR3/t **Value: ZAR50m to ZAR75m**
	South of Ogies Dyke No 4 Seam: • Shaft mothballed; • Capex to re-establish mine and access equivalent to new mine; • No 2 Seam extensively mined out; • Pillar stability/condition on No 2 Seam unknown; and • Not economic at current prices.	**Coal Resources (**Table 6-10, Table 6-11**)** No 4 Seam 48.42 Mt 22.0 MJ/kg Valuation **Value: ZERO**
Goedehoop North No 2 Seam (Figure 6-49)  	**North of Ogies Dyke No 2 Seam:** • Isolated blocks at edge of Mining Right (north, northeast) • Exploitable from SAEC operations on adjoining properties, either via underground or open pit • Economically viable in conjunction with No 1 and No 4 Seams • Pillar areas excluded as well as coal remaining in roof or floor due to seam height limitations	**Coal Resources (**Table 6-10, Table 6-11**)** Simunye OC 11.18 Mt 20.2 MJ/kg Brown 1 19.74 Mt 20.8 MJ/kg Total 30.92 Mt 20.6 MJ/kg Valuation Median: ZAR2/t to ZAR3/t **Value: ZAR62m to ZAR93m**
	South of Ogies Dyke No 2 Seam: • Isolated remnants with no access	**Coal Resources (**Table 6-10**)** No 2 Seam NIL Valuation **Value ZERO**

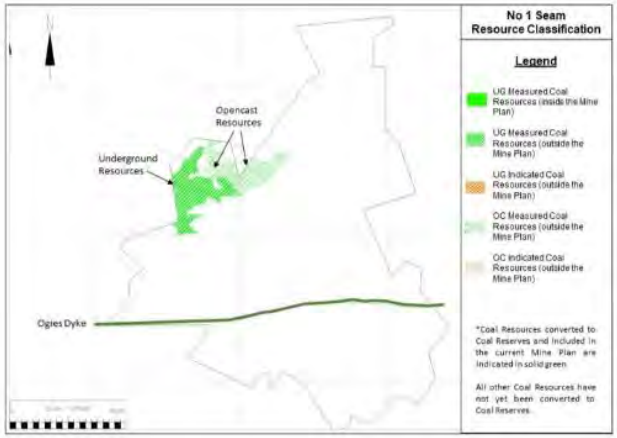
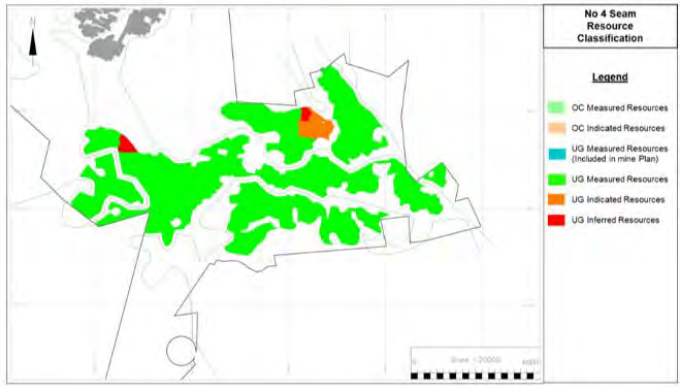
Coal Resource Diagram	Technical Factors affecting Exploitation	Coal Resources Valuation
Goedehoop North No 1 Seam (Figure 6-50)  	**North of Ogies Dyke No 1 Seam** • Isolated blocks at edge of Mining Right (north); • Limited exploitation underground due to proximity of old No 2 Seam workings; and • Economically viable in conjunction with No 2 and No 4 Seams in potential open pit.	**Coal Resources (**Table 6-10**,** Table 6-11**)** Simunye OC 6.97 Mt 22.2 MJ/kg Brown 10.57 Mt 22.6 MJ/kg Total 17.54 Mt 22.4 MJ/kg Valuation Median: ZAR2/t to ZAR3/t **Value: ZAR35m to ZAR52m**
	GOEDEHOOP SOUTH	
Goedehoop South No 4 Seam (Figure 6-52)  	**No 4 Seam** • Scattered blocks in northern section, access lost as shaft closed; • Some remnants require development through dolerite for access; • No 2 Seam extensively mined out; • Concern with pillar stability on No 2 Seam; • No access to southern section, no development; • Capex to establish southern section equivalent to a new mine; and • Not economically viable at current prices.	**Coal Resources (**Table 6-13, Table 6-14**):** No 5 Seam 7.67 Mt 26.2 MJ/kg No 4 Seam 91.27 Mt 21.2 MJ/kg Total 98.94 Mt 21.6 MJ/kg Valuation Value ZERO

Table 19-15: Summary Value of Coal Resources outside of the LoM Plan

Deposit/Coal Seam	Values (ZARm)		
	Lower	Average	Upper
Goedehoop North No 4 Seam (N of dyke)	50	-	75
Goedehoop North No 4 Seam (S of dyke)	0		0
Goedehoop North No 2 Seam (N of dyke)	62	-	93
Goedehoop North No 2 Seam (S of dyke)	0		0
Goedehoop North No 1 Seam	35	-	52
Goedehoop South No 4 and No 5 Seams	0	-	0
Total	**147**	**183**	**220**

19.6. Previous Valuations

[SV1.11, SV1.13]

SRK is not aware of any independent valuations for Goedehoop that have been published in the public domain during the previous two years.

19.7. Summary Valuation for Goedehoop Colliery

[12.10(h)(xii)] [SR5.8(i)] [SV1.12, SV1.13, SV1.14, SV1.15]

The summary valuation for Goedehoop at the Valuation Date (same as the Effective Date) is set out in Table 19-16.

The values for Goedehoop Coal Reserves were derived on a 100% basis and reflect SRK's preferred value for the Coal Reserves derived from the Income and Market valuation approaches. The effect of debt/loans and debt servicing was excluded in the compilation of the techno-economic model used in the Income Approach valuation method, with the necessary adjustments reflected in Table 19-16.

The value for the Coal Resources outside the Mine Plan on a 100% basis is incorporated into the summary valuation.

Adjustments have been made in Table 19-16 for balance sheet items, which include cash on hand, medium- and long-term borrowings and finished product inventories.

The medium- and long-term borrowings for Goedehoop is a pseudo position, since Goedehoop is not a legal entity, does not have its own bank account and as such does not have a standalone external net debt position. The "borrowings" are intra-company amounts held at the AOPL level. However, at the Listed company level these various intra-company "borrowings" are eliminated and only the external net debt/cash position is reflected. It is the intention that upon demerger, the Listed Company will not have external net debt within its capital structure. The invested equity adjustments required to redeem the "borrowings" are undertaken at a subsidiary level within the Group. Consequently, this change does not have an impact on the equity value at the Listed company level, as the mines held in AOPL are 100% owned and accordingly AOPL is 100% held by SACO which in turn is 100% held by the Listed entity. As such the flow-through interest held by AOPL, SACO and the Listed entity in Goedehoop does not change when the demerger occurs.

The Company confirmed to SRK that there are no hedge or derivative contracts in force.

Entries in Table 19-16 were derived in ZAR terms and converted to USD terms at the spot exchange rate of ZAR14.703 = USD1.00 ruling at the Valuation Date.

The percentage of the values of the Coal Reserves and the Coal Resources outside the Mine Plan that is attributable to the Company is then applied in the summary valuation in Table 19-16.

Table 19-16: Goedehoop Colliery Summary Valuation (at 31 December 2020)

Contract	Selected Value		Company's Interest (%)	Fair Value to the Company	
	ZARm	USDm		ZARm	USDm
Goedehoop Colliery					
Coal Reserves	1 308	89.0	100%	1 308	89.0
Coal Resources outside the Mine Plan	183	12.4	100%	183	12.4
Sub-total				**1 491**	**101.4**
Adjustments					
Cash on hand				0	0
Medium and long-term borrowings[1]				0	0
Finished product inventories[2]				18	1.2
Exploration budget costs				Included in cash flows	
Hedge contracts – mark to market				None in force	
Environmental liabilities				Included in cash flows	
Post-closure water treatment [3]				(155)	(10.5)
Net Goedehoop Value				**1 354**	**92.1**

Note:

1 Medium- and long-term borrowings are intra-company amounts that will have no cash impact on Goedehoop.

2 Finished product inventories are valued by the Company at the lower of cost of net realisable value. The holding value of consumables and spares inventories has been excluded.

3 The NPV of the projected Capex and Opex cash flows for water treatment post closure.

SRK repeated the construction of Table 19-16 using the selected minimum and maximum values derived from the Income and Market valuation approaches (see Table 19-13) and the Coal Resources outside the Mine Plan (see Table 19-15).

SRK considers that the fair value for Goedehoop attributable to the Company at the Valuation Date after adjustment for balance sheet items and post-closure water treatment costs is ZAR1 354 million (USD92.1 million), in the range of ZAR988 million (USD67.2 million) to ZAR1 757 million (USD119.5 million).

19.8. Risks and Opportunities

[12.10(h)(x)] [SR5.7(i)]

The ongoing operating costs of water maintenance post mine closure is a potential risk.

19.9. Conclusions

[SV1.15]

The trend towards decarbonisation is relatively recent and it remains unclear how this will impact on the value of the coal assets. SRK considers the valuation to be aligned with the SAMREC and SAMVAL Codes and to represent a reasonable interpretation of value and the associated risks. Current sentiment towards coal assets is not adequately reflected in the transactional analysis. The possible gap between the price that can be realised and the valuation is exacerbated by the recent increase in the coal price.

Values for the Coal Resources that fall outside of the LoM Plan have been included.

The Goedehoop operation yields a positive NPV and it does cover part of the Company's take or pay TFR/RBCT obligations and Company overheads/corporate costs. If Goedehoop was to cease operations, the TFR/RBCT obligations and corporate overheads would have to be re-allocated to the other collieries which may in turn affect their viability.

The NPV probability plot shows that for 91% of the time, the NPV of the cash flows should be positive.

SRK considers that the fair value for Goedehoop attributable to the Company at the Valuation Date after adjustment for balance sheet items and post-closure water treatment costs is ZAR1 354 million (USD92.1 million), in the range of ZAR988 million (USD67.2 million) to ZAR1 757 million (USD119.5 million).

SRK is satisfied that Coal Reserves can be declared for Goedehoop.

20. Risk Assessment

[12.10(h)(x)] [SR5.7(i)] [ESG4.9]

20.1. Introduction

An iterative, integrated and collaborative risk assessment was carried out as part of the study to identify existing and potential vulnerabilities that could affect the project, using inputs from each of the project disciplines.

The risk assessment was highly participative, with inputs from various technical team members, identified in Table 1-1. The various technical team members populated the risk register electronically, prior to the risk workshop. The risk workshop served to confirm and evaluate the various items from the risk register.

20.2. Approach

The risk framework used in the CPR of a related Company asset was used, in order to maintain consistency in approach, terminology and rating values[16]. The approach is summarised as follows:

- Description
  - The risk, the cause of the risk and the consequence/s that are associated if the risk is realised, were described;
  - The probability of occurrence was rated, using the standard terminology shown in Table 20-1; and
  - The consequence was rated, using the standard terminology shown in Table 20-2.
- Inherent Rating
  - Based on the likelihood of occurrence and consequence if realised, the inherent rating of each risk was determined using the standardised risk matrix shown in Table 20-3.
- Mitigation and residual rating
  - Mitigatory measures were identified for the risks and described; and
  - Based on the interpretation that the actions for mitigation will be incorporated into the risk management of the project, and the perceived efficacy of the implementation (as shown in Table 20-4), the residual risk ratings were determined using the risk matrix in Table 20-3.

The risk assessment concluded with the theme of *Risk Resilience* [16] – which is understanding the Residual following the implementation of mitigation. Using this concept, the residual risks can be classified into four types:

- **Resilient** – where the reduction in risk is nil or very small, and the residual risk is essentially the same as the initial risk;
- **Robust** - where the reduction in risk is limited, and although the risk has been mitigated to some degree, the residual risks remain of concern and further mitigation is necessary;
- **Temperate** - where the reduction in risk is moderate, and although the risk has been mitigated to a larger degree, some further mitigation may be necessary; and
- **Weak** - where the reduction in risk is considerable, and the risk has been effectively mitigated and further mitigation is probably not necessary.

[16] The risk framework used in the CPR of a related Company asset was used in order to maintain consistency in approach, terminology and rating values; namely: AAC. (2019y). Greenside Colliery CPR Reserves and Resources for the period ending 31st December 2018. page 145-147.

Table 20-1: Descriptors for Probability of Occurrence

Description	Probability	Informal Guidance
Rare	<3% likelihood of occurring	Occurs only in **exceptional** circumstances
Unlikely	3% to 10% likelihood of occurring	May occur in uncommon circumstances
Possible	>10% to 30% likelihood of occurring	Might occur at some time
Likely	>30% to 90% likelihood of occurring	Will probably occur in most cases
Almost certain	>90% likelihood of occurring	Is expected to occur in most circumstances

Table 20-2: Descriptors for Consequence

Description	Financial/ Economic	Operational/ Business Interruption	Health and Safety	Skills	Natural Environment	Social	Corporate Image/Reputation	Legal
Insignificant	<5% change in value	2.5% of project schedule overrun	Medical treatment case, dressing station, no impairment	<5% unavailability of critical skills	Natural processes are affected but with impacts being reversible immediately	Issue of no political and community concern	Issue of no public concern	Low-level legal issue
Minor	5% to 10% change in value	5% of project schedule overrun	Reversible impairment or LTI	Up to 10% unavailability of critical skills	Natural processes are affected, but continued in a modified way with impacts being reversible within lifetime of operation	Local concern consisting of repeated complaints	Local press interest and Local political concerns	Non-compliance and breach of regulations
Moderate	10% to 25% change in value	10% of project schedule overrun	LTI - Reportable	Up to 25% unavailability of critical skills	Natural processes are notably altered but continued in a modified way with impacts being reversible within lifetime of operation.	Declared Provincial Concerns and serious inflow of community complaints.	Limited damage to reputation, extended local press interest/ Provincial press interest.	Breach of regulations; investigation or report to authority with prosecution and/or moderate fine possible.
High	25% to 80% change in value	20% of project schedule overrun	Single fatality, multiple injuries or permanent disability	Up to 80% unavailability of critical skills	Natural processes are disrupted for the duration of the activity but resume functioning after the operation has been terminated.	Loss of credibility and confidence. Criticism by National Government	National press coverage. Independent External Enquiry.	Breach of regulation, severe litigation
Major	>80% change in value	>30% of project schedule overrun	Multiple fatalities or health impact of similar nature affecting multiple persons	>80% unavailability of critical skills	Natural processes are permanently disrupted to the extent that these processes could permanently cease.	Widespread social riots & work blockages, Declared National Political Concerns and Investigations.	Declared National political concerns, International and Local Media Coverage.	Prosecution and fines, litigation including class actions

Table 20-3: Risk Matrix[17]

		Consequence				
		Insignificant	Minor	Moderate	High	Major
Probability	Almost Certain	Medium	High	High	Extreme	Extreme
	Likely	Medium	Medium	High	Extreme	Extreme
	Possible	Low	Medium	High	High	Extreme
	Unlikely	Low	Low	Medium	High	High
	Rare	Low	Low	Medium	Medium	High

Table 20-4: Descriptors for Effectiveness of Mitigation

Description	Effectiveness	Outcome Following Mitigation
No mitigation	No mitigation is carried out therefore the risk remains the same	The residual risk remains the same as the inherent risk; mitigation must be considered for intolerable risks
Damaging	The mitigation applied increases the risk instead of reducing the risk	The residual risk remains of concern; further and/or alternative mitigation is necessary to address the increased risk and/or intolerable risks
Deficient	The mitigation applied has very little effect on reducing the risk	The residual risk is essentially the same as the inherent risk; further mitigation is necessary
Marginal	The mitigation applied has reduced the risk to some degree	The residual risk remains of concern and further mitigation is necessary
Qualified	The mitigation applied has reduced the risk to a larger degree	Although the residual risk has largely been mitigated, further mitigation may be necessary
Effective	The mitigation applied has reduced the risk considerably	Further mitigation is probably not necessary
Excessive	The mitigation that has been applied is more than necessary to reduce the risk. There may be over-control	

20.3. Overview of Results

The full risk register and assessment are shown in Table B-1 in Appendix 2.

A total of 58 risks were evaluated across the disciplines, of those:

- 24 have a **low** residual rating;
- 23 have a **medium** residual rating;
- 11 have a **high** residual risk rating and
- 0 have an **extreme** residual risk rating.

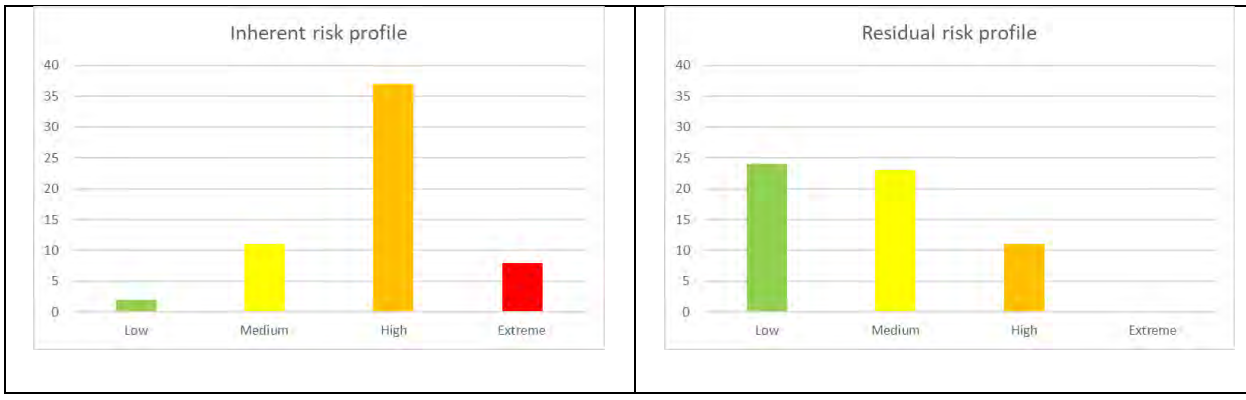
Subsequently, the risk resilience is as follows:

- 11 residual risks are considered to be **resilient;**
- 32 residual risks are considered to be **robust;**

[17] The risk framework used in the CPR of a related Company asset was used in order to maintain consistency in approach, terminology and rating values; namely: AAC. (2019y). Greenside Colliery CPR Reserves and Resources for the period ending 31st December 2018. page 145-147.

- 13 residual risks are considered to be **temperate;** and
- 2 residual risks are considered to be **weak.**

Figure 20-1 shows the comparison of risk profiles, whereas the heat map plots in Figure 20-2 (inherent risk rating) and Figure 20-3 (residual risk rating) contrast the elements of the risk profile – and highlight the importance of effective mitigation and control measures.



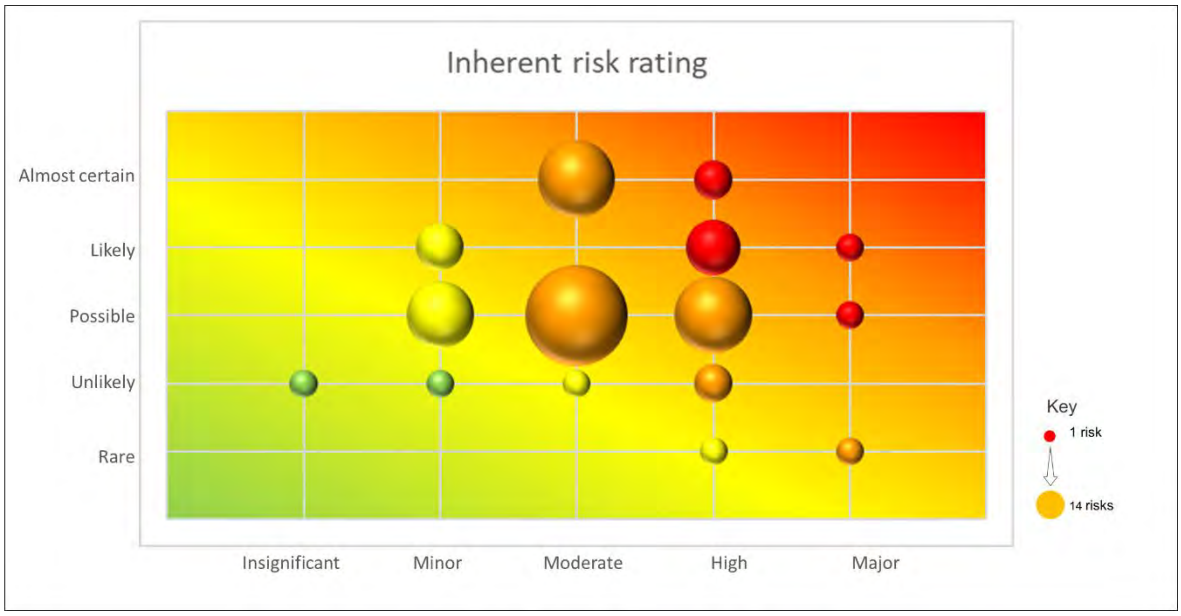
srk consulting	**GOEDEHOOP COLLIERY CPR** Comparison of Risk Profiles Pre- and Post-Mitigation	Project No. 566657

Figure 20-1: Comparison of Risk Profiles Pre- and Post-Mitigation

Table 20-5: Comparison of Risk Rank Elements using the Company's Framework[18]

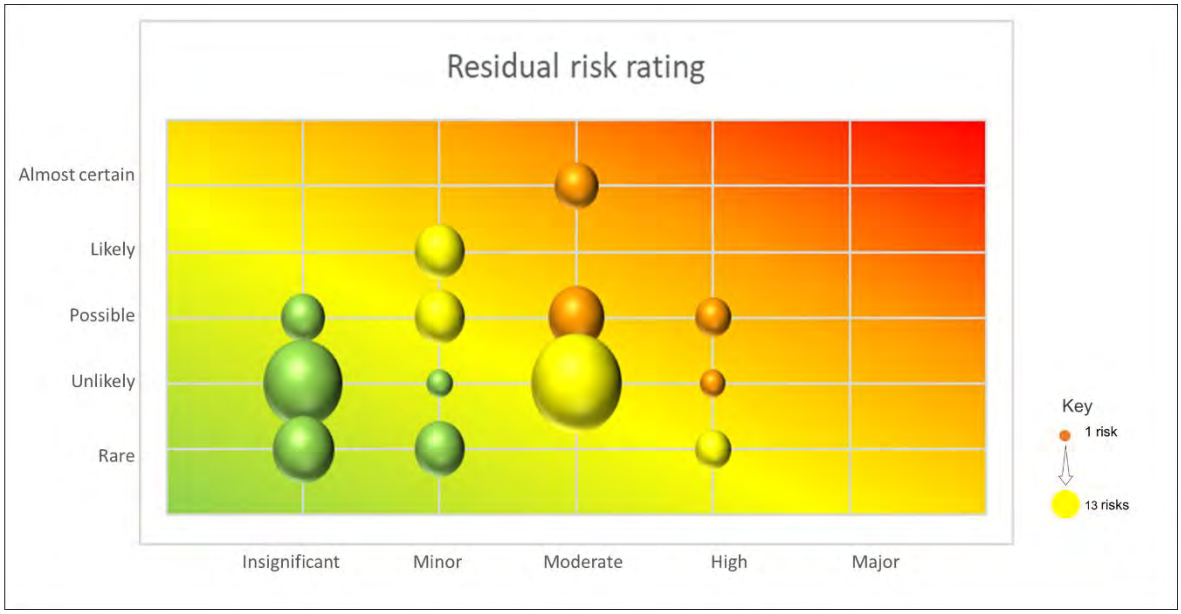
			Consequence				
			Insignificant	**Minor**	**Moderate**	**High**	**Major**
			1	**2**	**3**	**4**	**5**
Probability	**Almost Certain**	**5**	Medium 0/0	High 0/0	High 4/0	Extreme 2/0	Extreme 0/0
	Likely	**4**	Medium 0/0	Medium 3/4	High 8/3	Extreme 4/0	Extreme 1/0
	Possible	**3**	Low 0/3	Medium 6/4	High 14/5	High 8/2	Extreme 1/0
	Unlikely	**2**	Low 1/10	Low 1/1	Medium 1/13	High 2/1	High 0/0
	Rare	**1**	Low 0/6	Low 0/4	Medium 0/0	Medium 1/2	High 1/0

[18] The risk framework used in the CPR of a related Company asset was used in order to maintain consistency in approach, terminology and rating values; namely: AAC. (2019y). Greenside Colliery CPR Reserves and Resources for the period ending 31st December 2018. page 145-147.



srk consulting	**GOEDEHOOP COLLIERY CPR** Distribution of Risk Rank Elements (Pre-Mitigation)	Project No. 566657

Figure 20-2: Distribution of Risk Rank Elements (Pre-Mitigation) [19]



srk consulting	**GOEDEHOOP COLLIERY CPR** Distribution of Risk Rank Elements (Post-Mitigation)	Project No. 566657

Figure 20-3: Distribution of Risk Rank Elements (Post-Mitigation) [19]

[19] In reading the color-coded heatmaps of Figure 20-2 and Figure 20-3 - red shows the higher risk rating and green shows the lower risk rating. Furthermore, the size of the bubble corresponds with the number of risks i.e. smaller bubbles indicate a *fewer* number of risks and large bubbles indicate a *greater* number of risks at the particular probability and consequence combination.

The detailed results from each of the disciplines of the risk assessment are presented in Table A-1 in Appendix 1.

20.4. Risks per Discipline

Table 20-6 consolidates the key risks identified for Goedehoop, arranged per discipline.

Table 20-6: Key Risks

Discipline	Risk description	Probability	Consequence	Inherent Risk Rating	Residual Risk Rating
Closure	Closure liability underestimated	Almost certain	High	Extreme	High
Coal Processing	Insufficient coal into plant	Possible	High	High	High
Sustainability - External factors	Several external factors could influence the sustainability of Goedehoop colliery - COVID-19 and the global macro-economic environment, impact of climate change on coal production, a 'just transition for coal mining', social transitioning during closure and/or care and maintenance, social and labour legacy issues during mergers and acquisitions	Almost certain	High	Extreme	High
Valuation	RoM Production targets are not met	Possible	High	High	High
Valuation	Operating costs are understated	Possible	Moderate	High	High
Valuation	Capital budgets are understated	Likely	Moderate	High	High
Valuation	Projected plant yields are not achieved	Possible	Moderate	High	High
Valuation	Projected saleable product mix not achieved	Possible	Moderate	High	High
Valuation	Projected coal selling prices not achieved	Likely	High	Extreme	High
Valuation	Unable to manage portfolio costs	Possible	Moderate	High	High
Ventilation	There is a delay in establishing the ventilation for Brown 2 Seam	Possible	Major	Extreme	High

20.5. Opportunities per Disciplines

Table 20-7 consolidates the key opportunities identified for Goedehoop, arranged per discipline.

Table 20-7: Opportunities

Discipline	Risk Description	Opportunity Description
Engineering Infrastructure	High SIB capital budget for 2021 - 2024	Improved profitability through revision and/or review of the SIB budget (by taking the revised production schedule into account)
Environmental	Legal implications and reputational damage due to non-compliance to several environmental conditions contained within environmental authorisations	Once the amendments to the environmental authorisations have been approved, the mine should have a streamlined EMPR that reflects the realities on the ground and compliance can be achieved
Geology	Loss of Coal Resources due to structural disturbances such as faults and dolerite intrusions and floor rolls	Where areas have been excluded from the resource base due to their proximity to known geological structures, there may be the opportunity to add these Coal Resources with increased exploration/studies
Geology	Lost potential of extra coal measures not included in the current resource estimation	The potential to increase the current Coal Resources
Hydrology and Hydrogeology	Failure to intercept seepage and prevent erosion at Bank 5 Discard Dump, resulting in an impact to the riparian habitat and in-stream habitat. Similar findings related to the Hope Dump and Springbok Dump occur	Determine if the MRD can be remined
Social	Social closure liabilities	Implement projects as part of Zimele Hub to reduce social dependency on mine
Sustainability - External Factors	Several external factors could influence the sustainability of Goedehoop colliery - COVID-19 and the global macro-economic environment, impact of climate change on coal production, a 'just transition for coal mining', social transitioning during closure and/or care and maintenance, social and labour legacy issues during mergers and acquisitions	Implement projects as part of Zimele Hub to reduce social dependency on mine
Coal Discards (GH South)	Mine closure process delayed	Potential for recovery from the MRD, commercial benefit for closure

21. Conclusions and Recommendations

[SR5.7(i)] [SR7.1(ii)] [SV1.2] [ESG4.9]

21.1. Regulatory Environment and Tenure

Goedehoop Colliery is well run from an environmental perspective. The mine has an approved EMPr, several EAs and a WUL. The colliery is registered as a waste producer however they do not have a waste management licence in terms of the National Environmental Management: Waste Act (Act No. 59 of 2008). All general waste generated on site is transported and disposed of at the Secunda landfill site. All hazardous waste is removed by a contractor and is disposed of at the Holfontein landfill site.

A Social and Labour Plan (**SLP**) was prepared as part of the requirements of the MPRDA. The SLP for the 2020 to 2024 period (AAC, 2020h) was submitted to the Department of Mineral Resources and Energy (DMRE) in September 2020.

The site has a training centre that is ISO 9001: 2008 certified and has training provider status from the MQA. Goedehoop complies and will continue to comply with the requirements of the Skills Development Act.

Goedehoop has sufficient Mining Rights in place to cover the area of mining.

Numerous land claims have been registered over Goedehoop; some have been finalised, whilst others are still being resolved.

Based on a review of the Lease Agreement Schedule (AAC, 2020j), the lease agreements on several portions of land have expired. These include the following:

- Portions of land on the farm Enkeldebosch 20 IS, Haasfontein 28 IS and Goedehoop 46 IS, leased to Islardu Boerdery;
- Several portions of the farm Vlaklaagte 21 IS, Enkeldebosch 20 IS and Haasfontein 28 IS, leased by Valco Boerdery (Pty) Ltd;
- Goedehoop 46 IS and Wilmansrust 47 IS, leased to PJ Honeyborne;
- Several portions of the farm Wilmansrust 47 IS, leased to WA de Klerk;
- The farm Koornfontein 27 IS, leased by Makoya Supply Chain Holdings (Pty) Ltd; and
- Several portions of the farm Kleinfontein 49 IS, leased by C van Dyk.

An online discussion with the Company's Mineral, Property Rights and Permitting Manager on 8 October 2020 revealed that processes are in place to update the lapsed lease agreements.

21.2. Sufficiency of the Rights

Goedehoop has the appropriate Mining Rights in place over both sections of Goedehoop; the rights expire in 2038 and 2042. The conversion application from a prospecting to Mining Right over the Komati Power Station area has been submitted and is awaiting conversion.

The Company has the appropriate surface rights where required; the remainder of the surface rights are held by numerous different entities, mostly concerning private agriculture, as well as the State, the Middleburg Municipality, two churches, Transnet, Eskom, Ingwe Surface Holdings Ltd and Koornfontein Mines (Pty) Ltd.

Goedehoop Colliery (GHN and GHS) operate under several EMPrs, EAs and WULs. The Colliery does not require a waste licence and no longer holds a valid an AEL. All of the required environmental permits are therefore in place for the activities taking place on GHS and GHN. While these permits are in place, the Environmental Coordinator has acknowledged that there are certain conditions within the permits that are not being complied with. In order to mitigate this, amendments to the affected environmental permits are in process to address the non-compliances.

21.3. Geology, Exploration, Drilling, Sampling Techniques and Data

Coal is found in South Africa in 19 coalfields in the Karoo Supergroup, mainly in the Vryheid Formation of the

Ecca Group. Goedehoop Colliery is located near the northern extent of the Witbank Coalfield, within the Mpumalanga Province of South Africa.

The stratigraphy of the Witbank Coalfield is described from the base upwards:

- The Dwyka Group sequence - massive diamictites with lesser matrix-supported conglomerates and coarse-grained sandstones;
- The Vryheid Formation - sandstones, mudstones and siltstones, with lesser amounts of coal. Five coal seams are present - the No 1, 2, 3, 4 and 5 Seams, named from the base up. The No 1 and No 3 Seams are thin and discontinuous throughout the coalfield. The No 2 Seam (1.5 - 4.0 m thick) consists of mainly dull coal; it has been extensively mined and little unexploited coal remains. The No 4 Seam averages four metres thick and is now the most important seam economically; the coal is of lower quality than the No 2 Seam and shale intercalations are common in the upper part of the seam. The No 5 Seam, a bright to dull coal, is present over most of the coalfield, attaining mineable thicknesses in the northern and western portions of the field only. It too has been extensively mined and little mineable coal remains.

Strata at Goedehoop are typical of the Witbank Coalfield, with all five coal seams being present on both properties. Underlying the coal sequence of the Vryheid Formation are glacial deposits of the Dwyka Group, which accumulated on the erosional pre-Karoo basement surface. The distribution of the lower seams (No 1 and No 2 Seams) is controlled by the underlying palaeotopography while that of the uppermost No 5 Seam is controlled by the level of the present-day erosion. The seams are generally flat lying and gently undulating.

There are no reported faults in Goedehoop North, while minor small-scale (1.5 m throw) faulting has been reported in the No 4 Seam in the Block 14 area of Goedehoop South. Seam dislocations occur along some dykes or where sills transgress the coal seams, but these are not interpreted as true faulting. The Goedehoop area has been intruded by transgressive Karoo dolerite sills, resulting in displacement of the seams. Large areas of coal have been devolatilised where a sill is in close proximity to the seam. Dolerite dykes and stringers are commonly encountered. The average dyke spacing is 200 to 500 m with a preferred orientation of northwest-southeast and northeast-southwest.

Historical exploration data has been incorporated into the current geological database and model, which contains drill hole data and analytical results.

Planned exploration for 2020 in Goedehoop North focuses on drilling and sampling 20 cored drill holes with a total length of approximately 1 200 m and is expected to have a total cost of ZAR5 million; no exploration has been conducted at Goedehoop South due to closure in December 2019.

The complete core is sampled and sent to the Bureau Veritas laboratory in Middelburg for analysis. The coal samples are crushed and screened to produce a -25 mm +0.5 mm sample fraction and a -0.5 mm fines fraction for analysis. The mass percentage of the two size fractions are determined and reported. The samples are air-dried (under controlled, prescribed atmospheric conditions) and conditioned before being analysed.

The Goedehoop-specific analytical regime applied to each sample is determined by a set of “Mask Codes”, developed in conjunction with the laboratory. The Mask Codes are based on the seam and coal type/parting material. Some samples are analysed raw, while others undergo full float and sink analysis; this applies to coal horizons that could potentially supply both the high and low-quality export markets. This allows the Company to perform all required export and domestic product simulations. Each float and sink fraction is analysed for proximate analysis (inherent moisture content, ash content and volatile matter content), calorific value and total sulphur content; fixed carbon content is determined by difference. Full washability tables with fractional and cumulative values for each density fraction are provided for each sample (where applicable). Samples that are analysed raw are described by a single line of data containing the proximate analysis, calorific value and total sulphur.

21.4. Coal Resource Estimates

[SR1.4(iii), SR4.2(v), SR4.5(vi), SR6.1(iii)]

The Coal Resource estimates were conducted in accordance with the SAMREC Code, as well as SANS10320:2020.

The Coal Resource estimates have been independently estimated by Ms K. Black of KJB GeoServices and signed

off by Ms L. Jeffrey on behalf of SRK, based on the model supplied by the Company and verified by SRK. The Coal Resource estimate is declared as at 31 December 2020. SRK estimated the Goedehoop Coal Resources as at 31 December 2020.

During the resource verification process carried out by SRK, certain coal measures, either excluded totally by the Company, or included as 'Low Potential' Coal Resources in their internal coal inventory, were deemed by SRK as meeting the necessary requirements (RPEEE) to be included in the SRK Coal Resource Estimate for both Goedehoop North and Goedehoop South. These Coal Resources were excluded by the Company predominantly on the basis of access (current mining had ceased in the immediate vicinity), as well as challenging mining conditions, while some of the coal measures were excluded on the basis of poor quality (did not meet the current strategy of an underground export product; however, these Coal Resources could meet the quality requirements of a local steam coal.

After careful consideration, SRK took the decision to include some of these coal measures as reportable Coal Resources, based on the fact that different mining methodologies and markets could result in this coal becoming economically viable.

There are no Inferred Coal Resources at either Goedehoop North or Goedehoop South.

21.4.1. Goedehoop North Coal Resource Estimates

The Goedehoop North Coal Resource estimate has been subdivided as follows:

- Resources within the current Mine Plan (underground coal only);
- Resources outside of the current Mine Plan, further subdivided as follows:
  - Underground coal north of the Ogies Dyke, including the MRD;
  - Opencast coal north of the Ogies Dyke; and
  - Underground coal south of the Ogies Dyke (there are no opencast coal south of the Ogies Dyke.

Note that the opencast Coal Resources will only be available for mining provided the MRD has been completely removed.

Provision has been made for a geological loss factor (discount). Losses may occur mainly as a result of intersection of dolerite dykes, faulting and other unforeseen geological losses.

The Company has applied geological losses of between 10 to 15 % for the Measured Coal Resources and between 15 and 20% for the Indicated Coal Resources. However, SRK is of the opinion that lower geological losses are warranted, based on the redefined resource polygons. SRK has thus applied geological losses of between 5.0 to 15% for the Measured Resources and 15% for the Indicated Coal Resources; this translates to an average geological loss of 9.3%.

The Coal Resources for Goedehoop North inside the Mine Plan on a total basis[20] (100% attributable to Goedehoop) at 31 December 2020 are summarised in Table 6-8; the average raw coal qualities on an air-dried basis are shown in Table 21-2. Note that these Coal Resources are all north of the Ogies Dyke.

The Coal Resources have been subdivided into those inside and outside the Life of Mine Plan, which has been determined using the specified mine design parameters within the economic footprint (SANS 10320:2020, clauses 3.2.5, 8.1.1.1, 8.1.2.3 and Table F1).

Coal Resources inside the Mine Plan are reported inclusive of the Coal Reserves.

The Goedehoop North Coal Resource within the current Mine Plan on an MTIS air-dried basis amounts to 38.07 Mt. This estimate consists of Measured and Indicated Coal Resources only; there are no Inferred Coal Resources within the current Mine Plan. 31.47 Mt of the Coal Resources are derived from the *in situ* coal with an

[20] Note that "total basis" refers to 100% of the Coal Resources and/or Coal Reserves attributable to Goedehoop North and South and are equivalent to the term "gross" used in the AIM Mining Guidance.

average moisture content of 2.5%. The Measured Coal Resources account for 95.1% (29.93 Mt) of the *in* situ Coal Resources, while the Indicated Coal Resources account for 4.9% (1.54 Mt). The Goedehoop North MRD contributes 6.6 Mt with an average moisture content of 2.3%. The estimate for the Goedehoop North MRD is that as determined by the Company; SRK does not have any means to evaluate the accuracy of this estimate and accepts it in good faith; the Goedehoop North MRD estimate is included in SRK's Coal Resource Statement.

Table 21-1: Goedehoop North: MTIS Coal Resource Statement at 31 December 2020 (Inside the Mine Plan – north of the Ogies Dyke)

Block	Resource Classification Category	Mining Method	Seam	Area (ha)	Seam Thickness (m)	Raw ARD	Geo. Loss (%)	MTIS (Mt)
Simunye	Measured	UG+BP	No 4	399.38	2.67	1.57	10.0	15.05
	Indicated	UG+BP	No 4	47.91	2.42	1.56	15.0	1.54
Brown 2	Measured	UG+BP	No 2	236.95	4.37	1.56	8.0	14.88
MRD	***Measured***	***OC***	***Discard***	**-**	**-**	**-**	**-**	***6.6***
Total Inside the Mine Plan		**UG+BP**	**No 4, 2**	**684.23**	**3.46**	**1.56**	**9.3**	**38.07**

Note:
1. Note that "total basis" refers to 100% of the Coal Resources and/or Coal Reserves within the Goedehoop Mining Rights and is not necessarily the percentage attributable to the holder of the Mining Rights.
2. Coal within Mining Right boundary.
3. UG+BP = Underground Bord and Pillar; OC = Opencast.
4. MRD = Mineral Residue Deposit (derived from the No 4 and No 2 Seam discard material).
5. Minimum UG seam thickness cut-off: No 4 Seam = 1.5 m; No 2 Seam = 2.0 m (the same as the minimum mining height).
6. Maximum UG seam thickness cut-off of 4.5 m (the same as the maximum mining height).
7. Minimum UG depth = 20 m.
8. Ash < 50% cut-off applied.
9. DAFV > 24% cut-off applied.
10. ARD – Apparent Relative Density.
11. The bulk density for the MRD is not stated in the Company's estimate.
12. All seam thicknesses used are true thicknesses.

Table 21-2: Goedehoop North: Average Raw Coal Qualities (adb) (Inside the Mine Plan)

Block	Resource Classification Category	Seam	Ash (%)	CV[1] (MJ/kg)	FC (%)	IM (%)	TS (%)	VM (%)	DAFV (%)
Simunye	Measured	No 4	25.7	22.93	49.2	2.6	1.39	22.6	31.6
	Indicated	No 4	24.8	23.26	50.0	2.6	1.66	22.6	31.2
Brown 2	Measured	No 2	23.1	22.38	49.3	2.4	1.04	19.9	29.4
MRD	*Measured*	*Discard*	-	*12.64*	-	*2.3*	-	-	-
Average		**All**	**26.9**	**22.69**	**49.3**	**2.5**	**1.24**	**21.3**	**30.5**

Note:
1. Weighted average qualities estimated on MTIS.
2. adb = air-dried basis.
3. CV[1] - Calorific Value, VM – Volatile Matter Content, FC - Fixed Carbon, TS - Total Sulphur, IM - Inherent Moisture, DAFV – Dry Ash Free Volatile Matter Content.
4. MRD = Mineral Residue Deposit (derived from No 4, No 2 and No 1 Seam discard material).
5. The CV for the MRD has been converted by SRK from kcal/kg to MJ/kg (kcal/kg * 0.004187 = MJ/kg).
6. Note that the MRD CV and IM have not been considered in the average values.

The Goedehoop North Coal Resource outside of the current Mine Plan on an MTIS air-dried basis amounts to 121.91 Mt at an average IM of 2.5%. The estimate consists of:

- 90.48 Mt of Measured underground Coal Resources (74%);
- 2.90 Mt of Indicated underground Coal Resources (2%);
- 25.51 Mt Measured opencast Coal Resources (21%); and
- 3.02 Mt of Indicated opencast Coal Resources (3%).

The Coal Resources for Goedehoop North outside the Mine Plan on a total basis[21] (100% attributable to Goedehoop) at 31 December 2020 are summarised in Table 21-3 the average raw coal qualities on an air-dried basis are shown in Table 21-4.

Table 21-3: Goedehoop North: MTIS Coal Resource Statement at 31 December 2020 (Outside the Mine Plan)

Block	Resource Classification Category	Mining Method	Seam	Area (ha)	Seam Thickness (m)	Raw ARD	Geo. Loss (%)	MTIS (Mt)
North of the Ogies Dyke								
Simunye + Brown 1+ Brown 2	Measured	UG+BP	No 4	289.64	2.82	1.60	10.0	11.75
	Indicated	UG+BP	No 4	99.22	2.22	1.55	15.0	2.90
	Total No 4 Seam	***UG+BP***	***No 4***	***388.86***	***2.70***	***1.59***	***11.0***	***14.65***
	Measured	UG+BP	No 2	327.84	4.46	1.59	15.0	19.74
	Total No 2 Seam	***UG+BP***	***No 2***	***327.84***	***4.46***	***1.59***	***15.0***	***19.74***
	Measured	UG+BP	No 1	247.76	3.00	1.58	10.0	10.57
	Total No 1 Seam	***UG+BP***	***No 1***	***247.76***	***3.00***	***1.58***	***10.0***	***10.57***
Subtotal Simunye, Brown 1+2		**UG+BP**	**No 4, 2, 1**	**964.46**	**3.54**	**1.59**	**12.5**	**44.96**
Simunye	Measured	OC	No 4	215.13	2.48	1.53	10.0	7.36
	Indicated	OC	No 4	91.88	2.53	1.53	15.0	3.02
	Total No 4 Seam	***OC***	***No 4***	***307.01***	***2.49***	***1.53***	***11.5***	***10.38***
	Measured	OC	No 2	255.62	2.91	1.67	10.0	11.18
	Total No 2 Seam	***OC***	***No 2***	***255.62***	***2.91***	***1.67***	***10.0***	***11.18***
	Measured	OC	No 1	171.51	2.84	1.59	10.0	6.97
	Total No 1 Seam	***OC***	***No 1***	***171.51***	***2.84***	***1.59***	***10.0***	***6.97***
Subtotal Simunye		**OC**	**No 4, 2, 1**	**734.14**	**2.74**	**1.60**	**10.5**	**28.53**
Total North of the Ogies Dyke		**UG + OC**	**No 4, 2, 1**	**1 698.60**	**3.23**	**1.59**	**11.7**	**73.49**
<u>South of the Ogies Dyke</u>								
South	Measured	UG+BP	No 4	1 204.76	2.96	1.60	15.0	48.42
Total South of the Ogies Dyke		**UG+BP**	**No 4**	**1 204.76**	**2.96**	**1.60**	**15.0**	**48.42**
TOTAL		**UG+OC**	**No 4**	**2 903.36**	**3.12**	**1.59**	**13.0**	**121.91**

Note:
1. Note that "total basis" refers to 100% of the Coal Resources and/or Coal Reserves within the Goedehoop Mining Rights and is not necessarily the percentage attributable to the holder of the Mining Rights.
2. Coal within Mining Right boundary.
3. UG+BP = Underground Bord and Pillar; OC = Opencast.
4. Minimum UG seam thickness cut-off: No 4 Seam north of the Ogies Dyke = 1.5 m and 2.0 m south of the Ogies Dyke; No 2 Seam = 2.0 m, No 1 Seam = 1.5 m (the same as the minimum mining height)
5. Maximum UG seam thickness cut-off of 4.5 m (the same as the maximum mining height).
6. Minimum UG depth = 20 m.
7. Minimum OC seam thickness cut-off of 0.5 m.
8. Strip ratio < 6.5.
9. Ash < 50% cut-off applied.
10. DAFV > 24% cut-off applied.
11. ARD – Apparent Relative Density.

[21] Note that "total basis" refers to 100% of the Coal Resources and/or Coal Reserves attributable to Goedehoop North and South and are equivalent to the term "gross" used in the AIM Mining Guidance.

Table 21-4: Goedehoop North: Average Raw Coal Qualities (adb) (Outside the Mine Plan)

Block	Resource Classification Category	Seam	Ash (%)	CV[1] (MJ/kg)	FC (%)	IM (%)	TS (%)	VM (%)	DAFV (%)
North of the Ogies Dyke									
Simunye + Brown 1+ Brown 2	Measured	No 4	28.3	21.80	47.3	2.6	1.29	21.7	31.6
	Indicated	No 4	23.7	23.80	51.4	2.8	1.40	22.1	30.1
	Average No 4 Seam	***No 4***	***27.4***	***22.19***	***48.19***	***2.6***	***1.31***	***21.8***	***31.3***
	Measured	No 2	27.9	22.27	48.9	2.4	1.18	20.7	30.1
	Average No 2 Seam	**No 2**	**27.9**	**22.27**	**48.9**	**2.4**	**1.18**	**20.7**	**30.1**
	Measured	No 1	27.8	22.82	47.5	2.1	1.14	22.6	32.9
	Average No 1 Seam	**No 1**	**27.7**	**22.82**	**47.5**	**2.1**	**1.14**	**22.6**	**32.9**
Average Simunye, Brown 1+2		**No 4, 2, 1**	**27.7**	**22.3**	**48.3**	**2.4**	**1.22**	**21.5**	**31.1**
Simunye	Measured	No 4	23.0	23.94	52.3	2.9	1.14	21.8	29.4
	Indicated	No 4	23.0	24.18	52.6	2.7	1.44	21.7	29.3
	Average No 4 Seam	***No 4***	**23.0**	**24.01**	**52.4**	**2.9**	**1.23**	**21.8**	**29.4**
	Measured	No 2	35.3	19.19	42.2	2.3	0.83	20.2	33.2
	Average No 2 Seam	**No 2**	**35.3**	**19.19**	**42.2**	**2.3**	**0.83**	**20.2**	**33.2**
	Measured	No 1	30.2	22.36	45.6	2.0	1.01	22.2	32.8
	Average No 1 Seam	**No 1**	**30.2**	**22.36**	**45.6**	**2.0**	**1.01**	**22.2**	**32.8**
Average Simunye		**No 4, 2, 1**	**29.6**	**21.72**	**46.8**	**2.4**	**1.02**	**21.3**	**31.7**
Average North of the Ogies Dyke		**No 4, 2, 1**	**28.4**	**22.12**	**47.7**	**2.4**	**1.14**	**21.4**	**31.4**
South of the Ogies Dyke									
South	Measured	No 4	28.3	21.83	47.4	2.7	1.30	21.5	31.6
Average South of the Ogies Dyke		**No 4**	**28.3**	**21.83**	**47.4**	**2.7**	**1.30**	**21.5**	**31.6**
Average		**No 4, 2, 1**	**28.4**	**22.00**	**47.6**	**2.5**	**1.20**	**21.5**	**31.4**

Note:
1. Weighted average qualities estimated on MTIS.
2. adb = air-dried basis.
3. CV[1] - Calorific Value, VM – Volatile Matter Content, FC - Fixed Carbon, TS - Total Sulphur, IM - Inherent Moisture, DAFV – Dry Ash Free Volatile Matter Content.
4. MRD = Mineral Residue Deposit (derived from the No 4 and No 2 Seam discard material).
5. The CV[1] for the MRD has been converted by SRK from kcal/kg to MJ/kg (kcal/kg * 0.004187 = MJ/kg)
6. Note that the MRD CV[1] and IM have not been considered in the average values.

21.4.2. Goedehoop South Coal Resource Estimates

The Goedehoop South Coal Resource on an MTIS air-dried basis amounts to 98.94 Mt. This estimate is made up of Measured, Indicated and Inferred Coal Resources, all of which are outside any Mine Plan.

Coal Resources contributing to the *in situ* estimate include 93.47 Mt of Measured Coal Resources (94.5%), 2.57 Mt of Indicated Coal Resources (2.6%) and 2.90 Mt of Inferred Coal Resources (2.9%). The average IM is 2.8%.

The Coal Resources for Goedehoop South on a total basis[22] (100% attributable to Goedehoop) at 31 December 2020 are summarised in Table 21-5the average raw coal qualities pertaining to the Coal Resources are shown in Table 21-6.

Provision has been made for a geological loss factor (discount). Losses may occur mainly as a result of

[22] Note that "total basis" refers to 100% of the Coal Resources and/or Coal Reserves attributable to Goedehoop North and South and are equivalent to the term "gross" used in the AIM Mining Guidance.

intersection of dolerite sills and dykes, faulting and other unforeseen geological losses. SRK believes the geological losses indicated in Table 21-5 are appropriate considering the dolerite intrusions prevalent in the area. The geological losses applied by the Company are similar to those applied by SRK.

Table 21-5: Goedehoop South: MTIS Coal Resource Statement at 31 December 2020 (Outside a Mine Plan)

Block	Resource Classification Category	Mining Method	Seam	Area (ha)	Thickness (m)	Raw ARD	Geological Loss (%)	MTIS (Mt)
GHS	Measured	UG+BP	No 5	277.25	1.66	1.47	15.0	5.77
	Inferred	UG+BP	No 5	90.16	1.76	1.52	20.0	1.90
	Subtotal No 5 Seam	***UG+BP***	***No 5***	***367.42***	***1.69***	***1.48***	***16.24***	***7.67***
	Measured	UG+BP	No 4	2 171.86	2.90	1.61	13.5	87.70
	Indicated	UG+BP	No 4	67.18	2.90	1.55	15.0	2.57
	Inferred	UG+BP	No 4	31.63	2.61	1.57	20.0	1.00
	Subtotal No 4 Seam	***UG+BP***	***No 4***	***2 270.67***	***2.90***	***1.61***	***13.6***	***91.27***
GRAND TOTAL		**UG+BP**	**No 5, 4**	**2 638.09**	**2.81**	**1.60**	**13.8**	**98.94**

Note:
1. Note that "total basis" refers to 100% of the Coal Resources and/or Coal Reserves within the Goedehoop Mining Rights and is not necessarily the percentage attributable to the holder of the Mining Rights.
2. Coal within Mining Right boundary.
3. UG + BP = Underground Bord and Pillar
4. OC = Opencast
5. GHS = Goedehoop South
6. Minimum No 5 Seam thickness cut-off of 1.5 m; minimum No 4 Seam thickness cut-off of 2.0 m (the same as the minimum mining height).
7. Maximum seam thickness cut-off of 4.5 m (both seams) (the same as the maximum mining height).
8. Ash < 50% cut-off applied.
9. DAFV > 24% cut-off applied.
10. ARD – Apparent Relative Density.
11. All seam thicknesses used are true thicknesses.

Table 21-6: Goedehoop South: Average Raw Coal Qualities (All Seams) (adb) (Outside a Mine Plan)

Block	Resource Classification Category	Seam	ASH (%)	CV[1] (MJ/kg)	FC (%)	IM (%)	TS (%)	VM (%)	DAFV (%)
GHS	Measured	No 5	18.1	26.59	49.9	2.8	2.08	29.3	36.7
	Indicated	No 5	-	-	-	-	-	-	-
	Inferred	No 5	21.7	25.20	48.9	2.7	2.27	26.7	35.4
	Average No 5 Seam	***No 5***	***19.0***	***26.25***	***49.6***	***2.7***	***2.1***	***28.6***	***36.4***
GHS	Measured	No 4	29.8	21.41	48.2	2.8	1.18	19.9	29.2
	Indicated	No 4	24.7	23.02	50.9	3.0	1.23	21.4	29.6
	Inferred	No 4	25.9	22.72	50.8	2.8	1.17	20.6	28.7
	Average No 4 Seam	***No 4***	***29.6***	***21.24***	***47.9***	***2.8***	***1.18***	***19.8***	***29.3***
AVERAGE		**No 5, 4**	**28.2**	**21.84**	**48.4**	**2.8**	**1.25**	**20.6**	**29.8**

Note:
1. Weighted average qualities estimated on MTIS.
2. adb = air-dried basis.
3. CV[1] - Calorific Value, VM – Volatile Matter Content, FC - Fixed Carbon, TS - Total Sulphur, IM - Inherent Moisture, DAFV – Dry Ash Free Volatile Matter Content.
4. GHS = Goedehoop South

21.4.3. Reconciliation with the Previous Resource Estimate

Goedehoop North

The differences between the SRK Coal Resource estimates and those of the Company amount to 39.68 Mt (approximately 25%) and are explained by the following:

- No 4 Seam:
  - SRK included opencast Coal Resources of 10.38 Mt based on a favourable stripping ratio of less than 6:1 bcm/t when considering all seams (No 4, No 2 and No 1 Seams); this coal was classified by the Company as "Low Potential";
  - SRK has included 15.01 Mt of Measured No 4 Seam "Low Potential" south of the Ogies Dyke; SRK is of the opinion that these could be economically extractable and have thus included them in the estimate;
  - SRK has included 8.28 Mt of No 4 Seam "Low Potential" (Measured, Indicated and Inferred) as the same category of Coal Resources; SRK is of the opinion that these could be economically extractable and have thus included them in the estimate;
  - SRK has excluded 1.94 Mt of Indicated "Additional" Coal Resources as there are insufficient appropriate PoOs to categorize this coal according to SANS 10320:2020. Note that as with the Company "Low Potential" category, "Additional" is not a recognised SAMREC category;
  - SRK has relaxed the minimum mining height cut-off from 2.0 m as applied by the Company to 1.5 m. The relaxation in the minimum mining height was guided by the SRK Mining Team, and allowed for the inclusion of an additional 0.6 Mt of No 4 Seam coal;
  - Mining that took place between December 2019 and December 2020; this is forecast to be 4.8 Mt; and
  - There is an overall difference of 0.54 Mt (0.3%) between the SRK Coal Resource Estimates and those of the Company, which is potentially explained by a minor difference in the way the geological losses are applied. SRK is of the opinion that this difference is not material.
- No 2 Seam:
  - SRK has included an additional 7.25 Mt of opencast Coal Resources not included by the Company. SRK is of the opinion that these Coal Resources could be economically extractable (based on favourable depths to the coal seam roof, as well as a favourable stripping ratio) and have thus included them in the estimate;
  - SRK has included an additional 1.36 Mt in the Brown 2 area and 1.94 Mt in the Simunye UG area by consistently applying the theoretical mining height of 4.5 m over the entire areas; SRK has excluded 1.1 Mt of Inferred Coal Resources as reported by the Company due to unfavourable coal qualities, as well as excluding 1.28 Mt of Indicated Coal Resources during the reclassification of Coal Resources from underground to opencast; and
  - Mining that took place between December 2019 and December 2020; this is forecast to be 0.48 Mt.
- No 1 Seam:
  - SRK has included an extra 1.78 Mt of Coal Resources not included by the Company. This was achieved by revising the categorization of the No 1 Seam Coal Resources as follows:
    - 6.97 Mt of opencast Coal Resources, categorized by the Company as underground Coal Resources;
    - The remaining underground Coal Resources (10.57 Mt) were subdivided into separate polygons (Figure 6-3) based on different mining horizons dictated by the thickness of the clastic parting:
      - Parting < 0.3 m – the S1UM mining horizon is defined as the uppermost coal sub-

seam (S1U) plus the P1M parting plus the middle coal sub-seam (S1M) with a thickness ≤ 4.5 m; and

- Parting > 0.3 m – the mining horizon is defined as either the S1U or the S1M, whichever is the thicker, with a minimum thickness of 1.5 m and a maximum mining height of 4.5.

- Goedehoop North MRD:
  - Production during 2020, which amounted to 3.6 Mt; and an update to the Goedehoop North MRD estimate by the Company (not validated by SRK), resulting in an updated estimate of 6.6 Mt (January 2021 – June 2023).

Comparison of the SRK and Company estimates on an approximate like-for-like basis reveals that the difference between the estimates is not material.

However, it is suggested that there is potential for revisiting the current Company rationale behind the Goedehoop North extraction plan and resultant resource classification. This will enable the additional 38.8 Mt derived from the potential OC area and south of the Ogies Dyke to be exploited.

Goedehoop South

The differences between the SRK Coal Resource estimates and those of the Company amount to 14.04 Mt (approximately 17%) and are explained by the following:

- No 5 Seam:
  - The Company categorized all No 5 Seam Coal Resources as "Low Potential" (a category not recognised by SAMREC); SRK is of the opinion that some these Coal Resources could be economically extractable and have thus included them in the estimate (7.67 Mt);
- No 4 Seam:
  - SRK has included 37.74 Mt of No 4 Seam "Low Potential"; again, SRK is of the opinion that these could be economically extractable and have thus included them in the estimate;

    Note that both the No 5 Seam tonnage and this tonnage is not included in the 84.90 Mt in the Company's estimate.
  - SRK has included 0.36 Mt of Indicated No 4 Seam "Low Potential" to Inferred Coal Resources; SRK is of the opinion that these could be economically extractable and have thus included them in the estimate;
  - SRK excluded 30.42 Mt contained in coal remnants in the northern part of Goedehoop South as SRK is of the opinion that these could not be economically extractable; Note that these Coal Resources are included in the Company's estimate. According to SANS 10320:2020 Clause 3.18, coal in remnants or pillars may not be included in public reporting until such time as an extraction and coal processing plan has been defined;
  - SRK further excluded 0.65 Mt based on the DAFV quality cut-off of 24%; and
  - SRK downgraded 0.06 Mt of Indicated Coal Resources to the Inferred category.

Comparison of the SRK and Company estimates on a like-for-like basis reveals that the difference between the estimates amounts to only 1.31 Mt; the difference is thus not material. However, it is suggested that there is potential for revisiting the current Company rationale behind the Goedehoop South extraction plan and resultant resource classification. This will enable the additional 14.04 Mt as per SRK's estimate to be exploited.

21.5. Rock Engineering

Goedehoop has comprehensive procedures in place for managing rock engineering risks. The roof conditions are generally fairly good. The TARP system is generally effective and hazardous conditions appear to be identified

and addressed. There are a few exceptions, but these are addressed through the systems.

The pillar design is reasonably conservative and the surveyed pillars and bord widths are reconciled each month to ensure compliance. Subsidence protection and undermining of surface structures appears to be well managed.

21.6. Mining

Goedehoop mines the remaining Coal Reserves through Simunye Shaft. The LoM plan aims to maintain the tonnage at a suitable level to maintain economic viability (impacted strongly by the high proportion of fixed costs). This is achieved by balancing the seams being mined to ensure that the best value options are exploited in combination with the mining method. At present, the strategy is to target the required 5.5 Mtpa RoM from the No 4 and No 2 Seams. The mining method can be optimised to reduce contamination in the No 4 Seam but remains an underground mining method subject to shallow mining procedures in certain areas.

The restricted availability of capital for expansion and the current constraints to economic viability are highly leveraged to the export price and exchange rate. The Mine Plan must therefore maintain throughput as much as possible and keep the working costs as low as possible. This is done through maximising productivity on the mining equipment and the use of super-sections to fully utilise the available equipment. The development into the Brown No 2 Seam Coal Reserves is a key aspect of the Mine Plan; this will ensure sufficient space for all mining sections to continue mining to a synchronised LoM end.

While there is limited flexibility in the current plan to respond to upturns in the export price, the identification of alternative Coal Resources for exploitation should be seen as a potential opportunity to extend the mine life. The mine must also carefully manage the LoM plan to ensure the vast extent of mined out areas does not become a drain on the mine costs of the current area and cause early termination of the plan.

The mine is managed within a portfolio of other mines and may be subject to certain costs that do not appear in the stand-alone valuation. The continued mining of the Coal Reserves, even at a slight loss, may be preferable to the alternative of the portfolio-based costs. This will have to be continually monitored to ensure any decision to stop mining is not made prematurely.

21.6.1. Ventilation and Cooling

Flammable gas (methane) and coal dust explosions are one of the principle hazards in underground coal mines. In order to prevent an accumulation of flammable gas, sufficient ventilation has to be provided in the last through roads to maintain air speeds above the critical velocity of 1.0 m/s. The ventilation quantity of 450 m^3/s provided by the main fans is more than sufficient to maintain air speeds above the minimum velocity. However, in May 2020, an assessment of the ventilation system identified the following inefficiencies:

- The No 4 Seam surface fans are operating at high pressure. This is an indication of excessive resistance within the workings. The up- and downcast shafts planned for the Brown 2 Seam should reduce the resistance. In the interim, a thorough assessment is to be conducted on these fans by a fan engineer;
- Ventilation leakage is excessive within the workings of this mine, partially due to the pressure of the surface fans. Total air utilisation is in the order of 52% (48% leakage);
- Although the mine only utilizes 52% of the available ventilation quantity, current air speeds in through roads at all the mining sections were above the minimum requirement of 1.0 m/s;
- Two priority areas of the mine have been identified for sealing to reduce the leakage; and
- The Life of Mine plans show the workings can be adequately ventilated.

21.7. Coal Reserve Estimates

The Coal Reserve estimate has been independently estimated by and signed off by Mr N McGeorge on behalf of SRK, based on the mining model supplied by the Company and verified by SRK. The Coal Reserve estimate is declared as at 31 December 2020. The Coal Reserves for Goedehoop on a total basis[23] (100% attributable to

[23] Note that "total basis" refers to 100% of the Coal Resources and/or Coal Reserves within the Goedehoop Mining Rights and is not necessarily the percentage attributable to the holder of the Mining Rights.

Goedehoop) at 31 December 2020 are summarised in Table 21-7.

Table 21-7: Goedehoop North: Coal Reserve Statement at 31 December 2020

Reserve Classification Category	RoM Coal Reserves			Saleable Coal Reserves (adc)			
	RoM_{ar} (Mt)	Total Moisture (%)	CV^1_{adc} (kcal/kg)	Sales (Mt)	Practical Yield (%)	Total Moisture (%)	CV^1_{adc} (kcal/kg)
Proved	20.0	5.7	4 990	10.8	59.9%	8	6 310
Probable	1.3	5.7	4 897	0.7	53.6%	8	6 310
Total	**21.3**	**5.7**	**4 990**	**11.5**	**59.4%**	**8**	**6 310**

Note:
1. Assumes coal supply until mid-2025.
2. RoM_{ar} = Run of Mine on an as received basis.
3. CV^1_{adc} = Calorific Value air-dried, contaminated.
4. Assumes positive valuation of Mine Plan.
5. There are no Inferred Resources in the Mine Plan.

The Coal Reserves are extracted from the mining schedule model and are from the Effective Date to the last period scheduled (2025). The Coal Reserves are derived from the No 4 Seam and No 2 Seam.

21.8. Coal Processing

Goedehoop North coal preparation plant is the only plant remaining in the complex since the beginning of 2020. It is an old plant, circa 1976, that was one of the original plants producing Low Ash Coal for the Japanese Steel Mill contract. It has changed substantially over the years and now produces a single product, AFS at 5 600 kcal/kg. The condition of the Run of Mine stockpile, wash plant and the load out station is excellent, considering its age. Quality is well controlled, and all systems are in place. However, the feed sampling and fines treatment is poor.

The plant does not currently operate on Sundays; if it did, it could probably run four shifts with the same number of people, resulting in more operating hours and therefore treating more coal. This would also impact positively on the weekday maintenance, incurring less overtime and possibly lower cost per tonne feed.

21.9. Coal Discard Disposal

The current operational Goedehoop coal discard infrastructure consists of the following:

- The Co-disposal Discard Facility consisting of coarse discard outer slopes that support an inner central slurry compartment;
- Penstock (original design) for decanting supernatant water from the slurry pool;
- New elevated penstock planned for operations from 2020 until the end LoM (2025);
- Both penstocks decant into dissipators, toe trenches and silt traps, with excess water overflowing into the Return Water Dam complex; and
- Bankfontein Dam - earth fill dam that caters for clean runoff from upstream of the processing plant.

Dormant and rehabilitated structures consist of the following:

- Bank 5 Discard Facility: and
- Schoongezicht Discard Facility.

The summary of risks identified by SRK during the inspection of the Discard Facility is provided:

- The Co-Disposal Discard Facility is an unlined facility (no HDPE liner) and can potentially attract significant financial requirements. Therefore, consideration should also be given to lining the proposed expansion of the Co-Disposal Discard Facility;
- The required 55 m crest width of the coarse discard outer slopes and keeping the slopes at the present slope angle, may result in a reduction of available volume for deposition in the central slurry

compartment. This must be modelled to confirm sufficient deposition space;

- There is a risk of depleting the airspace of the facility before the LoM period is reached. The revised LoM plan must be reviewed to confirm sufficient airspace for coarse and fine tailings deposition capacity is available, when considering the planned extension;
- There is a risk of slope failure which can interrupt deposition onto the facility and plant production. A programme should be formulated for ongoing recording of phreatic surface in piezometers. Additional regular slope stability analyses should be conducted using actual phreatic surface information recorded;
- Reduction in airspace will create a risk of depleting the airspace before the LoM period is reached, where future sales reduction or termination of re-mined coarse discards occur;
- Where coarse discard compaction fails to achieve the minimum target dry density of 1 600 kg/m^3, spontaneous combustion of discard may occur;
- Discard Facility toe trenches effectiveness reduced due to silt and debris build-up and vegetation growth. This may potentially affect the stability of the toe and slope and contribute a potential pollution plume development;
- Silt traps effectiveness reduced due to silting up and vegetation growth. All compartments require desilting and kept clean to ensure effectiveness of this structure and minimise suspended solids entering the return water dam complex;
- RWD design storage capacity potentially compromised due to ineffective silt trap operations. Excessive siltation of the return water dam complex could make this facility non-compliant with Regulation 704., potentially resulting in dirty water spillage under major storm events;
- Risk of future return water not meeting the process plant's requirements due to high suspended solids increases the silt trap complex is operated incorrectly;
- Fencing around structures to be maintained to reduce potential public liability risks from injury or drowning;
- As the CCS ratings of the Discard Facility, RWD and Bankfontein Dam classify as Major, dam break analyses need to be conducted; and
- The hydrogeological study associated with the Discard Facility footprint extension suggests the extension does not require lining. Until this alternative risk-based approach for the extension is approved in writing by DWS, the Stay in Business (**SIB**) capital projected for the unlined extension could be significantly underestimated.

21.10. Infrastructure and Engineering

Goedehoop's infrastructure is robust and adequate to provide for the LoM requirements. The agreed NMD is also sufficient to supply the power requirements of the mine. There is an opportunity for a reduction in forecast capital as determined by Goedehoop; however, operating costs can be highly influenced by year-on-year electricity tariff increases that are significantly above inflation. The documents reviewed and meetings held with Goedehoop personnel revealed that the electrical infrastructure is well looked after and well maintained.

21.11. Logistics

The logistics of coal from underground right through to the RLT is well designed; however, there is a potential delay in getting coal to the RLT due to the mineral sizer immediately out of the silo and the belts to the RoM stockpile not being able to clear the tonnage in the event all underground sections running.

21.12. Occupational Health and Safety

21.12.1. Occupational Health

The Company complies with the Occupational Hygiene and Medical Surveillance legal requirements.

Airborne Pollutants

Coal dust is the main airborne pollutant in Coal Mines and the cause of the Occupational Diseases, CWP and COAD.

The dust measurement results exceeding the OEL have increased from 10% in 2017 to 44% in 2020. In the same period, the diagnosed CWP cases decreased from 24 to one case and the COAD cases from four to zero.

Most of the dust measurement samples exceeding the OELs were measured at the CM areas. Although the number of diagnosed CWP cases have decreased from 2017 to 2019, the dust measurement samples exceeding the OELs have increased from 2017 to 2019. With Occupational diseases having long lagging periods before there are any symptoms of a disease, the diagnosed cases can fluctuate from year to year.

However, there is a downward trend in the number in the number of diagnosed cases. Compared to Gold mine dust, the Silica content in dust can be classified as a low health risk (no silicosis cases recorded).

Noise Induced Hearing Loss

The Company has a good NIHL Management Programme in place.

The one diagnosed NIHL cases in 2020 is an indication that the program for the prevention of NIHL is reducing the number of NIHL cases at the mine. However, with NIHL also having a long lagging period before there are any symptoms, the diagnosed cases fluctuate from year to year.

21.12.2. Safety

The Company has excellent risk management and risk control procedures in place which are actively followed by all levels of management. The systems and procedures are commendable, with prompt investigation of LTIs and necessary remedial actions being implemented;

- Falls of ground in the underground operations continue to be one of the major causes of fatalities at the Company (one fatality in 2018);
- The consistent improvement in LTIs from eight in 2016 to two in 2019 to two in 2020 and the decrease in the LTIFR from 1.90 in 2016 to a consolidate 0.42 in 2020 (per million man-hours) is a commendable achievement; and
- In the quest towards zero harm, the comprehensive safety improvement plans for 2020 should further reduce the number of injuries at the operations. This improvement plan can only be effective if the safety initiatives are consistently applied by all, from the management leadership teams, and supervisors down to employee level on the working faces. Zero LTIs in one year is achievable as proven by Greenside Colliery in 2015.

21.13. Environmental and Social Compliance

Goedehoop Colliery is generally well run from an environmental perspective. The colliery has an appointed Environmental Coordinator and it is currently implementing and EMS to ensure that it can meet its permit obligations and manage environmental aspects relevant to its operations. Based on discussions held with the Environmental Coordinator as well as information obtained from the review, it is evident that the Colliery has several ongoing issues pertaining to water management, which have been highlighted and discussed in detail in section 15.2.3.

GHN and GHS have several EAs, approved EMPRs and WULs for both operations. The mine is registered as a waste producer; however, they do not have a waste management licence in terms of the NEM:WA (Act No. 59 of 2008) as this is not required.

It is imperative that the mine demonstrates good environmental performance especially regarding compliance with its permit conditions and management of exceedances measured and recorded in the various monitoring programmes to avoid DMRE censure, directives and/or fines for non-compliance with permit commitments.

Two pre-directives were issued to the mine by environmental authorities in the past two years, but the cited issues have been addressed and closed out.

A Social and Labour Plan (**SLP**) was prepared as part of the requirements of the MPRDA. The SLP for the 2020

to 2024 period (AAC, 2020h) was submitted to the DMRE in September 2020.

Goedehoop submitted its Mining Charter scorecard report in March 2020 (AAC, 2019aa) for the 2019 reporting year, against the Mining Charter III requirements.

21.14. Sustainability

The sustainability review of Goedehoop Colliery considered external factors, internal factors and sustainability reporting practices. Systematic analysis of the available information indicated that external factors such as the macro-economic environment, the impact of climate change and sustainability reporting practices pose a moderate sustainability risk to the operation. Mitigation measures for sustainability reporting practices can be implemented through brining the necessary skillsets on board on a site level. Internal factors which pose a high sustainability risk include – power supply, theft and vandalism (manufactured capital) and social license to operate, and lack of planning for social matters during closure (social and relational capital). Lack of local employment opportunities and unmet local employment targets (human capital) as well as environmental non-conformances (natural capital) are considered to pose a moderate sustainability risk to the operations. These high and moderate risks could be mitigated through careful management plans and should not be left unattended.

21.15. Mine Closure and Liabilities

The closure liability has been assessed at ZAR586 million using the approach currently required by legislation and reported as the liability in December 2019. SRK understands that a provision of ZAR852 million has been made to the DMRE. SRK is of the opinion that Goedehoop has met its legal obligations around assessing and making provision for the liability. SRK is of the opinion that Goedehoop's assessment of liability based on commercial costs, which indicates a liability of ZAR606 million at end December 2019 (ZAR631 million at end December 2020), is likely a more accurate reflection of liability, as a more focussed approach has been used to determine this liability. This does not include a ZAR20-30 million inaccuracy that SRK believes is in the calculation which would increase liability to ZAR636 million at end December 2019 (ZAR662 at end December 2020) nor does it include any of the post-closure water treatment costs with there likely to be a 10.8 Ml/d decant within fifteen years after closure. There are potential risk items that could increase the closure liability, with these being post-closure water treatment and the requirement for complex engineered covers at closure. This could add ZAR688 to ZAR1 100 million to the liability. In addition there is a post-closure risk of subsidence requiring remediation, potential shallow groundwater impacts on aquifers associated with discard facilities and sediment accumulation in the Bankfontein Dam, that may also increase liability, however, until further investigations have been undertaken, a quantum cannot be attached to this risk. SRK is of the opinion that Goedehoop has met statutory requirements and has a robust understanding of what the liability is, with future work required to refine the estimate as the end of the LoM approaches.

SRK understands that the Company is currently undertaking updates to the closure cost estimates in order to reflect liability as at December 2020. Once the 2020 assessments are complete and have received the necessary internal approvals, these figures will be reported to the DMRE and changes to the closure provision will be made where necessary. SRK has not interrogated the 2020 figures and has instead escalated the 2019 figures to represent a liability at the end of December 2020.

21.16. Water Management

Surface Water Management

The specific surface water material risks are as follows:

- Failure to intercept seepage and prevent erosion at Bank 5 Discard Dump, resulting in an impact to the riparian habitat and in-stream habitat. Similar findings related to the Hope Dump and Springbok Dump occur;
- No collection of water containing waste was contained for the polluted water at Bank 5; and
- Discharge of dirty water directly to the environment.

Remedial work has been done in the last few months to implement controls to deal with the pollution from the Bank 5 Discard Dump. A phytoremediation project for Hope Dump will also commence by the end of November

2020.

The cost for the stormwater controls will be in excess of ZAR 500 million and includes the following:

- Dealing with the excess groundwater that will discharge/seep to the water sources; and
- Construction of stormwater controls.

There will be ongoing treatment costs; these are covered in the Mine Closure section above.

Groundwater Management

The specific groundwater material risks are as follows:

- Groundwater quality monitoring indicates that groundwater within the area has been impacted by mining, with elevated concentrations of sulphates;
- Generation of acid rock drainage from mine voids and discard dumps;
- The shallow weathered zone aquifer is extremely vulnerable to surface-induced activities and impacts. The active Bank 2 Discard Dump is impacting on the groundwater to the north of Goedehoop;
- Dewatering of existing pans and dams caused by damage to the integrity of underlying geological formations. The impacts of underground mining on larger pans will be minimal unless dyke intrusions underlie the pan and intersect the mine workings. Smaller pans that dry up seasonally may dry up permanently;
- Decant of contaminated water from underground workings into surface and/or groundwater resource. The model estimates that, approximately three years after closure, 4.5 Ml/d and 6.3 Ml/d of decant will be produced by the Goedehoop North and Goedehoop South operations, respectively; and
- Post-closure, the total mine storage capacity is expected be exceeded at the current recharge rates and bord-and-pillar mining strategy, by approximately 2036.

21.17. Material Contracts

The main material contracts are the TFR and RBCT contracts. These must be maintained by consistent production of the export product and utilisation of the infrastructure.

The on-mine consumer contracts of significant value are the power supply and the equipment maintenance contracts, both closely linked to the throughput volume of the mine. At present, these are all well managed, reducing any significant risks.

Goedehoop is owner-operated with use of contractors for non-core operations. The colliery is managed within a portfolio of other coal mines and obtains some services from a Central Services division such as training, medical etc. The main supply commodities are not at risk from single sourcing and are competitively priced and managed through central purchasing contracts. The largest risk item, excluding the rail logistics, is the security of electricity supply; however, these are well managed through the contract and the supplier relationship.

21.18. Material Asset Valuation

[SV1.15]

The summary valuation for Goedehoop at the Valuation Date (same as the Effective Date) is set out in Table 21-8. The values for Goedehoop Coal Reserves were derived on a 100% basis and reflect SRK's preferred value derived from the Income and Market valuation approaches. The effect of debt/loans and debt servicing was excluded in the compilation of the TEM used in the Income Approach valuation method, with the necessary adjustments reflected in Table 21-8.

The value for the Coal Resources outside the Mine Plan on a 100% basis is incorporated into the summary valuation.

The percentage of the values of the Coal Reserves and the Coal Resources outside the Mine Plan that is attributable to the Company is then applied in the summary valuation in Table 21-8.

Adjustments have been made in Table 21-8 for balance sheet items, which include cash on hand, medium- and long-term borrowings (debt) and finished product inventories. The Company confirmed to SRK that there are no hedge or derivative contracts in force.

Entries in Table 21-8 were derived in ZAR terms and converted to USD terms at the spot exchange rate of ZAR14.703 = USD1.00 ruling at the Valuation Date .

Table 21-8: Goedehoop Colliery Summary Valuation (at 31 December 2020)

Contract	Selected Value		Company's Interest (%)	Fair Value to the Company	
	ZARm	USDm		ZARm	USDm
Goedehoop Colliery					
Coal Reserves	1 308	89.0	100%	1 308	89.0
Coal Resources outside the Mine Plan	183	12.4	100%	183	12.4
Sub-total				**1 491**	**101.4**
Adjustments					
Cash on hand				0	0
Medium and long-term borrowings[1]				0	0
Finished product inventories[2]				18	1.2
Exploration budget costs				Included in cash flows	
Hedge contracts – mark to market				None in force	
Environmental liabilities				Included in cash flows	
Post closure water treatment [3]				(155)	(10.5)
Net Goedehoop Value				**1 354**	**92.1**

Note:
1 Medium- and long-term borrowings are intra-company amounts that will have no cash impact on Goedehoop.
2 Finished product inventories are valued by the Company at the lower of cost or net realisable value. The holding value of consumables and spares inventories has been excluded.
3 The NPV of the projected Capex and Opex cash flows for water treatment post closure.

SRK repeated the construction of Table 21-8 using the selected minimum and maximum values derived from the Income and Market valuation approaches (see Table 19-13) and the Coal Resources outside the Mine Plan (see Table 19-15).

SRK considers that the fair value for Goedehoop attributable to the Company at the Valuation Date after adjustment for balance sheet items and post-closure water treatment costs is and post-closure water treatment costs is ZAR1 354 million (USD92.1 million), in the range of ZAR988 million (USD67.2 million) to ZAR1 757 million (USD119.5 million).

The Goedehoop operation yields a positive NPV, although it is very sensitive to coal prices. SRK is satisfied that Coal Reserves can be declared for Goedehoop.

The trend towards decarbonisation is relatively recent and it remains unclear how this will impact on the value of the coal assets. SRK considers the valuation to be aligned with the SAMREC and SAMVAL Codes and to represent a reasonable interpretation of value and the associated risks. Current sentiment towards coal assets is not adequately reflected in the transactional analysis. The possible gap between the price that can be realised and the valuation is exacerbated by the recent increase in the coal price.

21.19. Material Change

[12.10(b)] [SR4.1(iv), SR4.3(viii), SR5.5(iii)] [SV1.13]

The Company has observed a pronounced COVID19--related impact on production at Goedehoop Colliery at the

start of 2021. The Company has put in place several mitigation measures to claw back some of the production losses during 2021. However, due to ongoing concerns and uncertainties around the future impact of COVID-19, SRK has reduced the RoM and saleable production forecasts in 2021 by 5%. SRK views the downward revision for the purposes of this CPR is an appropriate measure to address the current uncertainty.

Should there be further COVID-19 infection peaks and associated lockdowns with a delayed vaccination roll-out, a similar 5% impact on 2022 forecast volumes may become necessary.

SRK has not taken into consideration the potential further impact of TFR shutdowns and/or rail constraints on sales.

Based on the information provided by the Company, no material changes are expected in the Coal Resource and Reserve statements. Changes resulting from the COVID-19-related impacts are not expected to be material regarding the overall Resource and Reserve or the remaining LoM.

21.20. Risk and Opportunities

[12.10(h)(x)] [SR5.7(i)]

An iterative, integrated and collaborative risk assessment was carried out using inputs from each of the project disciplines. A total of 58 risks were evaluated across the disciplines, spanning from low to high residual risk ratings. Mitigation measures have been identified, as far as possible, and are considered essential in successfully managing the risk profile. A small number of risks are; however, external and limited control can be applied to these (the regulatory uncertainty around provisions for Closure, for example, as well as external factors such as the COVID-19 and the global macro-economic environment).

22. Date and Signature Page

[12.10(f)] [SR9.1(i)(ii)]

This CPR documents the Coal Resource and Coal Reserve statements on Goedehoop Colliery located in Mpumalanga Province of the Republic of South Africa, as requested by the Company, and is effective as at 31 December 2020. The Coal Resource and Coal Reserve Statements were prepared by SRK.

The Competent Persons (Table 22-1) take responsibility for these statements as required by the JSE Listing Rules in terms of the SAMREC Code (2016) and the LSE Listing Rules in terms of Clause 133 and Appendices I and II of the ESMA update of the CESR recommendations (2011).

The Competent Valuator has completed a valuation section in this report and takes responsibility for the valuation as required by the JSE Listing Rules in terms of the SAMVAL Code and LSE Listing Rules in terms of Paragraphs 131 to 133 and Appendices I and II of the ESMA update of the CESR recommendations (2011).

Table 22-1: List of CPs

Author	Role	Qualifications and Affiliations	Date Signed	Signature
Lesley Jeffrey	Principal Geologist CP (Coal Resources, Lead CP)	Pr.Sci.Nat, BSc (Geology), MSc (Mining), FGSSA	25/03/2021	SRK Consulting - Certified Electronic Signature srk consulting 566657/44278/Report 4553-3147-7224-JEFF-25/03/2021 This signature has been printed digitally. The Author has given permission for its use for this document. The details are stored in the SRK Signature Database
Norman McGeorge	Principal Mining Engineer CP (Coal Reserves)	PrEng, BSc (Mining), MSc (Mining), MSAIMM	25/03/2021	SRK Consulting - Certified Electronic Signature srk consulting 566657/44278/Report 4182-1638-6065-MCGN-25/03/2021 This signature has been printed digitally. The Author has given permission for its use for this document. The details are stored in the SRK Signature Database
Andrew McDonald	Principal Engineer CV[2] (Valuation)	CEng, MSc (Geophysics), MBL, MIoM[3], FSAIMM	25/03/2021	SRK Consulting - Certified Electronic Signature srk consulting 566657/44278/Report 9179-5196-3130-MCDA-25/03/2021 This signature has been printed digitally. The Author has given permission for its use for this document. The details are stored in the SRK Signature Database

Reviewed by:

SRK Consulting - Certified Electronic Signature
srk consulting
566657/44278/Report
5623-1134-7672-WERT-25/03/2021
This signature has been printed digitally. The Author has given permission for its use for this document. The details are stored in the SRK Signature Database

Marcin Wertz PrEng, BSc (Eng), FSAIMM, MMCC

Partner & Principal Mining Engineer

Report Date: 25 March 2021

Effective Date: 31 December 2020

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Appendices

Appendix 1: Data and Model Validation Results

Table A-1: Drill Hole Collar Co-ordinates and Collar Elevations

Drill Hole	Collar Co-ordinates (m)										Collar Elevation (mamsl)					End of Hole Depth (m)					Comments (Co-ordinates in LO29 Cape)
	Easting					Northing															
	Original Log	GDB Log	Difference (GDB - Original)	Model	Difference (Model - GDB)	Original Log	GDB Log	Difference (GDB - Original)	Model	Difference (Model - GDB)	Original Log	GDB Log	Difference (GDB - Original)	Model	Difference (Model - GDB)	Original Log	GDB Log	Difference (GDB - Original)	Model	Difference (Model - GDB)	
CBC0014	-49330.00	-49330.00	0.00	-49330.00	0.00	2876365.00	2876365.00	0.00	2876365.00	0.00	1614.00	1614.00	0.00	1614.00	0.00	64.76	64.76	0.00	64.76	0.00	Original name: CB 14/73
CBC0172	-43841.00	-43841.00	0.00	-43841.00	0.00	2875948.00	2875948.00	0.00	2875948.00	0.00	1629.14	1629.10	0.04	1629.10	0.00	130.43	130.43	0.00	130.43	0.00	Original name: CB 197
CBC0588	-44474.20	-44474.00	-0.20	-44474.00	0.00	2876511.79	2876512.00	-0.21	2876512.00	0.00	1634.75	1634.70	0.05	1634.70	0.00	103.33	103.33	0.00	103.33	0.00	Original name: 371; SRK converted imperial measurements to metric
CBC2198	-50388.00	-50388.00	0.00	-50388.00	0.00	2876582.00	2876582.00	0.00	2876582.00	0.00	1618.00	1618.00	0.00	1618.00	0.00	58.06	58.06	0.00	58.06	0.00	
CBC2573	-	-42372.00	-	-42372.00	0.00	-	2876210.00	-	2876210.00	0.00	-	1610.30	-	1610.30	0.00	-	89.68	-	89.68	0.00	No original log
CBC3067	-	-45771.00	-	-45771.00	0.00	-	2874725.00	-	2874725.00	0.00	-	1595.44	-	1595.44	0.00	-	104.60	-	104.60	0.00	No original log
CBC3713	-	-43752.00	-	-43752.00	0.00	-	2876225.00	-	2876225.00	0.00	-	1629.25	-	1629.25	0.00	-	95.80	-	95.80	0.00	No original log
CBC3723	-	-43419.00	-	-43419.00	0.00	-	2875723.00	-	2875723.00	0.00	-	1626.88	-	1626.88	0.00	-	113.79	-	113.79	0.00	No original log
CBC4065	-46377.00	-46377.00	0.00	-46377.00	0.00	2874689.00	2874689.00	0.00	2874689.00	0.00	1582.24	1582.24	0.00	1582.24	0.00	30.97	30.97	0.00	30.97	0.00	
CBC4093	-44219.00	-44219.00	0.00	-44219.00	0.00	2876085.00	2876085.00	0.00	2876085.00	0.00	1630.60	1630.60	0.00	1630.60	0.00	119.45	119.45	0.00	119.45	0.00	
CBC4212	-44065.00	-44065.00	0.00	-44065.00	0.00	2875780.00	2875780.00	0.00	2875780.00	0.00	1628.68	1628.68	0.00	1629.00	-0.32	81.96	81.96	0.00	81.96	0.00	
CBC4270	-43928.00	-43928.00	0.00	-43928.00	0.00	2877352.00	2877352.00	0.00	2877352.00	0.00	1636.36	1636.36	0.00	1636.36	0.00	95.55	95.55	0.00	95.55	0.00	
CBC4272	-44185.00	-44185.00	0.00	-44185.00	0.00	2877326.00	2877326.00	0.00	2877326.00	0.00	1637.71	1637.71	0.00	1637.71	0.00	95.30	95.30	0.00	95.30	0.00	
CBC4409	-46506.00	-46506.00	0.00	-46506.00	0.00	2876174.00	2876174.00	0.00	2876174.00	0.00	1590.44	1590.44	0.00	1590.44	0.00	47.26	47.26	0.00	47.26	0.00	
CBC4428	-46308.00	-46308.00	0.00	-46308.00	0.00	2875267.00	2875267.00	0.00	2875267.00	0.00	1581.35	1581.35	0.00	1581.35	0.00	32.56	32.56	0.00	32.56	0.00	
CBC4485	-46796.00	-46796.00	0.00	-46796.00	0.00	2875345.00	2875345.00	0.00	2875345.00	0.00	1575.83	1575.83	0.00	1575.83	0.00	35.67	35.67	0.00	35.67	0.00	
CBC4503	-48912.00	-48912.00	0.00	-48912.00	0.00	2875508.00	2875508.00	0.00	2875508.00	0.00	1603.97	1603.97	0.00	1603.97	0.00	65.76	65.76	0.00	65.76	0.00	
CBC4521	-47519.00	-47519.00	0.00	-47519.00	0.00	2876359.00	2876359.00	0.00	2876359.00	0.00	1573.31	1573.31	0.00	1573.31	0.00	29.81	29.81	0.00	29.81	0.00	
CBC4533	-49562.00	-49562.00	0.00	-49562.00	0.00	2875610.00	2875610.00	0.00	2875610.00	0.00	1594.50	1594.50	0.00	1594.50	0.00	29.83	29.83	0.00	29.83	0.00	
CBC4539	-	-49852.00	-	-49852.00	0.00	-	2876215.00	-	2876215.00	0.00	-	1608.70	-	1608.70	0.00	-	47.74	-	47.74	0.00	No original log
CBC4577	-50806.00	-50806.00	0.00	-50806.00	0.00	2876348.00	2876348.00	0.00	2876348.00	0.00	1605.54	1605.54	0.00	1605.54	0.00	40.11	40.11	0.00	40.11	0.00	
CBC4583	-	-49998.00	-	-49998.00	0.00	-	2876960.00	-	2876960.00	0.00	-	1626.62	-	1626.62	0.00	-	74.79	-	74.79	0.00	No original log
CBC4605	-49384.00	-49384.00	0.00	-49384.00	0.00	2875096.00	2875096.00	0.00	2875096.00	0.00	1586.84	1586.84	0.00	1586.84	0.00	29.84	29.84	0.00	29.84	0.00	
CBC4632	-49742.00	-49742.00	0.00	-49742.00	0.00	2875872.00	2875872.00	0.00	2875872.00	0.00	1597.44	1597.44	0.00	1597.44	0.00	32.25	32.25	0.00	32.25	0.00	
CBC4645	-50520.00	-50520.00	0.00	-50520.00	0.00	2876513.00	2876513.00	0.00	2876513.00	0.00	1615.83	1615.83	0.00	1615.83	0.00	53.73	53.73	0.00	53.73	0.00	
CBC4659	-49913.00	-49913.00	0.00	-49913.00	0.00	2877098.00	2877098.00	0.00	2877098.00	0.00	1629.24	1629.24	0.00	1629.24	0.00	80.68	80.68	0.00	80.68	0.00	
CBC4814	-43890.00	-43890.00	0.00	-43890.00	0.00	2876796.00	2876796.00	0.00	2876796.00	0.00	1631.50	1631.50	0.00	1631.50	0.00	77.40	77.40	0.00	77.40	0.00	
CBC4849	-	-43066.00	-	-43066.00	0.00	-	2876570.00	-	2876570.00	0.00	-	1617.10	-	1617.10	0.00	-	59.27	-	59.27	0.00	No original log
GHC0046	-	-47108.00	-	-47108.00	0.00	-	2889959.00	-	2889959.00	0.00	-	1650.00	-	1650.00	0.00	-	123.90	-	123.90	0.00	No original log
GHC0174	-45861.00	-45861.00	0.00	-45861.00	0.00	2891174.00	2891174.00	0.00	2891174.00	0.00	1622.12	1622.10	0.02	1622.10	0.00	121.82	121.82	0.00	121.82	0.00	Original name: G174/70
GHC0451	-	-43309.00	-	-43309.00	0.00	-	2890020.00	-	2890020.00	0.00	-	1616.40	-	1616.40	0.00	-	110.56	-	110.56	0.00	No original log
GHC0477	-	-39081.00	-	-39081.00	0.00	-	2891580.00	-	2891580.00	0.00	-	1602.80	-	1602.80	0.00	-	71.30	-	71.30	0.00	No original log
GHC0513	-	-47444.00	-	-47444.00	0.00	-	2891175.00	-	2891175.00	0.00	-	1628.80	-	1628.80	0.00	-	113.82	-	113.82	0.00	No original log
GHC0992	-	-46480.00	-	-46480.00	0.00	-	2888470.00	-	2888470.00	0.00	-	1642.02	-	1642.02	0.00	-	94.68	-	94.68	0.00	No original log
GHC2307	-	-37320.00	-	-37320.00	0.00	-	2886880.00	-	2886880.00	0.00	-	1588.40	-	1588.40	0.00	-	59.87	-	59.87	0.00	No original log
GHC3179	-38685.00	-38685.00	0.00	-38685.00	0.00	2884825.00	2884825.00	0.00	2884825.00	0.00	1621.15	1621.10	0.05	1621.10	0.00	52.14	52.14	0.00	52.14	0.00	Original name: KF179
GHC4240	-37915.19	-37915.00	-0.19	-37915.00	0.00	2882607.34	2882607.00	0.34	2882607.00	0.00	Unknown	1584.90	-	1584.90	0.00	57.91	57.91	0.00	57.91	0.00	Original name: 240; SRK converted imperial measurements to metric; collar 243.87 m below datum (not stated)
GHC4447	-38260.00	-38260.00	0.00	-38260.00	0.00	2881821.00	2881821.00	0.00	2881821.00	0.00	1581.90	1581.90	0.00	1581.90	0.00	58.75	58.75	0.00	58.75	0.00	
GHC4763	-	-37315.00	-	-37315.00	0.00	-	2884786.00	-	2884786.00	0.00	-	1614.36	-	1614.36	0.00	-	97.58	-	97.58	0.00	No original log
GHC6080	-	-37500.00	-	-37500.00	0.00	-	2885821.00	-	2885821.00	0.00	-	1599.87	-	1599.87	0.00	-	69.19	-	69.19	0.00	No original log
GHC6652	-38157.00	-38157.00	0.00	-38157.39	0.39	2884311.00	2884311.00	0.00	2884311.24	-0.24	1613.76	1613.76	0.00	1613.76	0.00	32.77	32.77	0.00	32.77	0.00	
GHC6710	-36723.00	-36723.00	0.00	-36723.00	0.00	2886173.00	2886173.00	0.00	2886173.00	0.00	1579.40	1579.40	0.00	1579.40	0.00	39.40	39.40	0.00	39.40	0.00	
GHC6837	-45437.00	-45437.00	0.00	-45437.00	0.00	2889986.00	2889986.00	0.00	2889986.00	0.00	1615.24	1615.24	0.00	1615.24	0.00	59.30	59.30	0.00	59.30	0.00	
GHC6874	-37993.00	-37993.00	0.00	-37993.00	0.00	2887326.00	2887326.00	0.00	2887326.00	0.00	1594.93	1594.93	0.00	1594.93	0.00	41.33	41.33	0.00	41.33	0.00	
GHC6902	-41386.00	-41386.00	0.00	-41386.00	0.00	2891512.00	2891512.00	0.00	2891512.00	0.00	1607.44	1607.44	0.00	1607.44	0.00	68.50	68.50	0.00	68.50	0.00	
GHC7128	-42551.00	-42551.00	0.00	-42551.00	0.00	2890944.00	2890944.00	0.00	2890944.00	0.00	1601.90	1601.90	0.00	1601.90	0.00	63.18	63.18	0.00	63.18	0.00	
GHC7222	-39439.00	-39439.00	0.00	-39439.00	0.00	2889920.00	2889920.00	0.00	2889920.00	0.00	1580.19	1580.19	0.00	1580.19	0.00	37.28	37.28	0.00	37.28	0.00	
GHC7392	-37977.00	-37977.00	0.00	-37977.00	0.00	2886098.00	2886098.00	0.00	2886098.00	0.00	1612.20	1612.20	0.00	1612.20	0.00	65.02	65.02	0.00	65.02	0.00	
Number	**48**	**48**	**48**	**48**	**48**	**48**	**48**	**48**	**48**	**48**	**48**	**48**	**48**	**48**	**48**	**48**	**48**	**48**	**48**	**48**	

Table A-2: No 2 Seam and Sample Depths (m)

Drill Hole	Seam From Depth (m)					Seam To Depth (m)					Sample Name	Sample From Depth (m)					Sample To Depth (m)					Sample Coal Recovery (%)		Partings		Comment
	Original Log	GDB Log	Difference	Model	Difference	Original Log	GDB Log	Difference	Model	Difference		Original Log	GDB Log	Difference	Model	Difference	Original Log	GDB Log	Difference	Model	Difference	Original Log	GDB	Included in Sample?	Parting (if excluded)	
CBC0014	52.77	52.77	0.00	52.77	0.00						0014I	52.77	52.77	0.00	52.77	0.00	53.80	53.80	0.00	53.80	0.00	Not recorded	100	No		
CBC0014											0014H	53.80	53.80	0.00	53.80	0.00	53.97	53.97	0.00	53.97	0.00	Not recorded	100	Yes	7	
CBC0014											0014G	53.97	53.97	0.00	53.97	0.00	55.55	55.55	0.00	55.55	0.00	Not recorded	100	No		
CBC0014											0014Z	55.55	55.55	0.00	55.55	0.00	56.58	56.58	0.00	56.58	0.00	Not recorded	100	Yes	2	
CBC0014						55.55	56.58	-1.03	57.59	-1.01	0014F	56.58	56.58	0.00	56.58	0.00	57.59	57.59	0.00	57.59	0.00	Not recorded	100	No		Probable SA1 correlated as S2 base;to be checked
CBC2198	51.20	51.20	0.00	51.20	0.00						2198C	51.20	51.20	0.00	51.20	0.00	52.95	52.95	0.00	52.95	0.00	Not recorded	Not recorded	No		
CBC2198						54.53	54.53	0.00	54.53	0.00	2198A	53.60	53.60	0.00	53.60	0.00	54.53	54.53	0.00	54.53	0.00	Not recorded	Not recorded	No		
CBC2198											2198B	52.95	52.95	0.00	52.95	0.00	53.60	53.60	0.00	53.60	0.00	Not recorded	Not recorded	No		
CBC2925	41.29	41.29	0.00	41.29	0.00	43.79	43.79	0.00	43.79	0.00	2925A	41.29	41.29	0.00	41.29	0.00	43.79	43.79	0.00	43.79	0.00	Not recorded	100	No		
CBC4503	52.82	52.82	0.00	52.82	0.00						4503H	52.82	52.82	0.00	52.82	0.00	54.22	54.22	0.00	54.22	0.00	Not recorded	100	No		
CBC4503											4503G	54.22	54.22	0.00	54.22	0.00	54.83	54.83	0.00	54.83	0.00	Not recorded	100	Yes		
CBC4503											4503F	54.83	54.83	0.00	54.83	0.00	55.58	55.58	0.00	55.58	0.00	Not recorded	100	No		
CBC4503											4503E	55.58	55.58	0.00	55.58	0.00	56.75	56.75	0.00	56.75	0.00	Not recorded	100	No		
CBC4503											4503D	56.75	56.75	0.00	56.75	0.00	58.07	58.07	0.00	58.07	0.00	Not recorded	100	No		
CBC4503						59.02	59.02	0.00	59.02	0.00	4503C	58.07	58.07	0.00	58.07	0.00	59.02	59.02	0.00	59.02	0.00	Not recorded	100	No		
CBC4533	22.98	22.98	0.00	22.98	0.00						4533D	22.98	22.98	0.00	22.98	0.00	23.70	23.70	0.00	23.70	0.00	Not recorded	100	No		
CBC4533											4533C	23.70	23.70	0.00	23.70	0.00	24.33	24.33	0.00	24.33	0.00	Not recorded	100	No		
CBC4533											4533B	24.33	24.33	0.00	24.33	0.00	26.72	26.72	0.00	26.72	0.00	Not recorded	100	No		
CBC4533						28.81	28.81	0.00	28.81	0.00	4533A	26.72	26.72	0.00	26.72	0.00	28.81	28.81	0.00	28.81	0.00	Not recorded	100	No		
CBC4539	37.49	37.49	0.00	37.49	0.00						4539C	37.49	37.49	0.00	37.49	0.00	39.67	39.67	0.00	39.67	0.00	Not recorded	100	No		
CBC4539											4539B	39.67	39.67	0.00	39.67	0.00	41.24	41.24	0.00	41.24	0.00	Not recorded	100	No		
CBC4539											Not sampled	41.24	41.24	0.00	41.24	0.00	41.36	41.36	0.00	41.36	0.00	-	-	-	-	No original log
CBC4539						42.44	42.44	0.00	42.44	0.00	4539A	41.36	41.36	0.00	41.36	0.00	42.44	42.44	0.00	42.44	0.00	Not recorded	100	No		
CBC4543	40.80	40.80	0.00	40.80	0.00						4543B	40.80	40.80	0.00	40.80	0.00	41.67	41.67	0.00	41.67	0.00	Not recorded	100	No		
CBC4543						43.00	43.00	0.00	43.00	0.00	4543A	41.67	41.67	0.00	41.67	0.00	43.00	43.00	0.00	43.00	0.00	Not recorded	100	No		
CBC4549	25.43	25.43	0.00	25.43	0.00						4549C	25.43	25.43	0.00	25.43	0.00	26.65	26.65	0.00	26.65	0.00	Not recorded	100	No		
CBC4549						27.45	27.45	0.00	27.45	0.00	4549B	26.65	26.65	0.00	26.65	0.00	27.45	27.45	0.00	27.45	0.00	Not recorded	100	No		
CBC4577	33.06	33.06	0.00	33.06	0.00						4577E	33.06	33.06	0.00	33.06	0.00	33.53	33.53	0.00	33.53	0.00	Not recorded	100	No		
CBC4577											4577D	33.53	33.53	0.00	33.53	0.00	34.20	34.20	0.00	34.20	0.00	Not recorded	100	No		
CBC4577											4577C	34.20	34.20	0.00	34.20	0.00	34.86	34.86	0.00	34.86	0.00	Not recorded	100	No		
CBC4577											4577B	34.86	34.86	0.00	34.86	0.00	36.64	36.64	0.00	36.64	0.00	Not recorded	100	No		
CBC4577						37.48	37.48	0.00	37.48	0.00	4577A	36.64	36.64	0.00	36.64	0.00	37.48	37.48	0.00	37.48	0.00	Not recorded	100	No		
CBC4583	-	66.00	-	66.00	0.00						4583E	-	66.00	-	66.00	0.00	-	67.39	-	67.39	0.00	-	100	No		
CBC4583											4583D	-	67.39	-	67.39	0.00	-	69.22	-	69.22	0.00	-	100	No		
CBC4583											4583C	-	69.22	-	69.22	0.00	-	69.59	-	69.59	0.00	-	100	No		No original log
CBC4583											4583B	-	69.59	-	69.59	0.00	-	71.97	-	71.97	0.00	-	100	No		
CBC4583						72.92	72.92	0.00	72.92	0.00	4583A	-	71.97	-	71.97	0.00	-	72.92	-	72.92	0.00	-	100	No		
CBC4605	19.82	19.82	0.00	19.82	0.00						4605E	19.82	19.82	0.00	19.82	0.00	20.61	20.61	0.00	20.61	0.00	Not recorded	100	No		
CBC4605											4605D	20.61	20.61	0.00	20.61	0.00	21.91	21.91	0.00	21.91	0.00	Not recorded	100	No		
CBC4605											Not sampled	21.91	21.91	0.00	21.91	0.00	22.04	22.04	0.00	22.04	0.00	-	-	No		
CBC4605											4605C	22.04	22.04	0.00	22.04	0.00	23.07	23.07	0.00	23.07	0.00	Not recorded	100	No		
CBC4605											4605B	23.07	23.07	0.00	23.07	0.00	25.00	25.00	0.00	25.00	0.00	Not recorded	100	No		
CBC4605											Not sampled	25.00	25.00	0.00	25.00	0.00	25.51	25.51	0.00	25.51	0.00	-	-	No		
CBC4605						25.99	25.99	0.00	25.99	0.00	4605A	25.51	25.51	0.00	25.51	0.00	25.99	25.99	0.00	25.99	0.00	Not recorded	100	No		
CBC4632	25.98	25.98	0.00	25.98	0.00						4632E	25.98	25.98	0.00	25.98	0.00	27.61	27.61	0.00	27.61	0.00	Not recorded	100	No		
CBC4632						31.90	31.90	0.00	31.90	0.00	4632A	31.23	31.23	0.00	31.23	0.00	31.90	31.90	0.00	31.90	0.00	Not recorded	100	No		
CBC4632											4632D	27.61	27.61	0.00	27.61	0.00	28.20	28.20	0.00	28.20	0.00	Not recorded	100	No		
CBC4632											4632C	28.20	28.20	0.00	28.20	0.00	29.84	29.84	0.00	29.84	0.00	Not recorded	100	No		
CBC4632											4632B	29.84	29.84	0.00	29.84	0.00	31.23	31.23	0.00	31.23	0.00	Not recorded	100	No		
CBC4645	45.87	45.87	0.00	45.87	0.00						4645E	45.87	45.87	0.00	45.87	0.00	46.56	46.56	0.00	46.56	0.00	Not recorded	100	No		
CBC4645											4645D	46.56	46.56	0.00	46.56	0.00	47.24	47.24	0.00	47.24	0.00	Not recorded	100	No		
CBC4645											4645C	47.24	47.24	0.00	47.24	0.00	47.68	47.68	0.00	47.68	0.00	Not recorded	100	No		
CBC4645											4645B	47.68	47.68	0.00	47.68	0.00	48.57	48.57	0.00	48.57	0.00	Not recorded	100	No		
CBC4645						50.71	50.71	0.00	50.71	0.00	4645A	48.57	48.57	0.00	48.57	0.00	50.71	50.71	0.00	50.71	0.00	Not recorded	100	No		
CBC4647	51.11	51.11	0.00	51.11	0.00						4647E	51.11	51.11	0.00	51.11	0.00	51.90	51.90	0.00	51.90	0.00	Not recorded	100	No		
CBC4647											4647D	51.90	51.90	0.00	51.90	0.00	52.81	52.81	0.00	52.81	0.00	Not recorded	100	No		
CBC4647											4647C	52.81	52.81	0.00	52.81	0.00	53.64	53.64	0.00	53.64	0.00	Not recorded	100	No		
CBC4647											4647B	53.64	53.64	0.00	53.64	0.00	54.28	54.28	0.00	54.28	0.00	Not recorded	100	No		
CBC4647						55.44	55.44	0.00	55.44	0.00	4647A	54.28	54.28	0.00	54.28	0.00	55.44	55.44	0.00	55.44	0.00	Not recorded	100	No		

Drill Hole	Seam From Depth (m)					Seam To Depth (m)					Sample Name	Sample From Depth (m)					Sample To Depth (m)					Sample Coal Recovery (%)		Partings		Comment
	Original Log	GDB Log	Difference	Model	Difference	Original Log	GDB Log	Difference	Model	Difference		Original Log	GDB Log	Difference	Model	Difference	Original Log	GDB Log	Difference	Model	Difference	Original Log	GDB	Included in Sample?	Parting (if excluded)	
CBC4658	72.98	72.98	0.00	72.98	0.00						4658C	72.98	72.98	0.00	72.98	0.00	74.29	74.29	0.00	74.29	0.00	Not recorded	100	No		
CBC4658											4658B	74.29	74.29	0.00	74.29	0.00	75.73	75.73	0.00	75.73	0.00	Not recorded	100	No		
CBC4658						77.36	77.36	0.00	77.36	0.00	4658A	75.73	75.73	0.00	75.73	0.00	77.36	77.36	0.00	77.36	0.00	Not recorded	100	No		
CBC4659	72.16	72.16	0.00	72.16	0.00						4659E	72.16	72.16	0.00	72.16	0.00	72.85	72.85	0.00	72.85	0.00	Not recorded	100	No		
CBC4659											4659D	72.85	72.85	0.00	72.85	0.00	74.02	74.02	0.00	74.02	0.00	Not recorded	100	No		
CBC4659											4659C	74.02	74.02	0.00	74.02	0.00	75.63	75.63	0.00	75.63	0.00	Not recorded	100	No		
CBC4659											4659B	75.63	75.63	0.00	75.63	0.00	76.72	76.72	0.00	76.72	0.00	Not recorded	100	Yes		
CBC4659						78.06	78.06	0.00	78.06	0.00	4659A	76.72	76.72	0.00	76.72	0.00	78.06	78.06	0.00	78.06	0.00	Not recorded	100	No		
Number	**16**	**16**	**16**	**16**	**16**	**16**	**16**	**16**	**16**	**16**	**67**	**67**	**67**	**67**	**67**	**67**	**67**	**67**	**67**	**67**	**67**	**67**	**67**	**67**	**3**	

Table A-3: No 2 Seam Calorific Value (MJ/kg) per Sample

Drill Hole	Sample Name	CV (MJ/kg)					Comment
		Original Log	GDB Log	Difference	Model	Difference	
CBC0014	0014Z	-	2.98	-	2.98	0.00	
CBC0014	0014I	22.35	22.35	0.00	22.35	0.00	
CBC0014	0014H	-	8.12	-	8.12	0.00	Analysis data not recorded in the original log; default value used (parting code 2) for sample Z
CBC0014	0014G	23.96	23.96	0.00	23.96	0.00	
CBC0014	0014F	-	20.4	-	20.40	0.00	
CBC2198	2198C	25.36	25.36	0.00	25.36	0.00	
CBC2198	2198B	17.67	17.67	0.00	17.67	0.00	
CBC2198	2198A	23.45	23.45	0.00	23.45	0.00	
CBC2925	2925A	-	23.47	-	23.47	0.00	Analysis data not recorded in the original log
CBC4503	4503H	-	27.73	-	27.73	0.00	
CBC4503	4503G	-	4.83	-	4.83	0.00	
CBC4503	4503F	-	27.41	-	27.41	0.00	Analysis data not recorded in the original log
CBC4503	4503E	-	28.24	-	28.24	0.00	
CBC4503	4503D	-	20.52	-	20.52	0.00	
CBC4503	4503C	-	24.24	-	24.24	0.00	
CBC4533	4533D	-	25.02	-	25.02	0.00	
CBC4533	4533C	-	5.34	-	5.34	0.00	Analysis data not recorded in the original log
CBC4533	4533B	-	23.51	-	23.51	0.00	
CBC4533	4533A	-	23.89	-	23.89	0.00	
CBC4539	4539C	-	28.57	-	28.57	0.00	
CBC4539	4539B	-	25.01	-	25.01	0.00	No original log
CBC4539	4539A	-	21.42	-	21.42	0.00	
CBC4543	4543B	-	25.72	-	25.72	0.00	Analysis data not recorded in the original log
CBC4543	4543A	-	24.89	-	24.89	0.00	
CBC4549	4549C	-	27.06	-	27.06	0.00	Analysis data not recorded in the original log
CBC4549	4549B	-	22.77	-	22.77	0.00	
CBC4577	4577E	-	16.92	-	16.92	0.00	
CBC4577	4577D	-	28.91	-	28.91	0.00	
CBC4577	4577C	-	29.03	-	29.03	0.00	Analysis data not recorded in the original log
CBC4577	4577B	-	23.86	-	23.86	0.00	
CBC4577	4577A	-	24.1	-	24.10	0.00	
CBC4583	4583E	-	29.3	-	29.30	0.00	
CBC4583	4583D	-	26.24	-	26.24	0.00	
CBC4583	4583C	-	14.75	-	14.75	0.00	No original log
CBC4583	4583B	-	16.45	-	16.45	0.00	
CBC4583	4583A	-	12.74	-	12.74	0.00	
CBC4605	4605E	-	24.83	-	24.83	0.00	
CBC4605	4605D	-	21.58	-	21.58	0.00	
CBC4605	4605C	-	25.24	-	25.24	0.00	Analysis data not recorded in the original log
CBC4605	4605B	-	25.33	-	25.33	0.00	
CBC4605	4605A	-	23.63	-	23.63	0.00	
CBC4632	4632E	-	23.3	-	23.30	0.00	
CBC4632	4632D	-	25.58	-	25.58	0.00	
CBC4632	4632C	-	24.27	-	24.27	0.00	Analysis data not recorded in the original log
CBC4632	4632B	-	24.21	-	24.21	0.00	
CBC4632	4632A	-	17.56	-	17.56	0.00	
CBC4645	4645E	-	28.25	-	28.25	0.00	
CBC4645	4645D	-	28.72	-	28.72	0.00	
CBC4645	4645C	-	27.09	-	27.09	0.00	Analysis data not recorded in the original log
CBC4645	4645B	-	21.64	-	21.64	0.00	
CBC4645	4645A	-	24.2	-	24.20	0.00	
CBC4647	4647E	-	28.93	-	28.93	0.00	
CBC4647	4647D	-	27.43	-	27.43	0.00	
CBC4647	4647C	-	28.08	-	28.08	0.00	Analysis data not recorded in the original log
CBC4647	4647B	-	28.19	-	28.19	0.00	
CBC4647	4647A	-	19.22	-	19.22	0.00	
CBC4658	4658C	-	29.22	-	29.22	0.00	
CBC4658	4658B	-	29.68	-	29.68	0.00	Analysis data not recorded in the original log
CBC4658	4658A	-	26.07	-	26.07	0.00	

Drill Hole	Sample Name	CV (MJ/kg)					Comment
		Original Log	GDB Log	Difference	Model	Difference	
CBC4659	4659E	-	27.09	-	27.09	0.00	Analysis data not recorded in the original log
CBC4659	4659D	-	29.43	-	29.43	0.00	
CBC4659	4659C	-	28.89	-	28.89	0.00	
CBC4659	4659B	-	22.29	-	22.29	0.00	
CBC4659	4659A	-	16.38	-	16.38	0.00	
Number	**64**	**64**	**64**	**64**	**64**	**64**	

Table A-4: No 4 Seam and Sample Depths (m)

Drill Hole	Seam From Depth (m)					Seam To Depth (m)					Sample Name	Sample From Depth (m)					Sample To Depth (m)					Sample Coal Recovery (%)		Partings		Comment
	Original Log	GDB Log	Difference	Model	Difference	Original Log	GDB Log	Difference	Model	Difference		Original Log	GDB Log	Difference	Model	Difference	Original Log	GDB Log	Difference	Model	Difference	Original Log	GDB Log	Included in Sample?	Parting Code (if excluded)	
CBC0014	33.58	33.58	0.00	33.58	0.00						0014L	33.58	33.58	0.00	33.58	0.00	34.92	34.92	0.00	34.92	0.00	Not recorded	100	Yes	Code 4	
CBC0014						35.90	35.90	0.00	37.13	-1.23	0014K	34.92	34.92	0.00	34.92	0.00	35.9	35.90	0.00	35.90	0.00	Not recorded	100	No		
CBC0172	74.35	74.35	0.00	74.35	0.00	76.81	76.81	0.00	76.81	0.00	0172E	74.35	74.35	0.00	74.35	0.00	76.81	76.81	0.00	76.81	0.00	Not recorded	100	No		
CBC0173	57.43	57.43	0.00	57.43	0.00	59.92	59.92	0.00	59.92	0.00	0173E	57.43	57.43	0.00	57.43	0.00	59.92	59.92	0.00	59.92	0.00	100	100	No		
CBC0588	209.10	-	-	63.73	-	216.10	-	-	65.86	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		No sampling data in original log nor GDB; sampling and qualities excluded from model
CBC2198	29.90	29.90	0.00	29.90	0.00	33.15	33.15	0.00	33.15	0.00	2198D	29.90	29.90	0.00	29.90	0.00	33.15	33.15	0.00	33.15	0.00	Not recorded	Not recorded	No		
CBC2573	-	49.92	-	49.92	0.00	-	52.49	-	52.49	0.00	2573H	-	49.92	-	49.92	0.00	-	52.49	-	52.49	0.00	-	100	No		No original log
CBC2805	-	46.02	-	46.02	0.00	-	49.36	-	49.36	0.00	2805D	-	46.02	-	46.02	0.00	-	49.36	-	49.36	0.00	-	100	No		No original log
CBC3067	-	40.10	-	40.48	-0.38						3067G	-	40.10	-	40.10	0.00	-	40.48	-	40.48	0.00	-	100	No		No original log
CBC3067						-	42.48	-	42.48	0.00	3067F	-	40.48	-	40.48	0.00	-	42.48	-	42.48	0.00	-	100	No		
CBC3713	-	54.95	-	54.95	0.00	-	57.27	-	57.27	0.00	3713E	-	54.95	-	54.95	0.00	-	57.27	-	57.27	0.00	-	100	No		No original log
CBC3723	-	74.28	-	74.28	0.00	-	76.75	-	76.75	0.00	3723F	-	74.28	-	74.28	0.00	-	76.75	-	76.75	0.00	-	100	No		No original log
CBC4065	27.99	27.99	0.00	27.99	0.00	30.37	30.37	0.00	30.37	0.00	4065A	27.99	27.99	0.00	27.99	0.00	30.37	30.37	0.00	30.37	0.00	Not recorded	100	No		
CBC4093	71.62	71.62	0.00	71.62	0.00	73.84	73.84	0.00	73.84	0.00	4093E	71.62	71.62	0.00	71.62	0.00	73.84	73.84	0.00	73.84	0.00	Not recorded	100	No		
CBC4212	78.65	78.65	0.00	78.65	0.00	80.78	80.78	0.00	80.78	0.00	4212A	78.65	78.65	0.00	78.65	0.00	80.78	80.78	0.00	80.78	0.00	Not recorded	100	No		
CBC4270	91.32	91.32	0.00	91.32	0.00	93.79	93.79	0.00	93.79	0.00	4270A	91.32	91.32	0.00	-	-	93.79	93.79	0.00	-	-	Not recorded	Not recorded	No		Sampling and qualities excluded from model
CBC4272	89.48	89.48	0.00	89.48	0.00	91.76	91.76	0.00	91.76	0.00	4272A	89.48	89.48	0.00	89.48	0.00	91.76	91.76	0.00	91.76	0.00	Not recorded	100	No		
CBC4409	43.28	43.28	0.00	43.28	0.00	45.52	45.52	0.00	45.52	0.00	4409A	43.28	43.28	0.00	43.28	0.00	45.52	45.52	0.00	45.52	0.00	Not recorded	100	No		
CBC4428	27.92	27.92	0.00	27.92	0.00	30.12	30.12	0.00	30.12	0.00	4428A	27.92	27.92	0.00	27.92	0.00	30.12	30.12	0.00	30.12	0.00	Not recorded	100	No		
CBC4485	27.78	27.78	0.00	27.78	0.00	29.76	29.76	0.00	29.76	0.00	4485A	27.78	27.78	0.00	27.78	0.00	29.76	29.76	0.00	29.76	0.00	Not recorded	100	No		
CBC4503	30.03	30.03	0.00	30.03	0.00	32.54	32.54	0.00	33.54	-1.00	4503J	30.03	30.03	0.00	-	-	32.54	32.54	0.00	-	-	Not recorded	100	No		Sampling and qualities excluded from model
CBC4521	19.58	19.58	0.00	19.58	0.00	22.23	22.23	0.00	22.23	0.00	4521A	19.58	19.58	0.00	19.58	0.00	22.23	22.23	0.00	22.23	0.00	Not recorded	100	No		
CBC4533	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	No. 4 Seam not present
CBC4539	17.11	17.11	0.00	17.11	0.00	20.61	20.61	0.00	20.61	0.00	4539D	17.11	17.11	0.00	-	-	20.61	20.61	0.00	-	-	Not recorded	100	No		Sampling and qualities excluded from model
CBC4543	24.52	24.52	0.00	24.52	0.00	27.23	27.23	0.00	27.23	0.00	4543C	24.52	24.52	0.00	24.52	0.00	27.23	27.23	0.00	27.23	0.00	Not recorded	100	No		
CBC4549	6.68	6.68	0.00	6.68	0.00	8.32	8.32	0.00	8.32	0.00	4549D	6.68	6.68	0.00	6.68	0.00	8.32	8.32	0.00	8.32	0.00	Not recorded	100	No		
CBC4577	13.39	13.39	0.00	13.39	0.00	16.18	16.18	0.00	16.18	0.00	4577F	13.39	13.39	0.00	13.39	0.00	16.18	16.18	0.00	16.18	0.00	Not recorded	100	No		
CBC4583	-	45.68	-	45.68	0.00	-	48.55	-	48.55	0.00	4583F	-	45.68	-	45.68	0.00	-	48.55	-	48.55	0.00	-	100	No		No original log
CBC4605	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	No. 4 Seam not present
CBC4632	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	No. 4 Seam not present
CBC4645	24.77	24.77	0.00	24.77	0.00	28.31	28.31	0.00	28.31	0.00	4645F	24.77	24.77	0.00	24.77	0.00	28.31	28.31	0.00	28.31	0.00	Not recorded	100	No		
CBC4647	31.60	31.60	0.00	31.60	0.00	35.08	35.08	0.00	35.08	0.00	4647F	31.6	31.60	0.00	31.60	0.00	35.08	35.08	0.00	35.08	0.00	Not recorded	100	No		
CBC4658	51.20	51.20	0.00	51.20	0.00	54.91	54.91	0.00	54.91	0.00	4658D	51.2	51.20	0.00	51.20	0.00	54.91	54.91	0.00	54.91	0.00	Not recorded	100	No		
CBC4659	51.62	51.62	0.00	51.62	0.00	54.87	54.87	0.00	54.87	0.00	4659F	51.62	51.62	0.00	51.62	0.00	54.87	54.87	0.00	54.87	0.00	Not recorded	100	No		
CBC4814	68.37	68.37	0.00	68.37	0.00	70.86	70.86	0.00	70.86	0.00	4814A	68.37	68.37	0.00	68.37	0.00	70.86	70.86	0.00	70.86	0.00	Not recorded	100	No		
CBC4849	-	53.72	-	53.18	0.54	-	55.54	-	55.54	0.00	4849A	-	53.18	-	53.18	0.00	-	55.54	-	55.54	0.00	-	100	No		No original log
GHC0046	-	86.26	-	86.26	0.00						0046N	-	86.26	-	86.26	0.00	-	86.77	-	86.77	0.00	-	100	No		
GHC0046											0046M	-	86.77	-	86.77	0.00	-	86.79	-	86.79	0.00	-	100	No		
GHC0046											0046L	-	86.79	-	86.79	0.00	-	88.20	-	88.20	0.00	-	100	No		
GHC0046											0046K	-	88.20	-	88.20	0.00	-	88.33	-	88.33	0.00	-	100	No		No original log
GHC0046											0046J	-	88.33	-	88.33	0.00	-	88.73	-	88.73	0.00	-	100	No		
GHC0046											0046I	-	88.73	-	88.73	0.00	-	88.78	-	88.78	0.00	-	100	No		
GHC0046						-	89.46	-	89.46	0.00	0046H	-	88.78	-	88.78	0.00	-	89.46	-	89.46	0.00	-	100	No		
GHC0174	88.07	88.07	0.00	88.07	0.00						0174K	88.07	88.07	0.00	-	-	91.13	88.36	2.77	-	-	86	86	No		
GHC0174											0174J	-	88.36	-	-	-	-	88.38	-	-	-	86	86	No		Only one sample in the original log; sampling and qualities excluded from model
GHC0174						91.13	91.13	0.00	91.13	0.00	0174I	-	88.38	-	-	-	-	91.13	-	-	-	86	86	No		
GHC0451	-	68.03	-	68.03	0.00	-	70.40	-	70.40	0.00	0451E	-	68.03	-	68.03	0.00	-	70.40	-	70.40	0.00	-	100	No		No original log
GHC0477	-	40.70	-	40.70	0.00	-	43.65	-	43.65	0.00	0477E	-	40.70	-	40.70	0.00	-	43.65	-	43.65	0.00	-	100	No		No original log

Drill Hole	Seam From Depth (m)					Seam To Depth (m)					Sample Name	Sample From Depth (m)					Sample To Depth (m)					Sample Coal Recovery (%)		Partings		Comment
	Original Log	GDB Log	Difference	Model	Difference	Original Log	GDB Log	Difference	Model	Difference		Original Log	GDB Log	Difference	Model	Difference	Original Log	GDB Log	Difference	Model	Difference	Original Log	GDB Log	Included in Sample?	Parting Code (if excluded)	
GHC0513	-	81.55	-	81.55	0.00	-	83.59	-	83.59	0.00	0513E	-	81.55	-	81.55	0.00	-	83.59	-	83.59	0.00	-	100	No		No original log
GHC0992	-	68.21	-	68.21	0.00	-	70.94	-	70.94	0.00	0992E	-	68.21	-	68.21	0.00	-	70.94	-	70.94	0.00	-	100	No		No original log
GHC2307	-	28.00	-	28.00	0.00	-	30.90	-	30.90	0.00	2307E	-	28.00	-	28.00	0.00	-	30.90	-	30.90	0.00	-	100	No		No original log
GHC3179	28.86	28.86	0.00	28.86	0.00	31.74	31.74	0.00	31.74	0.00	3179A	28.86	28.86	0.00	28.86	0.00	31.74	31.74	0.00	31.74	0.00	Not recorded	100	No		
GHC4240	33.45	33.45	0.00	33.45	0.00	35.79	35.79	0.00	35.79	0.00	4240G	33.45	33.45	0.00	33.45	0.00	35.79	35.79	0.00	35.79	0.00	99	100	No		
GHC4447	34.20	34.20	0.00	34.20	0.00	36.77	36.77	0.00	36.77	0.00	4447F	34.20	34.20	0.00	34.20	0.00	36.77	36.77	0.00	34.20	2.57	Not recorded	100	No		
GHC4763	-	46.00	-	46.00	0.00	-	49.20	-	49.20	0.00	4763D	-	46.00	-	46.00	0.00	-	49.20	-	46.00	3.20	-	100	No		No original log
GHC6080	-	46.80	-	46.80	0.00	-	50.02	-	50.02	0.00	6080E	-	46.80	-	46.80	0.00	-	50.02	-	46.80	3.22	-	100	No		No original log
GHC6652	29.55	29.55	0.00	29.55	0.00	32.32	32.32	0.00	32.32	0.00	6652A	29.55	29.55	0.00	29.55	0.00	32.32	32.32	0.00	32.32	0.00	Not recorded	100	No		
GHC6710	29.54	29.54	0.00	29.54	0.00	32.76	32.76	0.00	32.76	0.00	6710A	29.54	29.54	0.00	29.54	0.00	32.76	32.76	0.00	32.76	0.00	Not recorded	100	No		
GHC6837	53.02	53.02	0.00	53.02	0.00	56.02	56.02	0.00	56.02	0.00	6837A	53.02	53.02	0.00	53.02	0.00	56.02	56.02	0.00	56.02	0.00	Not recorded	Not recorded	No		Analysis data not recorded in the original log and graphic log
GHC6874	32.75	32.75	0.00	32.75	0.00	35.55	35.55	0.00	35.55	0.00	6874A	32.75	32.75	0.00	32.75	0.00	35.55	35.55	0.00	35.55	0.00	Not recorded	100	No		
GHC6902	62.99	62.99	0.00	62.99	0.00	65.54	65.54	0.00	65.54	0.00	6902A	62.99	62.99	0.00	62.99	0.00	65.54	65.54	0.00	65.54	0.00	Not recorded	100	No		
GHC7128	58.22	58.22	0.00	58.22	0.00	60.82	60.82	0.00	60.82	0.00	7128A	58.22	58.22	0.00	58.22	0.00	60.82	60.82	0.00	60.82	0.00	Not recorded	100	No		
GHC7222	32.64	32.64	0.00	32.64	0.00	35.51	35.51	0.00	35.51	0.00	7222A	32.64	32.64	0.00	32.64	0.00	35.51	35.51	0.00	35.51	0.00	Not recorded	100	No		
GHC7392	39.20	39.20	0.00	39.20	0.00	42.24	42.24	0.00	42.24	0.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-		No sampling data in original log nor GDB; sampling and qualities excluded from model
Number	**54**	**54**	**54**	**54**	**54**	**54**	**54**	**54**	**54**	**54**	**64**	**64**	**64**	**64**	**64**	**64**	**64**	**64**	**64**	**64**	**64**	**64**	**64**	**64**	**4**	

Table A-5: No 4 Seam Calorific Value (MJ/kg) per Sample

Drill Hole	Sample Name	CV (MJ/kg)					Comment
		Original Log	GDB Log	Difference	Model	Difference	
CBC0014	0014L	24.35	24.35	0.00	24.35	0.00	
CBC0014	0014K	23.69	23.69	0.00	23.69	0.00	
CBC0172	0172E	25.85	25.96	-0.11	25.96	0.00	
CBC0173	0173E	23.08	23.08	0.00	23.08	0.00	
CBC0588	-	-	-	-	-	-	No sampling data in original log nor GDB; sampling and qualities excluded from model
CBC2198	2198D	21.44	21.44	0.00	21.44	0.00	
CBC2573	2573H	-	19.91	-	19.91	0.00	No original log
CBC2805	2805D	-	20.85	-	20.85	0.00	Analysis data not recorded in the original log
CBC3067	3067G	-	18.02	-	18.02	0.00	No original log
CBC3067	3067F	-	25.49	-	25.49	0.00	No original log
CBC3713	3713E	-	24.64	-	24.64	0.00	No original log
CBC3723	3723F	-	23.86	-	23.86	0.00	No original log
CBC4065	4065A	-	23.27	-	23.27	0.00	Analysis data not recorded in the original log
CBC4093	4093E	-	24.15	-	24.15	0.00	Analysis data not recorded in the original log
CBC4212	4212A	-	21.44	-	21.44	0.00	Analysis data not recorded in the original log
CBC4270	4270A	-	-	-	-	-	Qualities not recorded in original log nor GDB; sampling and qualities excluded from model
CBC4272	4272A	-	24.18	-	24.18	0.00	Analysis data not recorded in the original log
CBC4409	4409A	-	25.98	-	25.98	0.00	Analysis data not recorded in the original log
CBC4428	4428A	-	23.49	-	23.49	0.00	Analysis data not recorded in the original log
CBC4485	4485A	-	24.08	-	24.08	0.00	Analysis data not recorded in the original log
CBC4503	4503J	-	-	-	-	-	Qualities not recorded in original log nor GDB; sampling and qualities excluded from model
CBC4521	4521A	-	21.59	-	21.59	0.00	Analysis data not recorded in the original log
CBC4533	-	-	-	-	-	-	No. 4 Seam not present
CBC4539	4539D	-	20.76	-	20.76	0.00	Qualities not recorded in original log; sampling and qualities excluded from model
CBC4543	4543C	-	22.03	-	22.03	0.00	Analysis data not recorded in the original log
CBC4549	4549D	-	23.11	-	23.11	0.00	Analysis data not recorded in the original log
CBC4577	4577F	-	21.6	-	21.60	0.00	Analysis data not recorded in the original log
CBC4583	4583F	-	24.35	-	24.35	0.00	No original log
CBC4605	-	-	-	-	-	-	No. 4 Seam not present
CBC4632	-	-	-	-	-	-	No. 4 Seam not present
CBC4645	4645F	-	24.19	-	24.19	0.00	Analysis data not recorded in the original log
CBC4647	4647F	-	21	-	21.00	0.00	Analysis data not recorded in the original log
CBC4658	4658D	-	20.04	-	20.04	0.00	Analysis data not recorded in the original log
CBC4659	4659F	-	22.26	-	22.26	0.00	Analysis data not recorded in the original log
CBC4814	4814A	-	23.71	-	23.71	0.00	Analysis data not recorded in the original log
CBC4849	4849A	-	24.76	-	24.76	0.00	No original log
GHC0046	0046N	-	24.87	-	24.87	0.00	No original log
GHC0046	0046M	-	9.32	-	9.32	0.00	
GHC0046	0046L	-	24.87	-	24.87	0.00	
GHC0046	0046K	-	9.32	-	9.32	0.00	No original log
GHC0046	0046J	-	23.02	-	23.02	0.00	
GHC0046	0046I	-	8.12	-	8.12	0.00	
GHC0046	0046H	-	23.02	-	23.02	0.00	
GHC0174	0174K	10.39	10.39	0.00	-	-	
GHC0174	0174J	0.00	0.00	0.00	-	-	Only one sample in the original log; sampling and qualities excluded from model
GHC0174	0174I	10.39	10.39	0.00	-	-	
GHC0451	0451E	-	24.79	-	24.79	0.00	No original log
GHC0477	0477E	-	22.98	-	22.98	0.00	No original log
GHC0513	0513E	-	24.2	-	24.20	0.00	No original log
GHC0992	0992E	-	24.32	-	24.32	0.00	No original log
GHC2307	2307E	-	24.18	-	24.18	0.00	No original log
GHC3179	3179A	25.06	25.07	-0.01	25.07	0.00	
GHC4240	4240G	9.54	21.53	-11.99	21.53	0.00	
GHC4447	4447F	25.53	25.53	0.00	25.53	0.00	
GHC4763	4763D	-	24.32	-	24.32	0.00	No original log
GHC6080	6080E	-	25.54	-	25.54	0.00	No original log
GHC6652	6652A	-	24.31	-	24.31	0.00	Analysis data not recorded in the original log

Drill Hole	Sample Name	CV (MJ/kg)					Comment
		Original Log	GDB Log	Difference	Model	Difference	
GHC6710	6710A	-	24.98	-	24.98	0.00	Analysis data not recorded in the original log
GHC6837	6837A	-	-	-	23.26	-	Analysis data not recorded in the original log nor GDB
GHC6874	6874A	-	24.19	-	24.19	0.00	Analysis data not recorded in the original log
GHC6902	6902A	-	21.33	-	21.33	0.00	Analysis data not recorded in the original log
GHC7128	7128A	-	22.21	-	22.21	0.00	Analysis data not recorded in the original log
GHC7222	7222A	-	22.16	-	22.16	0.00	Analysis data not recorded in the original log
GHC7392	-	-	-	-	-	-	No sampling data in original log nor GDB; sampling and qualities excluded from model
Number	**64**	**64**	**64**	**64**	**64**	**64**	

Appendix 2: Risk Register and Assessment

Table B-1: Risk Register and Assessment

Item	Discipline	Contributor (Person)	Risk Description	Cause Description	Consequence Description	Probability	Consequence	Inherent Rating	Mitigation	Efficacy of Mitigation	Residual Risk Rating	Risk Type
1	Closure	James Lake	Closure liability underestimated	Post-closure water treatment and the requirement for complex engineered covers at closure	Additional amount of ZAR688 to ZAR1 100 million required for additional covers on the Goedehoop Discard Dump and water treatment for decant [Capital costs], Operational costs approximately R60 mill/per annum (pa), spanning +-30 years (starting approx. 2030 at GH N, 2035 at GH S)	Almost certain	High	Extreme	Undertake detailed closure planning and authority engagement to gain approval for closure actions. Develop passive treatment technology and demonstrate at scale or investigate alternate treatment technologies	Qualified	High	Robust
2	Closure	James Lake	Subsidence requires remediation [excludes unauthorised changes to underground workings e.g. vandalism; illegal mining]	Subsidence during closure and post-closure (GH N has older areas, small pillars on No 2 Seam; subsidence at GH S already occurred)	Additional costs incurred to mitigate surface impact of subsidence	Unlikely	Moderate	Medium	Update subsidence risk assessment and make provision for post-closure subsidence remediation	Qualified	Medium	Resilient
3	Closure	James Lake	Potential shallow groundwater impacts [negatively] on aquifers	Operational seepage from discard facilities impacting on aquifer and closure measures not effectively limiting seepage post-closure	Shallow ground water remediation required at closure, which has not been costed, potentially increasing costs	Almost certain	Moderate	High	Identify and implement appropriate closure measures to limit seepage post-closure	Qualified	Medium	Robust
4	Closure	James Lake	Quantum for additional potential liability items is uncertain	Studies not yet carried out	Insufficient funds available, difficulty sourcing funds needed, Closure certificate withheld	Possible	High	High	Conduct relevant studies	Qualified	Medium	Robust
5	Closure	James Lake	Increase in liability associated with the requirement to completely desilt Bankfontein Dam	Sediment accumulation in the dam, with current provision only to remove sediments in the headwaters. Current sediment load may not affect water quality while saturated, but if conditions change and water levels drops exposing currently submerged sediments, salt and acidity may be released	Post-closure water quality relinquishment criteria not achieved	Possible	Minor	Medium	Make provision for sediment removal from dam	Effective	Low	Robust
6	Coal Processing	Peter Hand	Insufficient coal into plant	Mine plan shows economic losses at current rate	Mine operates at narrow margins, may become uneconomic	Possible	High	High	More feed	Deficient	High	Resilient
7	Electrical Infrastructure	Ed Baldrey/ Kenneth Mahuma	Load curtailment disrupts power supply	Load curtailment imposed and required due to Eskom capacity constraints	Disruption to production	Almost certain	Moderate	High	Source additional alternate power supply [Operations have minimal alternate supply to maintain critical operations]	Qualified	Medium	Robust
8	Engineering Infrastructure	Alan Forsyth	Theft and/or vandalism of infrastructure	Breached security, and/or a breach of access	Restoration cost, OHSE consequences	Unlikely	High	High	Increased security is being implemented on perimeter and at higher risk areas such as cable yards, but risk of unauthorised access will not be eliminated	Qualified	Low	Temperate
9	Engineering Infrastructure	Alan Forsyth, Ed Baldrey	High SIB capital budget for 2021-2024	Application of maintenance management procedures ahead of reduced/ end of mining production	Reduced profitability	Likely	Moderate	High	Review and revise SIB considering revised production schedule	Effective	Low	Temperate
10	Engineering Infrastructure	Alan Forsyth, Ed Baldrey	Incidents and accidents occurring (excluding vehicle collisions)	Delayed implementation of upgraded safety standards	Infrastructure damage/ loss Injuries and/or fatalities	Unlikely	High	High	Maintain current procedures, policies, COPs and standards	Effective	Low	Temperate
11	Engineering Infrastructure	Alan Forsyth, Ed Baldrey	Reduced maintenance performance	Retirement of skilled, experienced artisans	Reduced plant, equipment and machine availability/ utilisation	Likely	Minor	Medium	*Advanced* training to be given to artisans Support from OEMs	Marginal	Low	Robust
12	Environmental	Ashleigh Maritz and Darryll Kilian	Legal implications and reputational damage due to non-compliance to several environmental conditions contained within environmental authorisations	Several conditions within the environmental authorisations cannot be complied with as they are difficult to measure, open ended and/or impractical.	The mine has received pre-directives from the authorities due to the non-conformance to specific conditions within the environmental authorisations.	Likely	Moderate	High	Amendment of environmental authorisations is currently in progress to address the non-compliances. Action plans have been put into place to address and close out practical non-compliances.	Effective	Low	Temperate
13	Geology	Katherine Black	Loss of resources due to structural disturbances such as faults and dolerite intrusions and floor rolls.	Intersecting unknown geological features	Loss of resources; decrease in mineable tonnes. Poor mining conditions, extraction delays and a decrease in coal quality. Overall increase in costs.	Likely	Minor	Medium	Increase drilling in those areas where geological confidence may be low. Use complimentary exploration tools such as in seam horizontal drilling.		Low	Robust
14	Geology	Katherine Black	Unforeseen changes in the seam stratigraphy resulting in the seam thinning, increased parting material, decreased qualities.	Unplanned changes in localised seam stratigraphy.	Decrease in resources, increase in dilution, reduction in coal quality and product.	Possible	Minor	Medium	Increase drill coverage with geophysical logging.	Marginal	Low	Robust
15	Geology	Katherine Black	Lost potential of additional coal measures not included in the current resource estimation	Not all coal measures included in the resource base for various reasons.	Under reporting of resources	Likely	High	Extreme	Detailed studies (including assessing alternative markets) may result in the increase in the reported resources.	Qualified	Medium	Temperate

Item	Discipline	Contributor (Person)	Risk Description	Cause Description	Consequence Description	Probability	Consequence	Inherent Rating	Mitigation	Efficacy of Mitigation	Residual Risk Rating	Risk Type
16	Hydrology and Hydrogeology	Peter Shepherd	Failure to intercept seepage and prevent erosion at Bank 5 Discard Dump, resulting in an impact to the riparian habitat and in-stream habitat. Similar findings related to the Hope Dump and Springbok Dump occur	Seepage and runoff from Bank 5/Hope/Springbok Dump	Water not able to be used by habitat and people (Cumulative impact will be severe for this area after closure)	Almost certain	Moderate	High	Capping of dump, shallow seepage drains and treatment (Passive or active)	Qualified	Medium	Robust
17	Hydrology and Hydrogeology	Peter Shepherd	Dirty water not contained from Bank 5 in a pollution control dam	Contaminated runoff from the Bank 5 enters the watercourse	Pollution of water resources	Almost certain	Moderate	High	Pollution control dams and dirty water drains, erosion protection and closure of dumps	Qualified	Medium	Robust
18	Hydrology and Hydrogeology	Peter Shepherd	Discharge of dirty water directly to the environment	Stormwater drains are not operating as should, runoff from plant enters the streams	Pollution of water resources; penalties [DWS, DHSWS]; reputational damage	Possible	Moderate	High	Clean drains of silt, reconstruct if not big enough	Effective	Low	Temperate
19	Hydrology and Hydrogeology	Benedict Mabenge	Water driven into active working areas	Water pressure in the overlying 5 Seam and underlying and 2 Seam workings	Financial, damage to equipment	Possible	Moderate	High	Groundwater level monitoring	Effective	Medium	Robust
20	Hydrology and Hydrogeology	Benedict Mabenge	Flooding in operational areas occurs	Dewatering system malfunctioning or dormant for extended periods	Financial, damage to equipment	Possible	Moderate	High	Maintenance of dewatering equipment	Effective	Medium	Robust
21	Hydrology and Hydrogeology	Benedict Mabenge	Post-mining decant of contaminated water occurs (as for Closure risks)	Cessation of active dewatering	Treatment and management [of decant] into perpetuity	Likely	High	Extreme	Post-closure, the mine water will need to be actively managed at a safe level to prevent decanting	Effective	Medium	Temperate
22	Mine planning	Andrew Treadwell / Ukwazi	Planned mining improvements not achieved	Unknown factors such as geological conditions, infrastructure and engineering issues	Negative profit generation	Possible	Moderate	High	Definite action plans for improvement to be developed	Qualified	Medium	Robust
23	OHS	Jacques van Eyssen	Vehicle collisions with pedestrians (some relation to 'Incidents and accidents')	Vehicles travelling in areas not intended for vehicles; Pedestrians travelling in vehicle roadways.	Injuries and/or fatalities	Rare	High	Medium	Continued Adherence to CoPs and SOPs, Proximity detection systems have been planned for implementation (c. 2021), comparison of technology best suited to mine conditions to be considered	Qualified	Low	Robust
24	OHS	Jacques van Eyssen	LTIs	Person struck by moving equipment	Injuries/fatality; possible DMRE Section 54 stoppages, disruption to production	Rare	Moderate	Medium	Continued Adherence to CoPs, SOPs	Qualified	Low	Robust
25	OHS	Jacques van Eyssen	Workers exposed to diesel fumes beyond OEL	Management of air quality deteriorates	Significant and/or extended exposure may lead to lung and/or bladder cancers, compensation claims	Unlikely	Moderate	Medium	Continued Adherence to CoPs and SOPs, continued sufficient ventilation, low emission engines	Effective	Low	Temperate
26	OHS	Jacques van Eyssen	Workers exposed to Coal dust beyond OEL	Management of air quality deteriorates	Significant and/or extended exposure may lead to CWP compensation claims	Rare	Moderate	Medium	Continued Adherence to CoPs and SOPs, which, inter alia, include water sprays, extraction fans	Effective	Low	Robust
27	OHS	Jacques van Eyssen	Significant or extended exposure to welding fumes	Welding in unventilated areas and/or failure to wear appropriate PPE	Significant and/or extended exposure may lead to Lung diseases, Kidney damage.	Rare	Moderate	Medium	Continued Adherence to CoPs and SOPs, which include, inter alia, extraction systems; ensure use of PPE	Effective	Low	Robust
28	OHS	Jacques van Eyssen	Prolonged exposure to loud noise during mining	Loud equipment	Significant and/or extended exposure may lead to Noise induced hearing loss.	Unlikely	Moderate	Medium	Continued Adherence to CoPs and SOPs; ensure use of PPE at all times, conduct hearing tests as necessary	Effective	Low	Temperate
29	Rock Engineering	William Joughin	Rockfalls occur	Geological structures, burnt coal, guttering, not identified during TARP inspections	Injuries and/or fatalities	Rare	High	Medium	Currently well managed (TARP). Ongoing oversight and on-the-job training	Effective	Medium	Resilient
30	Rock Engineering	William Joughin	Subsidence occurs during current mining	Insufficient precautions regarding pillar sizes and sinkholes in shallow areas	Legal, Corporate image, damage to surface infrastructure, such as roads, railways, powerlines and buildings; social re-settlement; powerline needs to be moved	Rare	Major	High	Currently well managed. Ongoing oversight and on-the-job training	Effective	Medium	Robust
31	Rock Engineering	William Joughin	Rockfalls occur	Geological structures, burnt coal, guttering, not identified during TARP inspections	Financial, damage to equipment	Unlikely	Insignificant	Low	Currently well managed. Ongoing oversight and on-the-job training. Ground conditions are identified using TARP	Effective	Low	Resilient
32	Social	Jessica Edwards and Vassie Maharaj	Potential loss of access to surface rights	Ineffective tracking of lease agreements and resolving pending land claims	Potential escalation in lease agreement cost, and loss of surface right access	Unlikely	Minor	Low	Track lease agreements and renew timeously. Track land claims and attend regular Joint Land Claims Working Committee meetings	Qualified	Low	Resilient
33	Social	Jessica Edwards and Vassie Maharaj	Loss of social license to operate	Perceived lack of community benefit and development from mine opportunities	Reputational damage, protest action and work stoppage, financial loss	Possible	Moderate	High	Implement current policies, management plans and social obligations. Manage stakeholder relations and expectations.	Qualified	Medium	Robust

Item	Discipline	Contributor (Person)	Risk Description	Cause Description	Consequence Description	Probability	Consequence	Inherent Rating	Mitigation	Efficacy of Mitigation	Residual Risk Rating	Risk Type
34	Social	Jessica Edwards and Vassie Maharaj	Social closure liabilities	Ineffective exit strategy for constructive obligations. Vandalism and theft occur due to inability to effectively secure the site	Reputational damage and ongoing dependency on the mine. Potential loss of assets and reduced ability to ensure post-closure rehabilitation of site	Possible	Minor	Medium	Track social obligations and implement social transitioning measures (e.g. exit strategies, attend Future Forum meetings)	Qualified	Low	Robust
35	Sustainability - External factors	Lisl Fair	Several external factors could influence the sustainability of Goedehoop colliery - COVID-19 and the global macro-economic environment, impact of climate change on coal production, a 'just transition for coal mining', social transitioning during closure and/or care and maintenance, social and labour legacy issues during mergers and acquisitions	Macro-political, environmental and economic factors outside the control of Goedehoop Colliery	National and global economic depression Reduced demand for coal Social and labour unrest Dire socio-economic circumstances in communities post mine closure	Almost certain	High	Extreme	Urgently develop a social transitioning plan to self-sustainability Investigate 'clean coal technologies' Contribute to economic diversification in host communities Proactively work on a post-closure livelihood plan for employees	Marginal	High	Robust
36	Sustainability - Public reporting	Lisl Fair	Onsite staff do not have the skills and the capacity to perform the tasks associated with public sustainability reporting	The Anglo America Group aggregates Anglo Coal's sustainability reporting practices into the reports of the larger group	Disconnect between public reporting, and governance standards and practices at Goedehoop	Likely	Minor	Medium	Identify necessary skillsets and equip personnel on a site level, for sustainability reporting practices Conduct periodic reporting reviews and/or updates to ensure governance standards and practices are reflected appropriately in public reports for Greenside, as in individual operation, within the larger group	Effective	Low	Robust
37	Coal Discard (GH North)	Colin Wessels	Run out of air space for fines slurry/discard deposition	Maintaining 55 m crest width for the outer coarse discard	Lack of discard deposition space, interruption in coal production	Possible	Moderate	High	Planned extension of current discard facility	Effective	Low	Temperate
38	Coal Discard (GH North)	Colin Wessels	Run out of air space for coarse discard deposition	Lower demand for re-mined coarse discard	Lack of coarse discard deposition space, interruption in coal production	Possible	Moderate	High	Planned extension of current discard facility	Effective	Low	Temperate
39	Coal Discard (GH North)	Colin Wessels	Elevated phreatic surface.	Fine slurry deposition method and pool management	Side slope instability	Possible	Minor	Medium	Design monitoring programme (piezo's are in place, but levels not recorded currently)	Effective	Low	Robust
40	Coal Discard (GH North)	Colin Wessels	Discard spontaneous combustion	Inadequate coarse discard compaction	Discard facility smouldering/fire	Possible	Minor	Medium	Continue monitoring discard compaction	Effective	Low	Robust
41	Coal Discard (GH North)	Colin Wessels	Silting of toe trenches, saturation of slope toes	Toe trenches not adequately maintained	Potential pollution plume development, reduced side slope stability	Possible	High	High	Conduct ongoing maintenance (clean trenches etc); enforce (**)	Effective	Low	Temperate
42	Coal Discard (GH North)	Colin Wessels	Silting up of silt traps	Silt traps not correctly operated	Silting of RWD, insufficient surge storage capacity for compliance with Reg. 704, dirty water spillage into environment and liability due to pollution.	Likely	Moderate	High	Regular de-silting of silt traps and correct operation thereafter	Effective	Medium	Robust
43	Coal Discard (GH North)	Colin Wessels	Silting up of silt traps	Silt traps not adequately maintained	Silting of RWD, reduced design volume, Coal Discard in return water turbidity not meeting Plant requirement	Possible	Moderate	High	Regular de-silting of silt traps and correct operation thereafter; Mine to ensure/enforce operator conducts these activities	Effective	Low	Temperate
44	Coal Discard (GH North)	Colin Wessels	Co-disposal extension may require a Class C liner by DWS as regulatory approval not granted to date.	Current geotech extension study has determined an unlined facility is planned. Unless this risk based approach provides a lining equal to or better than a Class C lining, DWS approval may not be granted.	Will attract significant SIB Capex, over and above the covers identified for Closure	Likely	Moderate	High	To present the unlined design and motivation thereof to DWS sooner than later.	Effective	Medium	Robust
45	Coal Discard (GH North)	Colin Wessels	Unauthorised access to RWD	RWD fencing ineffective	Injuries and/or fatalities to the public	Possible	High	High	Repair and maintain fence and signage on regular basis.	Effective	Medium	Robust
46	Coal Discard (GH South)	Noddy McGeorge	Mine closure process delayed	Commercial value of discard	Issue of Closure certificate delayed, potential additional costs (may or may not be offset against liability)	Possible	Moderate	High	Ensure compliance, as necessary to existing requirements until (if) Closure certificate issued	Qualified	Medium	Robust
47	Valuation	Andy McDonald & Vanessa Snyman	RoM Production targets are not met	Cash flow marginal, variety of external factors could worsen	Unit operating costs increase profitability decreases	Possible	High	High	Achieve RoM volumes achieve plant yields	Deficient	High	Resilient
48	Valuation	Andy McDonald & Vanessa Snyman	Operating costs are understated	Operating costs increase unexpectedly	Marginal mine becomes unprofitable	Possible	Moderate	High	Improve operational controls review costs cost cutting incentives	Marginal	High	Resilient
49	Valuation	Andy McDonald & Vanessa Snyman	Capital budgets are understated	Additional capital expenditure required, unfavourable exchange rates at time of spending	Marginal mine becomes unprofitable	Likely	Moderate	High	Delay capex revise capex strategy	Marginal	High	Resilient

Item	Discipline	Contributor (Person)	Risk Description	Cause Description	Consequence Description	Probability	Consequence	Inherent Rating	Mitigation	Efficacy of Mitigation	Residual Risk Rating	Risk Type
50	Valuation	Andy McDonald & Vanessa Snyman	Projected plant yields are not achieved	Insufficient feed from mine to plant; Plant and/or operational controls poor	Product available for sale decreases product mix does not match market demand revenue decrease	Possible	Moderate	High	Adjust Mine Plan to provide better coal (4 Seam cutting roof material, leading to contamination vs 2 Seam coal quality is in place) Improve plant controls	Marginal	High	Resilient
51	Valuation	Andy McDonald & Vanessa Snyman	Projected saleable product mix not achieved	Insufficient feed from mine to plant; Plant and/or operational controls poor	Revenue targets not achieved profitability decreases	Possible	Moderate	High	Adjust Mine Plan to provide better coal Improve plant controls	Marginal	High	Resilient
52	Valuation	Andy McDonald & Vanessa Snyman	Projected coal selling prices not achieved	External factors beyond control	Profitability decreases	Likely	High	Extreme	Adjust product CVs to maximise sales revenue	Marginal	High	Robust
53	Valuation	Noddy McGeorge	Unable to manage portfolio costs	Portfolio costs may affect individual mine, because forms part of the larger group	Mine becomes uneconomic, may lead to domino effect that the 'next' mine becomes uneconomic, potential reputational damage, force majeure declared --> affects prospect for sale	Possible	Moderate	High		No mitigation	High	Resilient
54	Ventilation	Jacques van Eyssen	Ignition of flammable gas (Methane)	Emissions from exposed Coal seams	Explosions, injuries/fatalities and production delays	Rare	High	Medium	Continue to Ensure air speeds above 1.0 m/s; Electronic Methane and air speed detectors. Shut-off of all equipment when a Ensure mined out areas are sealed timeously; gas release for Witbank coal field very low Continued adherence to flame-proofing standards and COPs	Effective	Low	Weak
55	Ventilation	Jacques van Eyssen	Ignition of Coal dust	Accumulation of Coal dust in underground areas.	Explosions, fires, injuries and/or fatalities, damage/destruction to equipment, disruption to production	Rare	High	Medium	Continued Adherence to CoPs and SOPs, which make use of stonedusting throughout the mine and Smoke/Carbon Monoxide detectors as a standard feature	Effective	Low	Weak
56	Ventilation	Jacques van Eyssen	Occurrence of underground fires	Spontaneous combustion, trackless vehicle fires. (It is noted that conveyor belt fires are rare – given the existing fire ***prevention*** systems).	Rapid accumulation of Carbon Monoxide, fatalities and production delays.	Rare	High	Medium	Adherence to Mandatory Fire Prevention Code of Practice (COP) and Smoke/CO detectors.	Effective	Low	Robust
57	Ventilation	Jacques van Eyssen	Ventilation seal leakage worsens	Failure to monitor ventilation and manage leakage	Reduced air speeds in the last through roads with resultant accumulations of flammable gas and explosions.	Unlikely	Moderate	Medium	Timeous sealing and air speed monitors, Continued Adherence to CoPs and SOPs	Effective	Low	Robust
58	Ventilation	Noddy McGeorge	Establishing the ventilation for Brown 2 Seam delayed	Delay of capital expenditure	Mining cannot commence until ventilation in place; Mine becomes uneconomic	Unlikely	Major	High	Assign necessary resources to complete the project [establish ventilation]	Effective	Low	Robust

Appendix 3: Certificates of Competent Persons and Competent Valuator

CERTIFICATE OF COMPETENT PERSON

As the co-author and co-signatory of the CPR entitled “Independent Competent Person’s Report on Goedehoop Colliery”, I hereby state:

1. My name is Lesley Sharon Jeffrey and I am a Principal Geologist with SRK Consulting (South Africa) (Pty) Ltd, with address SRK House, 265 Oxford Road, Illovo, Johannesburg 2196, South Africa.
2. I am a geologist and am registered as a Professional Natural Scientist (Pr.Sci.Nat) (Registration number: 400115/01) through the South African Council for Natural Scientific Professions, a Fellow of the Geological Society of South Africa (Membership number: 35715) and a Member of the Fossil Fuel Foundation of Africa (Membership number: 000451).
3. I have a BSc(Geology) from the University of Cape Town, South Africa in 1984 and an MSc (Mining Engineering) from the University of the Witwatersrand, South Africa in 2002.
4. I have worked as a geologist for over 35 years since graduation, all of which have been in coal specializing in exploration, geological modelling and resource estimation. I am a full-time employee of SRK Consulting (South Africa) (Pty) Ltd, with designation Principal Geologist.
5. I am a ‘Competent Person’ as defined in the SAMREC Code.
6. The information in this CPR that relates to exploration results and Coal Resources is based on information compiled by me.
7. Due to the travel restrictions imposed by the COVID-19 government controls, my age and existing health conditions, I was not able to visit the site. I, however, satisfied myself regarding the correctness of disclosure in this CPR via MS Teams™ meetings held on 19 June, 16 July and 24 July 2020 with Company representatives, verification of selected aspects against source documentation provided by the Company and questioning of the contributors to this CPR.
8. I am responsible for the reporting of the Coal Resources for Goedehoop Colliery as set out in this CPR.
9. I am not aware of any material fact or material change with respect to the subject matter of the CPR that is not reflected in the CPR, the omission of which would make the CPR misleading.
10. I declare that this CPR appropriately reflects my independent view.
11. I am independent of the Company.
12. I have read the SAMREC Code (2016) and confirm that the CPR has been prepared in accordance with guidelines of the SAMREC Code.
13. I do not have, nor do I expect to receive, a direct or indirect interest in Goedehoop or the Company.
14. At the effective date of the CPR, to the best of my knowledge, information and belief, the CPR contains all scientific and technical information that is required to be disclosed to make the CPR not misleading.

Dated at 25 March 2021 at Johannesburg, South Africa.

SRK Consulting - Certified Electronic Signature

srk consulting

566657/44278/Report

4553-3147-7224-JEFF-25/03/2021

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L Jeffrey Pr.Sci.Nat

CERTIFICATE OF COMPETENT PERSON

As the co-author and co-signatory of the CPR entitled “Independent Competent Person’s Report on Goedehoop Colliery”, I hereby state:

1. My name is Norman McGeorge and I am a Principal Mining Engineer with SRK Consulting (South Africa) (Pty) Ltd, with address SRK House, 265 Oxford Road, Illovo, Johannesburg 2196, South Africa.
2. I am a mining engineer and am registered as a professional engineer (PrEng) (Registration number: 20080141) with the Engineering Council of South Africa. I am a Member of the South African Institute of Mining and Metallurgy.
3. I have a BSc (Mining) from the University of the Witwatersrand, South Africa in 1986 and an MSc (Mining) from the University of the Witwatersrand, South Africa in 1990.
4. I have worked as a mining engineer for over 33 years since graduation. I am a full-time employee of SRK Consulting (South Africa) (Pty) Ltd, with the designation Principal Mining Engineer.
5. I am a ‘Competent Person’ as defined in the SAMREC Code.
6. The information in this CPR that relates to Coal Reserves is based on information compiled by me.
7. I conducted a site visit to Goedehoop Colliery on 23 June 2020.
8. I am responsible for the reporting of the Coal Reserves for Goedehoop Colliery as set out in this CPR.
9. I am not aware of any material fact or material change with respect to the subject matter of the CPR that is not reflected in the CPR, the omission of which would make the CPR misleading.
10. I declare that this CPR appropriately reflects my independent view.
15. I am independent of the Company.
11. I have read the SAMREC Code (2016) and confirm that the CPR has been prepared in accordance with guidelines of the SAMREC Code.
12. I directly hold 1 000 shares in Anglo American plc, which is an immaterial interest in Goedehoop or the Company (<0.01%). This shareholding has in no way influenced my objective and independent assessment of the Coal Reserves and the compilation of the CPR.
13. At the effective date of the CPR, to the best of my knowledge, information and belief, the CPR contains all scientific and technical information that is required to be disclosed to make the CPR not misleading.

Dated at 25 March 2021 at Johannesburg, South Africa.

N McGeorge PrEng

CERTIFICATE OF COMPETENT VALUATOR

As the co-author and co-signatory of the report entitled “Independent Competent Person’s Report on Goedehoop Colliery” in support of the proposed listing of the Company, I hereby state:

1. My name is Andrew McDonald and I am a Principal Engineer with SRK Consulting (South Africa) (Pty) Ltd, with address SRK House, 265 Oxford Road, Illovo, Johannesburg 2196, South Africa.
2. I am a graduate of the University of Witwatersrand with a BSc in Applied Mathematics in 1973. I obtained BSc(Hons) and MSc (cum laude) degrees in Geophysics from the University of Witwatersrand in 1974 and 1982 respectively. In 1987, I was awarded the MBL degree from the University of South Africa. I have practised my profession continuously since 1974. During the past 20 years, I have undertaken regulatory reporting for mining and exploration related projects for the major stock exchanges.
3. I am registered as a Chartered Engineer with the Engineering Council of the United Kingdom (Registration No 334987). I am a Fellow of the Southern African Institute of Mining and Metallurgy and a Member of the Institution of Materials, Minerals and Mining in the UK.
4. I have more than 10 years’ experience related to coal projects/operating mines within South Africa and Botswana. I work extensively in due diligence audits, valuation of mineral properties, regulatory reporting for stock exchanges and engineering studies.
5. I am a ‘Competent Valuator’ as defined in the SAMVAL Code.
6. I have reviewed the compilation of the CPR and confirmed that disclosure of techno-economic parameters in the CPR is consistent with those in the cash flow model for Goedehoop Colliery.
7. Due to the travel restrictions imposed by the COVID-19 government controls, I was not able to visit the site. I, however, satisfied myself regarding the correctness of disclosure in this CPR via verification of selected aspects against source documentation provided by the Company and questioning of the contributors to this CPR.
8. I am not aware of any material fact or material change with respect to the subject matter of the CPR that is not reflected in the CPR, the omission of which would make the CPR misleading.
9. I declare that this CPR appropriately reflects my independent view.
10. I am independent of the Company.
11. I have read the SAMREC Code (2016) and SAMVAL Code (2016) and confirm the CPR has been prepared in accordance with the guidelines of these Codes.
12. I do not have, nor do I expect to receive, any direct or indirect interest in the Goedehoop Colliery or the Company.
13. At the effective date of the CPR, to the best of my knowledge, information and belief, the CPR contains all scientific and technical information that is required to be disclosed to make the report not misleading.

Dated at 25 March 2021 at Johannesburg, South Africa.

SRK Consulting - Certified Electronic Signature
srk consulting
566657/4428/Report
9179-5196-31304/CDA-25/03/2021
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A McDonald CEng MIoM3 FSAIMM

Appendix 4: Compliance Checklist – JSE

Chapter 12 of JSE Listing Rules				Section in the CPR where this is located
Section				**Goedehoop**
12.9			In addition to the relevant Listings Requirements applicable to pre-listing statements/listings particulars/prospectuses (as per Section 6) or Category 1 circulars (as per Section 9), the following information must be included in such documents where they are required to be prepared by Mineral Companies, and by non-Mineral Companies in respect of substantial mineral assets (i) measured against the purchase or disposal consideration, as the case may be, of the asset in respect of a transaction and (ii) measured against the market capitalisation of the applicant issuer in respect of a new listing:	This report, Cover Page, Executive Summary, 1.3.1, 19
	(a)		a Competent Person's Report, complying with:	
		(i)	the SAMREC and SAMVAL Codes, (which, for purposes of this requirement, includes the guidelines in italics and Appendices and Tables of the SAMREC and SAMVAL Codes); and	
		(ii)	paragraph 12.10 of this section;	
	(b)		details of any direct or indirect beneficial interest, which each director (and his associates), Competent Person, Competent Valuator and, where applicable, related party (as defined in Section 10), has or, within two years of the date of the pre-listing statement, had:	1.6.3
		(i)	in any asset (including any right to explore for minerals):	
		(1)	of the applicant issuer;	
		(2)	which has been acquired or disposed of by, or leased to or by, the applicant issuer, including any interest in the consideration passing to or from the applicant issuer; and	
		(ii)	in the share capital of the applicant issuer;	
	(c)		financial information in terms of Section 8 of the Listing Requirements to the extent that the applicant issuer has a financial history;	2.6
	(d)		a statement by the directors regarding any legal proceedings that may have an influence on the rights to explore or mine, or an appropriate negative statement; and	1.6.2
	(e)		confirmation that the applicant issuer, or its group (including companies in which it has investments), is in possession of the necessary legal title or ownership rights to explore, mine or explore and mine the relevant minerals.	1.6.2, 3.3.3
Competent Person's Report				
12.10			A Competent Person's Report must comply with the SAMREC and SAMVAL Codes and must:	
	(a)		have an effective date (being the date at which the contents of the competent Person's Report are valid) less than six months prior to the date of publication of the pre-listing statement, listing particulars, prospectus or Category 1 circular;	Cover Page, Executive Summary, 1.4, 6.8, 19.1
	(b)		be updated prior to publication of the pre-listing statement, listing particulars, prospectus or Category 1 circular if further material data becomes available after the effective date;	Executive Summary, 1.4.1, 21.19
	(c)		if the Competent Person is not independent of the issuer, clearly disclose the nature of the relationship or interest;	1.6.3
	(d)		show the particular paragraph of this section, the SAMREC Code (including Table 1) and SAMVAL Code (including Appendices and Tables) complied with in the margin of Competent Person's Report;	This table, below section headings, Appendices
12.10	**(e)**		contain a paragraph stating that all requirements of this section, the SAMREC Code (including Table 1) and SAMVAL Code (including Appendices and Tables) have been complied with, or state that certain clauses in the SAMVAL code were not applicable and provide a list of such clauses; and include a statement detailing:	1.2.2, 1.6.2, 5, 5.1.3
		(i)	exploration expenditure incurred to date by the applicant issuer and by other parties, where available;	
		(ii)	planned exploration expenditure that has been committed, but not yet incurred, by the applicant issuer concerned; and	
		(iii)	planned exploration expenditure that has not been committed to by the applicant issuer, but which is expected to be incurred sometime in the future, in sufficient detail to fairly present future expectations;	
	(f)		contain a valuation section which must be completed and signed off by a Competent Valuator in terms of and in compliance with the SAMVAL Code (including Appendices and Tables);	Executive Summary, 19, 22
	(g)		be published in full on the applicant issuer's website;	In full in Circular
	(h)		be included in the relevant JSE document either in full (which includes incorporation by reference pursuant to paragraph 11.61) or as an executive summary. The executive summary must be approved by the JSE (after approval by the Readers Panel) at the same time as the Competent Person's Report is approved by the JSE and the Readers Panel. The executive summary should be a concise summary of the Competent Person's Report and must cover, at a minimum, where applicable:	Set out below
		(i)	purpose;	Executive Summary, 1.1, 1.2.1
		(ii)	project outline;	Executive Summary, 2, 2.1
		(iii)	location map indicating area of interest;	Executive Summary, 1.1.1, 2, 2.1, Figure 1.2
		(iv)	legal aspects and tenure, including any disputes, risks or impediments;	Executive Summary, 1.6.2, 3, 3.1, 3.3, 3.3.3, 3.4.3
		(v)	geological setting description;	Executive Summary, 4
		(vi)	exploration programme and budget;	5
		(vii)	brief description of individual key Modifying Factors;	7, 9, 9.2, 10
		(viii)	brief description of key environmental issues;	Executive Summary, 14, 15, 16, 16.1, 16.2
		(ix)	Mineral Resource and Mineral Reserve Statement;	6, 8, 9, 9.3, Table 9.2
		(x)	reference to risk paragraph in the full Competent Person's Report;	Executive Summary, 7.6, 9.6, 10.15, 12.3, 12.8, 15.2.5, 15.3.3,

Chapter 12 of JSE Listing Rules				Section in the CPR where this is located
Section				**Goedehoop**
				15.5.4, 16.1.7, 16.2.4, 18.8, 19.8, 20, 21.20
12.10	**(h)**	**(xi)**	statement by the Competent Person that the summary is a true reflection of the full Competent Person's Report; and	Not applicable
		(xii)	summary valuation table. Where the cash flow approach has been employed, the valuation summary must include the discount rate(s) applied to calculate the NPV(s) (net present value(s)) per share with reference to the specific paragraph in the Competent Person's Report. If inferred resources are used, show the summary valuation with and without inclusion of such inferred resources.	Executive Summary, 19, 19.7
Confirmation by Competent Person				
12.11			If an issuer prepares a circular containing resource and reserve information, the Competent Person must confirm to the JSE in writing that the circular contains no contradictions with the Competent Person's Report, prior to the JSE granting approval of the circular pursuant to the provisions of Section 16.	To be Completed
Announcements				
12.12			In addition to the other requirements under the Listings Requirements, announcements by Mineral Companies and by non-Mineral Companies in respect of substantial mineral assets must comply with the SAMREC Code insofar as they relate or refer to exploration results, Mineral Resources and Mineral Reserves and comply with the SAMVAL Code insofar as it relates to a valuation of mineral assets and announcements must state the name of the Competent Person/Competent Valuator and that the Competent Person/Competent Valuator:	Executive Summary, 1.6.3, 1.6.4
	(a)	**(i)**	has approved the information, in writing, in advance of publication; and	
		(ii)	if the Competent Person/Valuator is not independent of the issuer, clearly disclose the nature of the relationship or interest.	
12.12	**(b)**		The JSE reserves the right to request the detailed information supporting the announced information and submit the same for review by the Readers Panel, at the cost of the applicant issuer concerned, to assess compliance with the SAMREC and SAMVAL Codes. The approval mechanism in this instance is as per paragraph 12.4 above. Any non-compliance with the SAMREC and SAMVAL Codes may result in a restatement and consequent re-publication of the information concerned.	Not applicable

Appendix 5: Compliance Checklist – SAMVAL Code

	SAMVAL Code TABLE 1		Section in the CPR where this is located
Code	**Criteria**	**Comments**	**Goedehoop**
SV1.0	**General**	The Valuation Report shall contain: The signature of the CV; The CV's qualifications and experience in valuing mineral properties, or relevant valuation experience; A statement that all facts presented in the report are correct to the best of the CV's knowledge; A statement that the analyses and conclusions are limited only by the reported forecasts and conditions; A statement of the CV's present or prospective interest in the subject property or asset; A statement that the CV's compensation, employment, or contractual relationship with the Commissioning Entity is not contingent on any aspect of the Report; A statement that the CV has no bias with respect to the assets that are the subject of the Report, or to the parties involved with the assignment; A statement that the CV has (or has not) made a personal inspection of the property; and A record of the CP's and experts who have contributed to the valuation. Written consent to use and rely on such Reports shall be obtained. Significant contributions made by such experts shall be highlighted individually.	ES 32, 1.2.2, 1.3.2, 1.5, 1.6.3, 1.6.4, 1.8, Table 1.1
SV1.1	**Illustrations**	There are numerous instances (especially in the non-listed environment) when a valuation is not accompanied by the CPR on which it is based. In these cases, especially, diagrams/illustrations are required and shall be in the required format. Diagrams, maps, plans, sections, and illustrations shall be legible and prepared at an appropriate scale to distinguish important features. Maps shall be dated and include a legend, author or information source, coordinate system and datum, a scale in bar or grid form, and an arrow indicating north. A location or index map and more detailed maps showing all important features described in the text, including all relevant cadastral and other infrastructure features, shall be included.	Not applicable
SV1.2	**Synopsis**	Provide the salient features of the report – a brief description of the terms of reference, scope of work, the Valuation Date, the mineral property; its location, ownership, geology, and mineralization; history of exploration and production, current status, Exploration Targets, mineralization and/or production forecast, Mineral Resources and Mineral Reserves, production facilities (if any); environmental, social, legal, and permitting considerations; valuation approaches and methods, valuation, and conclusions.	Cover Page, Executive Summary, 1.1.1, 1.2, 1.2.1 1.4, 2.6.1, 3.4.3, 9, 15, 19, 21
SV1.3	**Introduction and Scope**	Introduction and scope, specifying commissioning instructions including reference to the valuation, engagement letter, date, purpose and intended use of the valuation. The CV shall fully disclose any interests in the Mineral Asset or Commissioning Entity. Any restrictions on scope and special instructions followed by the CV, and how these affect the reliability of the valuation, shall be disclosed.	ES1, 1.1, 1.2
SV1.4	**Compliance**	A statement that the report complies with SAMVAL shall be included. Any variations shall be described and discussed.	ES1, 1.1, 1.2.2, 19
SV1.5	**Identity, Tenure and Infrastructure**	The identity, tenure, associated infrastructure and locations of the property interests, rights or securities to be valued (*i.e.* the physical, legal, and economic characteristics of the property) shall be disclosed.	ES1, ES3, ES4, 1.1, 2.1, 3, 3.1, 3.3, 12
SV1.6	**History**	History of activities, results, and operations to date shall be included.	ES12, 2.5, 6.9, 9.4
SV1.7	**Geological Setting**	Geological setting, models, and mineralization shall be described.	ES5, 4, 19
SV1.8	**Exploration Results and Exploration Targets**	Exploration programmes, their location, results, interpretation, and significance shall be described. Exploration Targets shall be discussed.	ES6, 5, 5.1
SV1.9	**Mineral Resources and Mineral Reserves**	Mineral Resource and Mineral Reserve statements shall be provided. They shall be signed off by a Competent Person in compliance with the SAMREC Code or another CRIRSCO code. The CV shall set out the manner in which he has satisfied himself that he can rely upon the information in the CPR.	ES8, ES14, 6.8, 9, 9.3, 19
SV1.10	**Modifying Factors and Key Assumptions**	A statement of Modifying Factors shall be included, separately summarizing material issues relating to each applicable Modifying Factor. The CV shall set out the manner in which he has satisfied himself that he can rely upon the technical information provided. (**NOTE:** All the Modifying Factors shall be listed, or references provided to relevant definitions). This shall include an explanation of all material assumptions and limiting factors. When reporting on environmental, social and governance Modifying Factors, reference should be made to the ESG reporting parameters as required by the Southern African Minerals Environmental, Social and Governance Guideline (SAMESG) or other recognised code, e.g. Equator Principles.	ES11, ES13, ES32, 1.6.1, 9, 9.2, 19.1.2
SV1.11	**Previous Valuations**	The valuation shall refer to all available and relevant previous valuations of the Mineral Asset that have been performed in at least the previous two years, and explain any material differences between these and the present valuation.	ES27, 19, 19.6
SV1.12	**Valuation Approaches and Methods**	The valuation approaches and methods used in the valuation shall be described and justified in full.	ES26, ES28, 19, 19.1, 19.2, 19.3, 19.7

SV1.13	**Valuation Date**	A statement detailing the Report Date and the Valuation Date, as defined in this Code, and whether any material changes have occurred between the Valuation Date and the Report Date.	ES2, ES26, ES27, ES28, ES29, ES32, 1.4, 1.4.1, 19, 19.6, 19.7, 21.19
SV1.14	**Valuation Results**	For the Income Approach, the valuation cash flow shall be disclosed. For the Market Approach, the market comparable information shall be disclosed. For the Cost Approach, the relevant and applicable cost shall be disclosed.	ES24, ES26, ES28, 17,19, 19.2, 19.2.3, 19.7
SV1.15	**Valuation Summary and Conclusions**	A summary of the valuation details, consolidated into single material line items, shall be provided. The Mineral Asset Valuation shall specify the key risks and forecasts used in the valuation. A cautionary statement concerning all forward-looking or forecast statements shall be included. The valuation's conclusions, illustrating a range of values, the best estimate value for each valuation, and whether the conclusions are qualified or subject to any restrictions imposed on the CV, shall be included.	ES26, ES28, 1.6.5, 19, 19.7, 19.9, 21.18
SV1.16	**Identifiable Component Asset (ICA) Values**	In some valuations, the valuation shall be broken down into Identifiable Component Asset Values (an ICA valuation) equaling the Mineral Asset Value. This could be, for example, due to the requirements of other valuation rules and legislative practices including taxation (*i.e.* fixed property, plant, and equipment relative to Mineral Asset Value allocations such as in recoupment or capital gains tax calculations or where a commissioned Mineral Asset Valuation specifies a need for a breakdown of the Mineral Asset Valuation). In such cases, the separate allocations of value shall be made by taking account of the value of every separately identifiable component asset. Allocation of value to only some, and not all, identifiable component assets is not allowed. This requires a specialist appraisal of each identifiable component asset of property, plant and equipment, with the 'remaining' value of the Mineral Asset being attributed to the Mineral Resources and Reserves. Such valuations shall be performed by suitably qualified experts, who may include the CV. If the Mineral Asset Valuation includes an ICA Valuation, the CV shall satisfy himself or herself that the ICA Valuation is reasonable before signing off the Mineral Asset Valuation.	Not applicable
SV1.17	**Historic Verification**	A historic verification of the performance parameters on which the Mineral Asset Valuation is based shall be presented.	19
SV1.18	**Market Assessment**	A comprehensive market assessment should be presented.	19, 19.1, 19.3
SV1.19	**Sources of Information**	The sources of all material information and data used in the report shall be disclosed, as well as references to any published or unpublished technical papers used in the valuation, subject to confidentiality. A reference shall be made to any other report that has been compiled, for the purpose of providing information for the valuation, including SAMREC-compliant reports and any other contributions or reports from experts.	1.2.3, 19

Appendix 6: Compliance Checklist – SAMREC Code

SAMREC TABLE 1						Section in the CPR where this is located
			Exploration Results	Mineral Resources	Mineral Reserves	Goedehoop
Section 1: Project Outline						
SR 1.1	**Property Description**	**(i)**	Brief description of the scope of project (i.e. whether in preliminary sampling, advanced exploration, scoping, pre-feasibility, or feasibility phase, LoM plan for an ongoing mining operation or closure).			ES1, ES3, 1.1, 1.2.1
		(ii)	Describe (noting any conditions that may affect possible prospecting/mining activities) topography, elevation, drainage, fauna and flora, the means and ease of access to the property, the proximity of the property to a population centre, and the nature of transport, the climate, known associated climatic risks and the length of the operating season and to the extent relevant to the mineral project, the sufficiency of surface rights for mining operations including the availability and sources of power, water, mining personnel, potential tailings storage areas, potential waste disposal areas, heap leach pad areas, and potential processing plant sites.			ES17, 2.4, 3.3.3, 8.5, 11, 12, 12.3
		(iii)	Specify the details of the personal inspection on the property by each CP or, if applicable, the reason why a personal inspection has not been completed.			1.10
SR 1.2	**Location**	**(i)**	Description of location and map (country, province, and closest town/city, coordinate systems and ranges, etc.).			ES3, 2, 2.1, 2.2
		(ii)	Country Profile: describe information pertaining to the project host country that is pertinent to the project, including relevant applicable legislation, environmental and social context etc. Assess, at a high level, relevant technical, environmental, social, economic, political and other key risks.			2.7.1, 2.7.2, 3.4.2
		(iii)	Provide a general topocadastral map.	Provide a Topo-cadastral map in sufficient detail to support the assessment of eventual economics. State the known associated climatic risks.	Provide a detailed topo-cadastral map. Confirm that applicable aerial surveys have been checked with ground controls and surveys, particularly in areas of rugged terrain, dense vegetation or high altitude.	2.7.1, 2.7.2, 3.3.1 (Figs. 3-1 and 3-2)
SR 1.3	**Adjacent Properties**	**(i)**	Discuss details of relevant adjacent properties If adjacent or nearby properties have an important bearing on the report, then their location and common mineralized structures should be included on the maps. Reference all information used from other sources.			2.3
SR 1.4	**History**	**(i)**	State historical background to the project and adjacent areas concerned, including known results of previous exploration and mining activities (type, amount, quantity and development work), previous ownership and changes thereto.			2.5
		(ii)	Present details of previous successes or failures with reasons why the project may now be considered potentially economic.			2.5
		(iii)		Discuss known or existing historical Mineral Resource estimates and performance statistics on actual production for past and current operations.		ES8, ES9, ES12, ES15, 2,6.8, 6.9
		(iv)			Discuss known or existing historical Mineral Reserve estimates and performance statistics on actual production for past and current operations.	ES15, 29.3.3, 9.4
SR 1.5	**Legal Aspects and Permitting**	Confirm the legal tenure to the satisfaction of the CP, including a description of the following:				
		(i)	Discuss the nature of the issuer's rights (e.g. prospecting and/or mining) and the right to use the surface of the properties to which these rights relate. Disclose the date of expiry and other relevant details.			ES4, 1.1.1, 2.7.1, 3, 3.1, 3.3
		(ii)	Present the principal terms and conditions of all existing agreements, and details of those still to be obtained, (such as, but not limited to, concessions, partnerships, joint ventures, access rights, leases, historical and cultural sites, wilderness or national park and environmental settings, royalties, consents, permission, permits or authorisations).			1.1.1, 3, 3.3, 3.4.1, 3.4.2, 15.1
		(iii)	Present the security of the tenure held at the time of reporting or that is reasonably expected to be granted in the future along with any known impediments to obtaining the right to operate in the area. State details of applications that have been made.			3, 3.1, 3.2, 3.3
		(iv)	Provide a statement of any legal proceedings for example; land claims, that may have an influence on the rights to prospect or mine for minerals, or an appropriate negative statement.			3, 3.3, 3.4.2, 3.4.3
		(v)	Provide a statement relating to governmental/statutory requirements and permits as may be required, have been applied for, approved or can be reasonably be expected to be obtained.			3, 3.3, 3.4.1, 3.4.2, 15.1, 15.5.2
SR 1.6	**Royalties**	**(i)**	Describe the royalties that are payable in respect of each property.			3.1.4, 3.1.5, 19.2.1
SR 1.7	**Liabilities**	**(i)**	Describe any liabilities, including rehabilitation guarantees that are pertinent to the project. Provide a description of the rehabilitation liability, including, but not limited to, legislative requirements, assumptions and limitations.			ES21, 1.4.3, 1.6.1, 15.5, 15.5.2, 15.5.3
Section 2: Geological Setting, Deposit, Mineralisation						
SR 2.1	**Geological Setting, Deposit, Mineralisation**	**(i)**	Describe the regional geology.			ES5, 4, 4.1
		(ii)	Describe the project geology including deposit type, geological setting and style of mineralisation.			ES5, 4, 4.3
		(iii)	Discuss the geological model or concepts being applied in the investigation and on the basis of which the exploration program is planned. Describe the inferences made from this model.			4, 4.3, 5, 5.1, 6.2

SAMREC TABLE 1						Section in the CPR where this is located
			Exploration Results	Mineral Resources	Mineral Reserves	Goedehoop
		(iv)	Discuss data density, distribution and reliability and whether the quality and quantity of information are sufficient to support statements, made or inferred, concerning the Exploration Target or Mineralisation.			4, 4.3, 5.6
		(v)	Discuss the significant minerals present in the deposit, their frequency, size and other characteristics. Includes minor and gangue minerals where these will have an effect on the processing steps. Indicate the variability of each important mineral within the deposit.			ES5, 4, 6.3.1
		(vi)	Describe the significant mineralised zones encountered on the property, including a summary of the surrounding rock types, relevant geological controls, and the length, width, depth, and continuity of the mineralisation, together with a description of the type, character, and distribution of the mineralisation.			ES5, 4, 6.3.1
		(vii)	Confirm that reliable geological models and / or maps and cross sections that support interpretations exist.			ES5, ES7, 4, 6.3
Section 3: Exploration and Drilling, Sampling Techniques and Data						
SR 3.1	**Exploration**	(i)	Describe the data acquisition or exploration techniques and the nature, level of detail, and confidence in the geological data used (i.e. geological observations, remote sensing results, stratigraphy, lithology, structure, alteration, mineralisation, hydrology, geophysical, geochemical, petrography, mineralogy, geochronology, bulk density, potential deleterious or contaminating substances, geotechnical and rock characteristics, moisture content, bulk samples etc.). Confirm that data sets include all relevant metadata, such as unique sample number, sample mass, collection date, spatial location etc.			ES6, ES10, ES22, 5, 5.1, 5.5, 7, 16, 16.1
		(ii)	Identify and comment on the primary data elements (observation and measurements) used for the project and describe the management and verification of these data or the database. This should describe the following relevant processes: acquisition (capture or transfer), validation, integration, control, storage, retrieval and backup processes. It is assumed that data are stored digitally but hand-printed tables with well-organized data and information may also constitute a database.			1.5, 5, 5.1
		(iii)	Acknowledge and appraise data from other parties and reference all data and information used from other sources.			5, 5.1
		(iv)	Clearly distinguish between data / information from the property under discussion and that derived from surrounding properties.			5, 5.1
		(v)	Describe the survey methods, techniques and expected accuracies of data. Specify the grid system used.			5, 5.1, 5.2.4
		(vi)	Discuss whether the data spacing and distribution is sufficient to establish the degree of geological and grade continuity appropriate for the estimation procedure(s) and classifications applied.			5, 5.1
		(vii)	Present representative models and / or maps and cross sections or other two or three-dimensional illustrations of results, showing location of samples, accurate drill-hole collar positions, down-hole surveys, exploration pits, underground workings, relevant geological data, etc.			4, 5, 5.1, 6.3.1
		(viii)	Report the relationships between mineralisation widths and intercept lengths are particularly important, the geometry of the mineralisation with respect to the drill hole angle. If it is not known and only the down-hole lengths are reported, confirm it with a clear statement to this effect (e.g. 'down-hole length, true width not known').			5, 5.1
SR 3.2	**Drilling Techniques**	(i)	Present the type of drilling undertaken (e.g. core, reverse circulation, open-hole hammer, rotary air blast, auger, Banka, sonic, etc.) and details (e.g. core diameter, triple or standard tube, depth of diamond tails, face-sampling bit or other type, whether core is oriented and if so, by what method, etc.).			ES6, 5, 5.2, 5.2.6
		(ii)	Describe whether core and chip samples have been geologically and geotechnically logged to a level of detail to support appropriate Mineral Resource estimation, technical studies, mining studies and metallurgical studies.			ES6, 5, 5.6
		(iii)	Describe whether logging is qualitative or quantitative in nature; indicate if core photography. (or costean, channel, etc.) was undertaken.			ES6, 5, 5.2.5
		(iv)	Present the total length and percentage of the relevant intersections logged.			ES6, 5, 5.2.5
		(v)	Results of any downhole surveys of the drill hole to be discussed.			ES6, 5, 5.2.6
SR 3.3	**Sample method, collection, capture and storage**	(i)	Describe the nature and quality of sampling (e.g. cut channels, random chips, or specific specialised industry standard measurement tools appropriate to the minerals under investigation, such as down hole gamma sondes, or handheld XRF instruments, etc.). These examples should not be taken as limiting the broad meaning of sampling.			5.3.2, 5.6
		(ii)	Describe the sampling processes, including sub-sampling stages to maximize representivity of samples. This should include whether sample sizes are appropriate to the grain size of the material being sampled. Indicate whether sample compositing has been applied.			5.3.2, 5.6
		(iii)	Appropriately describe each data set (e.g. geology, grade, density, quality, diamond breakage, geo-metallurgical characteristics etc.), sample type, sample-size selection and collection methods.			5.3.2, 5.5, 5.6
		(iv)	Report the geometry of the mineralisation with respect to the drill-hole angle. State whether the orientation of sampling achieves unbiased sampling of possible structures and the extent to which this is known, considering the deposit type. State if the intersection angle is not known and only the downhole lengths are reported.			5.3.2, 5.6
		(v)	Describe retention policy and storage of physical samples (e.g. core, sample reject, etc.).			5.3.2, 5.6
		(vi)	Describe the method of recording and assessing core and chip sample recoveries and results assessed, measures taken to maximise sample recovery and ensure representative nature of the samples and 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.			5.3.2, 5.6

SAMREC TABLE 1						Section in the CPR where this is located
			Exploration Results	Mineral Resources	Mineral Reserves	Goedehoop
		(vii)	If a drill-core sample is taken, state whether it was split or sawn and whether quarter, half or full core was submitted for analysis. If a non-core sample, state whether the sample was riffled, tube sampled, rotary split etc. and whether it was sampled wet or dry.			5.3.2, 5.6
SR 3.4	Sample Preparation and Analysis	(i)	Identify the laboratory(s) and state the accreditation status and Registration Number of the laboratory or provide a statement that the laboratories are not accredited.			5.3.3
		(ii)	Identify the analytical method. Discuss the nature, quality and appropriateness of the assaying and laboratory processes and procedures used and whether the technique is considered partial or total.			5.3.3
		(iii)	Describe the process and method used for sample preparation, sub-sampling and size reduction, and likelihood of inadequate or non-representative samples (i.e. improper size reduction, contamination, screen sizes, granulometry, mass balance, etc.).			5.3.3
SR 3.5	Sampling Governance	(i)	Discuss the governance of the sampling campaign and process, to ensure quality and representivity of samples and data, such as sample recovery, high grading, selective losses or contamination, core/hole diameter, internal and external QA/QC, and any other factors that may have resulted in or identified sample bias.			5.3.1, 5.4
		(ii)	Describe the measures taken to ensure sample security and the Chain of Custody.			5.3.1
		(iii)	Describe the validation procedures used to ensure the integrity of the data, e.g. transcription, input or other errors, between its initial collection and its future use for modelling (e.g. geology, grade, density, etc.).			5.3.1, 5.4, 5.5
		(iv)	Describe the audit process and frequency (including dates of these audits) and disclose any material risks identified.			5.3.1
SR 3.6	Quality Control/Quality Assurance	(i)	Demonstrate that adequate field sampling process verification techniques (QA/QC) have been applied, e.g. the level of duplicates, blanks, reference material standards, process audits, analysis, etc. If indirect methods of measurement were used (e.g. geophysical methods), these should be described, with attention given to the confidence of interpretation.			5.4
SR 3.7	Bulk Density	(i)	Describe the method of bulk density determination with reference to the frequency of measurements, the size, nature and representativeness of the samples.			5.5
		(ii)	If target tonnage ranges are reported, state the preliminary estimates or basis of assumptions made for bulk density.			Not applicable
		(iii)	Discuss the representivity of bulk density samples of the material for which a grade range is reported.			Not applicable
		(iv)	Discuss the adequacy of the methods of bulk density determination for bulk material with special reference to accounting for void spaces (vugs, porosity etc.), moisture and differences between rock and alteration zones within the deposit.			5.5
SR 3.8	Bulk-Sampling and/or trial-mining	(i)	Indicate the location of individual samples (including map).			Not applicable
		(ii)	Describe the size of samples, spacing/density of samples recovered and whether sample sizes and distribution are appropriate to the grain size of the material being sampled.			Not applicable
		(iii)	Describe the method of mining and treatment.			Not applicable
		(iv)	Indicate the degree to which the samples are representative of the various types and styles of mineralisation and the mineral deposit as a whole.			Not applicable
Section 4: Estimation and Reporting of Exploration Results and Mineral Resources						
SR 4.1	Geological model and interpretation	(i)	Describe the geological model, construction technique and assumptions that forms the basis for the Exploration Results or Mineral Resource estimate. Discuss the sufficiency of data density to assure continuity of mineralisation and geology and provide an adequate basis for the estimation and classification procedures applied.			6.2, 6.3.1
		(ii)	Describe the nature, detail and reliability of geological information with which lithological, structural, mineralogical, alteration or other geological, geotechnical and geo-metallurgical characteristics were recorded.			ES7, ES10, 6.2, 6.3, 7
		(iii)	Describe any obvious geological, mining, metallurgical, environmental, social, infrastructural, legal and economic factors that could have a significant effect on the prospects of any possible exploration target or deposit.			6.3
		(iv)		Discuss all known geological data that could materially influence the estimated quantity and quality of the Mineral Resource.		ES7, ES8, ES28, 1.4.1, 6.3, 6.3.2, 6.4, 6.8, 20.18
		(v)		Discuss whether consideration was given to alternative interpretations or models and their possible effect (or potential risk) if any, on the Mineral Resource estimate.		ES7, 6.3
		(vi)		Discuss geological discounts (e.g. magnitude, per reef, domain, etc.), applied in the model, whether applied to mineralized and / or un-mineralized material (e.g. potholes, faults, dykes, etc.).		6.7

SAMREC TABLE 1						Section in the CPR where this is located
			Exploration Results	Mineral Resources	Mineral Reserves	Goedehoop
SR 4.2	Estimation and modelling techniques	(i)	Describe in detail the estimation techniques and assumptions used to determine the grade and tonnage ranges.			6.7
		(ii)		Discuss the nature and appropriateness of the estimation technique(s) applied and key assumptions, including treatment of extreme grade values (cutting or capping), compositing (including by length and/or density), domaining, sample spacing, estimation unit size (block size), selective mining units, interpolation parameters and maximum distance of extrapolation from data points.		ES11, ES14, 6.4, 6.7, 9, 9.1.1, 9.1.2
		(iii)		Describe assumptions and justification of correlations made between variables.		6.4
		(iv)		Provide details of any relevant specialized computer program (software) used, with the version number, together with the estimation parameters used.		6.2, 6.4, 8.2, 9.1.2
		(v)		State the processes of checking and validation, the comparison of model information to sample data and use of reconciliation data, and whether the Mineral Resource estimate takes account of such information.		ES9, ES15, 6.3
		(vi)		Describe the assumptions made regarding the estimation of any co-products, by-products or deleterious elements.		6.7
SR 4.3	Reasonable prospects for eventual economic extraction	(i)		Disclose and discuss the geological parameters. These would include (but not be limited to) volume / tonnage, grade and value / quality estimates, cut-off grades, strip ratios, upper- and lower- screen sizes.		6.4
		(ii)		Disclose and discuss the engineering parameters. These would include mining method, dilution, processing, geotechnical, geohydraulic and metallurgical) parameters.		Executive Summary (ES10, ES11, ES16, ES18, ES20, ES22), 6.4, 7, 8, 8.3, 9.1.2, 10, 12, 16
		(iii)		Disclose and discuss the infrastructural including, but not limited to, power, water, site-access.		6.4, 12.3
		(iv)		Disclose and discuss the legal, governmental, permitting, statutory parameters.		6.4
		(v)		Disclose and discuss the environmental and social (or community) parameters.		6.4, 15.3
		(vi)		Disclose and discuss the marketing parameters.		6.4, 12.7, 17
		(vii)		Disclose and discuss the economic assumptions and parameters. These factors will include, but not limited to, commodity prices and potential capital and operating costs.		6.4, 8.7, 12.7
		(viii)		Discuss any material risks.		ES27, 1.4.1, 6.4 21.18
		(ix)		Discuss the parameters used to support the concept of "eventual".		6.4
SR 4.4	Classification Criteria	(i)		Describe criteria and methods used as the basis for the classification of the Mineral Resources into varying confidence categories.		6.5
SR 4.5	Reporting	(i)	Discuss the reported low and high-grades and widths together with their spatial location to avoid misleading the reporting of Exploration Results, Mineral Resources or Mineral Reserves.			ES14, 6.3.2, 9
		(ii)	Discuss whether the reported grades are regional averages or if they are selected individual samples taken from the property under discussion.			ES8, 6.8
		(iii)	State assumptions regarding mining methods, infrastructure, metallurgy, environmental and social parameters. State and discuss where no mining related assumptions have been made.			9, 9.1.1, 9.1.2
		(iv)	State the specific quantities and grades / qualities which are being reported in ranges and/or widths and explain the basis of the reporting.			ES8, 6.8

SAMREC TABLE 1						Section in the CPR where this is located
			Exploration Results	Mineral Resources	Mineral Reserves	Goedehoop
		(v)		Present the detail for example open pit, underground, residue stockpile, remnants, tailings, and existing pillars or other sources in the Mineral Resource statement.		ES8, 6.8
		(vi)		Present a reconciliation with any previous Mineral Resource estimates. Where appropriate, report and comment on any historic trends (e.g. global bias).		ES9, ES15, 6.9, 9.4, 17
		(vii)		Present the defined reference point for the tonnages and grades reported as Mineral Resources. State the reference point if the point is where the run of mine material is delivered to the processing plant. It is important that, in all situations where the reference point is different, such as for a saleable product, a clarifying statement is included to ensure that the reader is fully informed as to what is being reported.		ES8, 6.8
		(viii)	If the CP is relying on a report, opinion, or statement of another expert who is not a CP, disclose the date, title, and author of the report, opinion, or statement, the qualifications of the other expert and why it is reasonable for the CP to rely on the other expert, any significant risks and any steps the CP took to verify the information provided.			Not applicable
		(ix)	State the basis of equivalent metal formulae, if applied.			Not applicable
Section 5: Technical Studies						
SR 5.1	**Introduction**	(i)	Technical Studies are not applicable to Exploration Results.	State the level of study – whether scoping, prefeasibility, feasibility or ongoing LoM.	State the level of study – whether prefeasibility, feasibility or ongoing LoM. The Code requires that a study to at least a Pre-Feasibility level has been undertaken to convert Mineral Resource to Mineral Reserve. Such studies will have been carried out and will include a mine plan or production schedule that is technically achievable and economically viable, and that all Modifying Factors have been considered.	ES13, ES14, 8.7, 9, 9.2
		(ii)			Provide a summary table of the Modifying Factors used to convert the Mineral Resource to Mineral Reserve for Pre-feasibility, Feasibility or on-going LoM studies.	ES13, 9, 9.2
SR 5.2	**Mining Design**	(i)	Technical Studies are not applicable to Exploration Results.	State assumptions regarding mining methods and parameters when estimating Mineral Resources or explain where no mining assumptions have been made.		ES11, 8, 8.2, 8.7
		(ii)			State and justify all modifying factors and assumptions made regarding mining methods, minimum mining dimensions (or pit shell) and internal and, if applicable, external) mining dilution and mining losses used for the techno-economic study and signed-off, such as mining method, mine design criteria, infrastructure, capacities, production schedule, mining efficiencies, grade control, geotechnical and hydrological considerations, closure plans, and personnel requirements.	ES10, ES21, ES22, 7, 8, 8.2, 8.6, 8.7, 15.5, 16.1
		(iii)			State what mineral resource models have been used in the study.	6.2, 8
		(iv)			Explain the basis of (the adopted) cut-off grade(s) or quality parameters applied. Include metal equivalents if relevant.	ES11, 8, 8.2
		(v)			Description and justification of mining method(s) to be used.	8, 8.2
		(vi)			For open-pit mines, include a discussion of pit slopes, slope stability, and strip ratio.	7.4, 7.5, 8, 8.2
		(vii)			For underground mines, discussion of mining method, geotechnical considerations, mine design characteristics, and ventilation/cooling requirements.	ES11, ES22, 8
		(viii)			Discussion of mining rate, equipment selected, grade control methods, geotechnical and hydrogeological considerations, health and safety of the workforce, staffing requirements, dilution, and recovery.	ES10, ES11, ES19, ES20, ES22, 7, 8, 8.1, 8.2, 8.3, 8.5, 10, 10.1, 10.6, 14, 16, 16.2

SAMREC TABLE 1						Section in the CPR where this is located
			Exploration Results	Mineral Resources	Mineral Reserves	Goedehoop
		(ix)			State the optimisation methods used in planning, list of constraints (practicality, plant, access, exposed Mineral Reserves, stripped Mineral Reserves, bottlenecks, draw control).	ES14, 8, 8.2, 9
SR 5.3	Metallurgical and Testwork	(i)	Technical Studies are not applicable to Exploration Results.		Discuss the source of the sample and the techniques to obtain the sample, laboratory and metallurgical testing techniques.	5.2, 5.3.3, 10
		(ii)			Explain the basis for assumptions or predictions regarding metallurgical amenability and any preliminary mineralogical test work already carried out.	10
		(iii)		Discuss the possible processing methods and any processing factors that could have a material effect on the likelihood of eventual economic extraction. Discuss the appropriateness of the processing methods to the style of mineralisation.	Describe and justify the processing method(s) to be used, equipment, plant capacity, efficiencies, and personnel requirements.	ES16, ES28, 10, 10.1, 10.6
		(iv)			Discuss the nature, amount and representativeness of metallurgical test work undertaken and the recovery factors used. A detailed flow sheet / diagram and a mass balance should exist, especially for multi-product operations from which the saleable materials are priced for different chemical and physical characteristics.	10, 10.1
		(v)			State what assumptions or allowances have been made for deleterious elements and the existence of any bulk-sample or pilot-scale test work and the degree to which such samples are representative of the ore body as a whole.	10
		(vi)			State whether the metallurgical process is well-tested technology or novel in nature.	10, 10.2
SR 5.4	Infrastructure	(i)	Technical Studies are not applicable to Exploration Results.	Comment regarding the current state of infrastructure or the ease with which the infrastructure can be provided or accessed.		ES18, 2.4, 2.4.2, 12
		(ii)			Report in sufficient detail to demonstrate that the necessary facilities have been allowed for (which may include, but not be limited to, processing plant, tailings dam, leaching facilities, waste dumps, road, rail or port facilities, water and power supply, offices, housing, security, resource sterilisation testing etc.). Provide detailed maps showing locations of facilities.	ES17, ES18, 2.4, 2.4.2, 11, 12, 12.3
		(iii)			Statement showing that all necessary logistics have been considered.	10.1, 13
SR 5.5	Environmental and Social	(i)	Technical Studies are not applicable to Exploration Results.	Confirm that the company holding the tenement has addressed the host country environmental legal compliance requirements and any mandatory and/or voluntary standards or guidelines to which it subscribes.		ES20, 2.7.1, 2.7.2, 3.4.1, 15, 15.2.2
		(ii)		Identify the necessary permits that will be required and their status and where not yet obtained, confirm that there is a reasonable basis to believe that all permits required for the project will be obtained.		ES20, 3.4.1, 15, 15.1
		(iii)		Identify and discuss any sensitive areas that may affect the project as well as any other environmental factors including I&AP and/or studies that could have a material effect on the likelihood of eventual economic extraction. Discuss possible means of mitigation.		ES28, 1.4.1, 2.7.1, 2.7.2, 3.4.1, 15, 15.1, 21.18
		(iv)		Identify any legislated social management programmes that may be required and discuss the content and status of these.		ES20, 15.3
		(v)		Outline and quantify the material socio-economic and cultural impacts that need to be mitigated, and their mitigation measures and where appropriate the associated costs.		2.7.2, 15.3
SR 5.6	Market Studies and Economic criteria	(i)	Technical Studies are not applicable to Exploration Results.		Describe the valuable and potentially valuable product(s) including suitability of products, co-products and by products to market.	17, 18
		(ii)			Describe product to be sold, customer specifications, testing, and acceptance requirements. Discuss whether there exists a ready market for the product and whether contracts for the sale of the product are in place or expected to be readily obtained. Present price and volume forecasts and the basis for the forecast.	ES23, ES24, 10.1.1, 17, 18

SAMREC TABLE 1						Section in the CPR where this is located
			Exploration Results	Mineral Resources	Mineral Reserves	Goedehoop
		(iii)			State and describe all economic criteria that have been used for the study such as capital and operating costs, exchange rates, revenue / price curves, royalties, cut-off grades, reserve pay limits.	6.4, 8.6, 12.7.1, 12.7.2, 19
		(iv)			Summary description, source and confidence of method used to estimate the commodity price/value profiles used for cut-off grade calculation, economic analysis and project valuation, including applicable taxes, inflation indices, discount rate and exchange rates.	6.4, 19, 19.2
		(v)			Present the details of the point of reference for the tonnages and grades reported as Mineral Reserves (e.g. material delivered to the processing facility or saleable product(s)). It is important that, in any situation where the reference point is different, a clarifying statement is included to ensure that the reader is fully informed as to what is being reported.	ES14, 9
		(vi)			Justify assumptions made concerning production cost including transportation, treatment, penalties, exchange rates, marketing and other costs. Provide details of allowances that are made for the content of deleterious elements and the cost of penalties.	ES24, 17, 18
		(vii)			Provide details of allowances made for royalties payable, both to Government and private.	3.1.5
		(viii)			State type, extent and condition of plant and equipment that is significant to the existing operation(s).	ES18, 12
		(ix)			Provide details of all environmental, social and labour costs considered.	8.6, 15.5.3
SR 5.7	**Risk Analysis**	(i)	Technical Studies are not applicable to Exploration Results.	Report an assessment of technical, environmental, social, economic, political and other key risks to the project. Describe actions that will be taken to mitigate and/or manage the identified risks.		ES29, 9.5, 10.13, 11.7, 12.8, 13.1, 14.4, 15.2.5, 15.3.3, 15.5.4, 16.1.10, 16.2.4, 18.8, 20, 21
SR 5.8	**Economic Analysis**	(i)	Technical Studies are not applicable to Exploration Results.	At the relevant level (Scoping Study, Pre-feasibility, Feasibility or on-going LoM), provide an economic analysis for the project that includes:		ES27, 19, 19.6
		(ii)		Cash Flow forecast on an annual basis using Mineral Reserves or an annual production schedule for the life of the project.		19, 19.2
		(iii)		A discussion of net present value (NPV), internal rate of return (IRR) and payback period of capital.		19, 19.2
		(iv)		Sensitivity or other analysis using variants in commodity price, grade, capital and operating costs, or other significant parameters, as appropriate and discuss the impact of the results.		19, 19.2
Section 6: Estimation and Reporting of Mineral Reserves						
SR 6.1	**Estimation and modelling techniques**	(i)		Describe the Mineral Resource estimate used as a basis for the conversion to a Mineral Reserve.		ES8, 6.8, 9, 9.1.1, 9.1.2
		(ii)		Report the Mineral Reserve Statement with sufficient detail indicating if the mining is open pit or underground plus the source and type of mineralisation, domain or ore body, surface dumps, stockpiles and all other sources.		ES11, 8, 9, 9.3, 9.3.3
		(iii)			Provide a reconciliation reporting historic reliability of the performance parameters, assumptions and modifying factors including a comparison with the previous Reserve quantity and qualities, if available. Where appropriate, report and comment on any historic trends (e.g. global bias).	ES9, ES13, ES15, 9, 9.1.1, 9.2
SR 6.2	**Classification Criteria**	(i)			Describe and justify criteria and methods used as the basis for the classification of the Mineral Reserves into varying confidence categories, based on the Mineral Resource category, and including consideration of the confidence in all the modifying factors.	ES13, 9, 9.2, 9.3.1
SR 6.3	**Reporting**	(i)			Discuss the proportion of Probable Mineral Reserves, which have been derived from Measured Mineral Resources (if any), including the reason(s) therefore.	ES14, 9, 9.3.3
		(ii)			Present details of for example open pit, underground, residue stockpile, remnants, tailings, and existing pillars or other sources in respect of the Mineral Reserve statement.	ES14, 9.3, 9.3.3

SAMREC TABLE 1						Section in the CPR where this is located
			Exploration Results	Mineral Resources	Mineral Reserves	Goedehoop
		(iii)			Present the details of the defined reference point for the Mineral Reserves. State where the reference point is the point where the run of mine material is delivered to the processing plant. It is important that, in all situations where the reference point is different, such as for a saleable product, a clarifying statement is included to ensure that the reader is fully informed as to what is being reported. State clearly whether the tonnages and grades reported for Mineral Reserves are in respect of material delivered to the plant or after recovery.	10.1, 10.2, 10.7
		(iv)			Present a reconciliation with the previous Mineral Reserve estimates. Where appropriate, report and comment on any historic trends (e.g. global bias).	ES9, 9.4
		(v)			Only Measured and Indicated Mineral Resources can be considered for inclusion in the Mineral Reserve.	9.3.3
		(vi)			State whether the Mineral Resources are inclusive or exclusive of Mineral Reserves.	ES8, 6.8, 9, 9.4
Section 7: Audits and Reviews						
SR 7.1	**Audits and Reviews**	(i)	State type of review/audit (e.g. independent, external), area (e.g. laboratory, drilling, data, environmental compliance etc.), date and name of the reviewer(s) together with their recognized professional qualifications.			1.1, 2.7.2, 3.4.2, 6.3, 15.2.2, 15.2.4, 15.3.1, 16.1.5
		(ii)	Disclose the conclusions of relevant audits or reviews. Note where significant deficiencies and remedial actions are required.			ES30, ES31, 2.7.2, 3.4.2, 6.3, 15.2.2, 15.2.4, 15.3.1, 16.1.5, 21
Section 8: Other Relevant Information						
SR 8.1		(i)	Discuss all other relevant and material information not discussed elsewhere.			Not applicable
Section 9: Qualification of CP(s) and other key technical staff. Date and Signature Page						
SR 9.1		(i)	State the full name, registration number and name of the professional body or RPO, for all the CP(s). State the relevant experience of the CP(s) and other key technical staff who prepared and are responsible for the Public Report.			1.3.2, 1.9, 22
		(ii)	State the CP's relationship to the issuer of the report.			1.9, 22
		(iii)	Provide the Certificate of the CP (Appendix 2), including the date of sign-off and the effective date, in the Public Report.			Cover Page, ES3, 1.4, Appendix 3

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