Exclusion of Blasting Study for Klipspruit Colliery's proposed Nwabu Project - Pit BD and Pit H Underground Expansion Project

Prepared for

Seriti Power (Pty) Ltd

Document Detail

Project Number:	SER04	**Authority Reference:**	MP 30/5/1/2/2/125MR
Report Title:	Exclusion of Blasting Study for Klipspruit Colliery's proposed Nwabu Project - Pit BD and Pit H Underground Expansion Project		
Project Name:	Blasting Memo of Exclusion for Klipspruit Colliery's Proposed Nwabu Project - Underground Mining Expansion Project		
Client Name:	Seriti Power (Pty) Ltd		
EAP:	Niara Environmental Consultants (Pty) Ltd		

Document History

Revision	EAP/Author	Reviewed By	Date of Issue	Comments
0	Vumile Ribeiro	Moyahabo Jumbo Makgalefe	20 July 2024	

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Independence

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Declaration of Independence

I Vumile Ribeiro, as duly authorised representative of Niara Environmental Consultants (Pty) Ltd., hereby confirm my independence and declare that I:

- I act as the independent specialist in this application;
- I will perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the applicant;
- I declare that there are no circumstances that may compromise my objectivity in performing such work;
- I have expertise in conducting the specialist report relevant to this application, including knowledge of the Act, regulations and any guidelines that have relevance to the proposed activity;
- I will comply with the Act, regulations and all other applicable legislation;
- I have no, and will not engage in, conflicting interests in the undertaking of the activity;
- I undertake to disclose to the applicant and the competent authority all material information in my possession that reasonably has or may have the potential of influencing any decision to be taken with respect to the application by the competent authority; and the objectivity of any report, plan or document to be prepared by myself for submission to the competent authority;
- all the particulars furnished by me in this form are true and correct; and
- I realise that a false declaration is an offence in terms of Regulation 71 and is punishable in terms of Section 24F of the Act.

Signature of the EAP:	V. Ribeiro
Designation:	Environmental Consultant
Qualifications:	Post Graduate Degree (Hons): BSocSc Environmental Analysis and Management
Name of Company:	Niara Environmental Consultants (Pty) Ltd
Experience (Years):	Seventeen (17)
Date:	July 2024

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1 Introduction

Seriti Power (Pty) Ltd ("Seriti Power") is the holder of a Mining Right for coal in respect of its Klipspruit Colliery ("KPS") operation issued under the Department of Mineral Resources and Energy ("DMRE") (Ref No. MP 30/5/1/2/2/125 MR).

KPS consists of three mining areas under a single Mining Right. These areas are referred to as:

- KPS Main Pit which includes the Main Pit, Smaldeel and Bankfontein Pits;
- "KPSX" or Klipspruit Extension Weltevreden including Pit BD, Pit H, Pit G and Pit S; and
- "KPSS" or Klipspruit South which includes the KPSS East of the Thungela conveyor and the KPSS West of the Thungela conveyor.

KPS Main Pit holds an Environmental Management Programme Report ("EMPr"), converted in terms of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002) ("MPRDA") and approved on 14 September 2010 and the EMPr for KPSS and KPSX (Pit BD) which was approved on 17 August 2017. KPS was further awarded an Environmental Authorisation ("EA") for the Opencast ("OC") mining of Pit H in October 2022. In August 2023, an EA was granted for the OC mining of Pit G & S.

In October 2022, KPS was granted a Section 102 ("S102") amendment approval as contemplated under the MPRDA to convert the mining method for KPSX and KPSS from opencast ("OC") to underground ("UG") bord and pillar mining. A subsequent amendment application for the EA was submitted to the DMRE on the 18th August 2023 as provided for under Regulation 29 of the NEMA Environmental Impact Assessment ("EIA") Regulations ("GNR 326"), for the conversion of the mining method from OC to UG of the area within KPSX named Pit BD. The approval of this EA is still pending.

KPS intends to apply for a change in mining method to the remainder of the KPSX and KPSS reserves from OC to UG (including all future mining areas of KPSX that fall outside of the Pit BD and inclusive of Pit H). This project has been termed and will for the purposes of this application be referred to as, the "Nwabu Project".

KPS intends on applying for an EA and an Integrated Water Use License ("IWUL") for proposed change in mining method to KPSX and KPSS. The application process to be followed in terms of NEMA, for the additional activities proposed across KPSX and KPSS, is a Basic Assessment ("BA") process as contemplated under Chapter 4 of GNR 326. Seriti Power is also required to apply for a Water Use Licence for the proposed amendments, in terms of Section 21 of the National Water Act, 1998 (Act No. 36 of 1998).

1.1 Project Applicant

Table 1-1: Applicants Details

Name of Applicant:	Seriti Power (Pty) Ltd (previously known as South32 SA Coal Holdings (Pty) Ltd)
Registration No:	1963/000537/07
Responsible Person:	Moyahabo Jumbo Makgalefe

Physical Address:	Klipspruit Colliery: Portion 12, Farm Klipfontein 3Registration Division IS Ogies, 2230 South Africa
Postal Address:	P.O Box 639 Northlands, Johannesburg 2116
Telephone No:	013 689 4620
Email:	Moyahabo.Makgalefe@seritiza.com

1.2 Details of the EAP

Niara Environmental Consultants (Pty) Ltd (Niara) has been appointed as an Independent Environmental Assessment Practitioner (EAP) by Seriti Power to undertake the BA process in support of an EA application, and an Integrated Water Use Licence Application (IWULA). The details of the EAP are captured in Table 1-2 below.

Table 1-2: EAPs Details

Name of Practitioner:	Vumile Ribeiro
Registration No:	2019/1183
Responsible Person:	Niara Environmental Consultants (Pty) Ltd
Physical Address:	Office 1 Palm Place Office Park 22 Bram Fischer Drive, Linden, Johannesburg 2195
Postal Address:	28 Shamrock Street, Ferndale, Randburg, Johannesburg 2194
Telephone No:	+27 82 767 2786
Email:	vumile@niara.co.za

1.3 Project Locality

KPS and KPSS are located approximately 1 km west of the town of Ogies, with KPSX located 6 km north of the town of Ogies, in the eMalahleni Local Municipality within the Nkangala District Municipality in the Mpumalanga Province. Refer to Figure 1-1 and Appendix B, Plan 1 for a regional setting.

Table 1-3 provides the location for which the proposed project will be undertaken. Plan 2a in Appendix B provides a local setting for the proposed infrastructure.

Table 1-3: Activity Location

Farm Name:	Hartebeestlaagte 325 JS, Weltevreden 324 JS, Tweefontein 328 JS, Wildebeesfontein 327 JS, Grootpan 7 IS, Oggiesfontein 4 IS, Prinshof 2 IS, Klipfontein 3 IS, Smaldeel 1 IS, Phola Plant 830 IS, Zwaaiwater 11 IS.
Magisterial District:	Nkangala District Municipality
Distance and Direction from Nearest Town:	Approximately 6km north of Ogies town.
21 Digit Surveyor General Code for each Farm Portion	Attached as Appendix B.

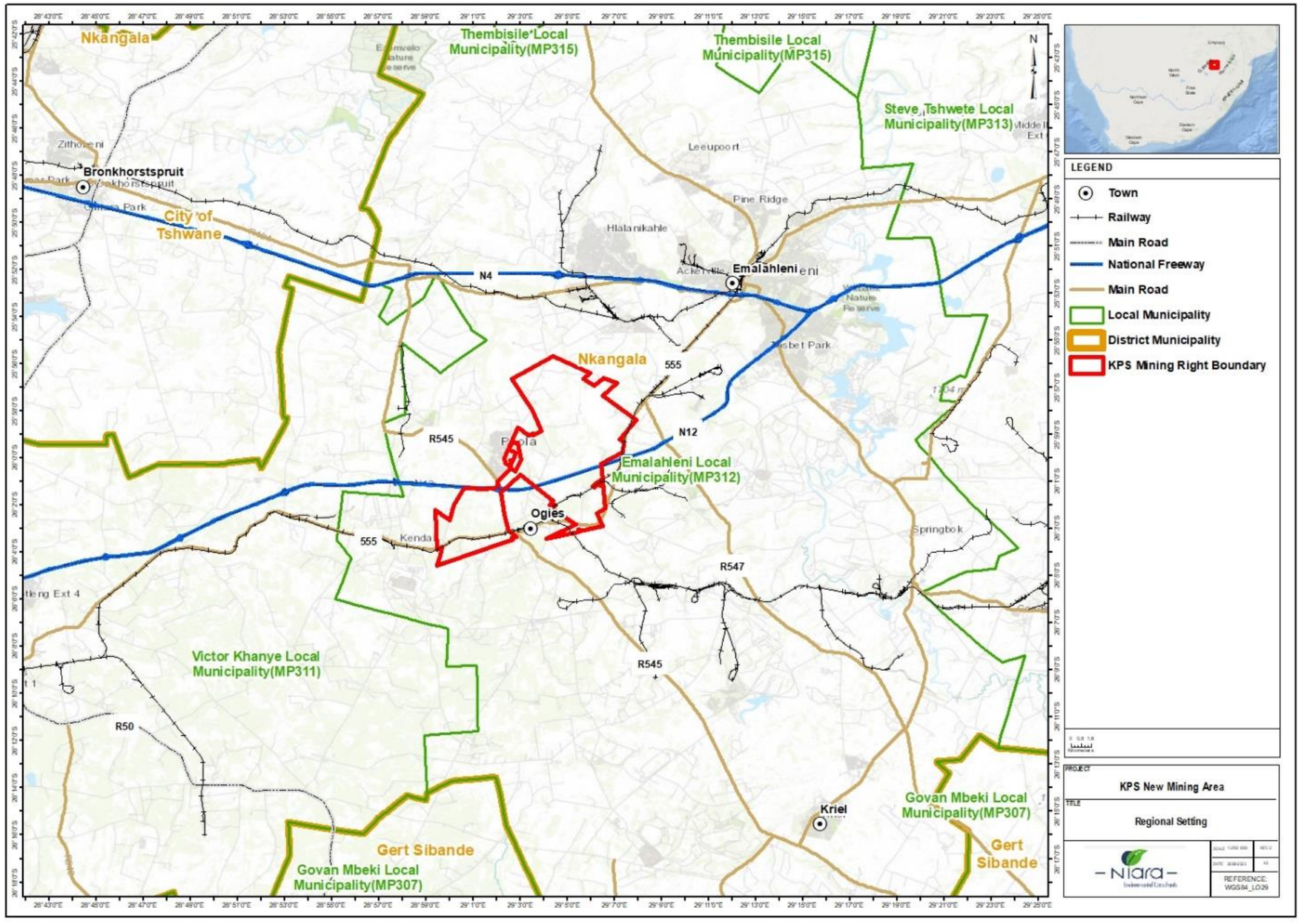

Figure 1-1: Locality Map

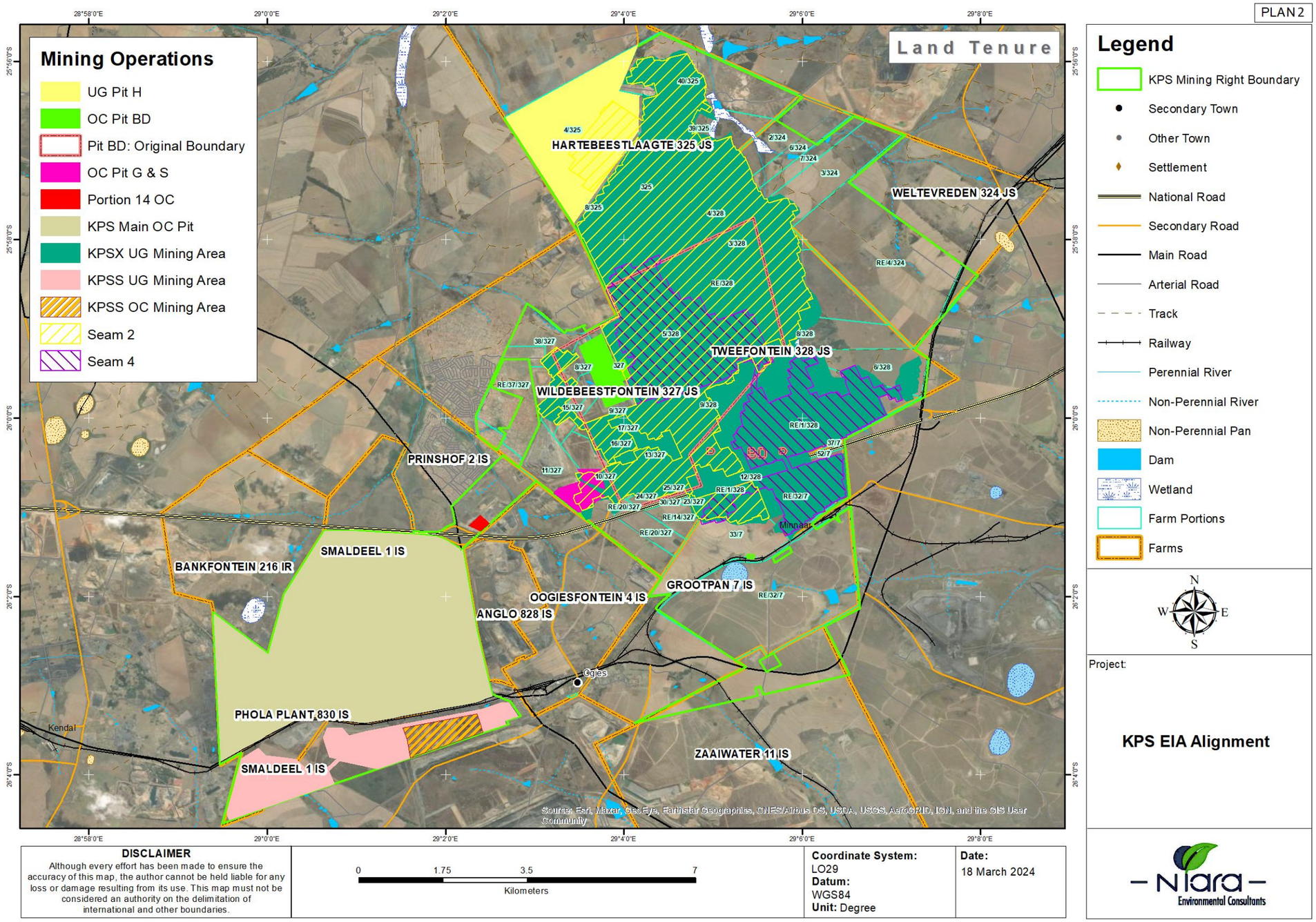

Figure 1-2: Affected farm portions over existing and proposed UG mining areas

1.4 Details and Expertise of Specialist

Founded by Vumile Ribeiro, Niara Environmental Consultants (Pty) Ltd is a 100% black female owned organisation. Our focus is environmental management services, integrated water resources management, biophysical studies as well as social issues and processes. Our key management personnel have accumulated vast experience in environmental management, integrated water resources management, mine closure and rehabilitation, and related fields. We assist our clients and communities they operate within in recognising that a healthy natural resource base is essential for economic self-sufficiency and that it provides opportunities for future livelihood options. Integral to this approach, is the need to educate our clients about the impact of their activities on their environment.

Our Managing Director, Vumile Ribeiro has 17 years of professional and international experience in Environmental Assessment and Management primarily in the minerals resources and energy sector. She has extensive experience in compiling Environmental Impact Assessments and Water Use Licence Applications for mining, electricity supply (generation, transmission and distribution), road infrastructure, as well as water management projects. Her roles include the operational management responsibilities of Niara Environmental Consultants, project management, report writing, client liaison, as well as business development.

Having worked for a multi-disciplinary advisory firms and environmental consultancies, Vumile has a competent understanding of the work effort and cross collaboration required for a successful multidisciplinary organisation. Vumile has been involved in a number of Environmental Impact Assessments and has a particular interest in health impacts assessments, water resource management, mining, energy and stakeholder engagement. Vumile has considerable experience across a range of developmental and environmental sciences and has worked in South Africa, Mozambique, Sierra Leone and Liberia and is familiar with Regulatory Environmental Legislation in other parts of Africa.

Vumile is very well versed in the IFC Environmental and Social Performance Standards (including IFC PS 2012) and the associated Equator Principles, which have informed the approach and standard for a number of ESIA processes that she has been involved in. Vumile is skilled at organising and driving effective project teams at a scale relevant to the project's requirements. She has technical experience and is able to quickly identify the most pertinent issues of a particular project whilst focussing on driving project success by rigorously implementing project management tools. Vumile's special interest areas involves understanding the systemic nature of factors that pose threats and opportunities in terms of establishing healthy, resilient communities, and exploring the use of various data types, approaches and methodologies to enable effective change.

2 Project Objectives

Seriti Power (Pty) Ltd ("Seriti Power") is the holder of a Mining Right for coal in respect of its Klipspruit Colliery ("KPS") operation issued under the Department of Mineral Resources and Energy ("DMRE") (Ref No. MP 30/5/1/2/2/125 MR).

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2.1 Mining

KPSX was approved in 2011 with the mining of the full extent of Pit BD via the OC method. Pit H was further approved in 2023 for mining via OC method. When Seriti Power took over the operation of KPS in 2021 from South32 SA Coal Holdings, Seriti Power undertook an evaluation of all the assets obtained. The evaluation's focus was on the viability of the mine, including product market evaluations, operational optimisation and cost optimisation. This resulted in Seriti Power's change in mining strategy for the whole of KPS's remaining reserves from OC to UG. UG mining was the initial strategy for KPSS mining in 2006 but was later changed to OC in 2017 due to the economic value at the time.

2.1.1 KPSX Proposed Mining

The KPSX mining of Pit BD was amended from OC to UG in October 2022 through a S102 amendment process as contemplated under the MPRDA. The EA amendment is still outstanding. The S102 approved amendment covers the full extent of the unmined UG reserves within the KPSX (including Pit H) and KPSS mining areas as indicated in **Figure 1-2** above. The mineable coal seams within the KPSX area are the following and the focus of the UG mining will be on the main seams as illustrated in **Figure 2-1** and **Figure 2-2**:

- 5 seam (“S5”)
- 4 upper A seam (“S4A”)
- 4 upper seam (“S4U”)
- 4 lower seam (“S4L”)
- 2A seam (“S2A”)
- 2 seam (“S2”)
- 1 seam (“S1”)

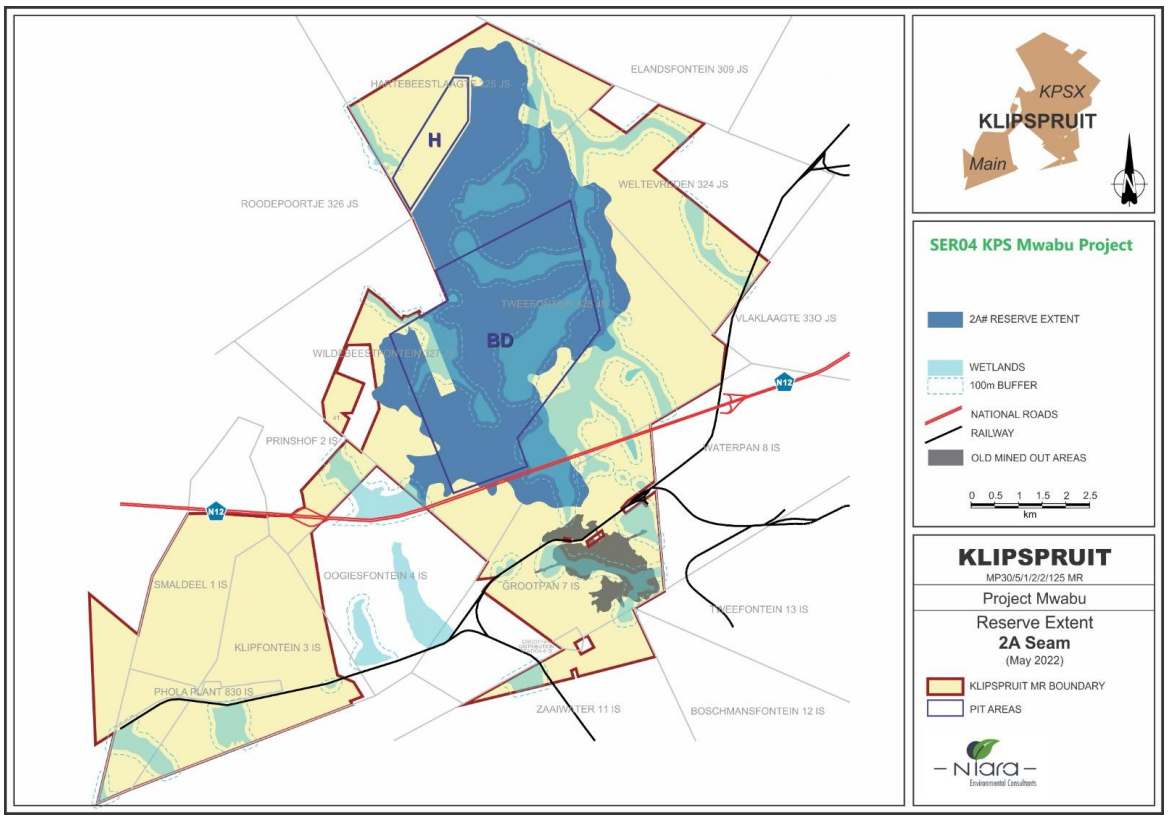


Figure 2-1: Proposed S2A mining

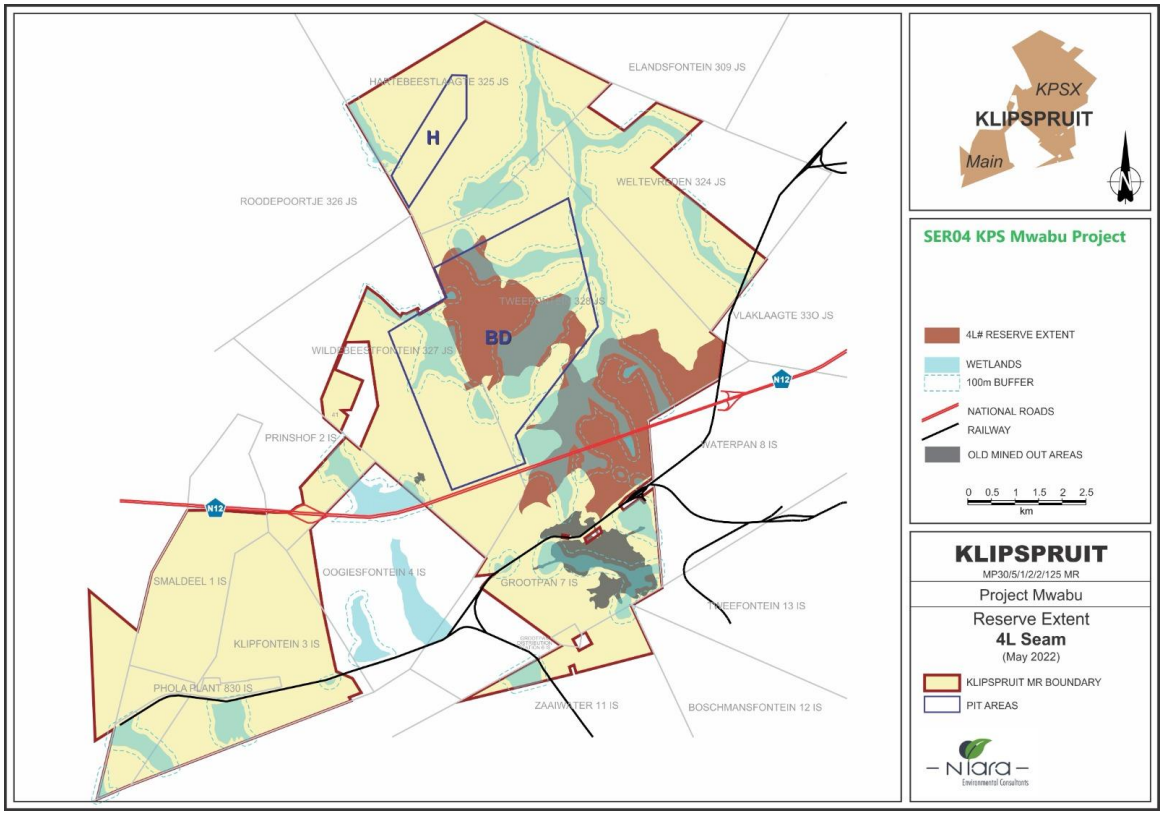


Figure 2-2: Proposed S4L Mining

The mineable coal seams at KPSS will include S5, S4U, S2 and S1.

UG mining has commenced within the Pit BD boundary and the mining method being utilised is bord and pillar mining. The inclusion of the bord and pillar mining method was to ensure optimal extraction of areas that are not profitable by OC method due to high strip ratio (Seriti Power, 2022). An adit has been developed from the pit BD highwall which provides access to the UG workings. The mining will advance towards the North, East, West and Southern directions from the Pit BD boxcut area. The proposed UG mining for both KPSS and KPSX is depicted in Figure 2-3 below. The proposed UG mining will extend mining to 2042. The UG workings designs are based on the following principles for both KPSS and KPSX (Seriti Power, 2022):

- UG workings are expected to be located approximately 25m below the ground surface with a mining height cut-off at 1.5m.
- A safety factor of not less than 1.3 will be applied on all workings with a pillar survival estimated at >99% for >500 years.
- No superimposition of the pillar between S4L and S2A and superimposition of the pillar between S2A and S1 as recommended by the geotechnical study.

UG mining using bord and pillar method will be conducted using a Continuous Miner ("CM") with parallel roadways in the direction of the advance. Perpendicular roads called splits will be developed at predetermined intervals to parallel roads. This road interlinks are the ones that create the pillars. The following activities form part of the board and pillar mining method (Seriti Power, 2022):

- Coal cutting and loading: The CM uses the rotating drum to cutting head, equipped with cutting picks to cut the coal face. The loading mechanism collects the broken coal and delivers it onto the gathering arm, which loads the coal on the CM's chain conveyor. The CM's conveyor transports the broken coal from the front to the rear of the CM. The CM's chain conveyor's capability of horizontal and vertical movements allows for coal loading into the shuttle car.
- Coal hauling and tipping: The loaded shuttle car is used to haul the coal to the section feeder breaker that crushes the coal and feeds it into the conveyor belt system.
- Roof support: A roof bolt machine installs the roof bolts once the CM has finished the development face and roof support is installed on a systematic basis. Roof bolts enhance the stability of the overlying roof. The spacing between roof bolts and the length of the roof bolts is determined during geotechnical studies.
- Coal transportation: The coal is transported using a conveyor belt system from the mining sections to the coal stockpile, linked with the overland conveyor on surface via the UG adit.

The strategy for the mining of the KPSS UG reserve will follow the same methodology as the one depicted above for KPSX and the UG resource will be accessed by using an adit which will be developed on the KPSS OC highwall.

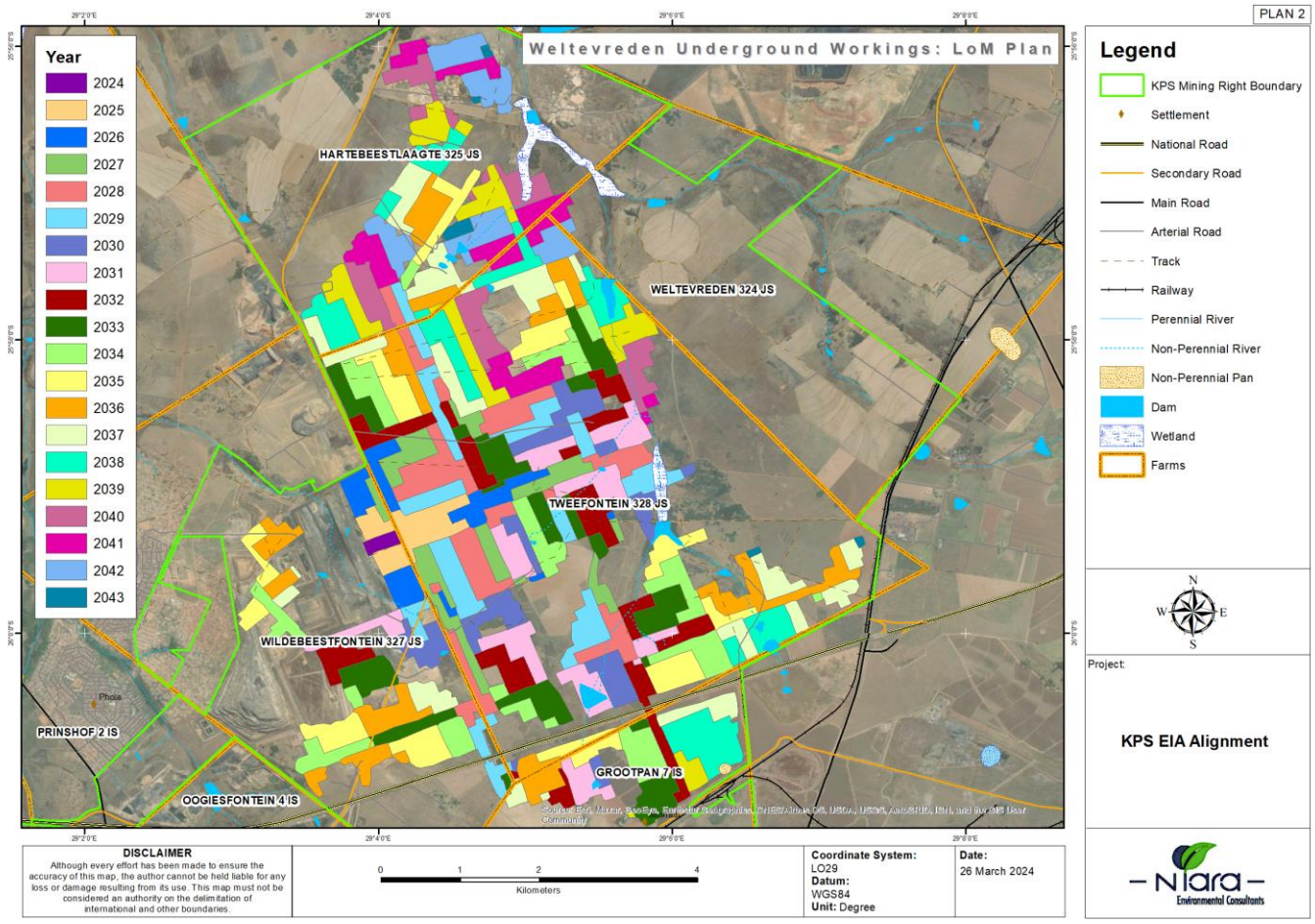


Figure 2-3: Life of Mine plan for the proposed KPSX UG mining

2.1.2 Processing

Once the coal is mined from the UG workings, it will be transported via a network of conveyors to the Phola Processing Plant ("PCPP") which is located adjacent to the KPS operation. The coal is beneficiated here resulting in various grades of quality produced. Following beneficiation at the PCPP, the coal will be transported via rail to the Richards Bay Coal Terminal for export, with a small component being retained for domestic use. Coal discard will be stored at the existing discard dump at the KPS and will be used as additional backfill material in the mining voids as part of the rehabilitation of the KPS.

2.1.3 Waste Management

All waste generated on site will be managed accordingly as per KPS' existing waste management procedures.

2.1.4 Summary of the Infrastructure Requirements

An adit has already been developed to support the UG mining at KPSX together with the supporting UG conveyors. An adit with the supporting UG conveyors will be constructed to support the UG mining at KPSS. This will be constructed on the existing KPSS OC highwall. Further, additional ventilation shafts and rescue boreholes will be constructed in strategic areas as the mining advances for both KPSX and KPSS. To manage additional dewatering activities from the UG workings, pipelines will be constructed which will link up with existing pipelines on surface and discharge in existing pollution control dams ("PCDs"). Should there be a need in future, a storage dam might also be constructed underground. Potable water supply to the UG workings will be delivered by pipelines which will link up with the existing potable water supply from the Emalahleni Water Treatment Plant. All other existing infrastructure will be utilised to support the proposed UG mining development including PCDs, power supply, haul roads, workshops, pipelines and water supply. The layout for the infrastructure at KPSX is depicted in **Figure 2-4**.

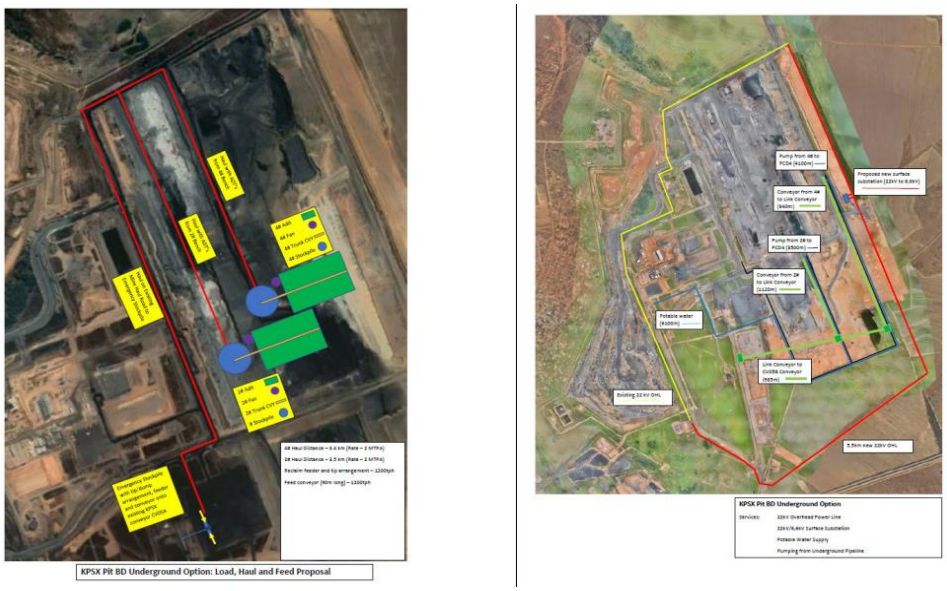


Figure 2-4: Layout for KPSX UG haul roads, pipelines, conveyor, load-haul and feed infrastructure

3 Legislative Requirements

The protocols applied in this document are based on the author's experience, guidelines elicited by the literature research, project applicant requirements and general indicators provided in the various applicable South African Acts. There is no direct reference in the consulted acts specifically regarding limiting levels for ground vibration and air blast. There is however specific requirements and regulations regarding blasting operations and the effect of ground vibration and air blast and some of the aspects addressed in this report. The acts consulted are:

- National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA)
- Mine Health and Safety Act, 1996 (Act No. 29 of 1996)
- Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002) (MPRDA)
- Explosives Act, 2003 (Act No. 15 of 2003)

There are no specific South African standards providing limiting levels regarding ground vibration and air blast. The guidelines and safe blasting criteria applied in this study are as per internationally accepted standards, and specifically the United States Bureau of Mines (USBM) criteria for safe blasting for ground vibration and the recommendations on air blast. The USBM is well accepted as a standard for South Africa. Additional criteria required by various institutions in South Africa were also taken into consideration, i.e. Eskom, Telkom, Transnet, Rand Water Board, etc. as well as specific limitations regarding traditional built structures where applicable.

In view of the acts consulted the following guidelines and regulations are noted. Only parts of the acts were extracted:

- Mine Health and Safety Act, 1996 (Act No. 29 of 1996)

(Gazette No.17242, Notice No. 967 dated 14 June 1996. Commencement date: 15 January 1997 for all sections with the exception of sections 86(2) and (3), which came into operation on 15 January 1998, [Proc.No.4, Gazette No. 17725])

3.1 Mine Health and Safety Regulations

Precautionary measures before initiating explosive charges:

4.7 The employer must take reasonable measures to ensure that when blasting takes place, air and ground vibrations, shock waves and fly material are limited to such an extent and at such a distance from any building, public thoroughfare, railway, power line or any place where persons congregate to ensure that there is no significant risk to the health or safety of persons.

General precautions

4.16 The employer must take reasonable measures to ensure that:

4.16(1) in any mine other than a coal mine, no explosive charges are initiated during the shift unless –

(a) such explosive charges are necessary for the purpose of secondary blasting or reinitiating the misfired holes in development faces;

(b) written permission for such initiation has been granted by a person authorised to do so by the employer; and

(c) reasonable precautions have been taken to prevent, as far as possible, any person from being exposed to smoke or fumes from such initiation of explosive charges;

4.16(2) no blasting operations are carried out within a horizontal distance of 500 metres of any public building, public thoroughfare, railway line, power line, any place where people congregate or any other structure, which it may be necessary to protect in order to prevent any significant risk, unless:

(a) a risk assessment has identified a lesser safe distance and any restrictions and conditions to be complied with;

(b) a copy of the risk assessment, restrictions and conditions contemplated, in paragraph (a) have been provided for approval to the Principal Inspector of Mines;

(c) shot holes written permission has been granted by the Principal Inspector of Mines; and

(d) any restrictions and conditions determined by the Principal inspector of Mines are complied with.

- Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002)

(Gazette No. 23922, Notice No. 1273 dated 10 October 2002. Commencement date: 1 May 2004 [Proc. No. R25, Gazette No. 26264])
Mineral and Petroleum Resources Development Regulations 67. Blasting, vibration and shock management and control

1) A holder of a right or permit in terms of the Act must comply with the provisions of the Mine Health and Safety Act, 1996, (Act No. 29 of 1996), as well as other applicable law regarding blasting, vibration and shock management and control.

2) An assessment of impacts relating to blasting, vibration and shock management and control, where applicable, must form part of the environmental impact assessment report and environmental management programme or the environmental management plan, as the case may be.

4 Alternative Assessment

In accordance with the requirements outlined in Appendix 2 of the EIA Regulations 2014, as amended, a consideration of reasonable and feasible alternatives, including site and technology alternatives and the “do-nothing” alternative must be undertaken. Each alternative is to be accompanied by a description and comparative assessment of the advantages and disadvantages that such development and activities will pose on the environment and socio-economy. When no feasible and/or reasonable alternatives can be identified and investigated in terms of a comparative assessment during the Scoping Phase, the EIA Report will then not contain a section with alternatives.

The EIA Regulations 2014, as amended, define alternatives as the different means of meeting the general purpose and requirements of the activity, which may include alternatives to:

- The property on which or location where it is proposed to undertake the activity;

- The type of activity to be undertaken;
- The design or layout of the activity;
- The technology to be used in the activity;
- The operational aspects of the activity; and
- The option of not implementing the activity.

Limited alternatives may exist for the project may exist for the Proposed Project.

The Department of Environmental Affairs (DEA) EIA guidelines necessitate the consideration of various development alternatives as part of the EIA process. The consideration of project alternatives is a key requirement of an EIA as it provides a basis for choice for the competent authority and I&APs. In the NEMA EIA Regulations, alternatives in relation to a proposed activity are defined as "different means of meeting the general purpose and requirements of the activity, which may include alternatives to the –

property on which or location where it is proposed to undertake the activity;

- type of activity to be undertaken;
- design or layout of the activity;
- technology to be used in the activity; and
- operational aspects of the activity.

Alternatives that are considered must be reasonable and feasible and should have the potential to reduce negative impacts that may occur due to the proposed Project. Alternatives are considered as a means of reaching the same need and purpose as the proposed Project in a way that minimises the impacts and maximises the benefits. The anticipated environmental impacts which these alternatives may pose have been discussed below.

The following alternatives were considered for the mining of the Nwabu Project:

- Mining method alternatives;
- Mining footprint;
- No-go option.

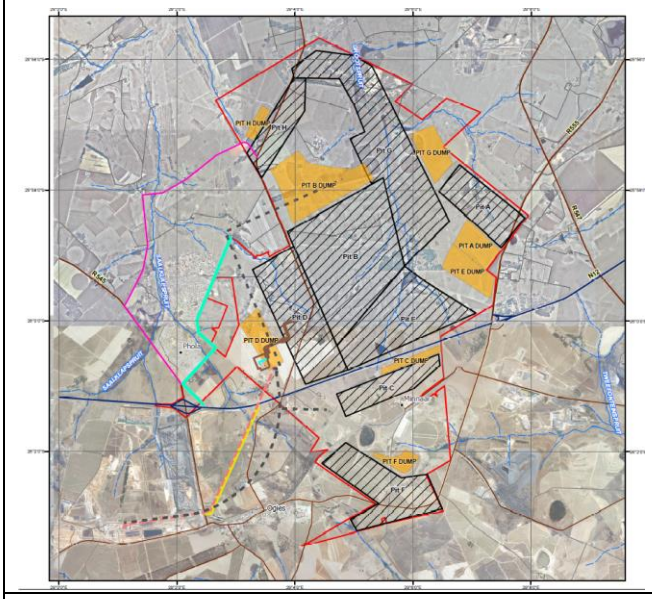
4.1 Mining Method Alternatives

An array of underground and surface mining techniques exists; however, technical and economic feasibility studies are required to determine which process/method is best. These studies are based on the regional geologic conditions, including characteristics of the site; seam continuity; thickness; structure; quality; and depth and strength.

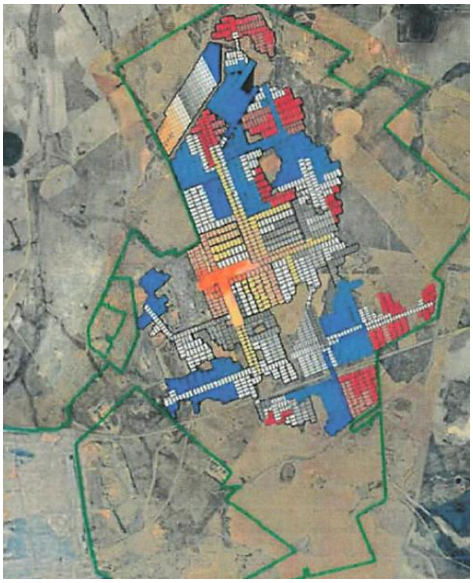
Both the OC mining method and the UG method were considered, where the UG mining was found to be the preferred mining strategy going forward due to the following reasons:

- The proposed area of mining has a significant number of wetlands which will be destroyed when using OC method;
- The destruction of wetlands requires rehabilitation compensation measures in other wetlands within the catchment which require significant financial resources;
- Most of the areas to be mined at KPSX had significantly higher strip ratios which would increase the mining expenses and waste management costs.

The OC mining considered and the UG preferred option are illustrated in **Figure 4-1** below.



OC Mining Alternative

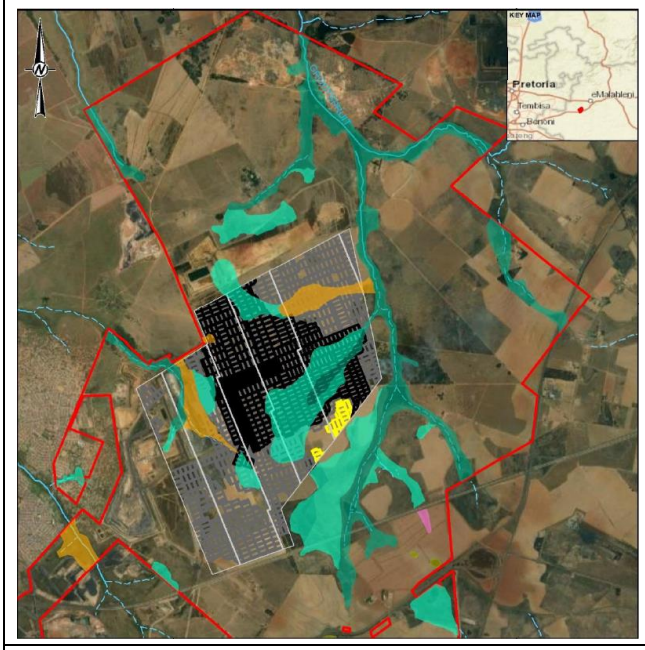


UG Mining (Preferred Option)

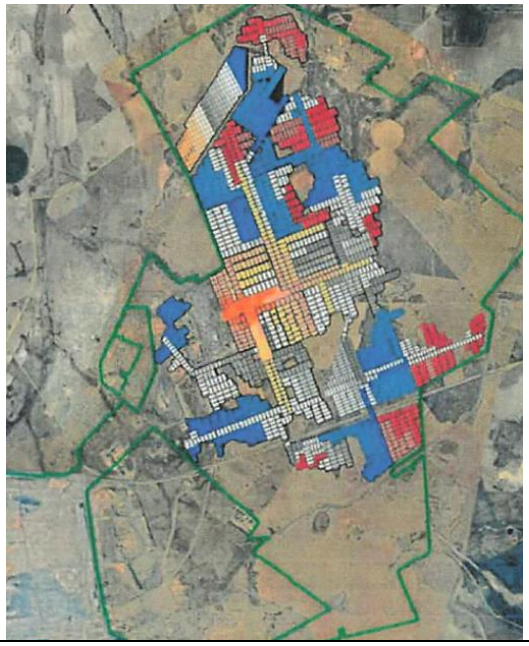
Figure 4-1: Mining Method Alternatives

4.2 Mining Footprint

As Pit BD mining has already been approved in 2017 for OC mining, KPS did consider only converting this pit to UG mining initially, as it was assumed that the authorisation process for the amendment would be quicker. However, the economic viability of the project was not adequate to sustain the project, hence the preferred alternative was to mine the economically viable reserves remaining at KPSX. The considered alternatives are illustrated in **Figure 4-2** below.



UG Mining Alternative- Only Pit BD



UG Mining _Whole Extent (Preferred Option)

Figure 4-2: Mining Footprint Alternatives

4.3 No-go Option

The No-go alternative was deemed non-viable as this would mean the current KPS OC pits would be depleted in 2039, resulting in the closure of the facility whilst the reserves are still available. This "premature" closure would also result in a shortage of coal to both Eskom and the Export market and impact negatively on the country's GDP. The ongoing capital investment planned for KPS for the development of UG and OC mining is estimated at R1.7 billion and will not be invested if the project does not continue.

5 Exclusion of Blasting Impact Study

With regards to the proposed expansion of Pit BD and the alteration of Pit H from opencast mining to underground mining, a Blasting Management Study was not deemed necessary as the mine does not intend on blasting.

This opinion addresses the exclusion of a blasting impact assessment study for a proposed expansion of Pit BD and Pit H underground Project that intends to utilize continuous miners. Continuous miners are specialized machines designed to cut and gather coal without the need for explosives. Given this mining method, it is pertinent to evaluate whether omitting a blasting impact assessment study is justified.

5.1 Continuous Miners

Continuous miners are advanced machines designed to remove coal efficiently and safely from underground mines. This sub-section delves into the mechanics of how continuous miners work, their benefits over traditional blasting methods.

Figure 5-1: A typical CM

5.1.1 How Continuous Miners Work

5.1.1.1 Components of a Continuous Miner

- Cutting Head: Equipped with a rotating drum fitted with tungsten carbide teeth that shear coal from the seam.
- Gathering Arms: Mechanisms that collect broken coal from the floor and feed it into the machine's conveyor system.

- Conveyor System: A series of belts that transport coal from the cutting area to the rear of the machine.
- Crawler Tracks: Tracks that enable the machine to move and position itself in the mine.
- Hydraulic System: Provides power to the cutting head and other moving components.
- Operator's Cabin: Enclosed area from which the operator controls the machine, often with remote control capabilities.

5.1.1.2 Operational Process

- Positioning: The machine is positioned at the coal face, where the seam is exposed.
- Cutting: The cutting head is activated, rotating and cutting into the coal seam. The head can be adjusted vertically and horizontally to reach the full extent of the seam.
- Gathering: Cut coal falls to the mine floor, where gathering arms scoop it onto the conveyor system.
- Conveying: The conveyor system transports coal to the rear of the machine, from where it is loaded onto shuttle cars, conveyor belts, or continuous haulage systems.
- Advancing: Once a section is mined, the machine advances to the next section, repeating the process.

5.1.1.3 Safety and Efficiency Features

- Remote Control Operation: Allows the operator to control the machine from a safe distance, reducing exposure to hazards.
- Dust Suppression: Water sprays reduce dust levels, improving air quality and minimizing respiratory risks.
- Roof Bolting: Some models are equipped with roof bolters to install roof support as the machine progresses.
- Monitoring Systems: Sensors and monitoring systems track performance, coal quality, and machine health.

5.1.2 Benefits of Continuous Miners Over Blasting Methods

Continuous miners are highly efficient at extracting mineral resources, often leaving behind fewer un-mined deposits. Their precise cutting and loading mechanisms maximize resource recovery, reducing waste and environmental impact. This not only benefits mining companies but also helps conserve valuable resources.

5.1.2.1 Enhanced Safety

One of the most significant positive effects of continuous miners is the improvement in safety for mine workers. These machines are designed to operate in confined spaces with minimal exposure to hazardous conditions. As a result, miners are less exposed to harmful dust, gases, and potential roof collapses. The controlled environment of a continuous miner cabin significantly reduces the risk of accidents, making mining operations safer for workers. In summary, CMs:

- Reduced Explosive Use: Eliminates the hazards associated with handling and using explosives.
- Remote Operation: Allows operators to control the machine from a distance, reducing exposure to dangerous conditions.

- Improved Air Quality: Dust suppression systems enhance air quality, reducing the risk of respiratory issues.

5.1.2.2 Increased Productivity

Continuous miners have significantly increased the rate at which coal and other minerals can be extracted from underground deposits. Unlike traditional methods, which rely on manual labour and slower equipment, continuous miners can operate 24/7, allowing for a continuous extraction process. This increased productivity has a positive impact on mining companies' bottom lines, as they can extract more material in less time.

5.1.2.3 Performance

A continuous miner offers trustworthy support at many coal production sites. Seriti has chosen this system for use in areas where they cannot safely perform longwall mining. However, the actual performance of a continuous miner machine depends upon several factors, including:

- The dimensions of the pillars in the mine
- The mine's ventilation scheme
- The company's haulage system

5.1.2.4 Improved Resource Recovery

Continuous miners are highly efficient at extracting mineral resources, often leaving behind fewer un-mined deposits. Their precise cutting and loading mechanisms maximize resource recovery, reducing waste and environmental impact. This not only benefits mining companies but also helps conserve valuable resources.

5.1.2.5 Reduced Environmental Impact

Continuous miners are designed to be more environmentally friendly than traditional mining methods. Their efficient extraction processes and reduced waste generation contribute to a smaller ecological footprint. Additionally, continuous miners are equipped with advanced dust control systems, minimizing air pollution and improving air quality in the surrounding areas.

- Reduced Vibration and Noise: Continuous miners generate less vibration and noise compared to blasting, minimizing disturbance to surrounding areas.
- Less Overbreak: More precise cutting reduces the amount of non-coal material extracted, minimizing waste.

5.1.2.6 Better Working Conditions

Continuous miners offer improved working conditions for miners. The enclosed cabin of the machine provides protection from harsh environmental conditions and noise, enhancing the comfort and well-being of operators. As a result, worker satisfaction and retention rates have improved in mines that utilize continuous miners.

5.1.2.7 Automation and Technological Advancements:

Continuous miners are equipped with advanced automation and monitoring systems, allowing operators to control and monitor the machine remotely. This reduces the need for workers to be in potentially dangerous areas of the mine. Furthermore, continuous miners can be equipped with sensors and data collection tools to gather valuable information about the mining process, leading to more informed decision-making and improved operational efficiency.

5.1.2.8 Versatility

Continuous miners are versatile machines that can be adapted for various mining applications, including coal, salt, potash, and more. Their flexibility makes them suitable for a wide range of geological conditions, allowing mining companies to use them in different locations and mining projects.

5.1.2.9 Efficiency

While the initial investment in continuous miners may be substantial, their long-term benefits in terms of increased productivity and reduced operating costs are undeniable. They require less maintenance and have longer lifespans compared to older mining equipment, making them a cost-effective choice for mining companies in the long run.

- Increased Productivity: Continuous miners can remove large volumes of coal quickly and continuously, unlike the intermittent process of blasting.
- Reduced Downtime: Continuous operation minimizes downtime associated with setting up and detonating explosives.

5.1.2.10 Operational Flexibility

- Adaptability to Seam Conditions: Continuous miners can operate in a variety of coal seam conditions, including thin seams and irregular formations.
- Consistent Coal Quality: Continuous mining produces a more uniform coal product, improving overall quality control.

Continuous miners are a critical component of the coal mining industry. Although drilling costs increase, as Continuous Mining utilizes twice to three times as many holes as conventional blasting therefore an increase in explosive costs per hole, and explosive costs are significantly higher than conventional blasting, these machines enhance productivity and safety, contributing to the efficient extraction of coal in diverse geological conditions. Continuous miners represent a significant advancement in underground coal mining technology. Their ability to improve efficiency, safety, and environmental impact makes them a preferred choice over traditional blasting methods. In South Africa, the adoption of continuous miners has revolutionized coal mining, driving productivity and enhancing safety standards in the industry.

5.2 Technical Rationale

Continuous miners are employed in underground coal mining to extract coal from seams without the use of explosives. These machines operate using a rotating cutting head equipped with tungsten carbide teeth to shear coal from the seam. The coal is then gathered by mechanical arms and transported via conveyor systems. The primary advantages of continuous miners include:

- Elimination of Explosives: Continuous miners do not require explosives, thereby negating the associated risks and impacts of blasting.
- Reduction of Vibration and Noise: The cutting action of continuous miners produces significantly less vibration and noise compared to blasting.
- Dust Control: Continuous miners are often equipped with dust suppression systems, minimizing airborne particulates.

5.2.1 Environmental Impacts

The use of continuous miners significantly alters the environmental impact profile of the mining operation. Key considerations include:

- Air Quality: Blasting generates substantial dust and releases gases such as NOx and CO2. Continuous miners, with integrated dust suppression systems, drastically reduce airborne particulate matter.
- Ground Vibration: Blasting induces ground vibrations that can affect structural integrity and stability of nearby infrastructure. Continuous miners produce minimal vibration, mitigating this risk.
- Noise Pollution: The detonation of explosives produces high levels of noise, impacting both workers and nearby communities. Continuous miners operate at lower noise levels.
- Seismic Activity: Blasting can induce minor seismic events. Continuous mining avoids this risk altogether.

5.2.2 Regulatory Compliance

Excluding a Blasting Impact Assessment is consistent with regulatory frameworks that align assessments with actual operational practices. Key points include:

- Accuracy and Relevance: Including a blasting impact assessment for a mine that will not use blasting would provide irrelevant data, leading to unnecessary analysis and potential misdirection in environmental management plans.
- Focused Mitigation Strategies: Assessments should focus on pertinent impacts, such as those from continuous mining operations. This ensures that mitigation strategies are targeted and effective.

6 Recommendations

The following recommendations have been made for the Nwabu Project:

- Regulatory Adherence: Ensure compliance with all relevant environmental regulations specific to continuous mining methods.
- Stakeholder Communication: Clearly communicate the rationale for excluding a blasting impact assessment to stakeholders, emphasizing the safety and environmental benefits of continuous mining.
- Ongoing Monitoring: Implement robust monitoring systems to continually assess and mitigate the impacts of continuous mining operations on the environment and surrounding communities.

This approach ensures that environmental assessments remain relevant, targeted, and effective, aligning with best practices and regulatory requirements while promoting sustainable mining operations.

7 Conclusion

The exclusion of a Blasting Impact Assessment Study for the proposed Nwabu Project using continuous miners is technically and environmentally justified. Continuous mining operations inherently avoid the environmental and safety impacts associated with blasting, including air quality degradation, ground vibration, noise pollution, and seismic activity. Therefore, focusing on relevant impact assessments related to continuous mining will provide a more accurate and effective environmental management strategy.

8 Specialist Opinion

An impact statement is required as per the NEMA regulations with regards to the proposed Nwabu Project.

It is the opinion of the specialist that the proposed Nwabu Project be authorised provided that all mitigation measures are implemented, particularly as the proposed conversion of opencast mining to underground mining will result in a reduction of impacts to the overall environment.

V. Ribeiro

Vumile Ribeiro

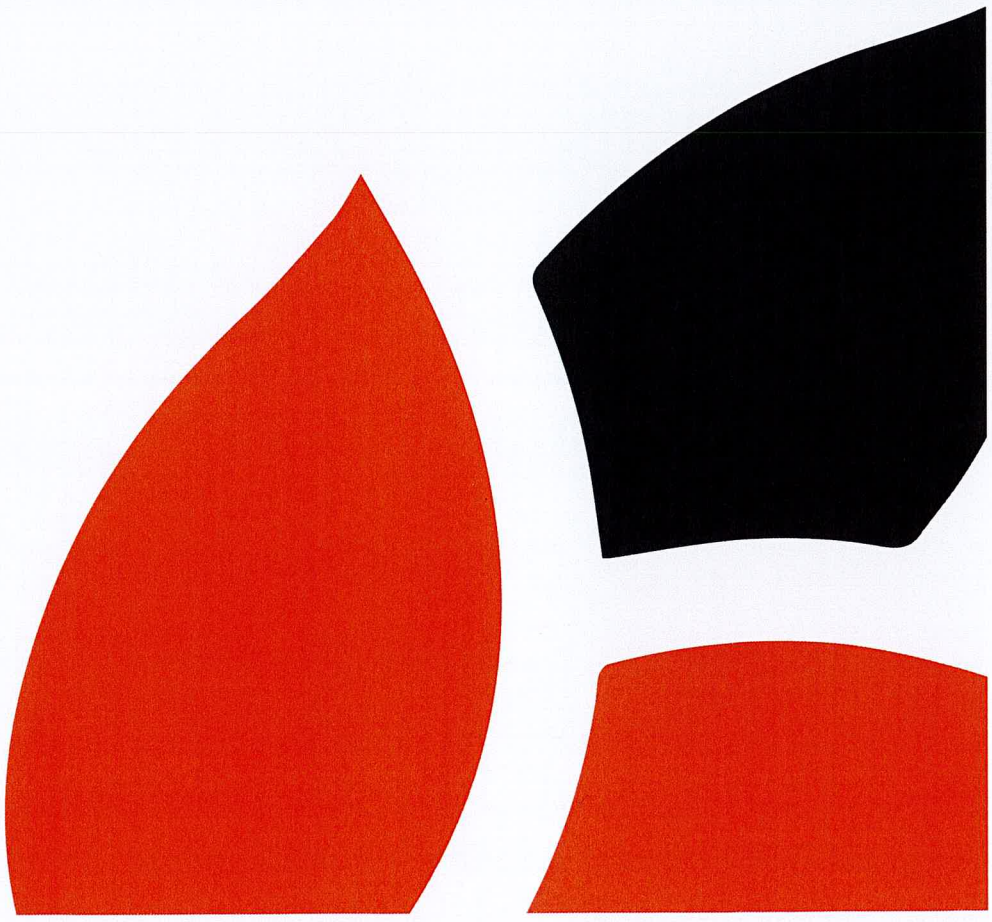
Environmental Assessment Practioner (EAP)

Appendix A: Klipspruit Colliery Underground Mining Method Statement

OH&S GEN FM 006 CMS ALPHA METHOD STATEMENT KLIPSRUIT UNDERGROUND COLLIERY

Seriti Power (Pty) Ltd

Author:	TM Prinsloo
Doc No:	OH&S GEN FM 006
Version:	1.1
Issued:	2023/11/22
Review Due:	2024/11/22
Classification:	INTERNAL



Authorisations	Name	Description	Signature	Date
Author	TM Prinsloo	Chief Safety Officer		12/12/2023
Reviewed by	John Tichana	Section Engineer		12/12/23
Reviewed by	Tshepo Mbonani	Production Manager		12/12/2023
Approved by	Lesiba Chuene	Mine Manager	T. L Chuene	12/12/23.

1. Method Statement
    a. People **(Annexure A)**
        i. Requirements (in terms of qualifications, certification, appointments, and authorisations)
        ii. Capability (experience and skills)

    b. Equipment and Tools **(Annexure B)**
        i. Type and number of
        ii. Requirements (e.g. flameproof, certified – available at Engineer on request))

    c. Activities
        i. Excavations, 11kV, roof support, building, working at heights, etc)

- All underground equipment will be required to be flameproof in accordance with SANS 868-4 (For underground vehicles not within 200 meters from face)

  Compression-ignition engine systems and machines powered by such engine systems, for use in mines and plants with explosive gas atmospheres or explosive dust atmospheres or both Part 4: Non-hazardous locations in underground coal mines.

2. Al working at hights will be managed according to KPS_UG_PROD_028

   All electrical installations will be conducted in accordance to KPS_UG_COP_ENG_001 Lockout and De-Energise and KPS_UG_COP_ENG_007 Managing Electricity Reticulation

3. Baseline risk assessment was done and approved - KPS_UG_BLRA_001

SCOPE OF WORK and METHOD STATEMENT

The Scope of Work (SOW) and Method Statement for the Main Contract consists of the Underground Mining Operations of the #4 Seam and #2 Seam. This includes the Early Works to support of the proposed #2 Seam Highwall at Klipspruit Colliery, Pit BD, and to do the portal development as per the mining plan for the proposed #2 Seam Underground Mine. It also includes mining by means of production units and all associated activities such as transporting of the coal out to the mine entrance, water supply, power supply, dewatering, ventilation and road building of both the #4 Seam and #2 Seam. Further more the scope includes the development through any geological structures by means of drilling and blasting and its associated support. The scope also includes the Mining Technical Services such as Ventilation and Occupational Hygiene (VOHE), Mine Surveying, Mine Planning, Rock Engineering and Geology for all the associated mining activities. Included in the scope is also the establishment and construction of all associated main infrastructure such as the main substation, service water Ericson dams and pump stations, Offices, Change Houses, Proto Room, Control Room, Surface Workshop, Sewerage Facility, Diesel Bay, Oil Separator and Parkings for private vehicles.

The Main Contract consist of five (5) distinct activities:

1. Project Management
2. Site Establishment
3. Highwall Support
4. Portal Development
5. Underground Mining
6. Technical Services

Project Management

The proposed contractor to provide a team to assist Seriti with the planning and execution of the proposed project, including the following activities:

a. Planning of Underground Mining Operation:;
b. management and change management involving Seriti and Stakeholders
c. Final position of offices and facilities and logistics integration with current operations
d. Site Establishment of Permanent Infrastructure
e. On-boarding of Mining Teams
f. On-Boarding of Service Providers

Site Establishment

All Site Establishment activities will be on a transparent cost basis, the project team must endeavour to optimise site establishment through realising opportunities with used equipment and integration with permanent infrastructure. Activities include:

1. Site Preparation, preparation performed by Opencast Operations, make provision limited preparation work.
2. Offices, for Operational Teams and Contractors.
3. Change houses for Operational Teams and Contractors
4. Permanent power
    a. 22kV Auto-Reclosure with protection relay and remote switching, pole mounted complete with control transformer and earth-able gang-link for isolation purposes for both supplies.
    b. 20 MVA 22kV/11kV transformers complete with NER
    c. Two (2) containerised sub-stations with ten (10) 11kV breakers complete with protection relays and Ground Continuous Monitors (GCM) on all outgoing breakers required. Breakers required:
        i. Incomer
        ii. Underground Feeder 1
        iii. Underground Feeder 2
        iv. Yard / Utility Supply
        v. Local supply
        vi. Ventilation Fan supply
        vii. Power Factor Correction
        viii. Spare

ix. Spare
x. Bus section

d. Fencing of electrical yard, including pedestrian and truck access gates
e. All cables
f. Legal compliance signages and notices

5. Service water
   a. Design and Construct Ericsson dams and pump stations
   b. 2 of 1.5 million litre dams and 800 liter per minute pump stations
6. Lamproom
   a. Capacity to accommodate all lamps for all employees and contractors
   b. Rescue Packs
   c. All testing and monitoring equipment to be fully legally compliant including
      i. PDS Check-out stations
      ii. Handheld Gas Testing instruments
      iii. Air Velocity Testing instruments
7. Control Room and Communication
   a. Establish an effective communication system
   b. Establish Control Room for managing communication and monitor operations
8. Proto Room
9. Sewerage Facility
10. Parking for private vehicles
11. Conveyors
    a. Conveyor drive complete with stockpile capacity to allow operations to stockpile coal (approximately 4000+ tons), and
    b. Main Trunk Conveyors to handle three sections' production, and
    c. Section conveyors for the first 1000m of conveyor complete with belt and all safety devices
12. Portal canopies
    a. Portal canopies complete with structural design and certification for at least 7 entries to accommodate access
13. Surface Workshop for Boilermaker and Diesel Equipment
14. Diesel Bay and Oil Separator

Highwall Support

Support the highwall to ensure long term (15 to 20 year) safe access to portal and mine. Total of nine (9) headings. Scope includes:

1. Establish highwall standard and final design in conjunction with Rock Engineers and Opencast Operations.
2. Agree on handover standards and conditions.
3. Compile final Scope of Work for Highwall Support and test the market in terms of competitive bidding to identify suitable contractor based on both technical availability and value.
4. Proposed Method Statement

a. Complete Contractors Pack complete with detail Method Statement, Risk Assessments and Project Schedule
b. Site establish with all equipment and facilities
c. Take over Highwall from opencast, including final assessment in terms of support and additional cleaning requirements
d. Survey portal positions and agree on final support requirements
e. Establish safe working environment on #3 Seam bench
f. Scrape highwall with chains if required to dislodge loose material
g. Install life-line on #3 Seam bench
h. Anchor mesh and support systematically from top, support only planned for portal areas, above entrances.
i. Access with a Mobile Elevated Platform (MEP) – Seriti Standard (Eazi Access)
j. Mesh, oslo straps and anchors as per Rock Engineering Recommendations and site conditions.
k. Support brow after establishment and primary support from Portal Development Team, install face trusses, additional support and anchors as per Rock Engineering recommendations and site conditions.
l. Anchors and additional support for portal development as required
m. Wrapping of portal pillars as per as per Rock Engineering recommendation
n. Apply shotcrete on wrapped pillars and as dictated by Rock Engineer and site conditions

5. Install portal canopies for safe access.

Portal Development

The establishment of eight (8) portal pillars, develop nine (9) roads of 30m and first trough road developed and supported as per Rock Engineering recommendations and site conditions.

1. Site establishment to enable safe Continuous Miner operations, including electricity supply, water supply, ventilation and effective communication and monitoring of operations.
2. Agree site Traffic Management Plan and Layout to enable safe operations and separate Opencast and Underground Operations.
3. Develop cutting and support sequence in conjunction with Highwall Support
4. Mine and support portals as per Mine Design
5. Mining (Portal Development) number of shifts to be optimised for project schedule and risk management
    a. Start core team on one shift
    b. Second shift only established based on conditions, risk and project schedule
6. Integrate with Highwall Support Contractor to perform additional support, pillar rapping and shotcrete as per Rock Engineering recommendations and site conditions.
7. Optimise cutting sequence for roof support and ventilation purposes.
8. Establish trough ventilation and monitoring for first production section.
9. Sign off Portal Development with Rock Engineers, VOHE and Mining Operations

1.

2. Underground Mining

1. Underground mining by is done by means of board and pillar mining of production sections utilising mining equipment that consist of the following equipment and activities in the section:
    a. Continuous Miner, cutting and loading of coal
    b. Roof Bolter, supporting mined headings
    c. Shuttle cars, transporting coal from the continuous miner to the tip at the feeder breaker and offloading the coal at the tip
    d. Feeder Breaker, crushing the coal and loading it onto the conveyor belt system
    e. Battery Scoop or LHD, cleaning the section by means of sweeping the floors as well as loading and transporting material
    f. Conveyor Belts, transporting the coal out the mine
2. It also includes the associated activities to the mining cycle such as:
    a. Water supply to the underground sections, conveyor belts, fire hydrants and fire suppression systems
    b. Power supply to the underground equipment by means of a MV reticulation system
    c. Dewatering the underground workings by means of water pumps into a reticulation of pump columns through transfer dams to the surface to PCD dams
    d. Ventilation of the underground workings by means of a extraction main ventilation fan and ventilation structures such as ventilation walls, ventilation doors, air crossings and brattices
    e. Road building of both the #4 Seam and #2 Seam access roads to each production section
3. Further the scope includes the development by means of blasting and its associated support work for:
    a. Drilling, blasting and support of air crossings to increase the mining height to for the required ventilation flow
    b. Drilling, blasting and support of geological structures such as dykes and faults

3.

Technical Services

1. Mine Planning Services of the following:
    a. 90 days rolling plan.
    b. Ongoing monthly planning.
    c. Generate weekly & monthly production plans.
    d. Present weekly, monthly, 3 month and yearly Plan.
    e. Mine design and Production Scheduling on selected software.
    f. Monthly Target using Month-end Faces.
    g. Monthly Forecast and plans with daily Targets using adjusted and committed capacity.
    h. Monitor Primary Capacity i.e. Exposure machines, Extraction machines, drilling and blasting, water management.

i. Interdepartmental engagements e.g. Interaction with the long-term planner to align the short-term plan with the company's life of mine plan.
j. Site visit and data collection to create a design criterion that will be representative of the current mining operation.
k. Planning management and control to ensure the business goals are being met, and there is a clear definition of the scope for the mine planning department.
l. Provide further Planning assistance which may not been covered in the above mentioned.

2. Survey services of the following:
   a. Survey of surface features and infrastructure for updating of mine plans
   b. ROM and product stockpile survey (on the mine)
   c. Underground ventilation and rescue plans
   d. Underground alignment – setting out of pegs and direction lines
   e. Survey and offsetting of underground section for the calculation and reporting on the advance and production
   f. Recording of data for updating mine plans and as required in terms of Chapter 17 of the Mine Health and Safety Act of 1996
   g. Mine planning layout survey plans
   h. Underground traffic management plans
   i. Additional Services:
      i. Topographical survey (conventional, walk-GPS, laser scanning)
      ii. Aerial laser scanning and/or the preparation thereof
      iii. Aerial photography and/or the preparation thereof
      iv. Off-site stockpile measures
      v. Setting out of Engineering Works
   j. Survey Report:
      i. Underground production – overburden and ore quantities
      ii. Coal on Stockpile (per site/per sizing)
      iii. Mining notes and notification in terms of Regulation 7.10
      iv. Walls & concrete works quantity survey report
   k. Plans:
      i. Mine plans (general)
      ii. Working plans (general)
      iii. Risk Assessment plans
3. Ventilation and Occupational Hygiene Services
   a. Correspondence with the DMRE relating to Ventilation and Occupational Hygiene
   b. Occupational hygiene monitoring of silica, PNOC, coal dust, noise, thermal stress, and potable water, if the Risk Assessment indicates additional quantification and monitoring is required for hazards
   c. Additional work derived from DMR directives
   d. Continuous Miner (CM) Dust Sampling:
      i. laboratory analysis & reporting.
   e. Stonedust Sampling

f. Lamproom Inspections
    i. gravimetric dust pumps, vane anemometers or ventilation meters, mobile gas detectors or testers and SCSR's.
g. DMR Audits
    i. Ventilation Occupational Hygiene Auditing
h. Ventilation Occupational Hygiene Training & Awareness (Induction)
i. Investigations:
    i. Occupational Hygiene Over Exposure Investigations
    ii. Occupational Diseases Investigations
    iii. Ventilation. Gasses, Fire Explosion Investigations
j. Ventilation Planning:
    i. Long Term (Life Of Mine)
    ii. Medium Term
    iii. Short Term (VOHE Layouts)
k. Ventilation simulation modelling

4. Rock Engineering
    a. Rock engineer inspections, audits, FOG assessments, assessments of underground production sections, special area visits as well as back areas
    b. Rock engineer visit reports stating findings of routine assessments. Including update of geotechnical hazard plan and administrative duties
    c. Pre-emptive risk assessments for new mining panels
    d. Mining dimensions reconciliation report
    e. Roof Support Material Quality Control
    f. Installed support product quality assurance through in-situ pull testing and report on the findings
5. Geology
    a. Grade Controller weekly visits per section
    b. Report in terms of compliance to mining to the correct horizon for each section
    c. Coal samples from each section of representative of the mining horizon being mined
    d. Reports of coal qualities for each section
    e. Collaboration with Seriti Geologist and reporting

Annexure A (Clear skills matrix available on request)

JOB DESCRIPTION	TRADE CERTIFICATE	COMP A	COMP B	GAS TESTING	GASTESTING OPERATORS	BASIC RIGGING & SLINGING	WORKING @HEIGHTS	BLASTING ASSISTANT	LOCK OUT	FLAME PROOF CERTIFICATE	PDS TRAINING	ROOF BOLTER LICENSE	CM LICENSE	SCLICENSE	SCOOP LICENSE	STONEDUSTER	MPV	TRACTOR	FACE DRILL	SKIDSTEER	LHD	NON FLAME PROOF LDV	POWER ACTUATE TOOL	FEL	CONVEYOR BELT TRAINING	GAS CUTTING AND WELDING	CABLE JOINT TRAINING	POWER TOOLS TRN	MEDIUM VOLTAGE	DOVER	MATERIAL HANDLING	MONITOR	BASIC HAND TOOLS	INSPECTION OF FLAMEPROOF EQUIP	CABLE JOINTER	OEM SYSTEMS TRAINING	Hazchem	LEGAL LIABILITY	SELF CONTAIN RESCUE PACK	SENTINAL INSTRUMENT	SHE REP COURSE	LAMPSMAN CERTIFICATE	FIRST AID	KLOPPERSBOS	SERITI SOP INDUCTION	SERITI CLASS ROOM INDUCTION	ON SITE INDUCTION	FATIGUE MANAGEMENT	CONVEYOR AUTHORISATION	HAZCHEM APPOINTMENT	LIFTING AUTHORISATION	LEGAL APPOINTMENT	STEEL HAMMER AUTHORISATION	UTILITY KNIFE AUTHORISATION
BELT CREW						X	X		X		X													X				X			X		X														X		X	X
BELT DRIVE OPERATOR						X	x		X		X													X						X		X														X				X
BELT MAN	X	X		X		X	x		X		X													X						X		X					X	X								X		X	X	X	X
BOILERMAKER	X			X		X	X		X	X	X											X			X	X		X		X	X	X					X	X								X	X	X	X	X
BOILERMAKER ASSISTANT						X	X		X		X														X	X		X			X	X						X	X								X	X	X	X	X
CABLE REPAIRER						X			X		X																X	X			X	X	X					X	X								X	X	X	X	X
CM OPERATOR					X	X			X		X		X												X				X	X	X	X						X	X								X	X	X	X	X
CONTROL ROOM OPERATOR																																			X	X												X	X	X	X	X
DIESEL MECHANIC	X			X		X	X		X	X	X					X	X	X			X	X		X				X	X	X	X	X	X			X	X	X	X								X	X	X	X	X
DRIVER									X																						X							X										X	X	X	X	X
ELECTRICAL ASSISTANT						X	X		X		X						X	X				X			X			X	X	X		X	X	X			X		X								X	X	X	X	X
ELECTRICAL FOREMAN	X			X		X	X		X	X	X	X	X	X	X		X	X				X			X			X	X	X	X	X	X	X			X	X	X	X								X	X	X	X	X
ELECTRICIAN	X			X		X	X		X	X	X	X	X	X	X			X				X			X		X	X	X	X	X	X	X	X			X	X	X	X								X	X	X	X	X
ENGINEER	X			X					X	X	X							X				X								X							X	X	X								X	X	X	X	X
ENGINEERING CLERK											X																			X						X			X								X	X	X	X	X
FACE DRILL OPERATOR			X		X	X		X	X		X								X										X	X		X	X					X	X								X	X	X	X	X
FITTER	X			X		X	X		X	X	X	X	X	X	X			X				X			X			X	X	X	X	X	X			X	X	X	X								X	X	X	X	X
FRONT END LOADER										X	X													X						X	X			X				X	X								X	X	X	X	X
FITTER ASSISTANT						X	X		X		X							X				X			X	X		X	X	X		X	X			X		X								X	X	X	X	X
DIESEL ASSISTANT						X	X		X		X							X				X			X	X		X		X		X	X			X		X								X	X	X	X	X
FITTER FOREMAN	X			X		X	X		X	X	X	X	X	X	X		X	X		X		X			X	X		X		X	X	X	X	X			X	X	X	X								X	X	X	X	X
FULL TIME HSE REP						X			X		X														X						X		X						X								X	X	X	X	X
HR CLERK											X																				X						X											X	X	X	X	X
LAMPSMAN				X					X	X	X																				X		X	X		X						X	X	X	X	X	X	X	X	X	X	X	X	X
LAMPSMAN ASSISTANT				X					X	X	X																				X		X	X		X						X	X	X	X	X	X	X	X	X	X	X	X	X
LEARNER BOILERMAKER				X		X	X		X	X	X											X			X	X		X	X	X	X		X	X		X						X	X	X	X	X	X	X	X	X	X	X	X
LEARNER DIESEL MECHANIC				X		X	X		X	X	X											X			X	X		X	X	X	X		X	X		X						X	X	X	X	X	X	X	X	X	X	X	X
LEARNER ELECTRICIAN				X		X	X		X	X	X											X			X	X		X	X	X	X		X	X		X						X	X	X	X	X	X	X	X	X	X	X	X
LEARNER FITTER				X		X	X		X	X	X											X			X	X		X	X	X	X		X	X		X						X	X	X	X	X	X	X	X	X	X	X	X
LEARNER MINER				X		X			X	x	X											X	X		X				X	X	X		X			X						X	X	X	X	X	X		X	X	X	X	X
LHD OPERATOR						X			X		X										X		X		X			X		X	X		X	X		X						X	X	X	X	X	X						
MINE MANAGER	X			X					X	X	X											X			X					X		X	X				X	X								X	X	X	X	X	X
MINE OVERSEER	X			X		X			X	X	X											X			X					X		X	X				X	X								X	X	X	X	X	X
MINER	X	X		X		X			X	X	X											X	X		X					X	X	X	X				X	X								X	X	X	X	X	X
MPV OPERATOR						X			X		X					X	X						X		X			X		X	X		X	X				X	X								X	X	X	X	X	X
PUMP ATTENDANT						X	X		X		X														X			X		X			X					X	X								X	X	X	X	X	X
ROOFBOLTER OPERATOR			X		X	X		X	X		X	X													X					X	X		X	X				X	X								X	X	X	X	X	X
SAFETY OFFICER	X			X		X	X		X	X	X											X			X					X							X	X								X	X	X	X	X	X
SCOOP OPERATOR						X			X		X				X										X					X		X	X				X	X								X	X	X	X	X	X
SENIOR FOREMAN	X			X		X			X	X	X											X			X					X		X	X				X	X								X	X	X	X	X	X
SHIFTBOSS	X	X		X		X			X	X	X											X	X		X					X	X	X	X				X	X								X	X	X	X	X	X
SHUTTLECAR OPERATOR						X			X		X			X								X			X					X	X		X					X								X	X	X	X	X	X
SKID STEER OPERATOR						X			X		X								X			X	X		X			X		X	X		X					X								X	X	X	X	X	X
STONEDUSTER OPERATOR						X			X		X					X	X						X		X			X		X	X		X					X								X	X	X	X	X	X
STORE CLERK											X																			X								X								X	X	X	X	X	X
SUPERVISOR				X					X		X											X								X	X		X					X								X	X	X	X	X	X
SUPERVISOR PUMPS						X			X		X																				X		X					X								X	X	X	X	X	X
SUPERVISOR TRANSPORT						X			X		X					X	X	X				X								X	X		X					X								X	X	X	X	X	X
TECHNICIAN	X			X		X	X		X	X	X											X			X		X	X	X	X	X		X	X	X			X	X	X	X								X	X	X	X	X
TRACTOR						X			X		X							X				X			X			X		X	X		X	X				X	X								X	X	X	X	X	X
TRAINEE SAFETY OFFICER	X			X		X			X		X											X								X	X		X						X	X								X	X	X	X	X	X
TRAINING CO-ORDINATOR	X	X	X	X		X					X											X			X			X		X	X	X	X						X	X								X	X	X	X	X	X
TRAINING INSTRUCTOR		X	X	X		X					X											X			X			X		X	X	X	X						X	X								X	X	X	X	X	X
UTILITY					X	X	x		X		X												X		x					X		X							X	X								X	X	X	X	X	X
SAFETY CLERK											X																			X								X	X								X	X	X	X	X	X

Annexure B

	ASSETS	MODEL	FLEET NO:/REGISTRATION	MAKE
		TRACKLESS MOBILE MACHINES		
1	LDV	2.4 DG 2X4 KING CAB	CMS-003 (JVN 082 MP)	TOYOTA
2	FORTUNER	2.8 DG6 4X4	CMS-002 (JDG 943 MP)	TOYOTA
3	FORTUNER	2.8 DG6	JST 735 MP	TOYOTA
4	DYNA	HINO 200	CMS-004	HINO
5	BUS	FTR 850	CMS-005	ISUZU
6	DELIVERY TRUCK	HINO 300	CMS-006	HINO
7	LHD	LS 312	LHD-001	SANDVIK
8	LHD	LS 312	LHD-002	SANDVIK
9	CONTINUOUS MINER	12HM31	SACM-7208	ACC
10	CONTINUOUS MINER	MC430	MC430-012	SANDVIK
11	CONTINUOUS MINER	MC430	MC430-014	SANDVIK
12	CONTINUOUS MINER	MC430	MC430-015	SANDVIK
13	ROOF BOLTER	FLETCHER 3.8	RB-001	IMMS
14	ROOF BOLTER	FLETCHER 3.8	RB-002	IMMS
15	ROOF BOLTER	FLETCHER HDDR 4.5	RB-008	IMMS
16	SHUTTLE CAR	HC 14 B-56	SC-001	PHILLIPS
17	SHUTTLE CAR	HC 14 B-56	SC-002	PHILLIPS
18	SHUTTLE CAR	10SC32 - 64AB	CMS-SC-003 SASC1272A	KOMATSU
19	SHUTTLE CAR	10SC32 - 64AB	CMS-SC-004 SASC1259A	KOMATSU
20	SHUTTLE CAR	10SC32 - 64AB	CMS-SC-005 SASC1256A	KOMATSU
21	SHUTTLE CAR	10SC32 - 64AB	CMS-SC-006 SASC1260A	PHILLIPS
22	SHUTTLE CAR	10SC32 - 64AB	CMS-SC-007 SASC1258A	PHILLIPS
23	SHUTTLE CAR	10SC32 - 64AB	CMS-SC-008 SASC1257A	PHILLIPS
24	FEEDER BREAKER	U12C4P7 LSFB	FB301	IMMS
25	FEEDER BREAKER	JAE21365	CMS-FB-001	JAE
26	FEEDER BREAKER	JAE21374	CMS-FB-002	JAE
27	FEEDER BREAKER	JAE21381	CMS-FB-003	JAE
28	CAT 966GC	966 GC	CMS-001	CAT
29	DIESEL BOWSER	FIXED BOWSER ON SKIDS	CMS-DB-001	GILBARCO AFS
30	STONEDUSTER	Bateleur	SD-16	BIRD
31	SCOOP	PG959	CMS-SCOOP-001	PHILLIPS
32	TRACTOR	INYATHI	CMS-TRACTOR-001	ELGIN
33	TRACTOR	INYATHI	CMS-TRACTOR-002	ELGIN

	ASSETS	MODEL	FLEET NO:/REGISTRATION	MAKE
		ELECTRICAL APPARATUS		
1	POWER TRANSFORMER	5MVA 22KV - 11KVA	1000V LOAD CENTRE	PINNACLE TRANSFORMERS
2	CONTAINERISED SUBSTATION	11KV CONTAINERISED SUB	TEMPORARY MAIN SUB	DIMAKO
3	SWITCHGEAR	1X 11KV INCOMER + 5 FEEDERS	INSIDE 11KV MAIN SUB	ABB
4	CONTAINERISED SUBSTATION	11KV CONTAINERISED SUB	TEMPORARY #4 SEAM BOX CUT SUB	DIMAKO
5	NON-FLP RMU	3-WAY SPLITTER - 11 KV	INSIDE 11KV #4 SEAM BOX CUT SUB	DIMAKO
6	NON-FLP RMU	3-WAY SPLITTER - 11KV	INSIDE 11KV #4 SEAM BOX CUT SUB	DIMAKO
7	POLE TRANSFORMER	100 KVA 22KV - 400V	POLE MOUNTED TRANSFORMER	
8	AUTO-RECLOSER	27KV 630/800A	NOJA POWER AUTO RECLOSER	NOJA POWER
9	MINISUB	630 KVA 11KV - 420V	MINISUB - MAIN SUB	DIMAKO
10	FLP SECTION 40 LOAD CENTRE	1250 KVA 11KV-1000V	1000V LOAD CENTRE	DIMAKO
11	FLP SECTION 41 LOAD CENTRE	1250 KVA 11KV-1000V	1000V LOAD CENTRE	DIMAKO
12	FLP SECTION 42 LOAD CENTRE	1250 KVA 11KV-1000V	1000V LOAD CENTRE	DIMAKO
13	NON-FLP RMU	3-WAY SPLITTER - 1000V	FEED TO #4 SEAM	DIMAKO
14	NON-FLP RMU	3-WAY SPLITTER - 1000V	FEED TO 2# SEAM	DIMAKO
15	NON-FLP TRANSFORMER	630 KVA 11kV - 1000V	#4 SEAM BOX CUT TRANSFORMER	DIMAKO
16	NON-FLP TRANSFORMER	630 KVA 11kV - 1000V	#2 SEAM BOX CUT TRANSFORMER	DIMAKO

	ASSETS	MODEL	FLEET NO:/REGISTRATION	MAKE
			CONTAINERS	
1	CONTROL ROOM		12 X 3 M CONTAINER	
2	LAMPROOM		12 X 3 M CONTAINER	
3	LAMPROOM		12 X 6 M CONTAINER	
4	MINE MANAGER AND MINE ENGINEER		12 X 3 M CONTAINER	
5	GES AND MINE OVERSEER		12 X 3 M CONTAINER	
6	BOARDROOM		6 X 6 M CONTAINER	
7	KITCHEN AND PRINTER ROOM		6 X 3 M CONTAINER	
8	SANDVIK OFFICE		6 X 3 M CONTAINER	
9	STORES OFFICE		6 X 3 M CONTAINER	
10	STORE ROOM		6 X 3 M CONTAINER	
11	ADMIN STAFF OFFICES		12 X 3 M CONTAINER	
12	SURFACE SPARES		6 X 3 M CONTAINER	
13	SURFACE SPARES		6 X 3 M CONTAINER	
14	SANDVIK SPARES		6 X 3 M CONTAINER	
15	MALE CHANGEHOUSES		12 X 6 M CONTAINER	
16	FEMALE CHANGEHOUSE		12 X 3 M CONTAINER	
17	UG ENGINEERING STORE		12 X 3 M CONTAINER	
18	UG ENGINEERING STORE		12 X 3 M CONTAINER	
19	UG MINING STORE		12 X 3 M CONTAINER	
20	UG MINING STORE		12 X 3 M CONTAINER	
21	UG WORKSHOP		12 X 3 M CONTAINER	
22	MALE CHANGEHOUSES		12 X 6 M CONTAINER	
23	FEMALE CHANGEHOUSE		12 X 3 M CONTAINER	
24	OFFICIALS CHANGEHOUSE		12 X 3 M CONTAINER	

	TEMPORARY INFRASTRUCTURE	
1	DAM & PUMP STATION 4#	ELECTRICAL PUMP PANEL, 6kW PUMP AND MOTOR
2	DAM & PUMP STATION 4#	ELECTRICAL PUMP PANEL, 6kW PUMP AND MOTOR
3	DAM & PUMP STATION 2#	ELECTRICAL PUMP PANEL, 6kW PUMP AND MOTOR
4	TEMPORARY VENTILATION FAN	JET FAN, 45kW WITH SILENCERS
5	TEMPORARY VENTILATION FAN	DONKIN 75kW VANAX-1 1800-E-1/1
6	TEMPORARY VENTILATION FAN	132kW
7	STONEDUST SILO	BIRD MACHINES STONEDUST SILO 1
	SECTION 40 EQUIPMENT	
1	WAITING PLACE SKID	WAITING PLACE WITH MINERS BOXES ON SKID
2	TOOLBOX SKID	TOOL BOXES ON SKID
3	LUBE SKID	LIFTING EQUIPMENT STORE, 1 TON MANUAL CRANE, WHEEL STOP
4	RH CURVE CHUTE	SUKUMA ENGINEERING
	SECTION 41 EQUIPMENT	
1	WAITING PLACE SKID	WAITING PLACE WITH MINERS BOXES ON SKID
2	LUBE SKID	LIFTING EQUIPMENT STORE, 1 TON MANUAL CRANE, WHEEL STOP
3	RH CURVE CHUTE	SUKUMA ENGINEERING
4	SECTION CONVEYOR BELT DRIVE & HEAD SECTION	SUKUMA ENGINEERING
5	CONVEYOR TAKE-UP SECTION	SUKUMA ENGINEERING
6	SECTION TAIL-END	SUKUMA ENGINEERING
	SECTION 42 EQUIPMENT	
1	WAITING PLACE SKID	WAITING PLACE WITH MINERS BOXES ON SKID
2	LH CURVE CHUTE	SUKUMA ENGINEERING
3	SECTION CONVEYOR BELT DRIVE & HEAD SECTION	SUKUMA ENGINEERING
4	CONVEYOR TAKE-UP SECTION	SUKUMA ENGINEERING
5	SECTION TAIL-END	SUKUMA ENGINEERING
	TEMPORARY TRUNK CONVEYOR	
1	RH CURVE CHUTE	SUKUMA ENGINEERING
2	HEAD SECTION	SUKUMA ENGINEERING
3	CONVEYOR BRIDGE SECTION	SUKUMA ENGINEERING
4	DRIVE SECTION	SUKUMA ENGINEERING
5	CONVEYOR TAKE-UP SECTION	SUKUMA ENGINEERING
6	TAKE-UP WINCH	SUKUMA ENGINEERING
7	SECTION TAIL-END	SUKUMA ENGINEERING
8	CONVEYOR BELT STRUCTURE COMPLETE	H-FRAMES, LEGS, STRINGERS, TOP FRAMES, BOTTOM FRAMES, IDL
9	INTERMEDIATE TAIL END SECTION	SUKUMA ENGINEERING
10	STOCKPILE CONVEYOR DRIVE SECTION	SUKUMA ENGINEERING
11	STOCKPILE TAKE-UP SECTION	SUKUMA ENGINEERING
12	STOCKPILE TAKE-UP WINCH	SUKUMA ENGINEERING
13	STOCKPILE CONVEYOR TAIL END	SUKUMA ENGINEERING
14	STOCKPILE CONVEYOR GANTRY SECTIONS	SUKUMA ENGINEERING
15	STOCKPILE CONVEYOR TRESSTLES	SUKUMA ENGINEERING
	OUTBYE EQUIPMENT	
1	HORISONTAL EXPLORATION DRILL	VENTSERVE DE 140
2	HORISONTAL EXPLORATION DRILL	CMS
3	3.7KW GRUNDOS FLAMEPROOF PUMP COMPLETE	Witbank Pump Services
4	11KW FLAMEPROOF PUMP COMPLETE WITH	Witbank Reliable Services
5	3.7 FLAMEPROOF GRUNDFOS SUBMERSIBLE PUMP COMPLETE	Witbank Reliable Services
6	3.7KW GRUNDOS FLAMEPROOF PUMP COMPLETE	Witbank Reliable Services
7	PORTAL CANOPY 4# L1	SUKUMA ENGINEERING
8	PORTAL CANOPY 4# BR	SUKUMA ENGINEERING
9	PORTAL CANOPY 4# R1	SUKUMA ENGINEERING
10	PORTAL CANOPY 4# R2	SUKUMA ENGINEERING

Appendix A: Proof of Conciliation

Review document							
Document number	OH&S GEN FM 006	Content changes	X	No content changes		COP	
Document title	Method Statement					SOP	
Risk Assessment Nr						STA	
Reason for changes	Full review of Document					Obsolete document	
Page & heading number of changes	All						

Validation of Document Control Request			
Name	**Designation**	**Signature**	**Date**

Proof of Conciliation / Review Committee			
Name	**Designation**	**Signature**	**Date**
HSE Committee Members			
Original Equipment Manufacturers (OEM) Representatives			
Contractor Employee(s)			
Other Relevant Stakeholders (Superintendents, Operators, etc)			