DRAFT

SCOPING REPORT FOR THE PROPOSED EXXARO BELFAST MINE EXPANSION PROJECT WITHIN THE JURISDICTION OF EMAKHAZENI LOCAL MUNICIPALITY IN THE MPUMALANGA PROVINCE

REF:

(DMRE REF NO. MP 30/5/1/2/2/431 MR)

DATE

05 APRIL 2022

PREPARED FOR

exxaro
POWERING POSSIBILITY

PREPARED BY

NSOVO
ENVIRONMENTAL CONSULTING

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SCOPING REPORT FOR THE PROPOSED EXXARO BELFAST MINE EXPANSION PROJECT WITHIN THE JURISDICTION OF EMAKHAZENI LOCAL MUNICIPALITY IN THE MPUMALANGA PROVINCE

NSOVO REF: P029-19

(DMRE REF NO. MP 30/5/1/2/2/431 MR)

Prepared For:	
Exxaro Coal Mpumalanga (Pty) Ltd. Att: Vinny Moodley Tel: 082 532 1642 E: Vinny.Moodley@exxaro.com	exxaro POWERING POSSIBILITY
Prepared By:	
Nsovo Environmental Consulting Cell: 071 602 2369 Tel: 087 803 9294 Fax: 086 602 8821 Email: admin@nsovo.co.za Date of Submission: 05th April2022	NSOVO ENVIRONMENTAL CONSULTING "From the world, we live, to the world we seek"

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"From the world, we live to the world we seek "

DOCUMENT CONTROL

PROJECT TITLE:

Draft Scoping Report for the proposed Exxaro Belfast Mine Expansion Project within the jurisdiction of Emakhazeni Local Municipality in the Mpumalanga Province.

QUALITY CONTROL:

Report:	**Compiled By:**	**Peer-Reviewed and Authorised By:**
Draft Scoping Report	Rejoice Aphane  _____	 Munyadziwa Rikhotso

EXECUTIVE SUMMARY

Exxaro Coal Mpumalanga (Pty) Ltd. is a subsidiary of Exxaro Coal (Pty) Ltd. and is owned by Exxaro Resources Limited.).

The Department of Minerals and Energy (DMRE) issued Exxaro Coal Mpumalanga (Pty) Ltd. (Exxaro) a Mining Right (MR) (DMRE Ref No. MP 30/5/1/2/2/431 MR) for the development of the Belfast open cast mine in Belfast on the 9th of October 2013. The mining operation is referred to as the Belfast Implementation Project (BIP) and is located along the N4, south of Belfast within the jurisdiction of the Emakhazeni Local Municipality, Mpumalanga Province. In 2018 the BIP commenced with mining activities and the construction of the associated plant and infrastructure to process 3 Mtpa of Run of Mine (ROM) with a life of mine (LOM) of 17 years. The first coal was produced at the processing plant in September 2019. The Belfast Expansion Project (BEP) area falls within the Belfast mining right area and subsequently forms part of the Belfast resource.

Exxaro has assessed the feasibility of the Belfast Project, situated some 10 km southwest of Belfast in Mpumalanga. The Belfast Project entails the development of an opencast mine to produce 2.0 Mtpa of coal for Eskom and 1.5 Mtpa of A-grade thermal coal for export markets. In 2019, the exploitation analysis of the Belfast Resource, outside the current BIP layout area, revealed during the Concept Phase that there is potential for a 5,200 kilocalorie/kilogram (kcal/kg) opencast and underground mining scenario as well as a 5,800 kcal/kg underground scenario. A potential of 39.7 Mt of Run of Mine (ROM) can be additionally mined at a yield of 69%, resulting in 27.4 Mt of product. The coal mined from the BEP will be transported the same way as that from the BIP, i.e., through the existing road to Rietkuil Siding (also known as the Pioneer Siding) and subsequently transported to Richards Bay Coal Terminal by rail. The proposed BEP will entail, the following main activities and infrastructure:

- Opencast (five separate areas)
- Development of Area 8 with an extended footprint of 141.762824 hectares (ha);
- Development of Area 9 with an extended footprint of 209.37819 ha;
- Development of Area 10 with an extended footprint of 109.094467 ha;
- Development of Area 11 with an extended footprint of 127.980751 ha.
- Development of Area 12 with an extended footprint of 74.907883 ha.
- Development of an underground mine and associated infrastructure with an extended footprint of 343.97 ha;
- Construction of a decline shaft of approximately 45 ha;
- Construction of an approximately 4km conveyor belt;
- Construction of a discard dump with an extended footprint of 25.64 ha;

- Development of a 2.75 km long haul road starting from the Run of Mine stockpiles, crossing over previously mined areas to the BIP areas; and
- The associated activities

The proposed development triggers the National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA) Environmental Impact Assessment (EIA) listed activities; as such, the mine is required to undertake an integrated EIA process and obtain an integrated Environmental Authorisation (EA) in line with the requirements of the EIA Regulations of 2014 as amended. As a result, Exxaro commissioned an EIA for the site and the project collectively known as the BEP.

This is an integrated EA application and will include the following:

Environmental Authorisation for listed activities as contained in Government Notice Regulations (GN R) GN R984 and R985); and

Waste Management Licence (WML) in terms of activities listed in Government Notice 718 gazetted in terms of the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008) (NEM: WA).

Further, the proposed development will trigger Section 21 water use activities; as such, a Water Use Licence Application (WULA) in terms of the National Water Act, 1998 (Act No. 36 of 1998) (NWA) will be undertaken to obtain an Integrated Water Use Licence (IWUL) from the Department of Water and Sanitation (DWS) before the commencement of any listed water use activity. Subsequently, Golder and Associates were appointed to undertake the requisite WULA process to comply with the requirement of the NWA.

As part of the integrated EA, a Scoping and EIA process will be undertaken. This report details the activities undertaken at the scoping phase. The objectives of the Scoping process are to, through a consultative approach—

a) identify the relevant policies and legislation relevant to the activity;
b) motivate the need and desirability of the proposed activity, including the and desirability of the activity in the context of the preferred location;
c) identify and confirm the preferred activity and technology alternative through identification of impacts and risks and ranking process of such impacts and risks;
d) identify and confirm the preferred site through a detailed site selection process, which includes an identification of impacts and risks inclusive of identification of cumulative impacts and a ranking process of all the identified alternatives focusing on the geographical, physical, biological, social, economic, and cultural aspects of the environment;
e) identify the key issues to be addressed in the assessment phase;
f) agree on the level of assessment to be undertaken, including the methodology to be applied, the expertise required as well as the extent of further consultation to be conducted to determine the impacts and risks the

activity will impose on the preferred site through the life of the project, including the nature, significance, consequence, extent, duration, and probability of the impacts to inform the location of the development footprint within the preferred site; and

g) identify suitable measures to avoid, manage or mitigate identified impacts and determine the extent of the residual risks that need to be addressed, and monitored.

Accordingly, the Scoping Report has been prepared in accordance with the requirements of Appendix 2 of the NEMA EIA Regulations of 2014 as amended, and it contains the following information:

(a) The details and expertise of the Environmental Assessment Practitioner (EAP) who prepared the report;
(b) The location of the proposed activities;
(c) A plan which locates the proposed activities to be undertaken;
(d) Description of the scope of the proposed project, including the listed activities and the associated structures and infrastructures;
(e) Description of policy and legislative content within which the development is located and an explanation of how the development complies with and responds to the legislation and policy context;
(f) A motivation for the need and desirability of the proposed development;
(g) A full description of the process followed to reach the proposed preferred activities, site, and proposed location of the development footprint within site;
(h) A plan of study for undertaking the EIA process to be conducted; and
(i) An undertaking under oath or affirmation by the EAP.

The Scoping phase entailed a detailed description of the baseline environment, which forms the backdrop of the impact assessment phase. Further, it allowed for the identification of critical issues and concerns based on input from the relevant stakeholders, I&APs, and the EAP's professional judgment based on experience and expertise in the field. In considering the alternatives, various aspects are considered, including the degree of sensitivity of the site, technical viability, and to a certain extent, economic viability.

Consequently, the EIA phase will only assess the following alternatives:

- Opencast Shaft Options 1 and 2.
- Conveyor belts alternatives linked with Opencast Shaft Option 2. This alternative has four options within it namely Alternative A, B, C, and D.
- Mine Residue Facility expansion options.
- Open pits and underground mining; and
- No Go Option.

The identification and assessment of impacts were based on input from specialist studies that provided baseline information and the necessary detail in preparing the Report. The details of the specialists are included in the table below, and the reports are attached as Appendix C:

Specialist Study	Company	Specialist
Biodiversity (flora and fauna);	Hawkhead Consulting	Andrew Zinn
Soil, land use, and land capability	Zimpande Research Collaborative	Braveman Mzila
Heritage	Vhubvo Archeo Heritage Consulting	Munyadziwa Magoma
Wetland	Golder Associates Africa (Pty) Ltd.	Lufuno Nemakhavhani
Hydropedology	Golder Associates Africa (Pty) Ltd.	Talita van Zyl
Hydrology	Golder Associates Africa (Pty) Ltd.	Nirvishee Juggath
Traffic	Eco Elemetum	Pieter Jooste
Air quality and climate change	Kijani Green	Simon Gear
Socio-economic	Neville Bews and Associates	Neville Bews
Visual impacts	Outline Landscape	Katherin Hamelouw
Hydrogeological study	Golder Associates Africa (Pty) Ltd.	Talita van Zyl
Noise impact assessment	Barend Jacobus Barnardt van der Merwe	dBAcoustics CC.
Palaeontology	Marion Bamford Consulting	Prof Marion Bamford
Financial Provision	Digby Wells and Associate	Anthony Lamb
Geochemistry Specialist Study and Acid Rock Drainage Management Strategy	Golder Associates Africa (Pty) Ltd.	Shameer Hareeparsad

This report will be made available to the Interested and Affected Parties (I&APs) as well as Organs of State for thirty (30) days to allow them to review and comment. All comments received will be included in the Comments and Response Report, forming part of this report. The Plan of Study for the EIA is also incorporated in this report and is submitted to the Competent Authority (CA), the DMRE, as per section 24C of the National Environmental Management Act (NEMA). The DMRE will assess the draft scoping report and the plan of study for EIA and advice accordingly.

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LIST OF ACRONYMS AND ABBREVIATIONS

BEP	Belfast Expansion Project
BIP	Belfast Implementation Project
CBA	Critical Biodiversity Area
CMA	Catchment Management Agency
DEA	Department of Environmental Affairs
DMRE	Department of Mineral Resources Energy
EA	Environmental Authorisation
EAP	Environmental Assessment Practitioner
EIA	Environmental Impact Assessment
EIS	Environmental Importance and Sensitivity
EMPr	Environmental Management Programme
GNR	Government Notice Regulations
Ha	Hectare
HDPE	High Density Poly Ethylene
HIA	Heritage Impact Assessment
I&APs	Interested and Affected Parties
IBA	Important Bird Area
LOM	Life of Mine
LDV	Light Duty Vehicle
mamsl	meter above mean sea level
MBSP	Mpumalanga Biodiversity Sector Plan
MDARDLEA	Mpumalanga Department of Agriculture and Rural Development, Land and Environmental Affairs
MOD: AASHTO	Moisture Density Relationship: American Association of State Highway and Transportation Officials
MPRDA	Minerals and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002)
MRA	Mining Right Area
MRF	Mine Residue Facility
Mt	Million tonnes
MTPA	Mpumalanga Tourism and Parks Agency

NEMA	National Environmental Management Act, 1998 (Act 107 of 1998)
NEMWA	National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008) (NEM: WA)
NFEPA	National Fresh Water Ecosystem Priority Areas
NHRA	National Heritage Resources Act (Act 25 of 1999)
NWA	National Water Act, 1998 (Act No. 36 of 1998)
PAA	Protected Agricultural Areas
PCD	Pollution Control Dam
PES	Present Ecological State
PHRA	Provincial Heritage Resources Authority
ROM	Run of Mine
SACNASP	South African Council for Natural Scientific Professions
SAHRA	South African Heritage Resources Agency
SANBI	South African National Biodiversity Institute
ToPS	Threatened or Protected Species
VIA	Visual Impact Assessment
WMA	Water Management Area
WML	Waste Management Licence
WULA	Water Use Licence Application

MINIMUM REQUIREMENTS AND CONTENT OF SCOPING REPORT AS PER EIA REGULATION, 2017 APPENDIX 2

A scoping report must contain the information that is necessary for a proper understanding of the process, informing all preferred alternatives, including location alternatives, the scope of the assessment, and the consultation process to be undertaken through the Environmental Impact Assessment process, and must include:

Requirement of scoping report	Section
(a) details of- (i) the EAP who prepared the report; and (ii) the expertise of the EAP, including a curriculum vitae;	**Section 2**
(b) the location of the activity, including— (i) the 21 digit Surveyor General code of each cadastral land parcel; (ii) where available, the physical address and farm name; (iii) where the required information in items (i) and (ii) is not available, the coordinates of the boundary of the property or properties.	**Section 3**
(c) a plan which locates the proposed activity or activities applied for at an appropriate scale, or, if it is— (i) a linear activity, a description, and coordinates of the corridor in which the proposed activity or activities is to be undertaken; or (ii) on land where the property has not been defined, the coordinates within which the activity is to be undertaken.	**Section 4**
(d) a description of the scope of the proposed activity, including— (i) all listed and specified activities triggered; (ii) a description of the activities to be undertaken, including associated structures and infrastructure;	**Section 5**
(e) **a description of the policy and legislative context** within which the development is proposed including identification of all legislation, policies, plans, guidelines, spatial tools, municipal development planning frameworks, and instruments that are applicable to this activity and are to be considered in the assessment process;	**Section 6**
(f) **a motivation for the need and desirability** for the proposed development including the need and desirability of the activity in the context of the preferred location;	**Section 7**

(g) **a full description of the process followed to reach the proposed preferred activity**, site, and location of the development footprint within the site, including— (i) details of all the alternatives considered;	**Section 8**
(ii) details of the public participation process undertaken in terms of regulation 41 of the Regulations, including copies of the supporting documents and inputs; (iii) a summary of the issues raised by interested and affected parties, and an indication of the manner in which the issues were incorporated, or the reasons for not including them;	**Section 9**
(iv) the environmental attributes associated with the alternatives focusing on the geographical, physical, biological, social, economic, heritage, and cultural aspects.	**Section 10**
(vi) the methodology used in identifying and ranking the nature, significance, consequences, extent, duration, and probability of potential environmental impacts and risks associated with the alternatives;	**Section 11**
(v) the impacts and risks which have informed the identification of each alternative, including the nature, significance, consequence, extent, duration, and probability of such identified impacts, including the degree to which these impacts—	**Section 12**
(h) a plan of study for undertaking the environmental impact assessment process to be undertaken, including—	**Section 13**
(i) a description of the alternatives to be considered and assessed within the preferred site, including the option of not proceeding with the activity;	
(ii) a description of the aspects to be assessed as part of the environmental impact assessment process;	
(iii) aspects to be assessed by specialists;	
(iv) a description of the proposed method of assessing the environmental aspects, including aspects to be assessed by specialists;	
(v) a description of the proposed method of assessing duration and significance;	

(vi) an indication of the stages at which the competent authority will be consulted;	
(vii) particulars of the public participation process that will be conducted during the environmental impact assessment process; and	
(viii) a description of the tasks that will be undertaken as part of the environmental impact assessment process;	
(ix) identify suitable measures to avoid, reverse, mitigate or manage identified impacts and to determine the extent of the residual risks that need to be managed and monitored.	
(i) an undertaking under oath or affirmation by the EAP in relation to— (i) the correctness of the information provided in the report; (ii) the inclusion of comments and inputs from stakeholders and interested and affected parties; and ((iii) any information provided by the EAP to interested and affected parties and any responses by the EAP to comments or inputs made by interested or affected parties;	**Section 14**
(j) an undertaking under oath or affirmation by the EAP in relation to the level of agreement between the EAP and interested and affected parties on the plan of study for undertaking the environmental impact assessment;	
(i) where applicable, any specific information required by the competent authority; and	
(i) any other matter required in terms of section 24(4)(a) and (b) of the Act.	
k) Description of any assumptions, uncertainties and knowledge gaps	**Section 15**
l) Fatal Flaws	**Section 16**
m) Conclusion	**Section 17**

1 INTRODUCTION

The Department of Minerals and Energy (DMRE) issued Exxaro Coal Mpumalanga (Pty) Ltd. (Exxaro) a Mining Right (MR) (DMRE Ref No. MP 30/5/1/2/2/431 MR) for the development of the Belfast open cast mine in Belfast on the 9th of October 2013. The mine is located along the N4, south of Belfast within the jurisdiction of the Emakhazeni Local Municipality, Mpumalanga Province. In 2018 the Belfast Implementation Project (BIP) commenced with mining activities and the construction of the associated plant and infrastructure to process 3 Mtpa of Run of Mine (ROM) with a Life of Mine (LOM) of 17 years. The first coal was produced at the processing plant in September 2019. The proposed Belfast Expansion Project (BEP) area falls within the Belfast Mining Right Area (MRA) and subsequently forms part of the Belfast resource.

In 2019, the exploitation analysis of the Belfast Resource, outside the current BIP layout area, revealed during the concept phase that there is potential for a 5,200 kcal/kg (five thousand two hundred kilocalories/kilogram) opencast and underground mining scenario as well as a 5,800 kcal/kg (five thousand eight hundred kilocalorie/kilogram) underground scenario. A potential of 39.7 Mt (thirty-nine point seven million tonnes) of ROM can be additionally mined at a yield of 69% (sixty-nine percent), resulting in 27.4 Mt (twenty-seven point four million tonnes) of product. The objective of such an operation would be to access high-quality coal for export. As a result, Exxaro commissioned an Environmental Impact Assessment for the site, and the project is collectively known as the BEP. The coal mined from the BEP will be transported the same way as that from the BIP, i.e., through the existing road to Rietkuil Siding (also known as the Pioneer Siding) and subsequently transported to Richards Bay Coal Terminal by rail.

Subsequently, the BEP will include the following main activities and infrastructure:

- Opencast (five separate areas) as follows:
    - Development of Area 8 with an extended footprint of 141.762824 hectares (ha);
    - Development of Area 9 with an extended footprint of 209.37819 ha;
    - Development of Area 10 with an extended footprint of 109.094467 ha;
    - Development of Area 11 with an extended footprint of 127.980751 ha.
    - Development of Area 12 with an extended footprint of 74.907883 ha.
- Development of an underground mine and associated infrastructure with an extended footprint of 343.97 ha;
- Construction of a decline shaft of approximately 45 ha;
- Construction of an approximately 4km conveyor belt;
- Construction of a discard dump with an extended footprint of 25.64 ha;
- Development of a 2.75 km long haul road starting from the ROM stockpiles, crossing over previously mined areas to the BIP areas; and

- Associated activities.

The proposed development triggers the NEMA EIA listed activities; as such, the mine is required to undertake an integrated Environmental Impact Assessment (EIA) process and obtain an integrated environmental authorisation in line with the requirements of the EIA Regulations of 2014 as amended promulgated in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA).

This is an integrated Environmental Authorisation application and will include the following:
Environmental Authorisation (EA) for listed activities as contained in Government Notice Regulations (GN R) GN R984 and R985); and
Waste Management Licence (WML) in terms of the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008) (NEM: WA).

Further, the proposed development will trigger Section 21 water use activities; as such, a Water Use Licence Application (WULA) in terms of the National Water Act, 1998 (Act No. 36 of 1998) (NWA) will be undertaken to obtain an Integrated Water Use Licence (IWUL) from the Department of Water and Sanitation (DWS) before the commencement of any listed water use activity. Subsequently, Golder and Associates were appointed to undertake the requisite WULA process to comply with the requirement of the NWA.

Subsequently, Exxaro appointed Nsovo Environmental Consulting (Nsovo) to undertake the necessary authorisation process to comply with the requirement of the legislation. The project proponent is Exxaro Coal Mpumalanga (Pty) Ltd., whereas the Competent Authority is the Mpumalanga DMRE.

2 DETAILS OF THE ENVIRONMENTAL ASSESSMENT PRACTITIONER, APPLICANT AND SPECIALIST

2.1 DETAILS OF ENVIRONMENTAL ASSESSMENT PRACTITIONER

Nsovo has been appointed by Exxaro as the independent Environmental Assessment Practitioner (EAP) for the proposed project and meets the general requirements as stipulated in regulations 13(1) of the NEMA 2014 EIA Regulations, as amended. Nsovo is therefore:

- Independent and objective;
- Has expertise in conducting EIAs;
- Ensures compliance with the EIA Regulations;
- Considers all relevant factors relating to the application; and
- Provides full disclosure to the applicant, relevant environmental authority, specialists, and Interested and Affected Parties (I&APs).

Table 1 provides details of the EAP and relevant experience. A detailed CV and Qualifications are attached as **Appendix F**.

Table 1: Details of the Environmental Assessment Practitioner (EAP)

Name of Company	Nsovo Environmental Consulting
Person Responsible	Munyadziwa Rikhotso
Professional Registration	South African Council for Natural Scientific Professions (SACNASP) EAPASA
Telephone Number	087 803 9294
Fax Number	086 602 8821
Email	munyadzi@nsovo.co.za
Qualifications & Experience	B.Sc. Honours Environmental Management **18 years of experience**
Project Related Expertise	In terms of project-related expertise, the Environmental Assessment Practitioner has undertaken projects of varying scale and complexity, including: • Integrated Environmental Impact Assessment and WULA for Exxaro discard dump expansion (2021). • Integrated Environmental Impact Assessment and WULA for Bushveld Vanchem Expansion project (2021). • Integrated Environmental Impact Assessment and WULA for Grammatikos Vogelfontein project (2021). • EIA for the proposed Tubatse Strengthening Phase 1 – Senakangwedi B integration within the jurisdiction of Greater Tubatse Local Municipality in Limpopo Province 2018). • EIA for the proposed Maphutha-Witkop powerline in Limpopo Province (2018). • EMPr, WULA, and EA amendment for the proposed Juno Gromis 400kV power line (2017).

2.2 DETAILS OF THE APPLICANT

The Mineral Rights for the area earmarked for the development are owned by Exxaro Resources Limited (the Applicant) and the company details are provided in Table 2.

Table 2: Details of the Applicant

Name of Company	Exxaro Resources Limited
Name of Mine	Exxaro Coal Mpumalanga (Pty) Ltd.
Physical Address	Exxaro Coal Mpumalanga (Pty) Ltd. Belfast Coal Mine Farm Blyvooruitzicht Mpumalanga Province
Postal Address	Belfast Coal Mine P.O Box 321 Belfast 1100
Responsible Person	Londolani Rampfumedzi
Telephone Number	012 307 5000
Cell Phone	083 455 5364
Email Address	londolani.rampfumedzi@exxaro.com
Project Manager	Vinny Moodley
Email Address	vinny.moodley@exxaro.com

2.3 DETAILS OF SPECIALIST

To adequately identify and assess potential environmental impacts associated with the proposed project, sub-consultants have been appointed to conduct specialist impact assessments. The specialist reports are referenced and included in the draft Scoping Report (dSR). Refer to Table 3below for the specialist studies undertaken.

Table 3: Details of Specialist

Specialist Study	Company	Specialist
Biodiversity (flora and fauna)	Hawkhead Consulting	Andrew Zinn

Soil, land use, and land capability	Zimpande Research Collaborative	Braveman Mzila
Heritage	Vhubvo Archeo Heritage Consulting	Munyadziwa Magoma
Wetland	Golder Associates Africa (Pty) Ltd	Lufuno Nemakhavhani
Hydropedology	Golder Associates Africa (Pty) Ltd	Talita van Zyl
Hydrology	Golder Associates Africa (Pty) Ltd	Nirvishee Juggath
Traffic	Eco Elemetum	Pieter Jooste
Air quality and climate change	Kijani Green	Simon Gear
Socio-economic	Neville Bews and Associates	Neville Bews
Visual impacts	Outline Landscape	Katherin Hamelouw
Hydrogeological	Golder Associates Africa (Pty) Ltd	Talita van Zyl
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Palaeontology	University of the Witwatersrand	Prof Marion Bamford
Financial Provision	Digby Wells and Associate	Anthony Lamb
Blast Impact Assessment	Blast Management and Consulting	JD Zeeman
Geochemistry Specialist Study and Acid Rock Drainage Management Strategy	Golder Associates Africa (Pty) Ltd	Shameer Hareeparsad

3 DESCRIPTION OF LOCALITY AND THE PROPERTY ON WHICH THE ACTIVITY IS TO BE UNDERTAKEN AND LOCATION OF ACTIVITY ON THE PROPERTY

This section provides detailed information on the location of the proposed project. The main aim is to provide the environmental aspects found within the proposed development area and provide the baseline description of the surroundings.

3.1 LOCALITY OF THE PROPOSED PROJECT

The proposed BEP is located approximately 186 km from Pretoria and 27 km south of Belfast town, along the N4, within the jurisdiction of Emakhazeni Local Municipality in the Mpumalanga Province, South Africa. Exxaro's approved Mining Right (MR) (No. MP 30/5/1/2/2/431 MR) constitutes 5 819 ha, encompassing the BIP and BEP. However, the BEP will be undertaken within 3 251.210 ha of the MRA. **Figure 1** and **Figure 2** below are locality maps that depict the proposed study area at a scale of 1:50 000. Refer to Appendix A3 for the locality maps.

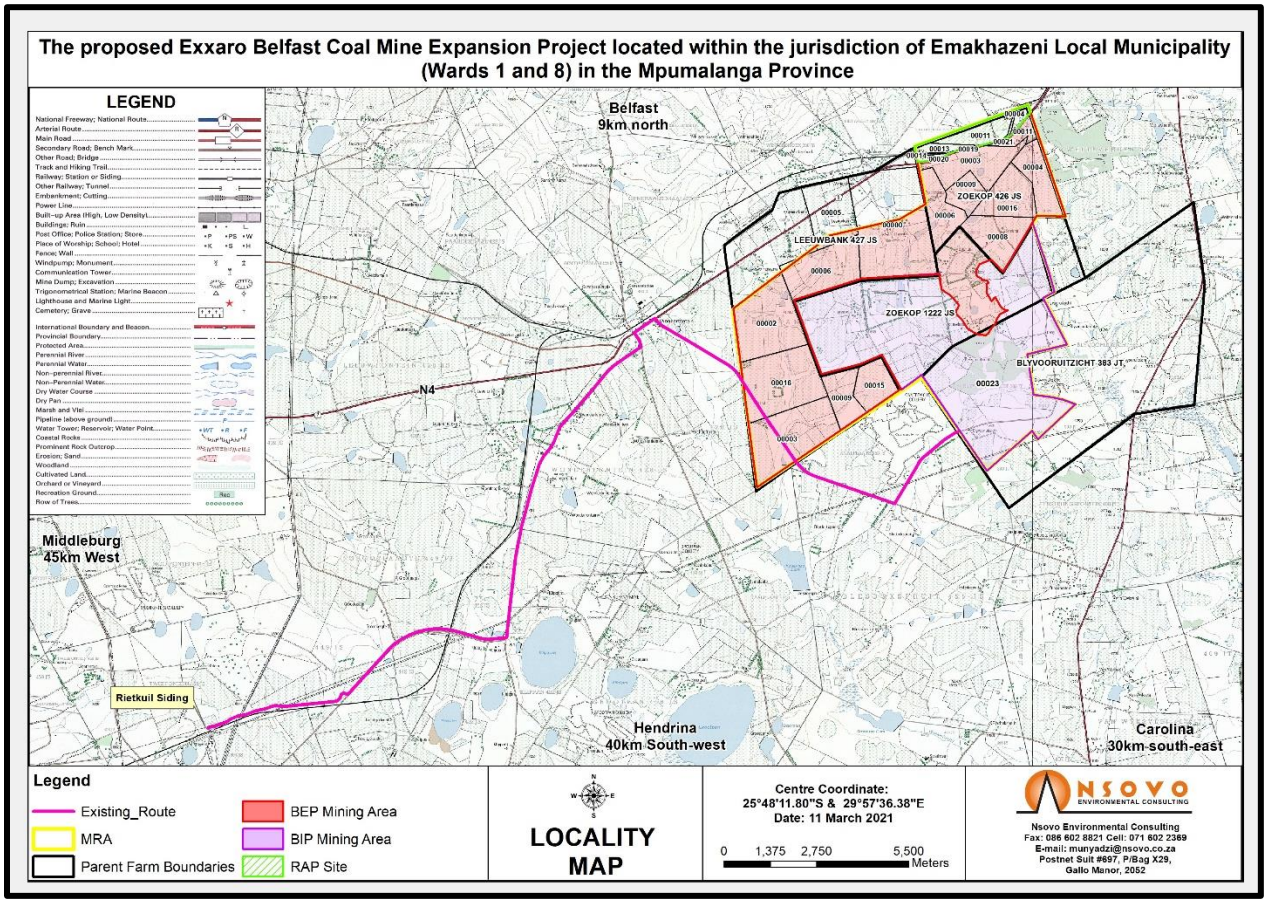

Figure 1: Locality map showing the proposed BEP Study Area

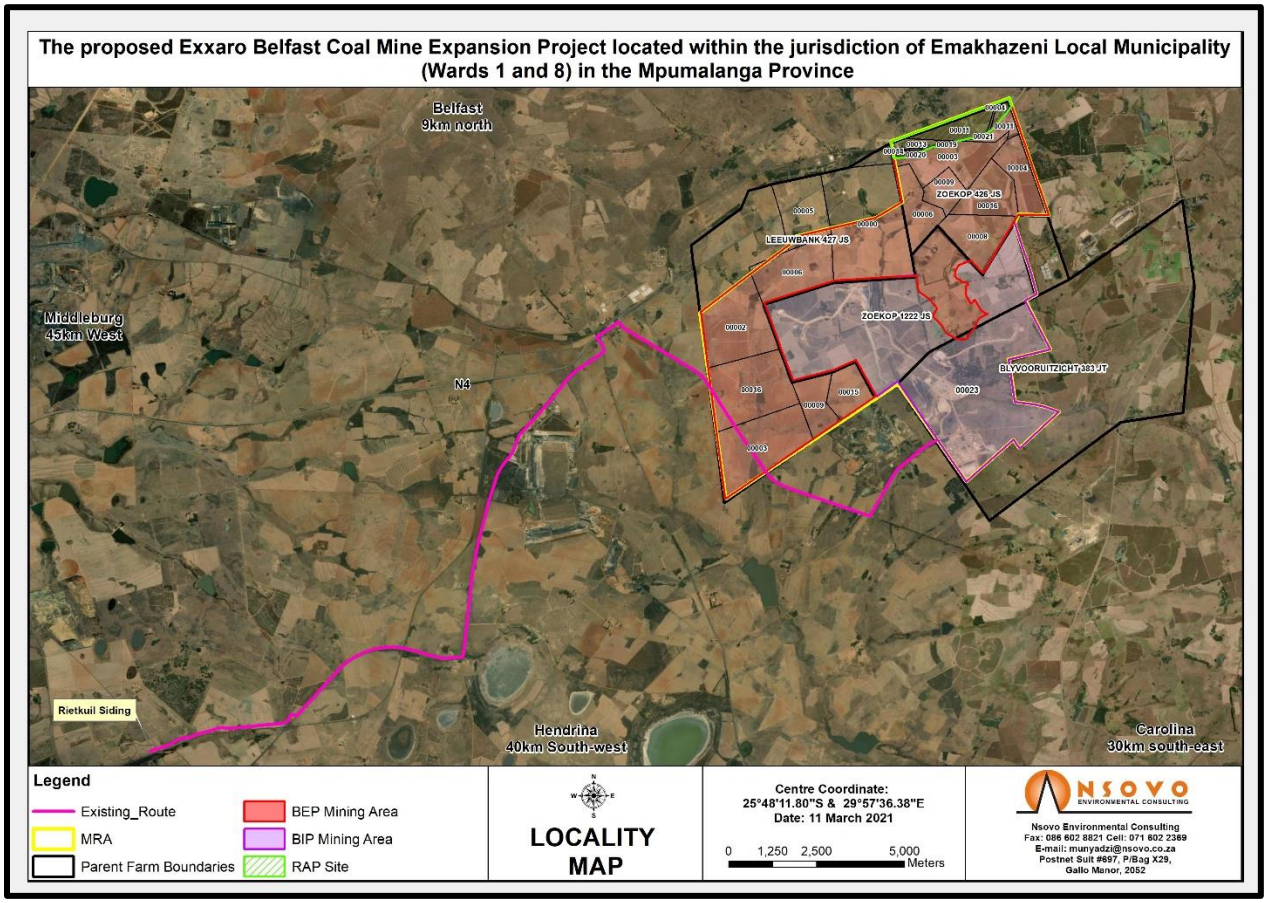

Figure 2: Aerial Photograph showing the proposed BEP Study Area

3.1.1 PROVINCE AND PROVINCIAL BOUNDARIES

The proposed development is within Mpumalanga Province, located in the eastern part of South Africa. The Mpumalanga Province borders the Gauteng, Kwazulu Natal, Free State and Limpopo Provinces.

3.1.2 MUNICIPALITY AND AFFECTED MUNICIPAL WARDS

The proposed development is in Wards 1 and 8 of Emakhazeni Local Municipality within the jurisdiction of the Nkangala District Municipality.

3.1.3 DESCRIPTION OF THE PROPERTY

The MRA traverses various farm portions listed in Table 4. Further, Figure 3 shows the affected farms.

Table 4: Details of the proposed site property

FARM NAME	FARM_NO	PORTION	SG_CODE	MAJ_REGION
LEEUWBANK	427	2	T0JS00000000042700002	JS
LEEUWBANK	427	4	T0JS00000000042700004	JS
LEEUWBANK	427	5	T0JS00000000042700005	JS

FARM NAME	FARM_NO	PORTION	SG_CODE	MAJ_REGION
LEEUWBANK	427	6	T0JS00000000042700006	JS
LEEUWBANK	427	25	T0JS00000000042700025	JS
LEEUWBANK	427	26	T0JS00000000042700026	JS
LEEUWBANK	427	0	T0JS00000000042700000	JS
Blyvooruitzicht	838	23	T0JT00000000000000023	JT
ZOEKOP	426	4	T0JS00000000042600004	JS
ZOEKOP	426	6	T0JS00000000042600006	JS
ZOEKOP	426	9	T0JS00000000042600009	JS
ZOEKOP	426	16	T0JS00000000042600016	JS
ZOEKOP	426	3	T0JS00000000042600003	JS
ZOEKOP	426	11	T0JS00000000042600011	JS
ZOEKOP	426	21	T0JS00000000042600024	JS
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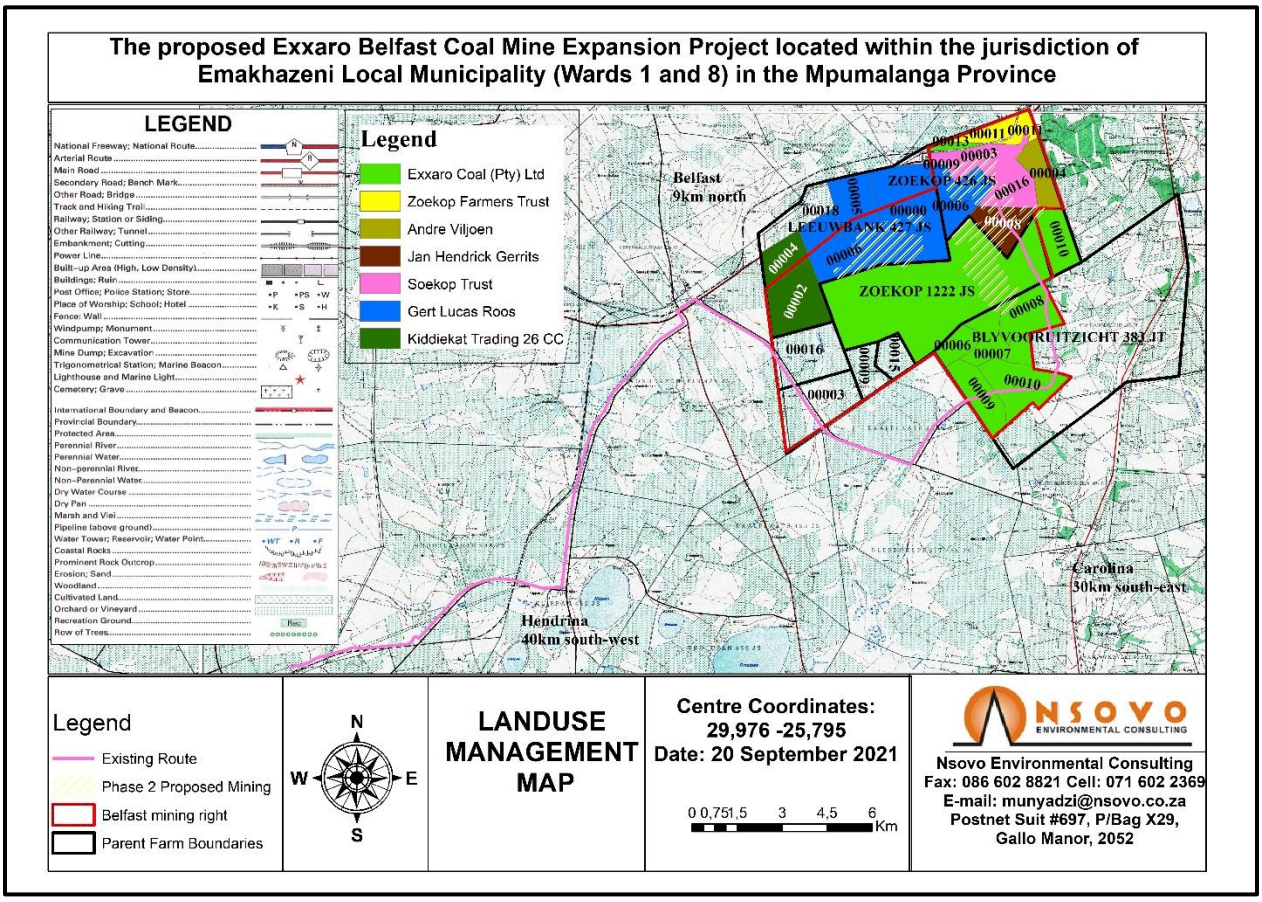

Figure 3: Land use map indicating the affected farms (Golder, 2021)

The owners of the affected farms have been identified and form part of the primary stakeholders. Section 2.1 of the Social Impact Assessment provides names of the affected landowners while the stakeholders database includes contact information.

3.2 SURROUNDING LAND USES

The land-uses within and around the proposed project area include farming, mining, and residential and are discussed in the sub-sections below:

3.2.1 RESIDENTIAL

The residential communities adjacent to the study area include the new community developed due to the Resettlement Action Plan (RAP), which consists of people relocated by Exxaro from the BIP site (refer to Figure 1). The RAP site known as Phumulani Agri-Village is located north of the BEP site, across the N4. Further, a few farm dwellings have been identified within the BEP area. Table 5 below describes the affected communities.

Table 5: Residential Communities and Farms adjacent to the study area

Community	Description
Phumulani Agri-Village	Phumulani Agri-Village is a low-medium income residential area located north of the BEP area. Exxaro established the RAP site during the development of the BIP.
Belfast	Belfast is the closest town to the site and is located approximately 10 km north of the mine, partly urban. Seventy informal dwelling units also characterize the town.
Farms dwellings	Active farms have been noted within and around the proposed project site, with one of the farms identified as a formal dwelling.

3.2.2 MINING ACTIVITIES WITHIN THE STUDY AREA

There are several mining activities within the Emakhazeni Local Municipality. These include but are not limited to Wonderfontein Colliery, Worldwide Coal and Paardeplaats, Droogvallei Collieries, GLISA, Eastelingsfontein mine, and Marlien Granite mine. However, none of these mines are adjacent to the proposed BEP. These mines play a considerable role in the general development of the surrounding communities, thus contributing to income generation, improving the local economy, and creating employment for the locals.

3.2.3 FARMING ACTIVITIES

The site is surrounded by active farms that include stock and crop farming.

3.2.4 SURFACE INFRASTRUCTURE

This section describes the surface infrastructures within the study area, including the road network, existing substations, and powerlines. Other infrastructure noted include, discard dumps, processing plant, diesel storage area, reticulation infrastructure, offices, and associated structures.

3.2.4.1 Road Network

Access to the mine is via the N4, which runs through a section of the northern portion of the MRA. This N4 is a major feeder road between Johannesburg and Maputo. The direct access to the mine is gained from Roads D1110 andD1770, which is classified as a Class 3 road (minor arterial road) and falls under the jurisdiction of the Mpumalanga Province Department of Public Works, Roads and Transport. Secondary access will be other public roads as well as private farm roads negotiated with landowners.

3.2.4.2 Powerlines and associated Infrastructure

A 22 kV distribution power line from Eskom's Kraal substation is approximately 17 km from the proposed site.

4 A PLAN WHICH LOCATES THE PROPOSED ACTIVITY OR ACTIVITIES APPLIED FOR AT AN APPROXIMATE SCALE

Error! Reference source not found. below presented the proposed activities at a scale of 1:50 000. The map is attached as **Appendix A** of this draft Scoping report

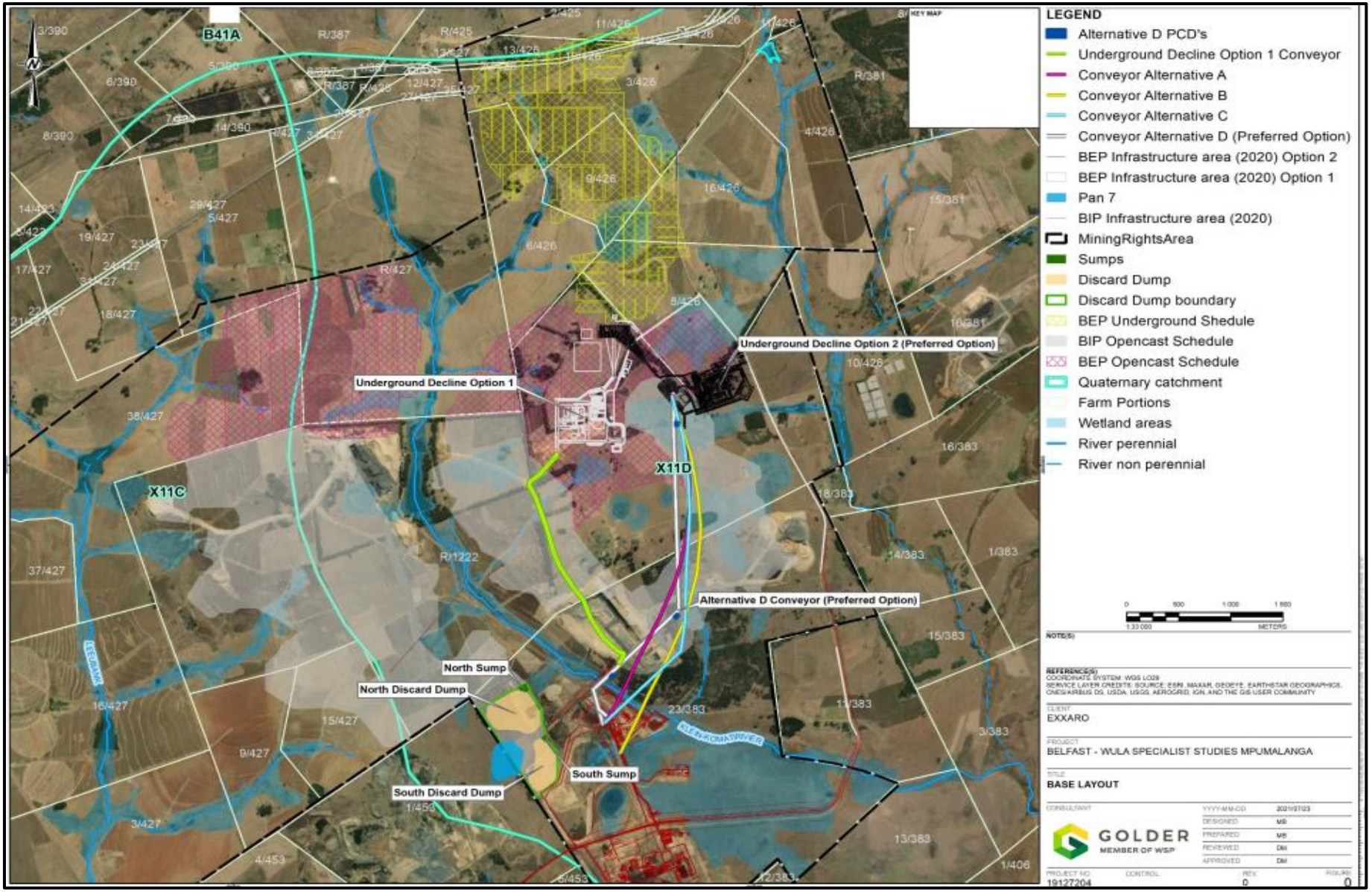

Figure 4: Base Layout Plan (Golder and Associates, 2021)

5 DESCRIPTION OF THE SCOPE OF THE PROPOSED ACTIVITY INCLUDING ALL LISTED AND SPECIFIED ACTIVITIES TRIGGERED AND A DESCRIPTION OF THE ACTIVITIES TO BE UNDERTAKEN, INCLUDING ASSOCIATED STRUCTURES AND INFRASTRUCTURE

This section describes the proposed activities, including the proposed project's scope, mainly focusing on the listed activities that trigger the EIA process. It also describes the associated structures and infrastructure related to the proposed development.

5.1 PROPOSED SCOPE OF WORK

The BEP expansion project entails the following and infrastructure:

- Opencast (five separate areas)
    - Development of Area 8 with an extended footprint of 141.762824 ha;
    - Development of Area 9 with an extended footprint of 209.37819 ha;
    - Development of Area 10 with an extended footprint of 109.094467 ha;
    - Development of Area 11 with an extended footprint of 127.980751 ha;
    - Development of Area 12 with an extended footprint of 74.907883 ha.
- Development of an underground mine and associated infrastructure with an extended footprint of 343.97 ha;
- Construction of a decline shaft of approximately 45 ha.
- Construction of an approximately 4km conveyor belt.
- Construction of a discard dump with an extended footprint of 25.64 ha.
- Development of a 2.75 km long haul road starting from the Run of Mine stockpiles, crossing over previously mined areas to the BIP areas.
- The associated activities will include the following:
    - A 20 kL Septic Tank;
    - Stormwater Plant, with a peak through of 5.25 m^3/s and 750 m long;
    - Overland CNV Stormwater, with a peak through of greater than 120 m^3/s and 1122 m long;
    - PCDs with a total volume of 47 200 m^2 within a demarcated wetland;
    - Vehicle berms;
    - Vehicle brake test ramps;
    - Parking;
    - Tyre change and top-up area;
    - Maintenance and OEM parking;
    - Contractors storage;
    - Diesel storage;
    - Lubricant storage;

- Nitrogen and compressed air storage;
- Equipment parking;
- Workshop area with oil/silt trap;
- Dirty water sump;
- Ablutions facilities;
- Store;
- Administration buildings;
- Refuel bay;
- Water filling point;
- Potable Water treatment plant
- Sewage treatment plant;
- A Treated Effluent Dam to contain the final sewage effluent;
- A BEP Pollution Control Dam to contain dirty stormwater runoff from the areas as listed above.

The construction phase of the proposed project would take approximately 24 months, and the activities to be undertaken are shown on the maps in Section 4, while other associated activities are discussed hereunder.

5.2 ACTIVITIES ASSOCIATED WITH THE PROJECT

5.2.1 SITE WALK-DOWN

A site walk-down will be undertaken for the authorised alternatives. The main aim of the walk-down survey is to ensure that the identified sensitive areas are avoided and to create buffer zones for conservation purposes.

5.2.2 ACCESS ROADS

As indicated above direct access to the mine is gained from Road D1110, which then joins the D1770, classified as a Class 3 road (minor arterial road) while secondary access will be other public roads as well as private farm roads negotiated with landowners.

Further, a 2.75 km long and 20m wide haul road is proposed and will run on a north-south axis in the east of the MRA and will take up an area of approximately 7.3 ha. The road starts from the ROM stockpiles and links the proposed underground area to the existing Belfast Implementation Project (BIP) processing facilities.

5.2.3 VEGETATION CLEARANCE

Vegetation clearance is required in preparation for the following structures and infrastructure:

- Opencast (four areas)
  - Pit 8 141.762824ha

  - Pit 9 209.37819ha
  - Pit 10 109.094467ha
  - Pit 11 127.980751ha
  - Pit 12 74.907883ha
- Conveyor belt = 20 ha.
- Mine Residue Facility (MRF) = 25.64 ha
- Haul Road = 5.7ha

During construction phase, only the immediate footprint within the study area will be cleared. Further, clearance will be undertaken in accordance with the approved Environmental Management Programme (EMPr), permits, licences, Municipal by-laws, as well as Exxaro's policies and guidelines.

The wetland assessment reports indicates that some of the proposed activities will take place within or encroach on the identified wetlands. Further, it must be noted that activities within the wetlands will be licensed through the Water Use Licence Application process. Such activities include the proposed opencast, conveyor belt, and MRF, wherein the construction activities will entail dredging, excavation, removal, and moving of soil.

5.2.4 CONSTRUCTION OF THE CONVEYOR BELT

The ROM coal from the underground and opencast operations will be transported via a conveyor belt to the existing BIP processing facility from where the discard will be disposed of at the extended MRF. The proposed overland conveyor belt and associated service road will be established to transfer ROM or beneficiated coal from BEP to the plant at the BIP.

The conveyor belt will be constructed on the approved alignment following a site walk down. The construction will entail the fabrication, installation modifications, and commissioning a 4km overland conveyor to link mining operations from the current BIP to the proposed BEP. The activities associated with the construction of the conveyor belt include the following:

5.2.4.1 Civil works

The civil works include the groundworks and service roads along the conveyor route. The civil works cater to the activities happening within and outside the demarcated wetlands.

Groundworks and concrete plinths for the conveyor support (outside wetlands area):

- Excavation needs to be done every 4m for the conveyor support structure on all areas outside the indicated wetland areas as indicated on the conveyor route drawing with the following specifications:
  - 2m long x 400mm wide x 400mm deep.
  - G5 material to be inserted into the hole and compacted.

- 1.2m x 300mm x 250mm concrete plinths to be installed on levelled G5 base.
- Steel conveyor gantry structure to be installed on the concrete plinths.

Groundworks and piles for the conveyor support (inside wetlands area):

- Pile holes to be done drilled every 6m for the conveyor support structure in the wetlands areas as indicated on the conveyor route drawing with the following specifications:
  - 2 x Diameter 300mm holes to be drilled 3m to 4m deep in the existing soil every 6m inside the wetlands area.
  - 2 x Diameter 300mm concrete piles to be installed in the holes and levelled to 300mm protrusion above ground level.
  - Steel conveyor gantry structure to be installed on the concrete piles.

Groundworks and concrete plinths for the conveyor transfer steel structures (outside wetlands area):

- Excavation needs to be done for 2 x conveyor transfer steel support structure on the areas outside the indicated wetlands as indicated on the conveyor route drawing with the following specifications:
  - Excavation holes for the support foundation as per the drawings to be dug to 1m deep.
  - G5 material to be inserted into the holes and compacted.
  - Concrete plinths to be installed on the levelled G5 base.
  - Steel conveyor transfer structure to be installed on the concrete plinths.

5.2.4.2 Mechanical works

The mechanical conveyor structure will fit on top of the concrete plinths and piles as per the drawings. The conveyor steel transfer structures will be built on the conveyor route.

5.2.5 Construction of the Mine Residue Facility

The preferred go-forward solution selected comprises locating the MRF adjacent to the current facility on the footprint of the proposed Pit 5. The footprint will be rehabilitated before the implementation of the MRF. The proposed layout of the MRF is dictated and constrained by:

- The extent and footprint of the proposed Pit 5 area;
- Existing and proposed roads to the southwest and south;
- The existing wetland located along the eastern boundary and edge of the Pit 5 footprints; and
- The plant layout to the northeast.

Due to prevailing constraints comprising the limited footprint and the wetland, the MRF is split into two stockpiles – a Southern stockpile and a northern stockpile, which provide the required capacity of 3.7 million m^3 (5.81 Mt). Each stockpile will be provided with dirty water canals along the toe, and these canals will divert the intercepted stormwater

runoff into one or two sumps (depending on topography). Access to the proposed MRF will be via ramps that link to the existing haul road infrastructure along the eastern boundary of Pit 5.

Coal discard is usually classified as Type 3 waste which requires a disposal facility for the waste to be constructed with a Class C liner; as described in the National Norms and Standards for Disposal of Waste to Landfill as per Government Gazette No. R636 of 23 August 2013 (DEA,2013B). The proposed MRF will be constructed on the footprint of Pit 5, which will be open cast mined and backfilled before the construction of the proposed MRF. Therefore, a risk-based (source-path-receptor) approach will be adopted to confirm that an alternative to the Class C liner for the facility will be acceptable for the design. This entails that the facility will not be provided with a liner. Contaminated seepage from the MRF reports to the pit water make and will be managed as part of the pit water and decant management.

5.2.5.1 Barrier design

According to the Waste Disposal Facility Study Report by Jones & Wagner (2019), the development of the discard dump will entail the removal of topsoil within the footprint and stockpiling for use during the rehabilitation phase. Following the removal of the topsoil, the barrier system will be constructed and will comprise the following layers from excavation level upwards:

- Substrate preparation layer: the substrate will be ripped and re-compacted to 90% of MOD AASHTO density with a moisture content of -2 to +2% of optimum.
- Primary impermeable layer: 2 x 150 mm layers of clay compacted to 98% of Standard Proctor density at a moisture content of +1 to +3% of optimum moisture content in order to have a permeability (k) of less than 1x10-6cm/s.
- Primary geomembrane layer: 1.5 mm HDPE double textured geomembrane layer.
- Protection layer: 200 mm layer of fine sand that will protect the geomembrane against damage from the coarse discard.
- Leachate collection layer and drains: 400 mm layer of coarse discard with HDPE pipe drainage network.

5.2.6 UNDERGROUND MINING AND INFRASTRUCTURE

The traditional Bord and Pillar (B&P) mining method was preferred for the identified underground areas at BEP. The B&P method allows for medium to high extraction of underground coal seams while navigating varying and challenging ground conditions. It also requires less initial capital investment than the longwall method with smaller increments in production. Development of an underground mine and associated infrastructure with an extended footprint of 343.97 ha. Civil infrastructure for the BEP underground mine includes the following:

- Earthworks / Platforms, including cut and fill embankments;
- Roads and traffic design; including Light Duty Vehicle (LDV) and haul roads;
- Stormwater management, including clean and dirty water separation;
- Pollution control dams;

- Cable ducts;
- Sewer system;
- Shaft area;
- Fencing; and
- Associated infrastructure

The water supply, i.e., potable, fire, and wash water, are included in the Mechanical Design Criteria. The link between the surface infrastructure and the underground mine is the incline conveyor that will feed the ROM stockpile on the surface from the main underground conveyor, approximately 3km long. Various options detailed in Section 8.1.4 will be implemented to reclaim the stockpile and transfer the ROM material to the overland conveyor belt to enter the plant.

5.2.7 OPEN PIT MINING

The proposed open-pit extension areas are located along the northern portion of the MRA and have a combined footprint of approximately 636.8 ha. The open-pit areas at Belfast Expansion Project (BEP) will be a continuation of existing mining activities and will be mined with a similar method as with the BIP. The BIP uses Strip Mining with a mixed hybrid of benching and doze-over. This method is successful for the shallow coal seams in the Witbank coal region.

It has proven successful because the waste is moved for a short distance, minimizing the cost impact of the mining process. To reduce waste mining costs further, doze-over mining is used, as the price per unit moved over a relatively short distance is cheaper than loading and hauling. The process entails:

- Topsoil – Load and haul topsoil to the low-wall side where backfilling has already been completed where the topsoil is spread and re-vegetated.
- Soft Overburden – Load and haul to the low-wall side where backfilling of hard overburden and parting has already been completed.
- Hard Overburden – Drill, blast, load, and haul to the low-wall side where backfilling of parting and parting has already been completed.
- Top Coal Seam – Drill, blast, load, and haul to the crusher or where required.
- Parting – Drill, cast blast, doze, load, and haul towards the low-wall side.
- Bottom Coal Seam – Drill, blast, load, and haul to the crusher or where required.

An example of the benching and doze-over method is illustrated in **Figure 5** to 7

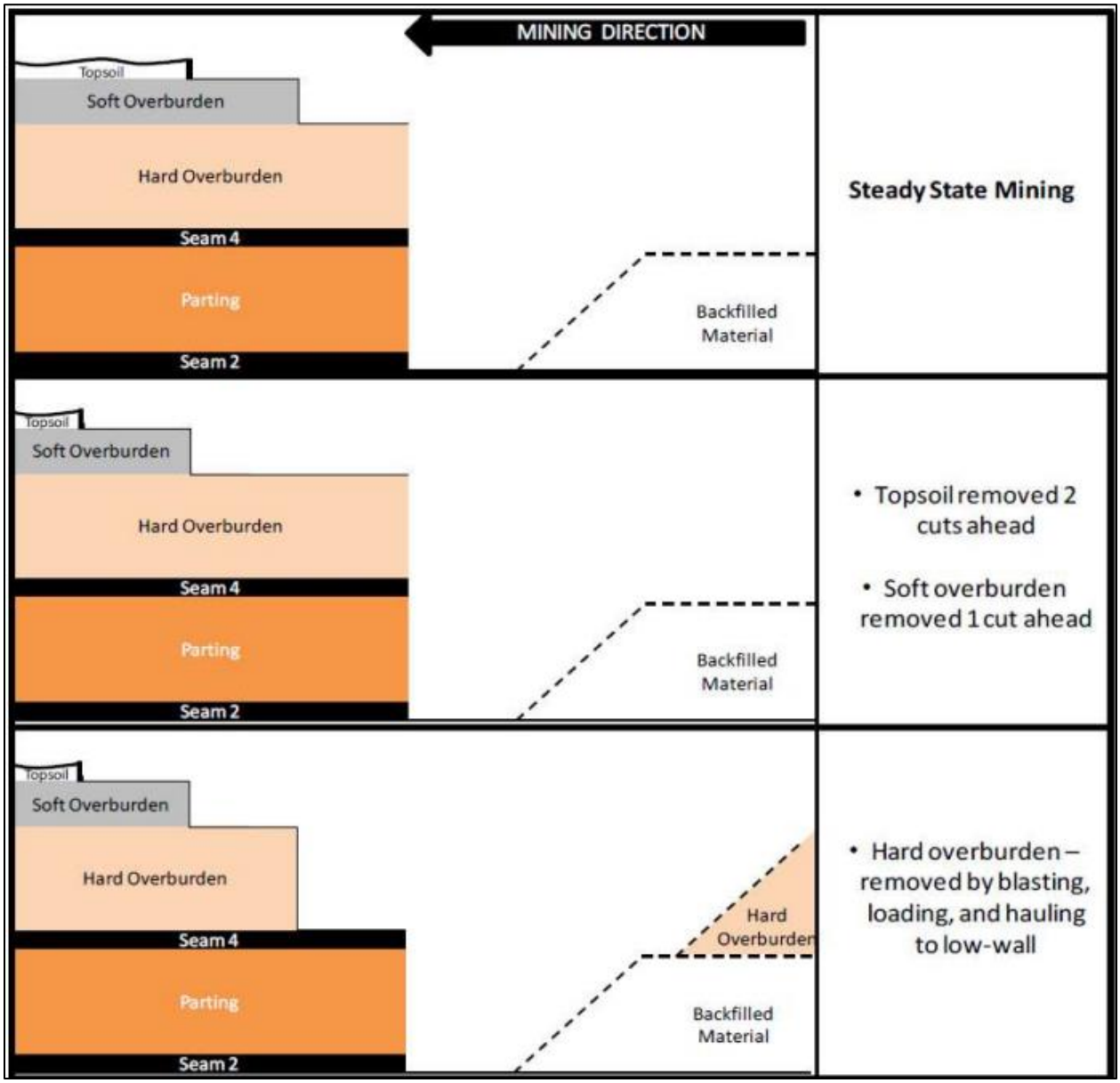

Figure 5: Benchmarking and doze over Method 1

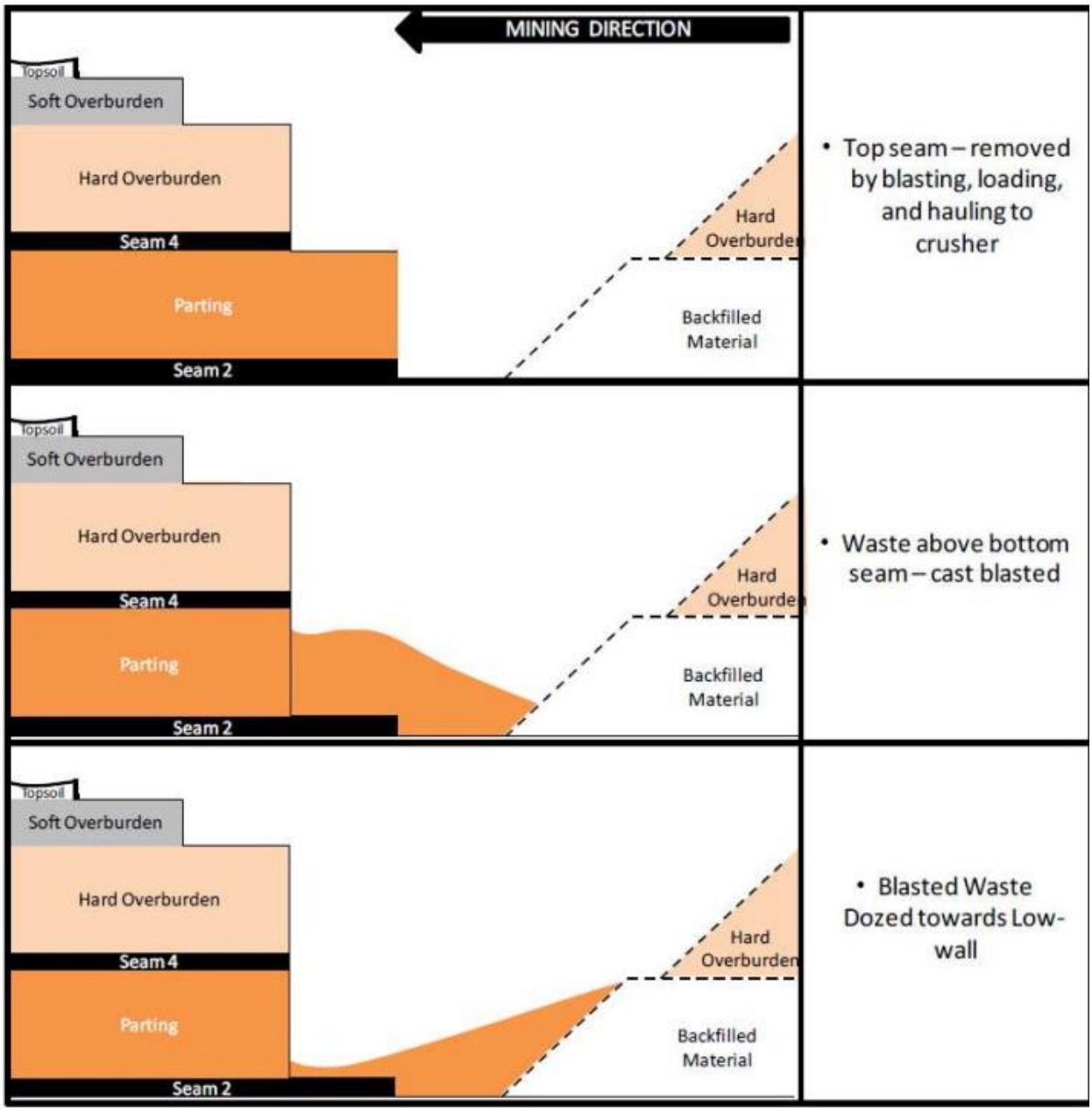

Figure 6: Benchmarking and doze over Method 2

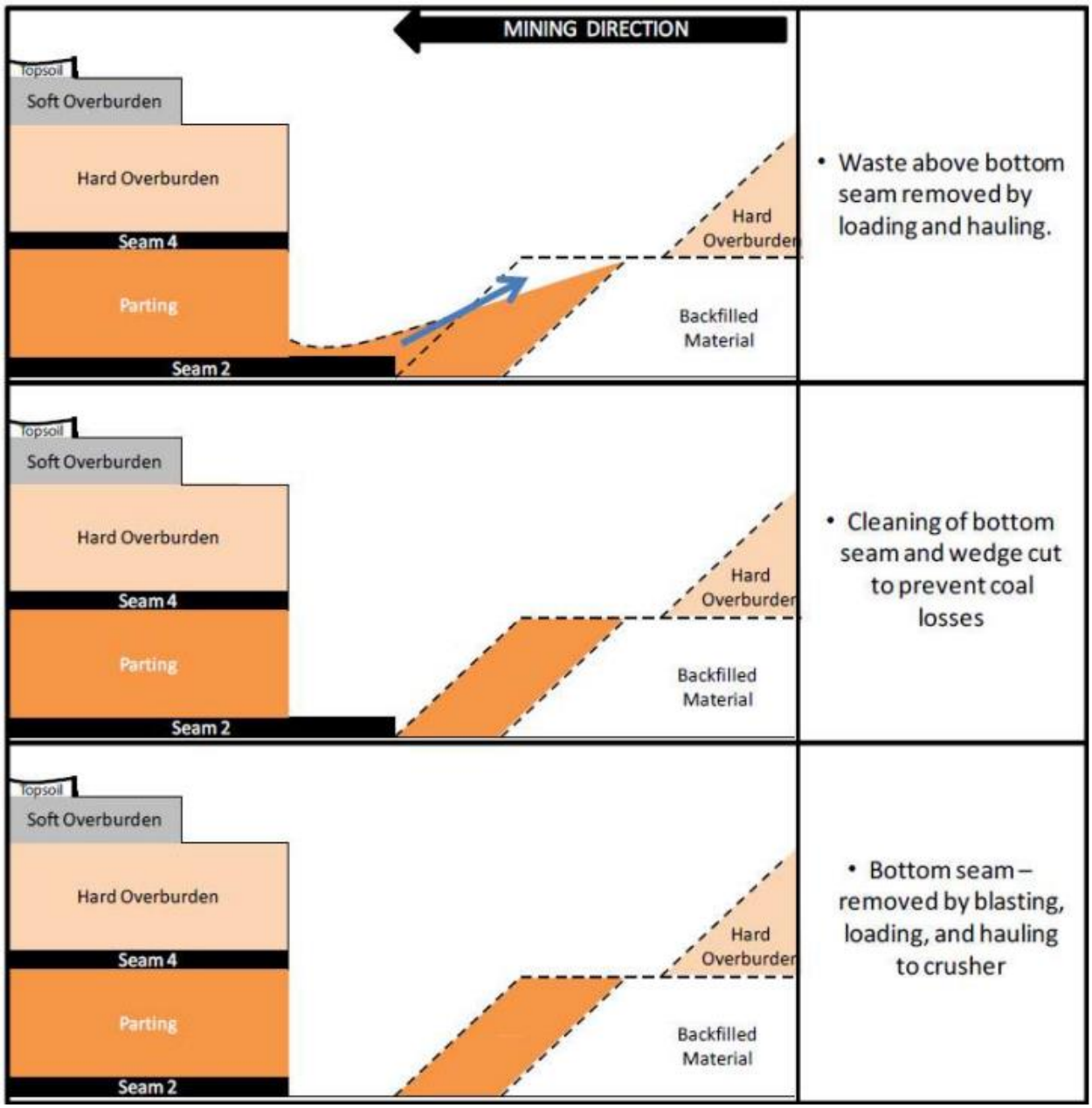

Figure 7: Benchmarking and doze over Method 2

Further, there will be three different variants to the sequence described above, including; only mining seam 2; mining seam 2 and 3; mining seam 2 and 4; and lastly, mining seam 2, 3, and 4.

- Seam 2 – When only mining Seam 2, the topsoil and softs will be mined as described initially, but the hard rock above seam 2 will be cast blasted, dozed-over, and the coal will be cleaned.
- Seam 2 and 3; and Seam 2 & 4 – Will be as described above.
- Seam 2, 3 & 4 – When mining all three seams, the sequence will be the same as described initially, except, when the top coal seam has been removed, the parting between seam 4 and 3 will be drilled and blasted, loaded, and hauled to the spoil area, and be backfilled. Once seam 3 has been removed, the

sequence is similar to with only seam 2, where the parting will be cast blasted, dozed over, and the coal will be cleaned.

With all these options, the topsoil will be removed one cut in front of the softs, and the softs will always be mined one cut in front of the hards and coal.

5.2.8 REHABILITATION

On completion of construction work, the site will be rehabilitated as per the specifications of the EMPr, approved Method Statements. It will meet the requirements of the Closure and Rehabilitation Plan. The rehabilitation activities will include:

- Removal of excess building material and waste;
- Repairing any damage caused by construction activities;
- Rehabilitating the area affected by temporary access roads;
- Reinstating existing roads; and
- Replacing topsoil and planting indigenous vegetation where necessary.

Various specialists have proposed the rehabilitation measures to be conducted which are related to biodiversity, wetland, hydrology, noise, hydropedology/groundwater, soil, land use, and capability. These rehabilitation measures will play a significant role to remedy the impacts caused by the proposed project. The detailed mitigation measures and rehabilitation inputs are included in the specialist reports attached as Appendix C4. However, the overall rehabilitation objectives for the project are as follows:

- Establishment of the suitable post-mining land capability, vegetation, wetland, and biodiversity.
- Implement progressive rehabilitation measures, where possible and conduct monitoring of rehabilitated areas; and
- Comply with the relevant local and national regulatory requirements.

The proposed activities may not commence without an EA from the Competent Authorities as they trigger listed activities under NEMA, EIA Regulations of 2014 as amended. The listed activities are detailed below.

5.3 LISTED ACTIVITIES APPLICABLE TO THE PROJECT

The proposed development triggers listed activities in terms of 2014 EIA Regulations as amended, National Environmental Management: Waste Act, 2008 (Act 59 of 2008) (NEMWA), and National Water Act, 1998 (Act 36 of 1998). The listed activities applicable are listed and described in Table 6:

Table 6: Listed activities relevant to the project

Listed activities	Activity/Project description
Activities listed under the National Environmental Management Act, 1998 (Act 107 of 1998), Listing Notice 1 (GNR983)	
GN R. 983 Activity 4 *The development and related operation of facilities or infrastructure for the storage, or storage and handling of a dangerous good, where such storage occurs in containers with a* *combined capacity of more than 80 cubic meters but 4 less than 500 cubic meters.*	The proposed project will entail the construction of seven 690000 L diesel storage tanks with a combined capacity of 483 cubic meters
GN R. 983 Activity 9 *The development of infrastructure exceeding 1000 metres in length for the bulk transportation of water or stormwater-* *(i) with an internal diameter of 0,36 metres or more; or* *(ii) with a peak throughput of 120 litres per second or more;* *excluding where-* *a) such infrastructure is for bulk transportation of water or stormwater or stormwater drainage inside a road reserve; or* *(b) where such development will occur within an urban area".*	The proposed development will entail the construction of the following: ○ Stormwater Plant, with a peak through of 5.25 m³/s and ±1000 m; and ○ Overland CNV Stormwater: Qmax > 120 l/s ; L 1122 m.
GN R. 983 Activity 10 *The development and related operation of infrastructure exceeding 1 000 metres in length for the bulk transportation of sewage, effluent, process water, wastewater, return water, industrial discharge, or slimes –*	The proposed development will entail the construction of an 1122 m long Overland CNV Stormwater, with a peak through of greater than 120 m³/s covering 5.6 ha, and Stormwater Plant, with a peak through of 5.25 m³/s and ±1000 m long.

Listed activities	Activity/Project description
a) with an internal diameter of 0,36 meters or more; or *b) with a peak throughput of 120 litres per second or more;* *excluding where—* *(a) such infrastructure is for the bulk transportation of sewage, effluent, process water, wastewater, return water, industrial discharge, or slimes inside a road reserve or railway line reserve; or* (b) *where such development will occur within an urban area.*	
GN R. 983 Activity 12: *"The development of–* *i) dams or weirs, where the dam or weir, including infrastructure and water surface area, exceeds 100 square metres; or* *(ii) infrastructure or structures with a physical footprint of 100 square meters or more;* *Where such development occurs –* *(a) Within a watercourse* *(c) If no development setback exists within 32 meters of a watercourse, measured from the edge of a watercourse".*	The proposed opencast mining and associated infrastructure will have a footprint greater than one hundred square meters (100m^2) , and some of these developments (i.e., Opencast, conveyor belt route, and the MRF) will be within a wetland.
GN R. 983 Activity 19: *Infilling or depositing of any material of more than 10 m^3 into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles, or rock of more than 5 cubic meters from: an active littoral zone, a watercourse*	The proposed opencast, conveyor belt, and MRF will entail dredging, excavation, removal, and moving of soil. These activities will occur within a wetland.

Listed activities	Activity/Project description
GN R. 983 Activity 24: *The development of a road-* *i. for which an environmental authorization was obtained for the route determination in terms of activity 5 in Government Notice 387 of 2006 or activity 18 in Government Notice 545 of 2010; or* *ii. with a reserve wider than 13.5m or were no reserve exits where the road is wider than 8m* *but excluding a road* *a) which is identified and included in Activity 27 in Listing Notice 2 of 2014 or roads where the entire road* b) *falls within an urban area or which is 1km or shorter*	The proposed haul road will be 2.855 km and wider than 20 m
GN R. 983 Activity 25: *The development and related operation of facilities or infrastructure for the treatment of effluent, wastewater, or sewage with a daily throughput capacity of more than 2000 cubic metres but less than 15000 cubic metres.*	The proposed project entails the construction of the wastewater treatment plant with a throughput of the capacity of 2025 m^3.
GN R. 983 Activity 28: *Residential, mixed, retail, commercial, industrial, or institutional developments where such land was used for agriculture, game farming, equestrian purposes or afforestation on or after 1 April 1998 and where such development will occur outside an urban area, where the total land to be developed is bigger than 1 hectare*.	The proposed BEP expansion will require approximately 3251.210 hectares and will be undertaken on land that was zoned agriculture.
Activities listed under the National Environmental Management Act, 1998 (Act 107 of 1998), Listing Notice 2 (GNR984)	

Listed activities	Activity/Project description
GN R. 984 Activity 6: *The development of facilities or infrastructure for any process or activity which requires a permit or license or an amended permit or license in terms of national or provincial legislation governing the generation or release of emissions, pollution, or effluent.*	The proposed development triggers Section 21 listed activities and will thus require a Water Use Licence in terms of NWA. Further, the development of the MRF trigger activities listed under NEMWA, hence an integrated application.
GN R. 984 Activity 15: The clearance of an area of 20 hectares or more of indigenous vegetation, excluding where such clearance of indigenous vegetation is required for— *i) the undertaking of a linear activity; or* *(ii) maintenance purposes undertaken in accordance with a maintenance management plan.*	The proposed open cast mining and development of the decline shaft, PCD, MRF, and other infrastructure will require clearance of more than 20 hectares.
Activities listed under the National Environmental Management Act, 1998 (Act 107 of 1998), Listing Notice 3 (GNR985)	
GN R. 985 Activity 12: *The clearance of an area of 300 square meters or more of indigenous vegetation except where such clearance of indigenous vegetation is required for maintenance purposes undertaken in accordance with a maintenance management plan* ***F Mpumalanga*** *ii. within critical biodiversity areas identified in bioregional plans."*	The proposed conveyer belt route crosses a CBA, and the project will require clearance of more than 300 square meters of indigenous vegetation.
Activities listed under National Environmental Management: Waste Act, 2008 (NEMWA) (Act No 59 of 2008)	

Listed activities	Activity/Project description
Government Notice 636 of November 2013: Category B, Activity 4 (11) *The establishment or reclamation of a residue stockpile or residue deposit resulting from activities that require a mining right exploration right or production right, in terms of the Mineral Resources and Petroleum Development Act (Act No. 28 of 2002).*	The proposed MRF will cater to discard disposal.
Government Notice 921 of November 2013: Category B, Activity 7 *The disposal of any quantity of hazardous waste to the land*	The proposed MRF will cater for the disposal of discarded coal
Government Notice 921 of November 2013: Category B, Activity 10 *The construction of facilities for a waste management activity listed in Category B of this schedule (not in isolation to the associated activity*	The proposed project entails the development of a discard dump facility that will cater to discard disposal and is expected to cater for the life of mine.
Government Notice R 921 under NEM: WA Category C, Activity 5(3) *The storage of waste tyres in a storage area exceeding 500 m².*	The proposed project will include the storage of tyres in an area exceeding 500 m²
The National Water Act, 1998 (Act 36 of 1998) Activities	
Section 21 (a)	Abstraction from boreholes and the pit
Section21 (c) & (i) *21(c) Impeding or diverting the flow of water in a watercourse; and* *21(i) Altering the Bed, Banks, Course, or Characteristics of a Water Course*	Some of the proposed activities either encroach or are within watercourses including wetlands.
Section 21 (g)	

Listed activities	Activity/Project description
Disposing of waste in a manner which may detrimentally impact on a water resource; and	The development of a discard dump facility, PCD, overburden stockpile and dust suppression will have negative impacts on water resources.
Section 21 (j) *Removing, discharging, or disposing of water found underground.*	The proposed activities will require the dewatering of underground mining and open pit areas.

6 A DESCRIPTION OF THE POLICY AND LEGISLATIVE CONTEXT WITHIN WHICH THE DEVELOPMENT IS LOCATED AND AN EXPLANATION OF HOW THE PROPOSED DEVELOPMENT COMPLIES WITH AND RESPONSE TO THE LEGISLATION AND POLICY CONTEXT

The EIA Regulations of 2014, as amended, under Appendix 2 Section 1(e) requires a description of applicable legislations in the Scoping Report. This section lists and describes the acts and legislations relevant to the proposed development and associated infrastructure. A list of the current South African environmental legislation pertinent to the proposed development is described in Table 7. It is not an exhaustive analysis; however, it provides a guideline to the relevant aspects of each legislation.

Further, Municipal policies, plans, and by-laws, Exxaro policies and world best practices, were considered during the undertaking of the EIA process.

Table 7: Legislation pertaining to the proposed project

Aspect	Relevant Legislation	Brief Description
Environment	• National Environmental Management: Act 1998, (Act No. 107 of 1998) as amended. • Environmental Impact Assessment Regulations, December 2014 as amended	As reflected in the National Environmental Management Act, 1998 (Act No. 107 of 1998), the overarching principles of sound environmental responsibility apply to all listed projects. Construction and operation of activities must be conducted in line with the generally accepted principles of sustainable development, integrating social, economic, and environmental factors. The EIA process followed complies with the NEMA and the EIA Regulations of December 2014 as amended. The proposed development involves "listed activities," as defined by NEMA. Listed activities are an activity that may potentially have detrimental impacts on the environment and therefore require an EA from the relevant Competent Authority, in this case, DMRE.
Mineral Resources	Mineral and Petroleum Resources Development Act No. 28 of 2002 (MPRDA)	Mineral and petroleum resources are the common heritage of all the people of South Africa and the State is the custodian thereof for the benefit of all South Africans. The objectives of the MPRDA are, inter alia, to: • recognise the internationally accepted right of the State to exercise sovereignty over all the mineral and petroleum resources within the Republic; • give effect to the principle of the State's custodianship of the nation's mineral and petroleum resources; • promote equitable access to the nation's mineral and petroleum resources to all the people of South Africa; • promote employment and advance the social and economic welfare of all South Africans; • provide for security of tenure in respect of prospecting, exploration, mining and production operations; • give effect to section 24 of the Constitution by ensuring that the nation's mineral and petroleum resources are developed in an orderly and ecologically sustainable manner while promoting justifiable social and economic development; and

Aspect	Relevant Legislation	Brief Description
		• ensure that holders of mining and production rights contribute towards the socio-economic development of the areas in which they are operating.
Mining Rights	The Mine Health and Safety Act (Act No. 29 of 1996)	The Mine Health and Safety Act, 1996 (Act No. 29 of 1996) (MHSA) aims to protect the health and safety of all employees and other personnel at the mines of South Africa. The main objectives of the act include the following: • Protection of the health and safety of all persons at the mines; • Requires employers and employees to identify hazards and eliminate, control and minimise the risks relating to health and safety at the mines; • Gives effect to the public international law obligations of the Republic that concern health and safety at all mines; • Provides for employee participation in matters of health and safety through health and safety representatives and the health and safety committees at the mines; • Provides for effective monitoring of health and safety conditions at the mines; • Provides for enforcement of health and safety measures at the mines; • Provides for investigations and inquiries to improve health and safety at mines; and • To promote: o Culture of health and safety in the mining industry; o Training in health and safety in the mining industry; and o Co-operation and consultation on health and safety between the State, employers, employees, and their representatives.

Aspect	Relevant Legislation	Brief Description
		The proposed BEP project is located within the existing Exxaro MRA and is proposed to be an extension to the existing Belfast Implementation Project. Exxaro MRA is dominated by undeveloped agricultural land and seminatural and natural grassland.
Biodiversity	National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004)	The purpose of the National Environmental Management Biodiversity Act, 2004 (Act No. 10 of 2004) (NEMBA) is to provide for the management and conservation of South Africa's biodiversity within the framework of the NEMA and the protection of species and ecosystems that warrant national protection. As part of its implementation strategy, the National Spatial Biodiversity Assessment was developed.
Protected Areas	National Environmental Management: Protected Areas Act, 2003 (Act No. 57 of 2003)	This Act aims to provide for the protection, conservation, and management of ecologically viable areas representative of South Africa's biological diversity and its natural landscapes. According to Biodiversity Specialist (2021), the study area falls within the Steenkampsberg Important Bird Area (IBA). DEA (2016), also recognizes the Steenkampsberg IBA as a key priority area for protected area expansion in Mpumalanga.
Heritage Resources	National Heritage Resources Act, 1999 (Act No. 25 of 1999)	The National Heritage Resources Act, 1999 (Act No. 25 of 1999) legislates the necessity for cultural and heritage impact assessment in areas earmarked for development, which exceed 0.5 ha. The Act provides for the potential destruction to existing sites, pending the archaeologist's recommendations through permitting procedures. Permits for this specific project would be administered by the Mpumalanga Heritage Agency or South African Heritage Resources Agency (SAHRA). No heritage or archaeological resources were identified in the proposed area which will be affected by the BEP expansion project.

Aspect	Relevant Legislation	Brief Description
Air quality management and control	National Environmental Management: Air Quality Act, 2004 (Act 39 of 2004)	The objective of the Act is to protect the environment by providing reasonable measures for the protection and enhancement of air quality and to prevent air pollution. The Act provides for measures to control dust, noise, and offensive odours. The project is situated in the Mpumalanga Province, in the Nkangala District Municipality. This area has not been formally declared as an Air Quality Priority Area in terms of Section 18(1) of the National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004) (AQA). Section 32 of The National Environmental Management: Air Quality Act, 2004 (Act 39 of 2004) deals with dust control measures in respect of dust control. The Minister or MEC may prescribe measures for the control of dust in specified places or areas, either in general or by specified machinery or in specified instances, the steps to be taken to prevent nuisance or other measures aimed at the control of dust. The National Dust Control Regulations (2013) provide for the management and monitoring of dust.
Noise Management and Control	Noise Control Regulations in terms of the Environmental Conservation, 1989 (Act 73 of 1989)	The assessment of impacts relating to noise pollution management and control, where appropriate, must form part of the EMPr. Applicable laws regarding noise management and control refer to the National Noise Control Regulations issued in terms of the Environment Conservation, 1989 (Act 73 of 1989).
Water Resources Management	National Water Act, 1998 (Act 36 of 1998)	This Act provides for fundamental reform of the law relating to water resources and use. The preamble to the Act recognises that the ultimate aim of water resource management is to achieve sustainable use of water for the benefit of all users and that the protection of the quality of water resources is necessary to ensure the sustainability of the nation's water resources in the interests of all water users.

Aspect	Relevant Legislation	Brief Description
		The activities that trigger a Water Use Licence requirement have been identified, and the application process is underway.
Agricultural Resources	Conservation of Agricultural Resources Act, 1983 (Act No. 43 of 1983)	The Act aims to provide for control over the utilization of natural agricultural resources to promote the conservation of the soil, water resources, and vegetation and to combat weeds and invader plants. Section 6 of the Act makes provision for control measures to be applied to achieve the objectives of the Act. The proposed BEP project will affect the agricultural activities as agricultural activities will not continue, particularly where open cast mining will be undertaken.
Human	The Constitution of South Africa, 1996 (Act No. 108 of 1996	The Constitution provides for an environmental right (section 24). The State is obliged "to respect, protect, promote and fulfill the social, economic and environmental rights of everyone…" The environmental right states that: "Everyone has the right - a) To an environment that is not harmful to their health or well-being; and b) 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."
Waste		This Act provides fundamental reform of the law regulating waste management to protect health and the environment by providing reasonable measures for preventing pollution and ecological degradation and

Aspect	Relevant Legislation	Brief Description
	National Environmental Management: Waste Act, 2008 (Act 59 of 2008)	securing ecologically sustainable development. This Act also ensures the provision of national norms and standards for regulating waste management by all spheres of government. Further, it provides for specific waste management measures, licensing and control of waste management activities; remediation of contaminated land, compliance and enforcement; and matters connected therewith. The proposed development entails the extension of a mine residue facility which will cater for coal discards and slurry.
Health and Safety	Occupational Health and Safety Act (OHS Act	The Major Hazard Installation (MHI) regulations (July 2001) published under Section 43 of the Occupational Health and Safety Act (OHS Act) requires employers, self-employed persons, and users who have on their premises, either permanently or temporarily, a major hazard installation or a quantity of a substance which may pose a risk (our emphasis) that could affect the health and safety of workers and the public to conduct a risk assessment in accordance with the legislation. Following legislation, the risk assessment must be done by an approved inspection authority (AIA) registered with the Department of Labour and accredited by the South African Accreditation Systems (SANAS) before construction of the facility.
Other Plans, Policies and Guidelines		
Strategic Development	National Development Plan (2030)	The National Development Plan (NDP) is a long-term National strategic plan with the aim of reducing inequality and eliminating poverty by 2030. The plan focuses on the following four broad objectives: 1. The establishment of overarching objectives to be achieved by 2030. 2. To find consensus on the key obstructions to the achievement of these objectives and to what needs to be accomplished in overcoming these obstacles. 3. To advance the long-term goals of the NDP through the establishment of a commonly shared long-term strategic framework against which future planning can occur.

Aspect	Relevant Legislation	Brief Description
		4. To create a framework against which choices can be made as to how best to utilise limited resources. The project is in accordance with the NDP with specific focus being placed on the Strategic Infrastructure Projects as indicated below. **Strategic Infrastructure Projects (SIPs)** The Government's Strategic Infrastructure Projects (SIPs) identifies the following five core functions: 1. To unlock opportunity 2. Transform the economic landscape 3. Create new jobs 4. Strengthen the delivery of basic services, and 5. Support the integration of African economies. In this regard, a balanced approach is being fostered through encouraging an environmentally sympathetic economy, boosting energy security, promoting integrated municipal infrastructure investment, facilitating integrated urban development, accelerating skills development, investing in rural development, and enabling regional integration. In this regard, the following is applicable in respect of the management of water resources with the following priority being identified: "*There is an urgent need for a coherent plan to ensure the protection of water resources and the environment in the Mpumalanga Highveld coalfields, upstream of the Vaal and Loskop dams, as well as in the Lephalale-Waterberg area. Given environmental pressures and development demands, current water allocations in the upper Vaal and Olifants River water-management areas urgently need to be revised.*

Aspect	Relevant Legislation	Brief Description
		Geographic areas where this is needed include: *Mpumalanga Highveld coalfields – a balance between environmental protection, agriculture, energy requirements and water resources. Olifants River (Limpopo/Mpumalanga) – careful consideration of the balance between mining, agriculture and nature conservation.* *By 2030, a perspective on changing settlement patterns must consider the distribution of, and threats to, natural resources, and the spatial implications of the emergence of green 3 technologies and green economies. The Commission has mapped the spatial dimensions of these concerns. These include biodiversity threats, particularly in the Western Cape; stressed water catchments; areas contributing disproportionately to greenhouse gas emissions and air pollution such as the Mpumalanga Highveld*" (National Planning Commission, 2012, pp. 179, 181 & 262).

7 A MOTIVATION FOR THE NEED AND DESIRABILITY FOR THE PROPOSED DEVELOPMENT INCLUDING THE NEED AND DESIRABILITY OF THE ACTIVITY IN THE CONTEXT OF THE PREFERRED LOCATION

This section justifies the need and desirability of the proposed development, focusing on the associated benefits and importance to both the locals and the region.

7.1 MOTIVATION FOR THE DEVELOPMENT

The DMRE issued Exxaro a Mining Right (MR) (DMRE Ref No. MP 30/5/1/2/2/431 MR) for development of the Belfast open cast mine in Belfast on 9th October 2013 with the first coal produced in September 2019. Once mined, the coal is transported by trucks from the Belfast mine to Rietkuil Siding (approximately 30km from the mine) and thereafter transported by rail to the Richards Bay Coal Terminal for export.

As indicated above, the exploitation analysis of the Belfast Resource outside the current BIP layout revealed the potential for a 5,200 kcal/kg opencast and underground mining scenario as well as a 5,800 kacl/kg underground scenario. A potential of 39.7 Mt of ROM can be additionally mined at a yield of 69% resulting in 27.4 Mt of product. The proposed development is thus an expansion project that aims to increase production and extend the life of the mine, and further respond to the commodity demand driven by the need for electrification. Subsequently, the proposed project will ensure the following:

- Reliable supply of coal for both local and export markets;
- Extend the life of the mine and thus create more stable job opportunities; and
- Improvement of South Africa's socio-economic status.

7.2 BENEFITS OF THE PROJECT

It is recognised that mining activities are an essential component of South Africa's economic development. According to the Chamber of Mines of South Africa's Integrated Annual Review (2015), the mining sector accounted for 7.7% of South Africa's Gross Domestic Product (GDP) directly, and approximately 17% of direct, indirect, and induced effects are included. Coal specifically is a national requirement to meet the demand for electricity supply. Further, coal provides 81% of the power generated within South Africa with imminent future expansions.

South Africa is home to 3.5% of the world's coal reserves thus it is likely that coal will continue to be utilised as a significant part of the energy generation mix. At the national level, the proposed project will increase coal exports through the Port of Richards Bay and deliver coal to several power stations within the country.

The Social Impact Assessment Report (2021) highlighted that it is likely that the project will result in the following economic benefits detailed below:

- Job creation and skills development
- Local economic development.

Therefore, at the regional level, the project will contribute security of local employment due to the extension of the Life of Mine (LOM). There would also be a less tangible but important benefit of positioning the Municipalities ahead in terms of job opportunities.

7.2.1 JOB CREATION AND SKILLS DEVELOPMENT

Over the construction phase, the project will lead to the creation of both direct and indirect jobs. The duration of construction is 24 months, which includes 4 months of detailed design and 16 months of manufacturing and construction (BVi Consulting Engineers Gauteng (Pty) Ltd, 2020, p. 65).

With regard to the operational phase of the project, (BVi Consulting Engineers Gauteng (Pty) Ltd, 2020, pp. 23-24) indicated that in terms of the Underground resources, the estimated amount of people will be:

- Underground workers – 455
- Surface workers – 117
- Total workers – 572

It is assumed that the underground workers will work in two or three shifts, resulting in a maximum of 455/2 + 117 = 345 people on the mine during day shift."

The Belfast Coal – Social and Labour Plan (2018-2023) Ref: MP 30/5/1/2/2/431 MR lays out a Human Resources Development Plan to which the mine is committed and which, amongst other aspects, covers:

- Mentorship and coaching
- Bursary and internship plan
- Women in mining.

7.2.2 LOCAL ECONOMIC DEVELOPMENT

The Capex estimated ceiling value of the project are included in Table 8.

Table 8: Project CAPEX (Social Impact Assessment Report, 2021)

Description	Amount in Rands
Direct Cost	
Internal Infrastructure	190,698,367.06
Internal Services	133,241,302.21

External Services	11,094,000.00
Indirect Cost	
EPCM	38,914,760.31
Owners Team	25,943,173.54
Consultants	3,242,896.69
Contingency	100,783,624.95
Nominal Estimate	**503,918,124.77**

The mine is also committed to community economic development which, amongst other areas, focuses on:

- The development of projects
    - The Belfast Enterprise Development Centre- An incubation centre
    - A community health programme (HIV / AIDS Programme) for the Mpumalanga (Belfast) region.
- Assistance with housing for employees.
- Preferential procurement for Historically Disadvantaged South African.

7.3 SUPPORTING STRATEGIES

At the **regional level,** the project would contribute to improving the socioeconomic status of the adjacent communities and the region at large. The Social Impact Assessment Report (2021) highlighted that the Nkangala District Municipality Integrated Development Plan (IDP) indicates that the district municipality's pre-COVID-19 estimates are for 140 000 additional jobs in Mining by 2020, and 200 000 jobs by 2030, not counting the downstream and side stream effects.

Based on the claim that:

"*Nkangala is the economic hub of Mpumalanga and is rich in minerals and natural resources. The Districts' economy is dominated by electricity, manufacturing and mining."*

And that:

"The NDM is cooperating with the mining sector to ensure that there is improvement in the impact of Social Labour Plans (SLP) and Corporate Social Investment (CSI) in the mining communities and labour sending areas. The mining sector should play a central role in ensuring the creation of secondary industries in mining towns."

While the Emakhazeni Local Municipality 2018-2022 IDP, indicated that the municipality's alignment to the National Development Plan (NDP) includes the creation of jobs:

> " *…in infrastructure development, agriculture, mining and beneficiation, manufacturing, the green economy and tourism.*"

And the provision of:

" …policy certainty to encourage long-term investment in mining and other sectors."

Notwithstanding the challenges identified in the Emakhazeni IDP, highlighting that t*he rise in mining applications for prospecting rights in the area, especially coal mining, adds extra pressure on environmental degradation and water quality issues, t*he proposed project aligns with the regional plans in terms of job creation and socioeconomic stability.

Further, at the national level, the project would contribute to implementing South Africa's new energy policy as embodied in the White Paper on Energy (Department of Minerals and Energy, 1998) which highlights that amongst others, coal play a central role in the socio-economic development of our country, while simultaneously providing the necessary infrastructural economic base for the country to become an attractive host for foreign investments in the energy sector. The priorities to which this project would contribute are laying the groundwork for enhancing supply and electrification.

8 DESCRIPTION OF THE PROCESS FOLLOWED TO REACH THE PROPOSED PREFERRED, SITE AND LOCATION WITHIN THE SITE

The identification of alternatives is a crucial component of the EIA process. The identified alternatives are assessed in terms of environmental acceptability, technical, and economic feasibility during the EIA process, wherein the preferred alternative is highlighted and presented in the final report.

The project is proposed within the authorised MRA; therefore no alternative site location was considered. However, the study considered other technical and conveyor routing alternatives (Refer to Section 8.1) that were found to be technically and environmentally viable compared to the other options. The alternatives are presented as part of this Scoping Report and will be scrutinised further during the EIA phase.

Site visits were undertaken by the environmental assessment practitioner and specialists and a site selection of the proposed development alternatives was undertaken. In addition, the selection process was technically determined by the broad location based on the need of the development and a detailed public consultation is underway to assess the viability of the selected options which may result in the identification of more options for consideration to assess the economic need and desirability of the project.

8.1 DETAILS OF ALTERNATIVES CONSIDERED

The EIA Regulations require that alternatives be considered, including technical, locality, structural, scheduling, etc. This section describes the alternatives/options considered and includes the location and route alignments options and no-go alternatives discussed below.

The proposed open-pit extension areas are located along the northern portion of the MRA and have a combined footprint of approximately 636.8 ha. This activity does not have an alternative as it is the extension of the existing infrastructure, however several alternatives of exclusion of watercourses were considered during the feasibility phase and are included in this report. The project will also entail the development of underground mining with associated Infrastructure For the identified underground areas at BEP, a traditional Board and Pillar (B&P) mining method was preferred, and no site alternatives are considered for this activity. The **Figure 10** depicts the two options of the opencast shaft and their route alternatives together with the associated infrastructure.

8.1.1 ALTERNATIVES FOR EXCLUSION OF WATERCOURSES

Several changes have been made to the mine layout since 2009 to reduce the adverse impact on water resources as shown in Figure 8.

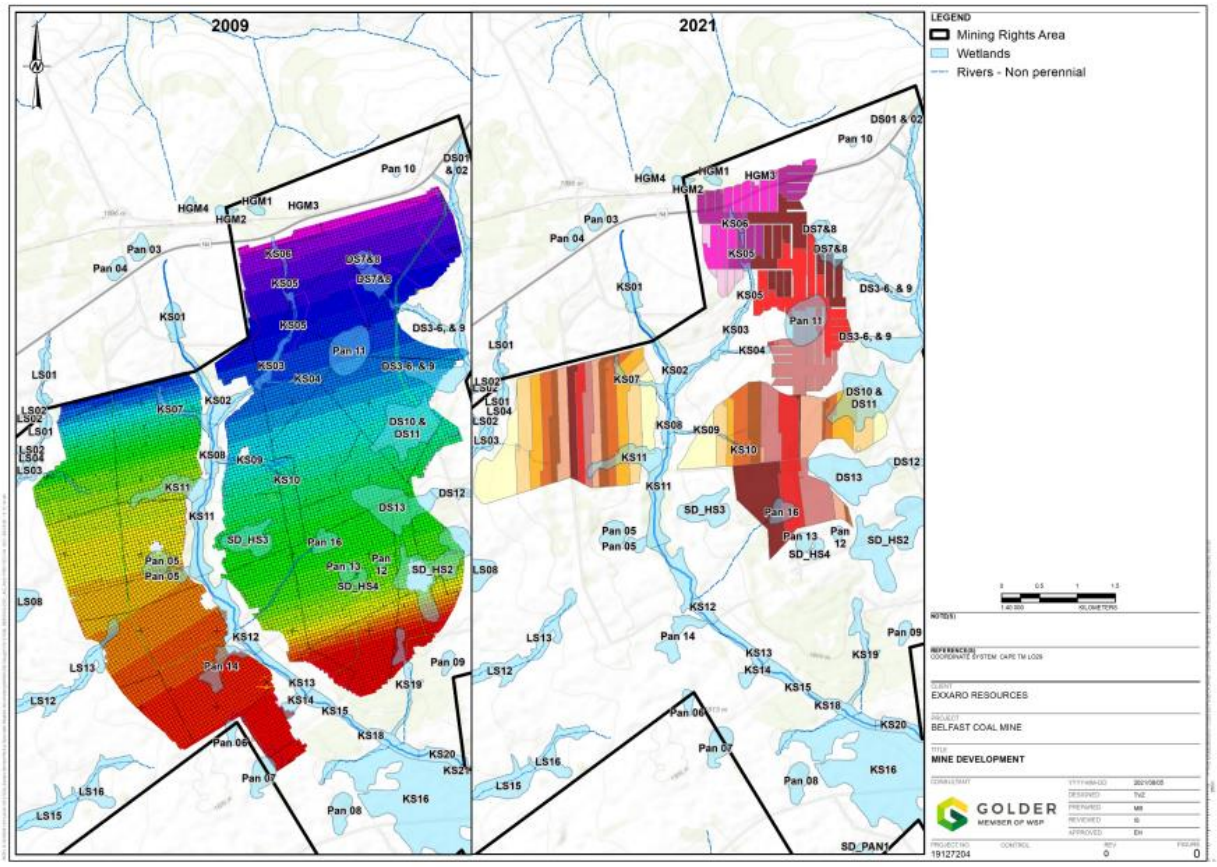

Figure 8: Change of mine layout from 2009 to 2021 (Golder an Associates, 2021)

Exxaro excluded R5.7 billion areas from BIP and BEP for environmental reasons and kept R1.6 billion within the mine plan as depicted in Figure 9and Table 9.

Table 9: Areas with tonnages and valuations for the areas included and excluded from BIP and BEP

Mine Plan Area number	In/Out Current Mine Plan	OC ROM (t AD)	OC Value (R real)	Value Left in the Ground (R real)	Value to be lost in removed (R real)
Area 1	Out	4,967,507	1,521,442,339	1,521,442,339	
Area 2	In	1,362,945	666,066,405		666,066,405
Area 3	In	2,467,358	971,293,743		971,293,743
Area 4	Out	1,774,452	627,731,720	627,731,720	
Area 5	Out	944,829	382,005,249	382,005,249	
Area 6	Out	6,318,065	1,540,028,144	1,540,028,144	
Area 7	Out	840,765	433,968,235	433,968,235	
Area 8	Out	4,657,814	420,250,760	420,250,760	
Area 9	Out	834,198	614,794,798	614,794,798	
Area 10	Out	214,152	161,048,616	161,048,616	
Total		**24,382,084**	**7,338,630,007**	**5,701,269,859**	**1,637,360,148**

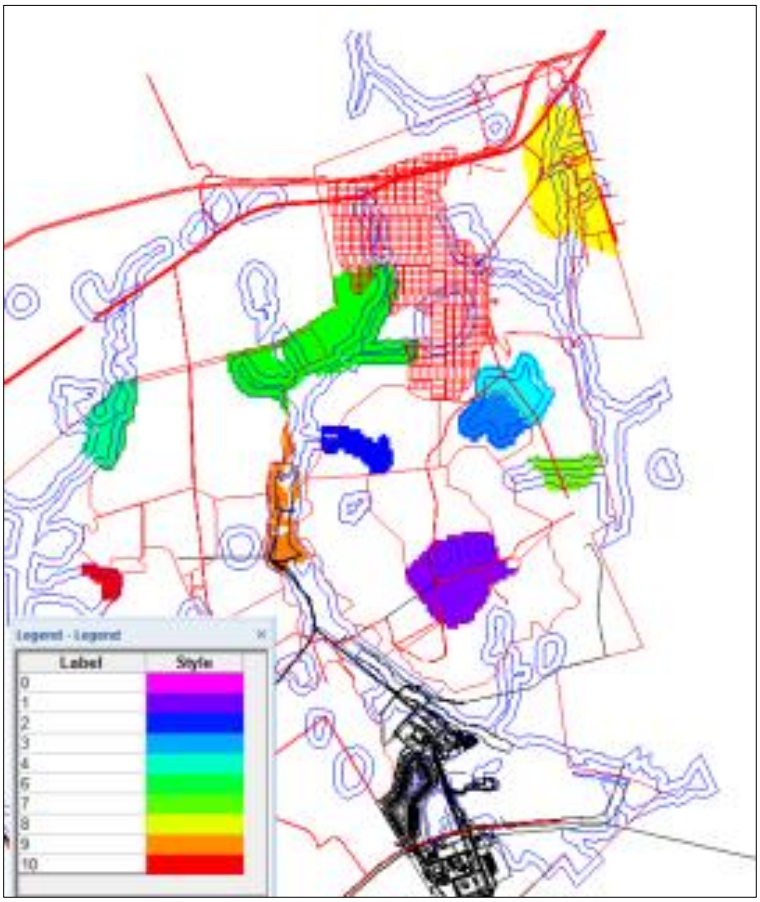

Figure 9: Mine Plan

Four alternative options for the proposed conveyor are currently being considered (refer to Figure 11 below). Construction and operation of the conveyor will result in the direct loss of between 0.39 and 1.02 ha of wetland habitat depending on the selected option, and disturbance of adjacent wetland habitats by construction activities and machinery. As is the case for direct loss to the opencast pit, additional measures will be required to address significant residual impacts i.e., compensate or offset the permanent loss of wetland habitat. As such, conveyor D is a preferred option from a wetland perspective (Golder Associates Africa (Pta) Ltd., 2021).

8.1.2 THE OPENCAST SHAFT ALTERNATIVES

Exxaro proposes the development of the opencast shaft east of the MRA with an approximate footprint of 45 ha, which will entail two alternatives, namely, Opencast Shaft Option 1 and Opencast Shaft Option 2. The associated infrastructure of these two options are the conveyor belts, whereby Option 1 has only one alternative and Option 2 have four alternatives as presented in **alternatives Table** and **Figure 10**.

Table 10: Summary of the opencast shaft options and their conveyor alternatives

Opencast Shaft Option 1		**Opencast Shaft Option 2**	
Alternative	**Colour in the map**	**Alternatives**	**Colour in the maps**
One conveyor/haul road route option (Option 1 Conveyor)	Lime	Conveyor Alternative A	Pink
		Conveyor Alternative B	Yellow
		Conveyor Alternative C	Light blue
		Conveyor Alternative D	White

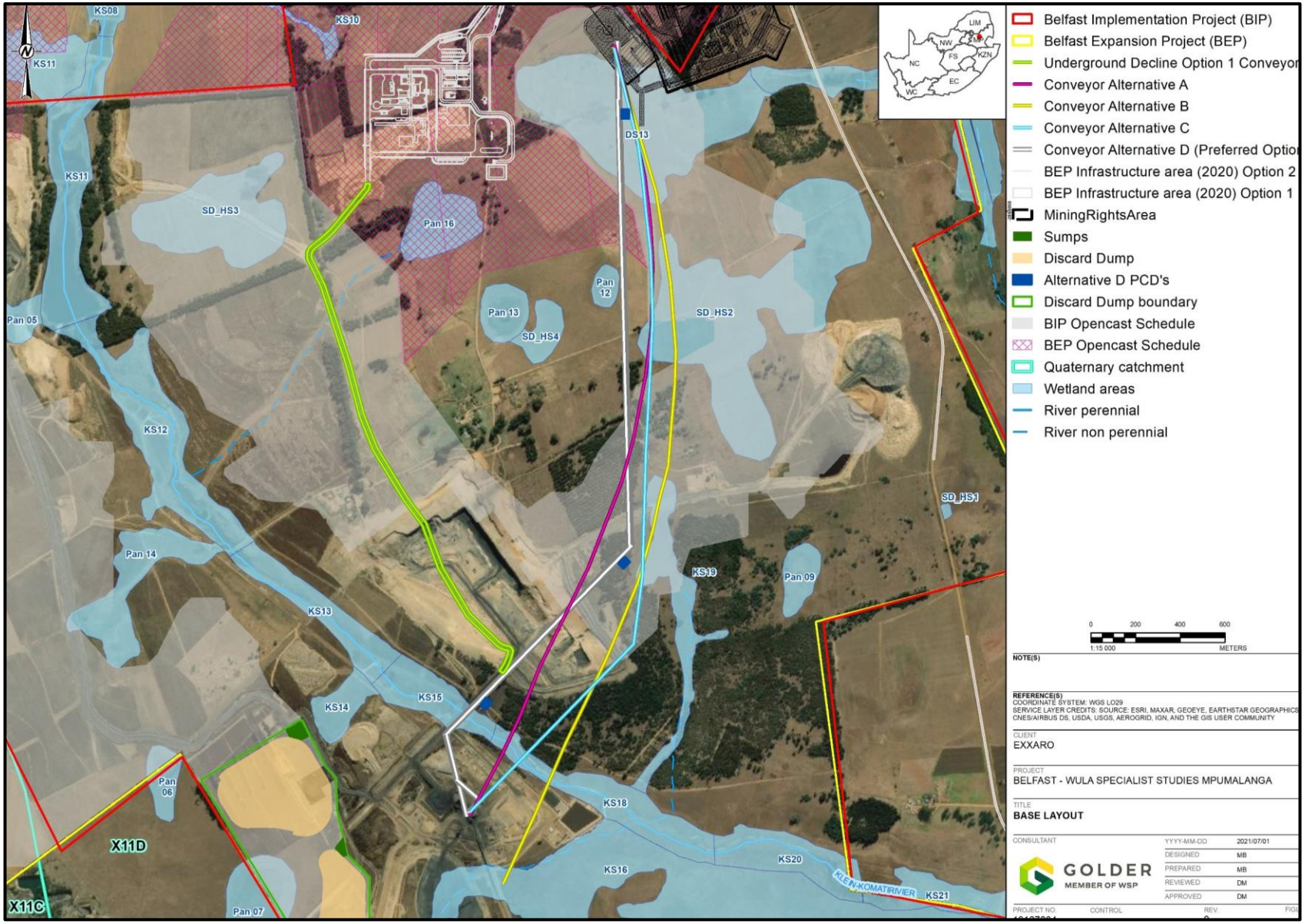

Figure 10: Opencast Shaft Options, route alternatives, discard dump and associated infrastructure (Golder and Associates: Wetland Specialist Report, 2021)

8.1.2.1 Opencast Shaft Option 1 (Option 1)

The Opencast Shaft Option 1 footprint is within the footprint of the proposed opencast pit (i.e., the Belfast Expansion Project). Therefore, the shaft is proposed within a landscape associated with mining activities. The Opencast Shaft Option 1 requires a conveyor belt, and only one alternative for the conveyor belt is proposed. The proposed option is depicted in green on the map, and it is described and assessed further below. This option will cross over the Klein Komati River. Further, this option will be over the planned pit area and will delay the commencement of the underground working as the mine would have to wait for the pit rehab to be completed before construction can commence for the shaft infrastructure

Option 1 emerges as the preferred option due to the benefit of retaining arable land and is thus supported on a social basis. Similarly it poses less of an impact from a soil, land use and land capability perspective. Conveyor Option 1 is also supported on a social basis, while it is noted in the soil, land use and land capability report that the difference in the impact of the two shaft options is minor.

8.1.2.2 Opencast Shaft Option 2 (Option 2)

The footprint of Opencast Shaft Option 2 covers small areas of non-mined vegetation communities, as well as post-mining rehabilitated land. As such, some habitat loss and modification will occur due to the development shaft covering approximately 45 ha.

The open cast shaft requires a conveyor and four conveyor alternatives from Opencast Shaft Option 2 are under consideration. All four alternatives span southerly before turning west and crossing the Klein-Komati River. The proposed options are shown in different colors on the map and is described and assessed further below.

Table 11 below presents the comparative analysis of the two proposed options of the opencast shaft with the specialist's options preference. This comparative analysis includes the input from approximately 12 specialists.

Table 11: Comparative analysis of the opencast options

Specialists	Comparative analysis of the opencast alternatives/options		Specialist preference
	Opencast Shaft Option 1 (Option 1)	**Opencast Shaft Option 2 (Option 2)**	
Wetland	• Construction and operation of the BEP opencast area (both Option Shafts 1 and 2 will result in the direct loss of approximately 31.38 ha of wetland habitat. However, •Option 1 will contribute more in terms of direct loss of wetland habitat. • Situated approximately 20 m of the Hillslope Seepage (DS13). • Option 1 is situated approximately 100m from Pan 16.	• The Opencast Shaft Option 2 will contribute less in terms of direct loss of wetland habitat as compared to Option 1. • A small portion of Alternative 2 is situated on the Hillslope seepage (DS13). • Option 2 is situated approximately 300 m from the Pan 16, which is relatively further compared to Alternative 1.	Open Shaft option 2
Biodiversity	• The entire footprint of the proposed Opencast Shaft Option 1 is located within a proposed opencast pit. • Option 1, along with its proposed conveyor option 1, was therefore not considered further with respect to the loss of biodiversity or habitat loss.	• The footprint of Opencast Shaft Option 2 covers small areas of non-mined vegetation communities, as well as post-mining rehabilitated land. • As such, some habitat loss and modification will occur because of the development of this facility. The extent of the impact has been assessed as part of the scoping and rated high significance; however, mitigation measures will reduce the impact to medium significance.	Open Shaft Option 2
Visual	• Option 1 is within the BEP but over the Mining Area. • Both options are within a landscape that is associated with mining activities.	• Although, both options are proposed within a landscape that is associated with mining activities, this alternative together with its associated infrastructure (i.e. Route Alternative D) will have low visual impacts.	Open Shaft Option 2

Palaeontology	• Option 1 is within the highly sensitive Vryheid Formation, but its footprint is much smaller than that of the general mining area.	• Option 2 is situated in moderately sensitive rocks of the Dwyka Group.	Open Shaft Option 2
Soil, land use, and capability	• Some portions of this infrastructure are located within and near the disturbed areas. • The impact is more localised since there is existing mining activities in the immediate vicinity • Relatively smaller footprint size (51.9 ha). • A short distance of the rope conveyors. • High potential of land fragmentation; and larger arable land affected within the BEP area (37.4 ha). • The bulk of the conveyor route follows existing roads.	• A Large portion will be constructed on the BIP mined out areas and the conveyor routes will also be over mined out areas, thus reducing impact footprint. • A large portion of the footprint is located within soils that are more suitable for grazing. • Larger footprint area (60.8 ha). • Longer distance for rope conveyors. • Situated in a sensitive area (high arable soils) since there are no mining activities in the immediate vicinity, this will introduce new impacts (i.e., soil contamination and loss of high potential soils). • A longer extent of the conveyor route is not located along existing roads; therefore, additional service roads would be required.	Open Shaft Option 1

Social	• Option 1 supports the objective of conserving as much arable and undisturbed land as possible and thus favour agricultural production continuity on the farm situated within the immediate vicinity, it emerges as the preferred option due to the benefit of retaining arable land and is thus supported on a social basis. • On similar grounds, because it poses less of an impact from a soil, land use and land capability perspective, conveyor belt Option 1 is also supported on a social basis. • Option is likely to impact significantly on the life of mine.	• Option 1 is likely to impact significantly on the life of mine, thus making Option 2 the only viable option. • Option 2 is preferred from a social perspective.	Open Shaft Option 2
Heritage	• There are no heritage and archaeological materials on the proposed Option Shaft 1.	• There are no identified heritage resources within the proposed BEP. • However, it is recommended that caution be exercised in case heritage resources are discovered during the construction and operational phases.	Any alternative option is acceptable
Surface water	• Situated on the existing opencast pit. • The conveyor route to the proposed Opencast Shaft Option 1 is the least preferred from the hydrology point of view as it utilise the new crossing of the Klein-Komati River, thus increasing the receiving environment (i.e., water resources). Thus opencast Option 1 the least preferred option as well compared to Option 2.	• Situated partially on the existing opencast pit. • The conveyor route to the proposed Opencast Shaft Option 2 is preferred from the hydrology point of view as it utilises the existing crossing of the Klein-Komati River to minimise impact to the receiving environment. Thus Opencast Option 2 is more preferred over Option 1.	Open Shaft option 2

Nosie	• The environmental noise impact associated with the proposed Opencast Shaft Option 1 will be low during the construction phase and during the operational phase will be moderate to low when the mitigatory measures are in place. • Although the impacts will be low, this option is least preferred because of its level of environmental noise as compared to Option 2.	• The location of this option and the subsequent activities will ensure that the noise will be insignificant at the abutting noise receptors. • Option 2 is preferred, together with its associated infrastructure (i.e., Alternative Conveyor D).	Open Shaft Option 2
Traffic	• This option will have low impacts on traffic during all phases of the project (construction, operation and decommission).	• Same as Option 1, this option will also result in low impacts on traffic during all phases of the project (construction, operation and decommission).	Any alternative option is acceptable
Groundwater	• Both these options will impact on the groundwater, such impacts include dewatering, contamination and recharge. • These impacts were rated medium without mitigation and low with mitigation except the impacts of all opencast mining on the base flow, which was rated high without mitigation, and medium with mitigation measures.	• Although the impacts for both options are the same, the Option 2 is the most preferred option as its associated infrastructure (route alternatives to Shaft 2) will have low impacts compared to Option 1.	Open Shaft Option 2
Air Quality	• Regarding the shafts, no dust impacts are expected in operation. Some dust might be generated in construction and through the operating of vehicles nearby, which are dealt with elsewhere in the report.	• Regarding the shafts, no dust impacts are expected in operation. Some dust might be generated in construction and through the operating of vehicles nearby, which are dealt with elsewhere in the report.	Any alternative option is acceptable
Climate Change	• The various alternatives will make no difference to the climate change impact of the project	• The various alternatives will make no difference to the climate change impact of the project	Any alternative option is acceptable

8.1.3 CONVEYOR BELT ALTERNATIVES TO OPENCAST SHAFT OPTIONS 1 AND 2

This section provides detailed information on the Conveyer Belt Route Options considered. The assessment of impacts of the conveyor belt will consider the impacts of the service road associated with the conveyor belt. One option for the conveyor/haul route has been proposed for open cast shaft option 1, while four conveyor routes, **Route A, B, C, and D,** have been proposed for Opencast Shaft Option 2 and shall be assessed. The proposed alignment is depicted on the locality map above.

8.1.3.1 Conveyor Belt Alternative Option 1 to Opencast Shaft Option 1

The proposed conveyor/haul road route runs on a north-south axis east of MRA and will link to the proposed Opencast Shaft Option 1. This alternative is shorter than all other proposed conveyor alternatives. It traverses areas that have been previously mined as part of the BIP project. However, it also traverses the new area and crosses the Klein-Komati River thus, increasing the impacts on the water resources.

The construction of the conveyor belt would only require the excavation of the foundation footprint to support the carriage every 4m on areas outside the wetlands as far as possible. The expected impacts from the conveyor route alternative are presented in Section 12, together with the impact ratings and mitigation measures.

The proposed start, middle, and end coordinates of the proposed conveyor are presented in Table 12.

Table 12: Conveyor belt option 1 coordinates

Coordinate's description	CONVEYOR ROUTE OPTION 1 TO OPENCAST SHAFT OPTION 1		
	Start	Middle	End
Latitude coordinates	25°49'5.65"S	25°48'37.47"S	25°47'54.67"S
Longitude coordinates	29°59'3.59"E	29°58'45.91"E	29°58'41.50"E

Specialist findings for the proposed conveyor alternative are presented in Table 13, while no comparative analysis was undertaken as only one option was considered.

Table 13: Summary of Specialist Finding for Conveyor Route to Opencast Pit 1

Specialist	Conveyor alternative to open Shaft Option 1
Wetland	This alternative is situated within 500 m of the channelled valley bottom wetlands associated with the main channels of the three riparian systems that are of moderate to high importance and sensitivity.

Specialist	Conveyor alternative to open Shaft Option 1
Biodiversity	This alternative, along with its proposed Open Shaft 1, was therefore not considered further concerning biodiversity loss because the entire footprint of the proposed conveyor Option 1 is located within a proposed opencast pit.
Visual	Visually, this route alternatives will have low impacts on the residents, tourists, and motorists but it crosses the Klein Komati River in the new area. This conveyor route intrudes on existing views and spoils the views of the landscape.
Heritage	No heritage resources were identified or discovered on this alternative route to the proposed open shaft 1; therefore, any alternative is acceptable.
Noise	All the alternatives, including this route to the proposed Opencast Shaft 1 Option, will result in low environmental noise during all project phases.
Soil, Land use, and capability	This alternative is shorter than all other proposed conveyor alternatives. It traverses areas that have been previously mined as part of the BIP project. Thus, it poses a low impact from a soil, land use, and land capability perspective.
Traffic	If no new access roads to the mining area are constructed, this alternative will have low impacts on traffic.
Air Quality	Regarding the conveyors, no preference regarding route or location is expressed from a dust perspective, so long as the conveyors are equipped with the standard coverings typical in the design of medium to long-distance mine conveyors.
Climate Change	The various alternatives will make no difference to the climate change impact of the project.

This conveyor route option is assessed together with Opencast Shaft Option 1. Based on the outcomes of the assessment of Opencast Shaft Option 1, this option is not preferred, therefore will also not be assessed further in the EIA Phase. The EIA phase will assess the four conveyor route options proposed for Opencast Shaft Option 2 in detail.

8.1.3.2 Conveyor belt alternatives to Opencast Shaft Option 2

The proposed conveyor/haul road route runs on a north-south axis east of MRA and will link to the proposed Opencast Shaft Option 2. Four alternatives (Alternative A, B, C, and D) to the proposed Opencast Shaft Option 2 are being considered. These alternatives, more especially D, cross the Klein-Komati River at an existing haul road crossing point (refer to Figure 11for existing crossing point). As such, habitat fragmentation resulting from Alternative D will have less impact than the other alternatives (Alternative A, B, and C), which require new downstream crossing points.

The comparative analysis of all four proposed conveyor belt alternatives to the proposed Opencast Shaft Option 2 is presented in Table 14 below.

Table 14: Conveyor belt alternatives coordinates

CONVEYOR ALTERNATIVE TO OPENCAST SHAFT OPTION 2	POINTS COORDINATES		
	Start	Middle	End
Alternative A	25°49'26.16"S 29°58'57.66"E	25°48'40.74"S 29°59'20.67"E	25°47'34.54"S 29°59'20.72"E
Alternative B	25°49'36.02"S 29°59'2.28"E	25°48'37.39"S 29°59'28.60"E	25°47'34.56"S 29°59'20.72"E
Alternative C	25°49'26.16"S 29°58'57.66"E	25°48'35.63"S 29°59'25.82"E	25°47'34.61"S 29°59'20.54"E
Alternative D	25°49'26.60"S 29°58'58.18"E	25°48'47.18"S 29°59'24.23"E	25°47'33.79"S 29°59'21.49"E

Table 15: Comparative analyses of the route conveyor belts

Specialist	Conveyor alternatives to Open Shaft Option 2				Specialist preference
	Conveyor A	**Conveyor B**	**Conveyor C**	**Conveyor D**	
Wetland	Alternative A will traverse **two** types of wetland, namely, channelled valley bottom wetland and isolated hillslope seep, which will lead to a total loss of approximately **0.83ha** of wetland.	Alternative B will traverse **three** types of wetlands such as hillslope seepage, channelled valley bottom wetland, and isolated hillslope seep which will lead to a total loss of approximately **1.02ha** of wetland.	This route alternative will traverse **two** types of wetlands namely, channelled valley bottom and isolated hillslope seep wetlands resulting in a total loss of approximately **0.79ha** of wetland.	Alternative D will traverse through only **one** type of wetland (channelled valley bottom wetland), which will lead to a total loss of approximately **0.28ha** of wetland. Alternative D has the least impact on wetlands compared to the other three alternatives (A, B, and C).	Alternative D
Biodiversity	The impacts of Alternative A on habitat fragmentation were rated high to medium as it will cross the Komati River in a virgin area resulting in habitat loss.	This alternative will also cross the Komati River in an area that is less disturbed leading to habitat fragmentation and impacts on this alternative are anticipated to be high without mitigation and medium with mitigation.	Similar to Alternative A and B, Alternative route C will also cross the Komati River in a new area leading to habitat fragmentation causing high to medium impacts on biodiversity.	Unlike the other proposed alternatives, conveyor alternative D crosses the Klein-Komati River at an existing haul road crossing point. As such, habitat fragmentation resulting from this will have the least impact compared to the other alternatives, which require new downstream crossing points.	Alternative D

Visual	Alternative A crosses the Klein Komati onto the overland belt before the secondary crusher without a transfer station.	Similar to Alternative A, Alternative B also crosses the Klein Komati onto the overland belt.	Similar to Alternative A and B, this alternative runs along the parallel routes and will have similar visual impacts with A and B.	The Alternative D traverse through the existing mining infrastructure resulting in less or no additional visual impacts to residents, tourist, and motorists.	Alternative D
Heritage	This route alternative does not impact any of the heritage resources, and impacts will be low.	Similar to Alternative A, this route is acceptable as it does not impact the heritage resources with the anticipated low impacts.	This alternative was also rated low as it does not disturb any archaeological and heritage features.	Alternative D will also have low impacts on heritage resources after mitigation measures as it will not impact any the archaeological and heritage features.	Any Alternative
Noise	The environmental noise impact during the construction phase will be low and during the operational phase will be moderate to low when the mitigatory measures are in place.	From a noise specialist perspective, this alternative will result in low impacts in the area for both fauna and surrounding communities.	Similar to Alternative A and B, this alternative is anticipated to have low environmental noise impacts on the surrounding residents.	All the conveyor alternatives will have a low environmental noise impact. However, this alternative will ensure that the noise will be insignificant at the abutting noise receptors, making it the most preferred.	Alternative D

Soil, Land use, and capability	It traverses areas that have not been previously mined as part of the BIP project. Thus, posing a more impact from a soil, land use, and land capability perspective.	This alternative does not support the objective of conserving as much arable and undisturbed land as possible compared to Option 1 to shaft 1.	This alternative together with Alternative A and B to shaft option 2, do not favour agricultural production continuity on the farm situated within the immediate vicinity.	Just like Alternative A, B, and C, this alternative route is longer, and it does not support the objective of conserving as much arable and undisturbed land as possible compared to route Option 1 to Shaft 1. It also does not favour agricultural production continuity on the farm situated within the immediate vicinity.	Option 1 to the proposed Shaft 1
Social	Option 1 emerges as the preferred option due to the benefit of retaining arable land and is thus supported on a social basis. On similar grounds, due it is posing less of an impact from a soil, land use and land capability perspective, conveyor belt Option 1 is also supported on a social basis. However, it is noted in the Soil, Land Use and Land Capability Assessment, that the difference in the impact of the two shaft options is minor and that Option 1 is likely to impact significantly on the life of mine, thus making Option 2 more viable. Due to this, Option 2 is deemed acceptable from a social perspective. The most socially acceptable conveyor belt route option will be recommended in the EIA phase.				
Traffic	Alternative A will have insignificant impacts on traffic during all phases of the project.	From the traffic impacts perspective, Alternative B will also have minor impacts on the surrounding traffic.	Alternative C will have insignificant impacts and it will only last for the duration of the activity which is estimated to be 1-2 years.	The traffic impacts will be insignificant during all phases of the project.	Any of the four alternatives is acceptable.

Surface water	This alternative will have a sump as stormwater management to collect dirty stormwater and wash water from the conveyor area and transfer stations.	Although this alternative does not cross the Klein-Komati River at the existing crossing of the river, pollution prevention measures are implemented in the form of erosion control and sediment traps.	Similar to Alternative A and B, Alternative C will have an impact on the receiving environment, but the stormwater management and pollution measures will be implemented.	Alternative D utilises the existing crossing of the Klein-Komati River to minimise the impact on the receiving environment. The conveyor route has been designed to minimise spillages through stormwater management measures, covering of conveyor over sensitive areas, and specific processes that assist with sediment control at the transfer stations.	Alternative D
Groundwater	This alternative is situated on the existing opencast pit, and it will have minor impacts on the groundwater.	Route Alternative B is also situated on the part of the existing opencast pit, and it will affect the groundwater system on a low or minor significance.	Just like Alternative A and B, this route alternative will have low or minor impacts on the groundwater impacts namely, dewatering, contamination, and recharge.	Alternative route D is partially proposed on the partially existing opencast pit, and it will also have minor impacts on the groundwater. It will minimise spillages of chemicals on the receiving environment through stormwater management measures and pollution prevention.	Alternative D
Paleontology	All four above-ground conveyor route options are the same as far as paleontology is concerned. These will be above ground so their impact on any fossils in the partings would be most unlikely.				Any

Hydropedology	Alternative A will cause the loss of wetland of approximately **0.83ha, affecting** two types of wetlands, including channeled valley bottom wetland and isolated hillslope seep.	Alternative B will result in the loss of wetland of approximately **1.02 ha** because it affects more (i.e., **three** types of wetlands such as hillslope seepage, channelled valley bottom wetland, and isolated hillslope seep wetland) as compared to Alternative A.	Similar to Alternative A, this route alternative will traverse through the **two** types of wetlands; namely, channelled valley bottom and isolated hillslope seep wetlands, but it will result in total loss of wetland compared to Alternative A of approximately **0.79ha** of wetland.	The Alternative D will traverse through only one type of wetlands called channelled valley bottom wetland, which will lead to a total loss of approximately **0.28ha** of wetland which is the lowest compared to the other three alternatives (A, B, and C)	Alternative D
Air Quality	No preference regarding route or location is expressed from a dust perspective, so long as the conveyors are equipped with the standard coverings typical in the design of medium to long-distance mine conveyors				Any
Climate Change	The various alternatives will make no difference to the climate change impact of the project.				Any

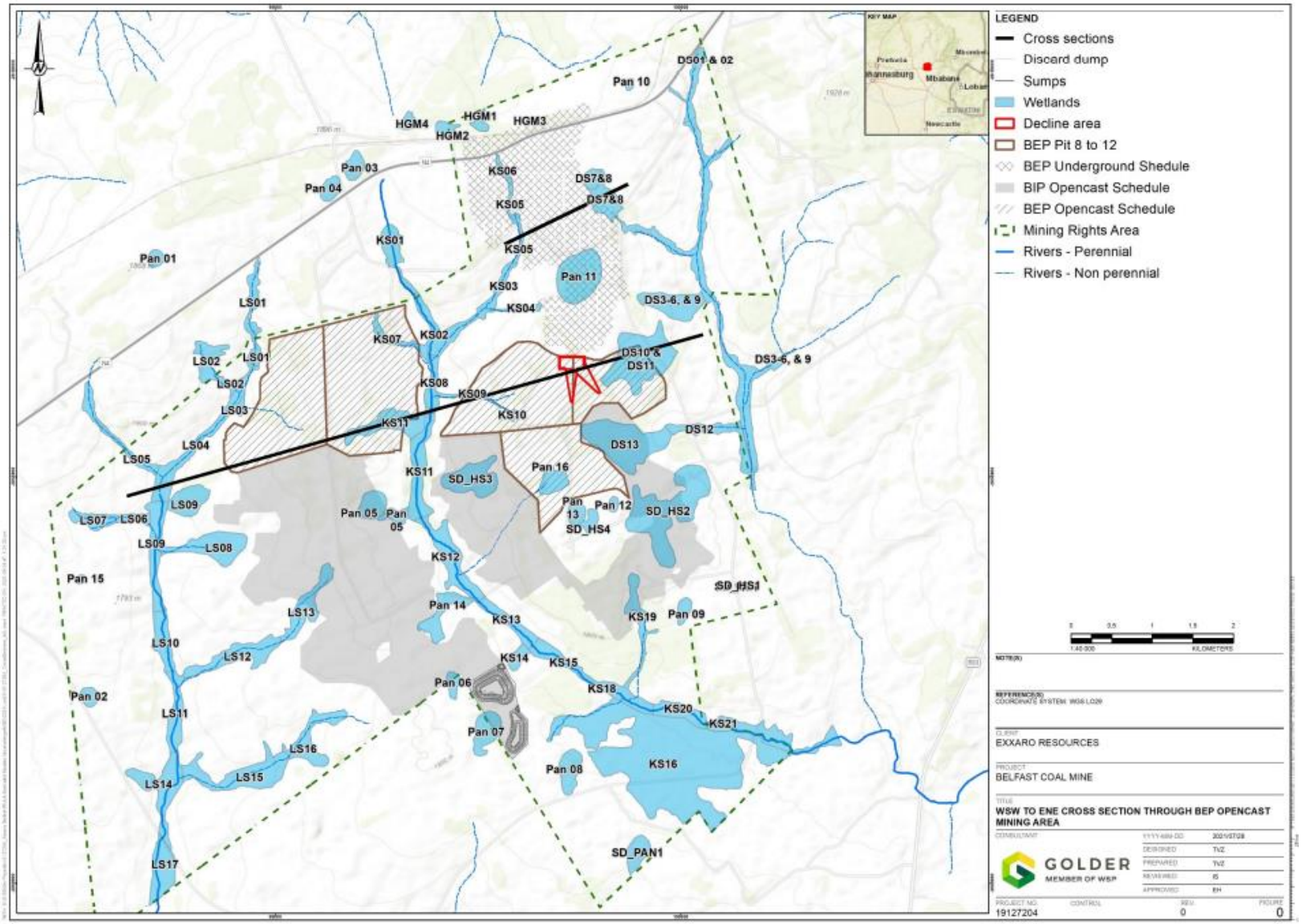

Figure 11: Position of existing cross section (Golder and Associates: Groundwater Specialist, 2021)

8.1.4 UNDERGROUND MINING AND INFRASTRUCTURE (COAL RECLAIM AND TRANSPORTB OPTIONS)

As indicated above, the traditional Bord and Pillar (B&P) mining method was preferred for the identified underground areas at BEP. Various options detailed below will be implemented to reclaim the stockpile and transfer the ROM material to the overland conveyor belt to enter the plant.

The coal reclaim options are:

a) Option 1: FEL to road truck 30t side tipper

b) Option 2: FEL via few ramps to haul road truck, Cat 773 or similar 50t

c) Option 3: stockpile tunnel with reclaim conveyor feeding surge truck loading bin

d) Option 4: stockpile tunnel with reclaim / sacrificial conveyor feeding new overland conveyor.

Road transport options from ROM stockpile at the inclined shaft to existing plant:

a) Option 1: Haul truck to existing tip (most probable modifications will be required to bypass primary crusher to reduce the generation of fines). This proposed route is shown on drawing ECN-P01-INF-CL-LO-0006.

b) Option 2: Side tipper (road truck) to new tip next to existing tip (via district road). This proposed route via the district road is indicated on drawing ECN-P01-INF-CLLO- 0006.

All the proposed options are feasible and none is preferred over the other. Therefore the EIA will provide more detail on the proposed options.

8.1.5 INTERFACE AND BATTERY LIMIT WITH PLANT OPERATIONS:

Conveyor options from the ROM stockpile at the inclined shaft to existing plant:

a) Option 1: New curved overland conveyor from underground section ROM stockpile across the existing Klein Komati crossing, with transfer stations and then onto the existing overland conveyor.

b) Option 2: New overland curved conveyor crossing the Klein Komati at a new position and then onto the overland belt before the secondary crusher without a transfer station. This solution might cross environmentally sensitive areas.

c) Option 3: New overland curved conveyor crossing the Klein Komati at a new position and then onto the overland belt after the secondary crusher without a transfer station. This solution might cross environmentally sensitive areas.

Based on the assessment undertaken Option one is preferred as it will have the least impact on the environmentally sensitive areas. Further, the wetland assessment and hierarchy of mitigation undertaken by Golder and Associates (2021) the conveyor and haul road route should be selected to use the existing crossing of the Klein-komati to minimise additional wetland loss, therefore Option is recommended.

8.1.6 MINE RESIDUE FACILITY (MRF)

A trade-off analysis was undertaken to decide on the location of the proposed MRF, which considered the following areas:

- Alternative 1 - A greenfield site across the Klein Komati River on the Eastern side of the current MRF;
- Alternative 2:- Adjoining the current facility; and
- Alternative 3-` Adjacent to the current facility over a backfilled opencast pit (Pit 5 – proposed).

The preferred go-forward solution selected comprises locating the MRF adjacent to the current facility on the footprint of the proposed Pit 5 (Alternative 3). As such, Alternatives 1 and 2 will not be considered and studied any further.

The footprint will be rehabilitated before the implementation of the MRF. The proposed layout of the MRF is dictated and constrained by:

- The extent and footprint of the proposed Pit 5 area;
- Existing and proposed roads to the southwest and south;
- The existing wetland located along the eastern boundary and edge of the Pit 5 footprints; and
- The plant layout to the northeast.

Due to prevailing constraints comprising the limited footprint and the wetland, the MRF is split into two stockpiles – a Southern stockpile and a northern stockpile, which provide the required capacity of 3.7 million m3 (5.81 Mt). Each stockpile will be provided with dirty water canals along the toe, and these canals will divert the intercepted stormwater runoff into one or two sumps (depending on topography). Access to the proposed MRF will be via ramps that link to the existing haul road infrastructure along the eastern boundary of Pit 5.

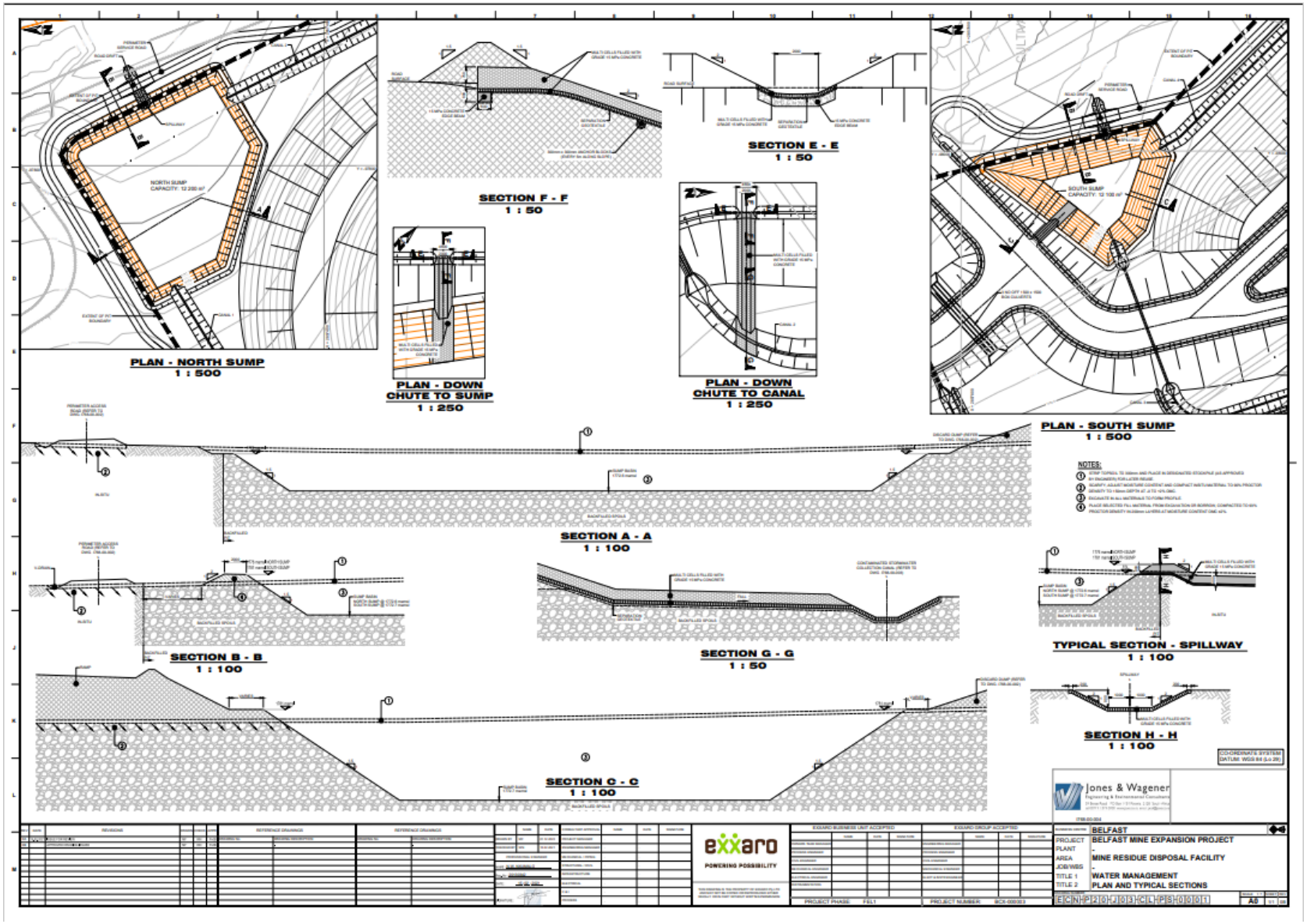

Figure 12: Layout of Mine Residue Facility BCX_000003-CI-RPT-0004 (Jones and Wagner, 2021)

The proposed MRF will be located along the south-western boundary of the MRA as shown in Figure 13**Error! Reference source not found.** below with yellow presenting the existing MRF and blue showing the proposed extension of MRF.

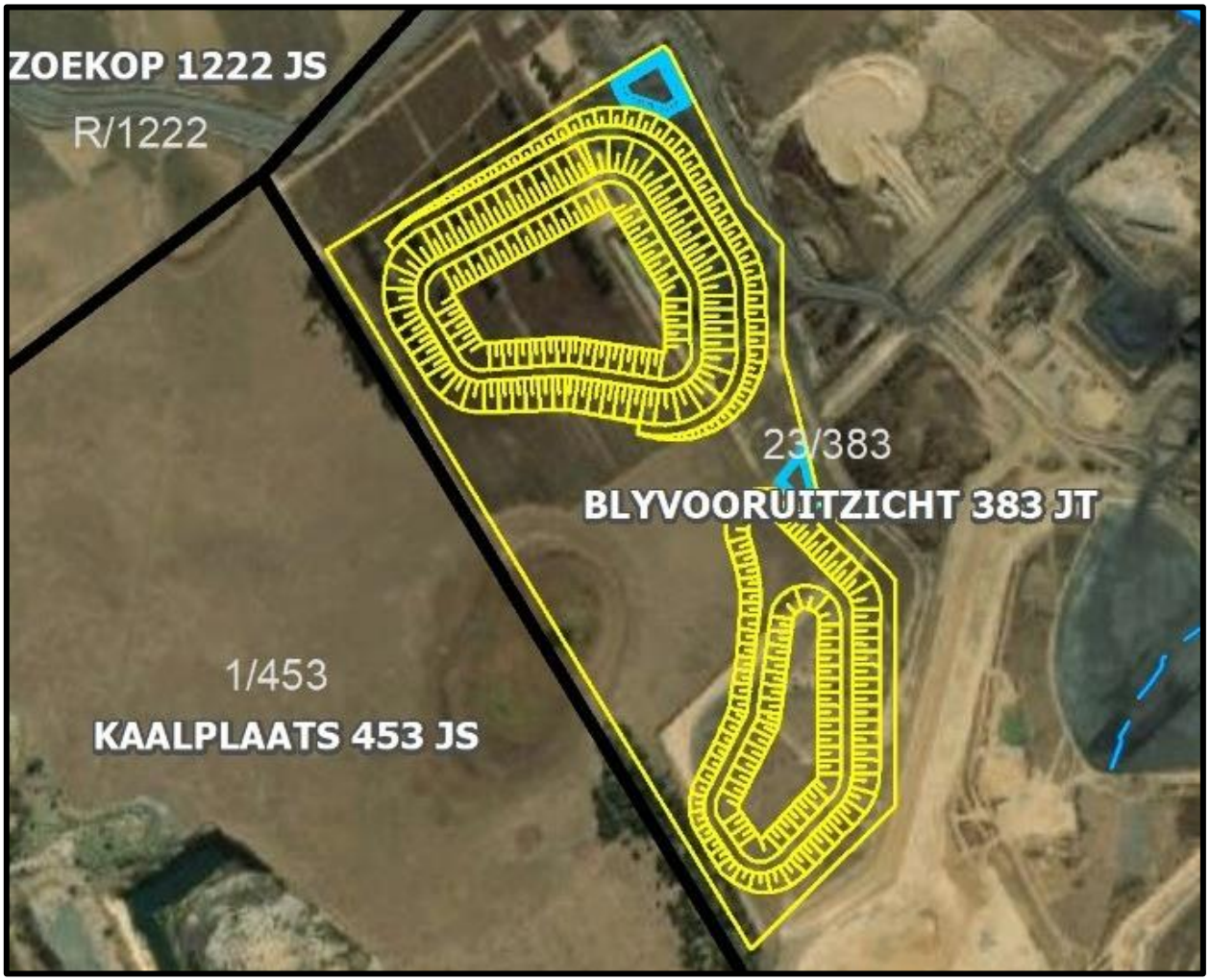

Figure 13: The layout of the proposed MRF (Golder and Associates: Surface Water Specialist Report, 2021)

Table 16: Summary of the Specialist Findings

Specialist	Description of the findings on Mine Residue Facility in relation to the impacts and significance
Surface water	The footprint clearance for the MRF stormwater infrastructure development will expose bare soil, resulting in sheet wash into nearby watercourses during a precipitation event. In addition, dust can further be transported into watercourses or deposited on infrastructure near watercourses, thereby exacerbating the impact of siltation during rainfall events. During the construction phase, the impact of the expansion activities on hydrology is low with and without mitigation measures. The rehabilitation of the MRF will expose and loosen contaminated soil that could result in sheet wash into nearby watercourses during a precipitation event. The MRF and open cast pits should be rehabilitated according to industry best practices. Rehabilitation should ensure adequate sloping and landform development to prevent ponding and pooling and allow for the drainage of clean runoff from the site. A stormwater channel will be located along the boundary of the MRF, and dirty stormwater will be routed as to a sump situated at the foot of the north stockpile area. The MRF will be located within the rehabilitated Pit 5 boundary area, and seepage from the MRF is expected to report directly into the pit. Therefore, the decant management for the western pit area will include seepage from the MRF area.
Soil, land use and capability	The proposed Mine Residue Facility (MRF) will be constructed over a backfilled opencast pit where soils have already been impacted through excavation and mechanical handling. Therefore, the impact of the proposed MRF is considered **low** from a soil and land capability point of view. However, all seepage from the MRF facility must be contained as far as practically possible to avoid contamination of the surrounding soils. The cumulative loss from a soil and land capability point of view including the development of the MRF is anticipated to be moderate, provided that the key mitigation measures to enable the reinstatement of agricultural activities (of a different nature) post-closure are carefully implemented in line with the Exxaro net benefit objective to mining.

Paleontology	The proposed MRF will be situated on sensitive Vryheid Formation rocks from the palaeontology point of view. It will also be located on a moderately sensitive Dwyka group. For the very sensitive rocks (red) it is possible that fossil plants of the Glossopteris flora could occur in the shales below ground, but not in the surface soils. However, it should be noted that the area is already highly disturbed and is the extension of the existing dump, and the impacts will be low before mitigation.
Visual	A location trade-off study was done, and the area selected for the infrastructure facility is steep due to the topography. The site is close to the district road, away from mining activities, protected from prevailing winds and outside of blasting lines. Buildings will be of prefabricated material and temporary for the life of the mine. The overall impacts of the MRF during the construction, operation and decommission phase will be **low** on the surrounding communities, motorists and tourists.
Wetland	The water quality in the wetland may deteriorate because of vegetation removal and increased risk of eroded soils and sediments being transported after rainfall events due to the development of the MRF. Contaminants from machinery and materials being used in the construction of the MRF could enter the wetland and contribute to water quality changes. Potential impacts on water quality in the wetlands have a moderate impact score without mitigation, as the effects will last for the duration of the construction which will roll out on a phased basis over the LOM and as such will be long-term, would occur on a local scale and result in a moderate magnitude of deterioration as a result of the entry of coal and other contaminants to the wetlands and subsequently the downstream watercourses. The implementation of the recommended mitigation measures is required to avoid and minimise adverse impacts on the water quality of wetlands and associated downstream riparian systems. Provided that the mitigation measures are implemented, the potential impacts can be reduced to low. In this scenario, a post-mitigation impact of low significance is predicted.

Groundwater	The proposed extension of the mine resides facility will increase the impacts on the groundwater systems. The modelling was used to assess (predictive simulations) the likely impacts of the MRF on the existing groundwater regime which are summarized as follows: • Possible impacts on the groundwater quality and quantity of existing groundwater users. • Possible development of pollution plumes emanating from the site activities. • Impacts on the existing groundwater level. • Transport model for pollution impact assessment and control. These impacts are anticipated to be **medium** before the implementation of the mitigation measures and can be reduced to **low** with the mitigation.
Heritage	The heritage impact assessment was conducted within the study area and there was no heritage and archaeological resources were identified within the proposed development of the MRF. However, it is recommended that caution must be exercised in case heritage resources are discovered during the construction and operational phases.
Noise	The environmental noise impact during the construction phase will be low and during the operational phase will be moderate to low when the mitigatory measures are in place. This includes for all the proposed activities in BEP including the development of the MRF. However, all the mitigation measures proposed by the specialist must be implemented to ensure that noise impact remain as low as possible.
Traffic	The traffic impacts associated with all the proposed development including the mine residue facility within BEP will be low with and without the mitigation during all the phases of the project such as construction, operation and decommission. However, all the mitigation measures proposed by the specialist must be implemented to ensure that traffic impact remain low.
Terrestrial	The development of the MRF footprint has been approved under the existing authorization for the BIP, and it is assumed that flora species of conservation concern occurring in this footprint have been relocated as part of the BIP search and rescue programme. The impact on biodiversity as a result of the development of the MRF was not assessed as the MRF has been approved already.

Air quality	The extension of the mine residue facility will have an impact on the air quality during all phases of the project. Emissions to air during the construction and operation of an MRF of this nature are generally limited to dust, smoke emissions from heavy machinery and vehicles, and a wide range of trace gases given off during the drying of solvents and similar processes resulting from activities associated with routine construction and maintenance. The extension will also have impacts on climate change; however, the air quality impacts will be moderate without mitigation measures and can be reduced to low with mitigation measures.

8.1.7 NO-GO ALTERNATIVE

Under GN R.982, consideration must be given to the option not to act. This alternative is usually considered when the proposed development is envisaged to have significant adverse environmental impacts that mitigation measures cannot ameliorate effectively. There would be no economic benefits, i.e., extended employment for local communities. Should the no-go option be adopted, the proposed mine expansion shall not materialise, and as such, the life of the mine shall not be prolonged. This would result in the loss of sustainable jobs at the mine and reduce employment opportunities over the medium and long term. Based on the information provided in the Mining Works Programme, the proposed project will certainly require both skilled and unskilled labour, which is expected to yield positive spinoffs for the locals, the province, and the country at large. However, this could be hindered if the no-go option is adopted. The mine is already a socio-economic anchor within the immediate communities and more so for the country.

The proposed project's planned infrastructure, excluding the actual mine investment, will further stimulate the local economy, given that total expenditure of R 503,918,124.77 is budgeted for the proposed project. Should the no-go option be adopted, this considerable investment will be forfeited, which will negatively affect the local economy as well as the Emakhazeni s Gross Geographic Production (GGP). Furthermore, the provision of coal products to existing power stations to secure South Africa's power supply would not be met, should this be the option to Eskom in the future. Also, the no-go alternative would result in lost foreign revenues from the planned export of coal products.

9 DETAILS OF THE PUBLIC PARTICIPATION PROCESS UNDERTAKEN IN TERMS OF REGULATION 41 OF THE REGULATIONS, INCLUDING COPIES OF THE SUPPORTING DOCUMENTS AND INPUT

The NEMA EIA Regulations require that during the EIA process, the Organs of State together with Interested and Affected Parties (I&APs) be informed of the application and allowed to comment on the application.

The Public Participation Process (PPP) is any process that involves the public in problem-solving and decision-making; it forms an integral part of the Scoping and EIA process. The PPP provides I&APs with an opportunity to provide comments and raise issues of concern or to make suggestions that may result in enhanced benefits for the project.

The primary purpose of the PPP report is as follows:

- To outline the PPP that was undertaken;
- To synthesise the comments and issues raised by the key stakeholders, I&APs; and
- To ensure that the EIA process fully addresses the issues and concerns raised.

Chapter 6, Regulation 39 through 44 of the 2014 EIA Regulations stipulates the manner in which the PPP should be conducted as well as the minimum requirements for a compliant process. These requirements include but not limited to:

- Fixing a notice board at or on the fence of-
  - (i) The site where the activity to which the application relates is or is to be undertaken; and
  - (ii) A place conspicuous to the public at the boundary of the site.
- Giving written notice to-
  - The occupiers of the site where the activity is or is to be undertaken or to any alternative site where the activity is to be undertaken;
  - The owners or persons in control of that land occupiers of land adjacent to the site where the activity is or is to be undertaken and to any alternative site where the activity is to be undertaken;
  - The municipal councillor of the ward in which the site and alternative site is situated and any organisation of rate payers that represent the community in the area;
  - The municipality which has jurisdiction in the area;
  - Any organ of state having jurisdiction in respect of any aspect of the activity; and
  - Any other party as required by the competent authority.
- Placing an advertisement in-two of the local Newspapers.

9.1 PUBLIC PARTICIPATION PRINCIPLES

The principle of Public Participation holds that those affected by a decision have the right to be involved in the decision-making process (i.e., the public's contribution will influence the decision). One of the primary objectives of conducting the PPP is to provide Interested and Affected Parties with an opportunity to express their concerns and views on the proposed project. The principles of public participation are to ensure that the PPP:

- Communicate the interests of and meet the process needs of all participants.
- Seek to facilitate the involvement of those potentially affected.
- Involves participants in defining how they participate.
- It is as inclusive and transparent as possible, it must be conducted in line with the requirements of Regulation 39 through 44 of the EIA Regulations as amended.

9.2 APPROACH AND METHODOLOGY

The Public Participation approach adopted in this process is in line with the process contemplated in Regulation 39 through 44 of the EIA Regulations as amended, in terms of NEMA, which provides that I&APs must be notified about the proposed project. The approach considers the COVD-19 Regulations, depending on the alert level at the time of engagement. The plan considers other regulations, including the Protection of Personal Information Act, 2013 (Act 4 of 2013) (POPIA) as amended, and COVID-19 regulates information sharing and record keeping.

When conducting PPP and dealing with I&APs, the provisions of the NEMA and the applicable regulations and guidelines remain valid and applicable. The EAP is required to collect details of I&APs in terms of regulation 42 of the NEMA EIA Regulations, which information shall be limited to:

i. Name
ii. Contact details; and
iii. Address.

Such information constitutes Personal Information as defined in POPIA; as such, it will be processed following the conditions for lawful processing of Personal Information set out in POPIA.

Furthermore, personal information is collected, recorded, and stored during the Public Participation Process as required by law. The EAP is obliged to comply with the provisions and requirements of POPIA by ensuring I&APs are informed about the collection and lawful processing of their information, as highlighted.

9.2.1 PRE-APPLICATION CONSULTATION

A pre-application meeting was scheduled with the DMRE in September 2021; however, the representatives from the DMRE indicated that there would be no need for a face-to-face meeting. The Department requested that the scope of work and associated documents be submitted for review and comments. The correspondence that entails the documents submitted and response from the authority is attached as Appendix D1.

9.2.2 IDENTIFICATION OF INTERESTED AND AFFECTED PARTIES

Interested and Affected Parties (I&APs) identified include pre-identified stakeholders (government department), landowners, and the public. Notification and request for comments would be submitted to the following key stakeholders:

- Mpumalanga Department of Agriculture and Rural Development d Land and Environmental Administration (M DARDLEA)
- Mpumalanga Department of Water and Sanitation

- Inkomati-Usuthu Catchment Management Agency (IUCMA).
- Mpumalanga Department of Transport and Public Works;
- Mpumalanga Heritage Resources Agency;
- South African Heritage Resource Agency;
- Wildlife and Environmental Society of South Africa;
- Eskom SOC Limited – Transmission
- Nkangala District Municipality
- Emakhazeni Local Municipality
- Mpumalanga Tourism and Parks Agency (MTPA)

The identification of stakeholders, landowners, and I&AP culminated in the PPP database compilation. The identified stakeholders will receive a copy of this draft Scoping Report for 30 days review, and comments and comments received will be included and addressed in the final Scoping report.

9.2.2.1 Public Participation Database

In accordance with the requirements of the EIA Regulations under Section 24 (5) of NEMA, Regulation 42 of GN R. 982, a register of I&APs must be kept by the public participation practitioner. In fulfilment of this requirement, such a register is compiled and details of I&APs including their comments will be updated throughout the project cycle. The database is attached as **APPENDIX D1.**

9.2.3 SITE NOTICES

Site notices have been prepared in English and translated to four other languages, i.e. Afrikaans, Isizulu, Seswati, and isiNdebele A2 size notices will be fixed at different conspicuous locations within and around the proposed project study area, including the entrance to the Belfast Coal Mine; Belfast Mine perimeter fence; Puma Filling Station; Belfast public library, along the access roads, Thubelihle community, Belfast Community and Emakhazeni Local Municipality offices. The notifications will inform stakeholders and the public of the project and allow them to register as I&AP and comment or raise any issues regarding the proposed project. Further site notices will also inform the I&APs of the availability of this Draft report for review and comments and provide details of the scheduled public meetings to discuss the project.

The proof of site notices will be included in the Final Scoping reports.

9.2.4 PLACEMENT OF AN ADVERTISEMENT IN THE LOCAL NEWSPAPER

An advertisement will be placed in the Middleburg Observer, Witbank News, and/or Emakhazeni Observer. The advertisement aims to further inform the I&APs of the proposed activities and the availability of draft reports for review

and comment. Thirty days will be allowed for the public to submit their comments, issues, and concerns. Proof of newspaper advertisement will be attached to the final Scoping report.

9.2.5 PLACEMENT OF THE DRAFT SCOPING REPORT FOR COMMENTS

In line with the requirements of the Regulations, the draft Scoping and EIA Report will be submitted to the identified stakeholders for review and comment. The reports will be available to I&AP's at specified public places and on the Nsovo website (www.nsovo.co.za). In line with the COVID-19 Regulations and depending on the alert level at the time of engagement, other modes of sharing the reports will be explored, including sharing the report link via WhatsApp and SMS. The review period is 30 days from the date of placement and advertisement.

The Draft Scoping Report will be placed for review and comment from the 11th of April 2022 for 30 days.

9.2.6 PUBLIC MEETINGS

As part of the PPP, public and focus group meetings will be conducted during the Scoping phase. The same will be undertaken during the EIA phase, and the details will be placed at conspicuous places and advertised in the local newspapers. Table 17 provide the public meeting details. Provision will be made for focus group meetings.

Table 17: Public Meeting Schedule

Date	Venue	Address	Time
05 May 2022	Belfast Golf Club	Orssak Street 1 Golf Street Belfast	09H00 to 12H00 14H00 TO 16H00

9.3 A SUMMARY OF ISSUES RAISED BY INTERESTED AND AFFECTED PARTIES

Comments, issues, and concerns raised together with the responses provided by the Environmental Assessment Practitioner (EAP) will be incorporated into the Comments and Response Report (CRR) and included in the final Scoping Report.

10 DESCRIPTION OF THE ENVIRONMENTAL ATTRIBUTES ASSOCIATED WITH THE ALTERNATIVES FOCUSING ON THE GEOGRAPHICAL, PHYSICAL, BIOLOGICAL, SOCIAL, HERITAGE AND CULTURAL ASPECTS

This section outlines parts of the socio-economic and biophysical environment that could be affected by the proposed development. Using the project description, and knowledge of the existing environment, potential interactions between

the project and the environment are identified below. The potential effects of the project on the human environment, socio-economic conditions, physical and cultural resources are included.

10.1.1 SOCIO-ECONOMIC DESCRIPTION

This section presents the socio-economic aspects focusing on the Province and Municipalities within which the proposed study area is located.

10.1.1.1 Provincial Description of the Proposed Project

Mpumalanga Province is in the north-eastern part of South Africa. The province borders two of South Africa's neighbouring countries viz. Mozambique and Swaziland; and other South African provinces, namely, Gauteng, Limpopo, KwaZulu-Natal, and Free State Provinces (Figure 8 below). Mpumalanga is characterised by the high plateau grasslands of the Middleveld, which rolls eastwards for hundreds of kilometres. It rises towards mountain peaks in the northeast and terminates in an immense escarpment (www.municipalities.co.za).

Mpumalanga province covers an area of 76 495km² and has a population of approximately 4 335 965 (IDP, 2017). The capital city of Mpumalanga is Mbombela (previously Nelspruit), and other major cities and towns include Emalahleni (formerly Witbank), Standerton, eMkhondo (previously Piet Retief), Malelane, Ermelo, Barberton, and Sabie. The province is divided into three district municipalities: Gert Sibande, Ehlanzeni, and Nkangala Districts. These three districts are further subdivided into 17 Local Municipalities, of which the proposed development falls within the Emakhazeni Local Municipality of the Nkangala District Municipality.

Mpumalanga is rich in coal reserves and home to South Africa's major coal-fired power stations, with Emalahleni, the biggest coal producer in Africa and the site of the country's second oil-from-coal plant after Sasolburg (www.municipalities.co.za). Further, the best-performing sectors in the province include mining, manufacturing, and services

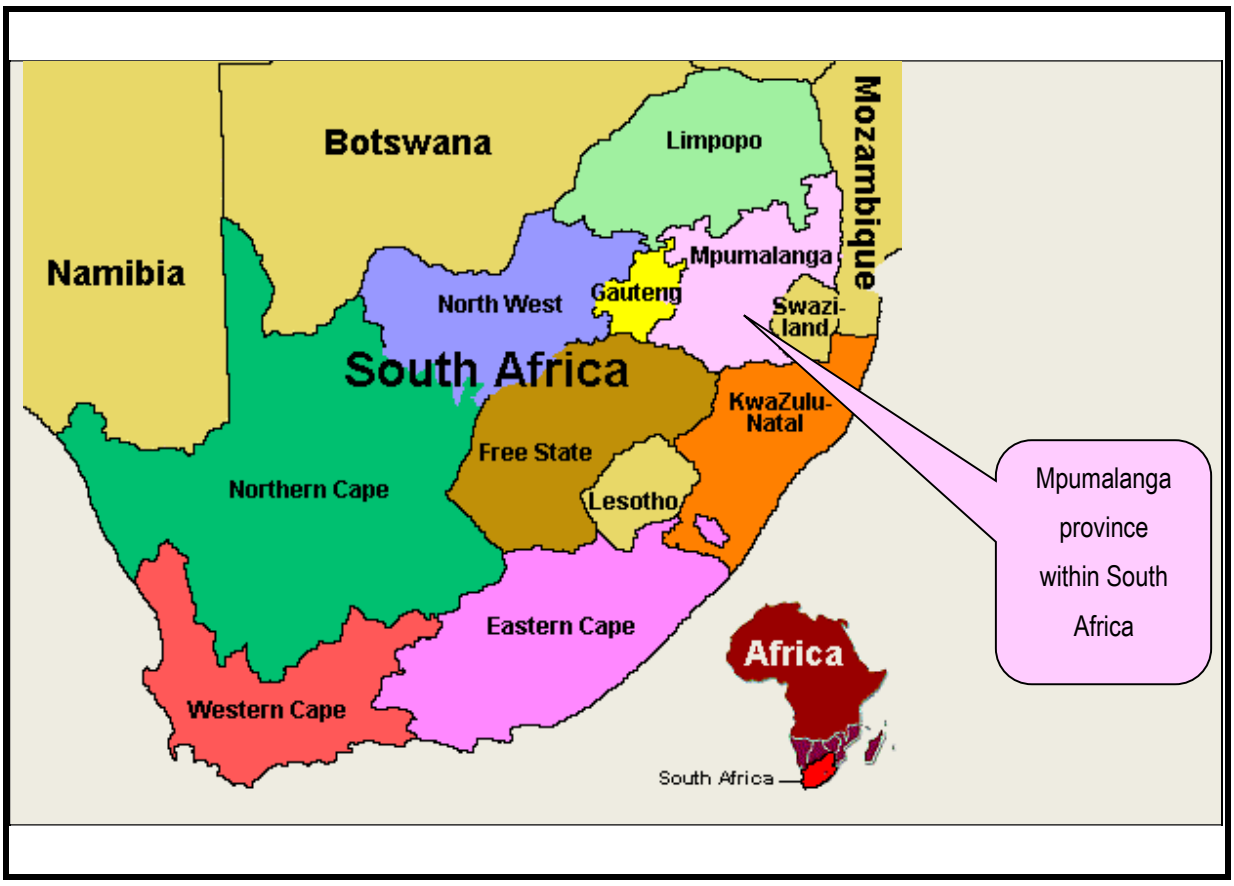

Figure 14: Map of South Africa showing the provinces (Source: www.odm.org.za).

10.1.1.2 District Municipality of the study area

The proposed development will be undertaken within the Nkangala District Municipality, a Category C municipality in the Mpumalanga Province. The total area comprises six local municipalities, i.e., Victor Khanye, Emalahleni, Steve Tshwete, Thembisile Hani, Dr JS Moroka, and Emakhazeni which the host Municipality (www.municipalities.co.za). The District's headquarters are in Middelburg. Nkangala is at the economic hub of Mpumalanga and is rich in minerals and natural resources. The District's stronghold is the Maputo Corridor, which increases economic growth and tourism development potential. The proximity to Gauteng opens opportunities to a larger market, which benefits the District's agricultural and manufacturing sectors. The main economic sectors within the District include mining, manufacturing, energy, and agriculture.

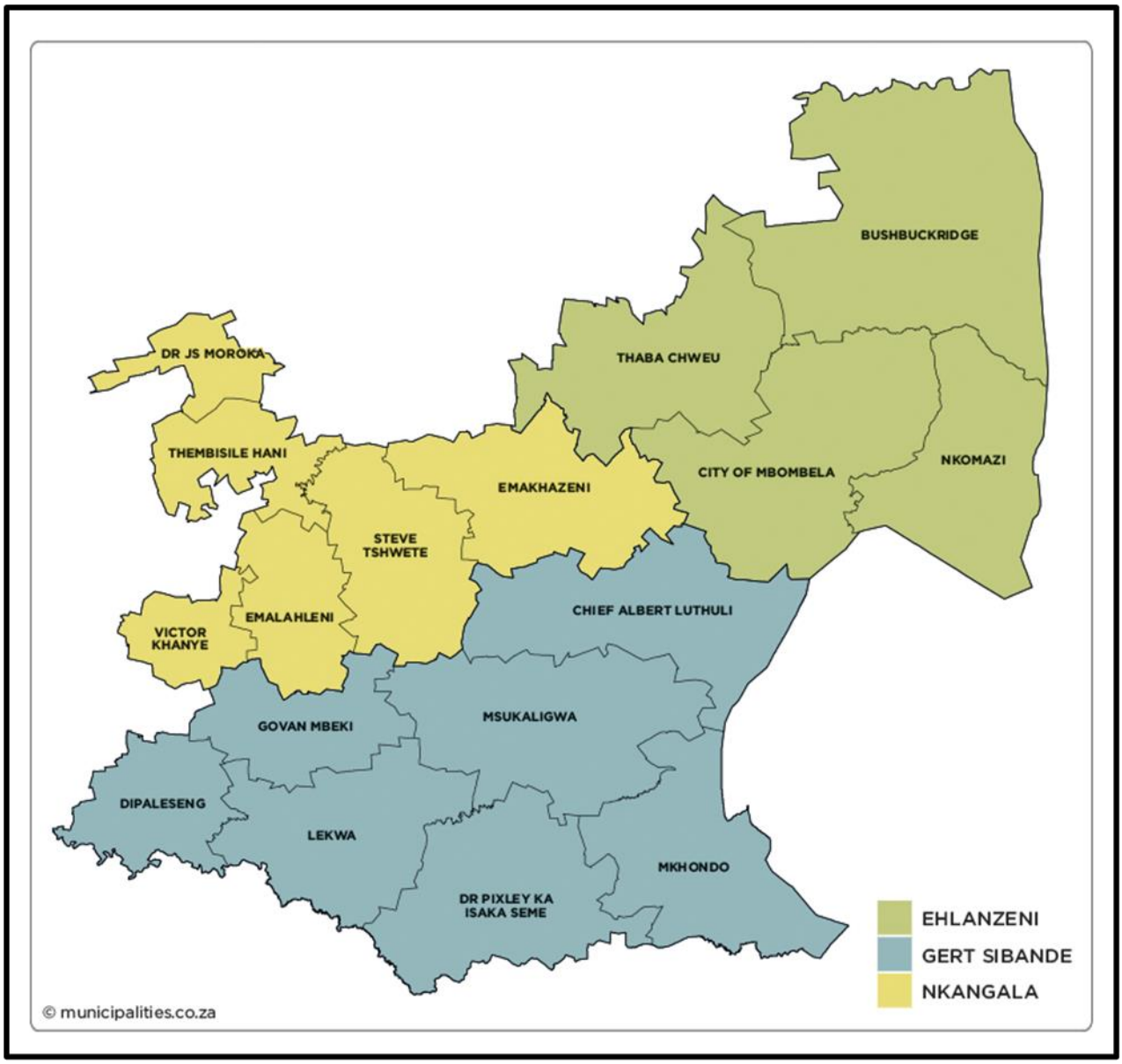

Figure 15: District Municipalities in Mpumalanga (www.municipalities.co.za)

10.1.1.3 Local Municipality of the proposed study area

The proposed project will be undertaken in Belfast in the Emakhazeni Local Municipality, a Category B municipality within the Nkangala District in Mpumalanga Province. It is bordered by the City of Mbombela in the east and Steve Tshwete in the west. It is the largest of the six municipalities in the district, making up almost a third of its geographical area. The Municipality covers approximately 4735,59 km2 and has a population of 47,216 (9.97 per km²) and approximately 13,722 (2.90 per km²) households (StatsSA, 2011). Further, as collected by Stats SA during Census 2011, the following demographic data applies to the Emakhazeni Local Municipality

Table 18: Emakhazeni Local Municipality (MP314) (Source: Social Impact Assessment Report, 2021).

Demographic Information	2016	2011
Population	48 149	47 216
Age Structure		
Population under 15	27.4%	28.0%
Population 15 to 64	67.8%	66.2%
Population over 65	4.8%	5.8%
Dependency Ratio		
Per 100 (15-64)	47.4	51.0
Sex Ratio		
Males per 100 females	105.4	104.2
Population Growth		
Per annum	0.44%	n/a
Labour Market		
Unemployment rate (official)	n/a	25.9%
Youth unemployment rate (official) 15-34	n/a	34.2%
Education (aged 20 +)		
No schooling	16.0%	15.0%
Matric	32.7%	28.6%
Higher education	5.1%	7.4%
Household Dynamics		
Households	14 633	13 722
Average household size	3.3	3.3
Female-headed households	36.6%	35.9%
Formal dwellings	80.4%	81.8%
Housing owned	56.6%	52.7%
Household Services		
Flush toilet connected to sewerage	75.2%	74.4%
Weekly refuse removal	56.3%	71.7%

Piped water inside dwelling	46.7%	55.0%
Electricity for lighting	83.1%	83.6%

10.1.1.4 eMakhazeni Non-Urban Main Place and eMakhazeni A Main Place

At the main place level, the project is within eMakhazeni Non-Urban (NU), which borders eMakhazeni A. While the former area, in which the project is located is more agricultural, with a population density of 2.24 per km², the latter, eMakhazeni A, which is more urban incorporates the town of Belfast with a population density of (57.05 per km²). The demographic data of eMakhazeni NU Main Place 870003 and eMakhazeni A Main Place 870006 are presented in **Table 19** to **Table 22.** More detail is provided in the Social impact assessment Report attached.

Table 19: Area and Population Density

	eMakhazeni NU Main Place 870003 from Census 2011	eMakhazeni A Main Place 870006 from Census 2011
Area	4,520.79 km²	80.00 km²
Population	10,146 (2.24 per km²)	4,564 (57.05 per km²)
Households	2,948 (0.65 per km²)	1,134 (14.17 per km²)

Table 20: Gender

Gender	eMakhazeni NU Main Place 870003		eMakhazeni A Main Place 870006	
	People	Percentage	People	Percentage
Male	5,536	54.57%	2,352	51.53%
Female	4,609	45.43%	2,212	48.47%

Table 21: Population group

Population Group	eMakhazeni NU Main Place 870003		eMakhazeni A Main Place 870006	
	People	Percentage	People	Percentage
White	9,442	93.05%	2,350	51.50%
Black African	630	6.21%	1,875	41.09%
Coloured	35	0.34%	198	4.34%
Indian or Asian	27	0.27%	118	2.59%

Population Group	eMakhazeni NU Main Place 870003		eMakhazeni A Main Place 870006	
	People	Percentage	People	Percentage
Other	13	0.13%	22	0.48%

Table 22: Key Statistics 2011

Aspect	eMakhazeni NU Main Place 870003	eMakhazeni A Main Place 870006
Young (0-14)	26,7%	22,1%
Working Age (15-64)	67%	67,4%
Elderly (65+)	6,3%	10,5%
Dependency ratio	49,2	48,4
Sex ratio	120,1	106,3
No schooling aged 20+	25,7%	5,4%
Higher education aged 20+	3,2%	18,2%
Matric aged 20+	18,3%	34,3%
Average household size	3,4	3,5
Female-headed households	26,4%	29,7%
Formal dwellings	67,8%	86,4%
Housing owned/paying off	29,3%	47,4%
Flush toilet connected to sewerage	32,9%	81,1%
Weekly refuse removal	8,4%	82,2%
Piped water inside the dwelling	32,7%	80,4%
Electricity for lighting	55,6%	85,1%

The Main Economic Sectors in this municipality include the following: Mining (28.7%), transport (25.1%), community services (14.2%), finance (8.5%), trade (7.7%), manufacturing (6.9%), agriculture (3.8%). The mining activities dominate in terms of the main economic factors, which shows that the proposed development will add value in terms of economic growth in the municipality.

10.1.2 COMMERCIAL AND INDUSTRIAL

The main economic sectors within the Emakhazeni Local Municipality are presented in **Table 23** below. These include agriculture, construction, mining, electricity, finance, manufacturing, transport, and community services.

Table 23: Main economic sectors (Integrated Development Plan (IDP), 2020 - 2021)

Economic Sector	2014	2015	2016	2017	2018	2019	Average Annual growth
Agriculture	179.5	161.6	152.6	152.4	153.9	156.0	-2.77%
Mining	380.8	348.0	357.7	361.1	358.0	349.3	-1.71%
Manufacturing	197.6	195.1	194.6	196.6	202.2	208.9	1.12%
Electricity	56.2	55.1	54.9	55.0	55.8	57.0	0.29%
Construction	77.8	78.0	78.8	79.6	81.0	82.9	1.28%
Trade	355.5	353.5	353.8	354.7	361.8	370.0	0.80%
Transport	235.4	234.1	234.5	235.7	240.3	245.8	0.87%
Finance	236.5	233.8	231.8	229.1	229.6	231.0	-0.47%
Community services	358.6	355.2	354.4	354.0	357.7	361.5	0.17%
Total Industries	2,077.8	2,014.3	2,013.2	2,018.3	2,040.2	2,062.4	-0.15%

10.1.3 CLIMATIC CONDITION OF THE PROPOSED AREA

The climate is typical of the Middelveld to Highveld and represents the temperate, warm climatic zone. The area receives most of the rainfall over the summer, from October to March (Golder, 2011). The Belfast Mine weather station (CR1000X) rainfall and evaporation data from November 2018 to March 2021 (2 years and five months). The average rainfall for this period was 889.1 mm per annum, and the average evaporation was 1344.8 mm/a. However, this was a wetter than average period. The average Mean Annual Precipitation (MAP) for the 0516554 W weather station (~17 km from the study area) is 693 mm. The nearest weather station with a reliable evaporation dataset near the Belfast site is Station X1E003, located at the Nooitgedacht dam. The station is 16.6 km away from the Belfast Mine. The station's Mean Annual Evaporation (MAE) is 1807 mm/a (S-Pan), and the MAP is 734.9 mm/a. The record dates from 1961 to 2020 (58 years).

10.1.4 GEOLOGY WITHIN THE STUDY AREA

The project area is on the Witbank coalfield, which forms part of the Karoo basin, extensively covering the central regions of South Africa. The Karoo Super Group overlies the basement rocks within the Karoo Basin. The basement of the Karoo Super Group is the Dwyka tillites that are regularly deposited over the basin except for paleo-topographical highs. The Dwyka tillites are overlain by the Vryheid formation, including the coal seams. The Vryheid formation consists of various sequences of sandstones, shales, and siltstones with different coal seams. In terms of the area's structural geology, many dolerite dykes and sills intruded into the Karoo formation during the Jurassic period, acting as important geological structures diverting and impending groundwater movements (DWA, 2009). A dolerite intrusion is indicated in the south of the mining area (1:250,000 Geological map for the study area (2628 Eastrand; Department of Mines – Geological Survey). Further, there are porphyritic rhyolite intrusions with interbedded mudstone and siltsone in the northeastern and eastern sections of the study area. Refer to Figure 16 below for a geological map of the study area.

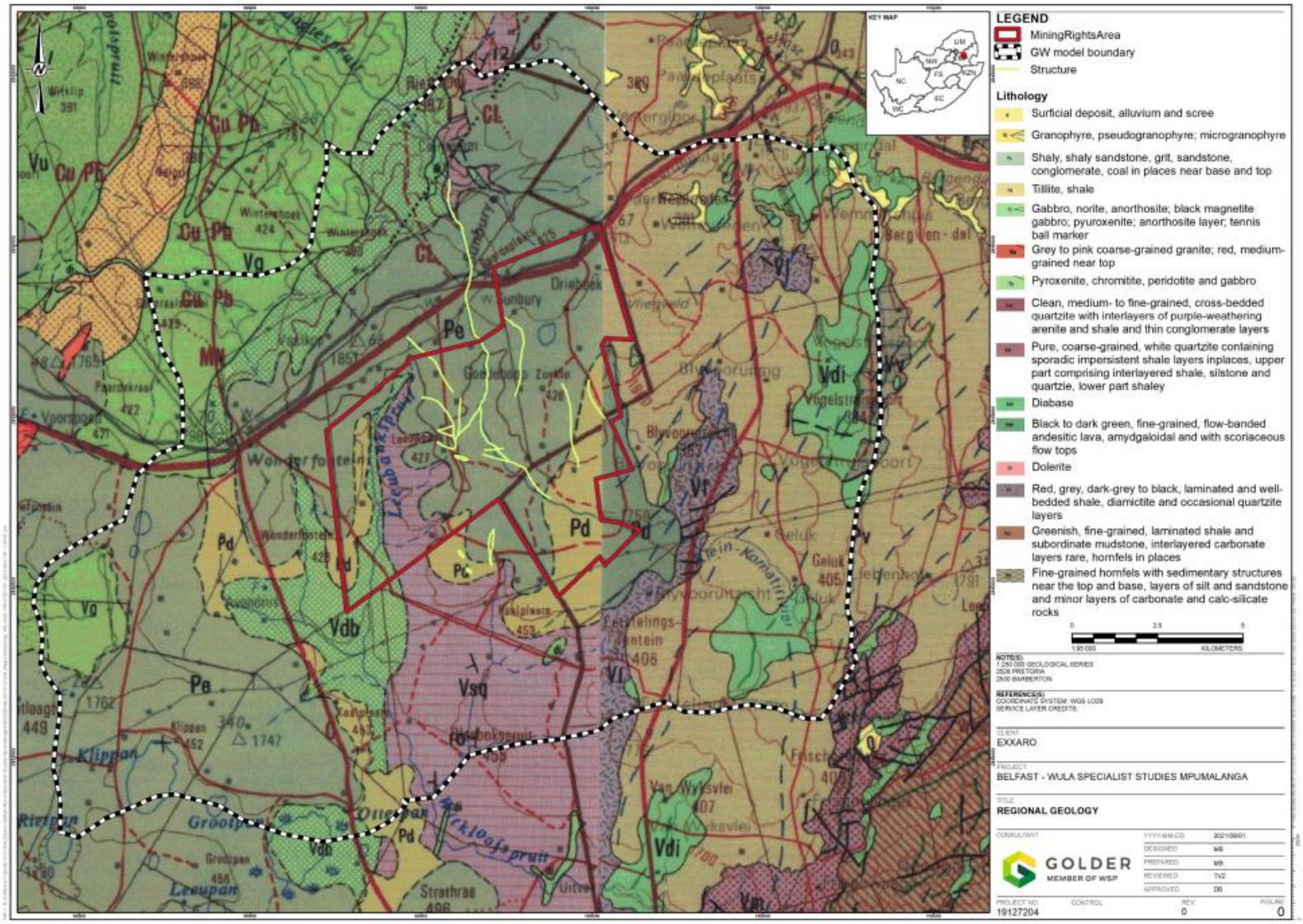

Figure 16: Geological map of the study area (Golder and Associates, 2021)

10.1.5 TOPOGRAPHY AND DRAINAGE OF THE STUDY AREA

The Study Area is approximately 3,126 ha, characterized by undulating topography. The area is dominated by agricultural cultivation and pastureland uses, interspersed with remnant areas of valley bottom wetlands, hillslope seepages, and dry grasslands, which is not possible due to wet conditions or shallow soils. The catchment consists of moderately hilly to flat areas. Rainfall that infiltrates the weathered rock soon reaches an impermeable layer of shale underlying the weathered zone.

The topography of the area slopes south-east towards the perennial Blesbokspruit and Klein-komati Rivers. The site is located on a topographical high, with drainage occurring radially in the southwestern and southeasterly directions. The site's elevation ranges from 1750 to 1860 meters above mean sea level (mamsl). The topography of the investigation area consists of a slightly undulating topography of open grassland, typically found in the central Highveld.

The highest topographical point is situated north with an altitude of approximately 1875 meters above main sea level (mamsl). The lowest topography is towards the south of the study area at 1725 mamsl. In the Belfast mining area itself, the highest elevation is approximately 1850 mamsl, while the lowest is 1775 mamsl. The site was subdivided into sub-catchments for the Leeubankspruit (western sub-catchment), Klein-Komati River (central sub-catchment), and the Driehoekspruit (eastern sub-catchment further separated into north and south).

10.1.6 HYDROLOGY

Regionally the area is in the Komati River catchment of Drainage Region X and locally falls over the X11C and the X11D quaternary catchment. The Belfast site is located on the south-western edge of the X11D catchment area, southward of the Klein-Komati River. The X11C quaternary catchment covers an area of 31 942 hectares, while the X11D catchment area has an area of 59 152 ha. The mean annual runoff (MAR) for the X11C and X11D catchments is 45 and 88 mm. The local topography determines the surface water flow direction. Refer to the Figure 17Figure 17 below for the hydrological map.

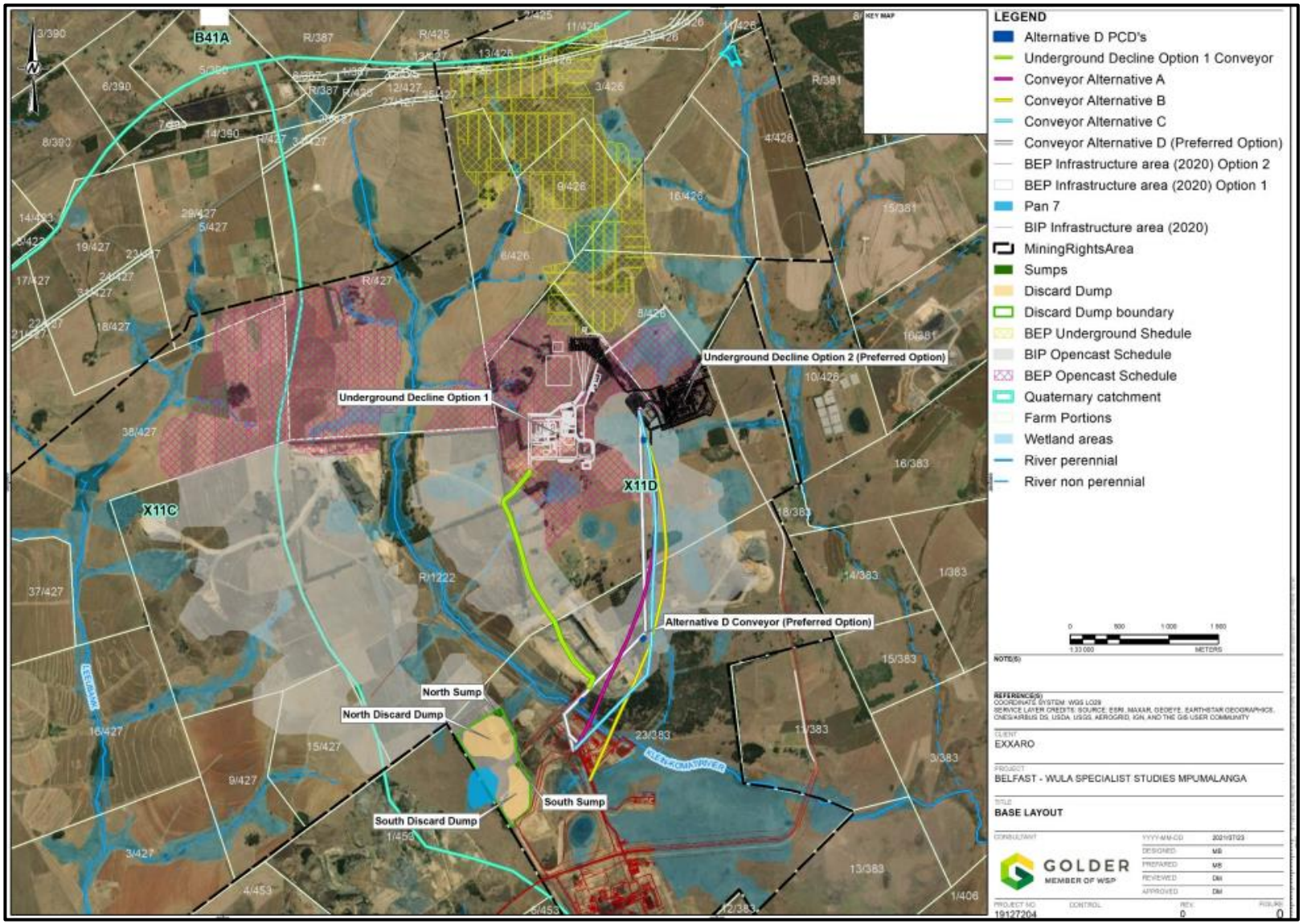

Figure 17 : Hydrological map of the site (Golder and Associates, 2021)

10.1.7 HYDROPEDOLOGY

According to van Tol et al. (2013), the hydropedological classification of soils in South Africa is based on defining the hydrological function of soils within a hillslope, while the pedological soil forms are typically associated with soil water regimes. The soil form and the soil hydromorphic signatures can be used to infer soil water flow dynamics. The hydropedology specialist (2021) indicated that the pedological soil forms had been categorised according to their hydropedological function in a hillslope, in work done by van Tol (2019). These categories were used to define the hydropedological classification of the project area. The project area comprises 16% Recharge soils, 73% Interflow soils, 11% Responsive soils, and the distribution of the hydropedological types within the project area is presented in Table 24, while the distribution of hydropedological types within sub-catchments in project area is presented in Figure 18 and 19.

Table 24: Hydropedology within the study area (Hydropedology Specialist Report, 2021)

Hydrological soil type	Description (van Tol *et al.*, 2013)	Associated soil form (van Tol et al., 2019)
Recharge	Soils without any morphological indication of saturation. Vertical flow through and outof the profile into the underlying bedrock is the dominant flow direction. These soils can either be shallow on fractured rock with limited contribution to evapotranspiration or deep freely drained soils with significant contribution to evapotranspiration.	**Hutton**
Interflow (A/B)	Duplex soils where the textural discontinuity facilitates buildup of water in the topsoil. Duration of drainable water depends on rate of ET, position in the hillslope (lateral addition/release), and slope (discharge in a predominantly lateraldirection).	None
Interflow (soil/bedrock)	Soils overlying relatively impermeable bedrock. Hydromorphic properties signify temporal build of water on the soil/bedrock interface and slow discharge in a predominantly lateral direction.	**Avalon** and **Bainsvlei**

Responsive (shallow)	Shallow soils overlying relatively impermeable bedrock. Limited storagecapacity results in the generation of overland flow after rain events.	**Arcadia**
Responsive (saturated)	Soils with morphological evidence of longperiods of saturation. These soils are close to saturation during rainy seasons and promote the generation of overland flow due to saturation excess.	**Katspruit**
Stagnating	Soils where outflow of water is restrictedor limited and have morphological signatures which indicate that neither recharge nor interflow are dominant.	**None**

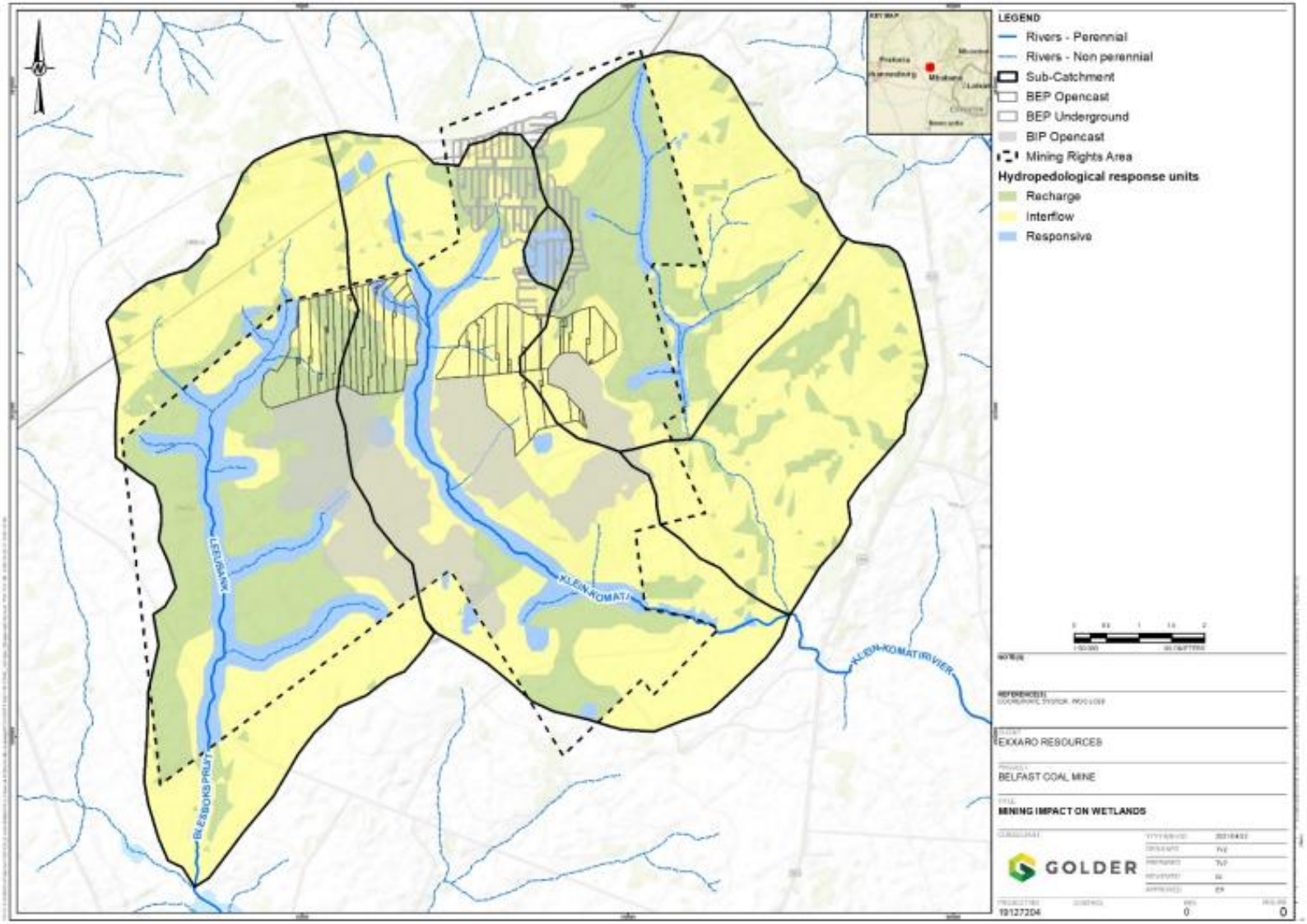

Figure 18: Distribution of hydropedological types within sub-catchments in project area (Golder and Associates: Hydropedology Specialist Report, 2021)

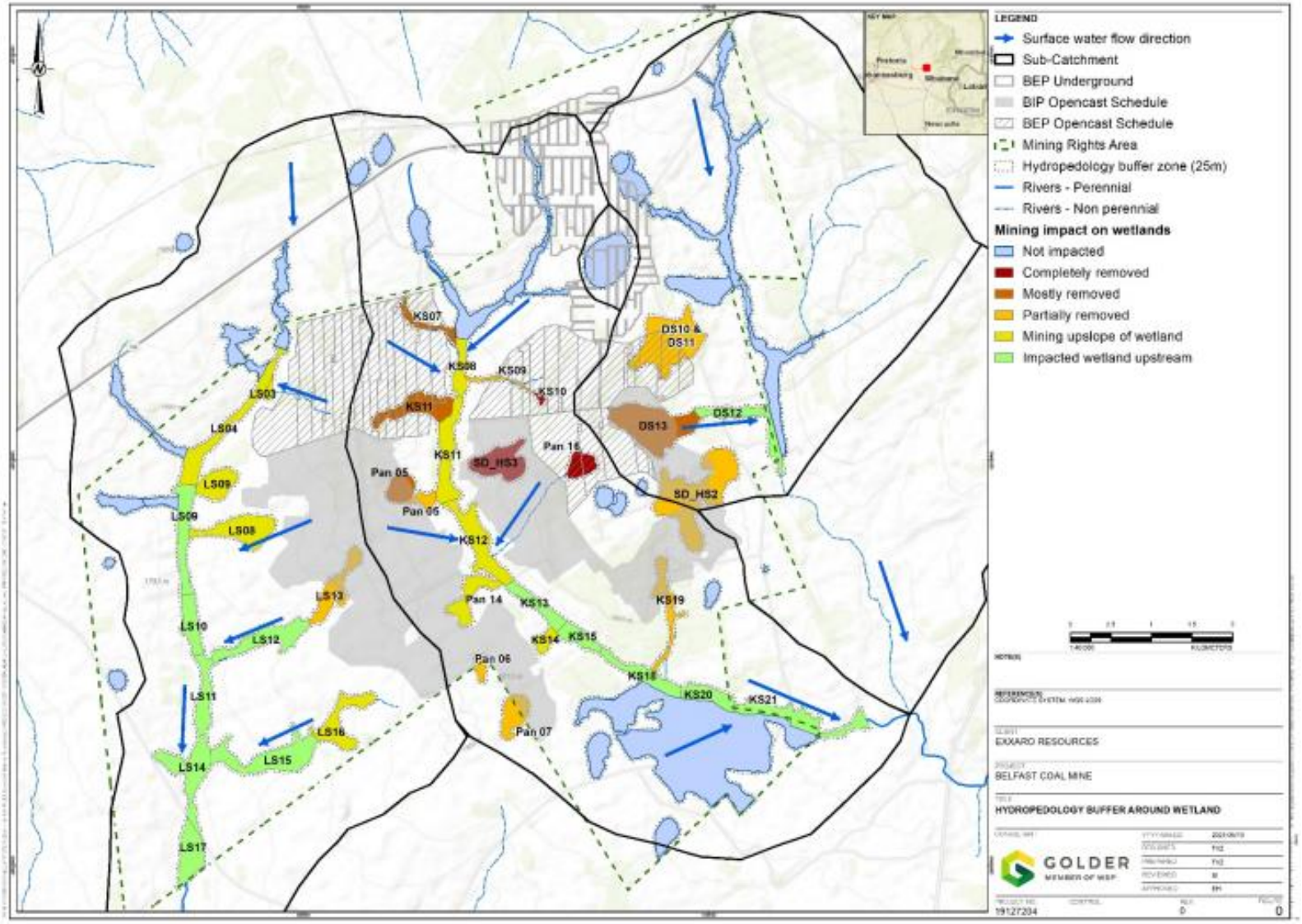

Figure 19: Hydropedology buffer around wetlands (Golder and Associates: Hydropedology Specialist Report, 2021)

10.1.7.1 Wetlands

Wetlands in the Study Area are associated with the three main riparian systems and are named based on their association with the relevant system. All the wetlands that have been delineated and classified within the original Belfast (BIP and BEP) mining right area (Golder, 2011), and include the following wetland types, or HGM units:

- Valley bottom with a channel.
- Valley bottom without a channel.
- Hillslope seepage (linked to a stream channel).
- Isolated hillslope seepage; and
- Pans and Depressions, the distinction being that a pan has a discernible basin.

- It must be noted that the impact of loss/disturbance of some wetlands (DS13, KS19, KS14, SDHS3, KS11 (Main), and Pan 05) have already been authorised for the BIP project and are not included as receptors in the current scope. Subsequently. The wetlands located within 500 m of the proposed BEP infrastructure and activities are listed in Table 25 and shown in Figure 20.

Table 25: Wetlands located within 500 m of BEP infrastructure

System	Wetland Name	Wetland type	Project activity within 500 m
Driehoekspruit	DS Main (03, 06, 09)	Channelled valley bottom	Underground mine within 500 m
	DS3-6, & 9 - HS	Hillslope seepage	Underground mine within 500 m
	DS07	Hillslope seepage	Underground mine
	DS08	Pan	Underground mine
	DS10, DS11	Isolated hillslope seepage	Opencast mine, underground mine and Decline shaft
	DS 12	Hillslope seepage	Opencast mine and Decline shaft
Klein-Komati	KS02 (main)	Channelled valley bottom	Opencast mine within 500 m
	KS03 (main)	Channelled valley bottom	Underground mine
	KS04	Hillslope seepage	Underground mine
	KS05	Unchannelled valley-bottom	Underground mine
	KS06	Hillslope seepage	Underground mine
	KS07	Unchannelled valley-bottom	Opencast mine
	KS08	Channelled valley bottom	Opencast mine
	KS09	Unchannelled valley-bottom	Opencast mine
	KS10	Hillslope seepage	Opencast mine
	KS 11	Hillslope seepage	Opencast mine
	KS15	Channelled valley bottom	Conveyor and/or haul road
Leeubankspruit	LS02	Hillslope seepage	Opencast mine within 500 m

	LS03	Hillslope seepage	Opencast mine within 500 m
	LS04 (Main)	Channelled valley bottom	Opencast mine within 500 m
	LS09	Hillslope seep	Opencast mine within 500 m
Pans	Pan11	Pan	Underground mine
	Pan12	Pan	Conveyor option D (preferred option)
	Pan13	Pan	Opencast mine within 500 m
	Pan16	Pan	Opencast mine
	Pan06	Pan	Discard dump
	Pan07	Pan	Discard dump
	Pan08	Pan	Discard dump
Resettlement village	HGM1	Hillslope seepage	Underground mine within 500 m
	HGM2	Isolated hillslope seep	Underground mine within 500 m
	HGM3	Depression	Underground mine within 500 m

According to the wetland specialist Golder (2021), the EIS of the wetlands in the Study Area varies widely, mainly as a function of their size and ecological integrity, which affects their capacity to deliver biodiversity and water-related ecosystem services, and subsequently, the ability of people to benefit from those services.

Accordingly, the channelled valley bottom wetlands associated with the main channels of the three riparian systems are of moderate to high importance and sensitivity, largely due to their hydro-functional importance, which relates to the role they play in flood attenuation, sediment trapping, and nitrate, phosphate and toxicant assimilation from their adjoining cultivated catchment area. Figure 21 and Figure 22 shows the Present Ecological Status of the identified wetland and associated potential impacts.

The hillslope seeps and unchanneled valley bottoms that form tributaries to the main systems are generally of low/marginal to moderate importance and sensitivity, typically a function of their small size and the extent to which they have been dammed or subjected to crop encroachment, limiting their capacity to provide ecosystem services.

With the exception of the pan at DS08, which has been partially dammed, and Pan 16, which has been impacted by cultivation, all other pans within the study area are of high or very high ecological importance or sensitivity – primarily as a result of their role in the delivery of biodiversity-related ecosystem services, that is, support of threatened plant species or populations of unique species, migration/feeding/breeding sites for fauna, and the regional context of their ecological integrity given the extent of loss/modification of pan systems in the region.

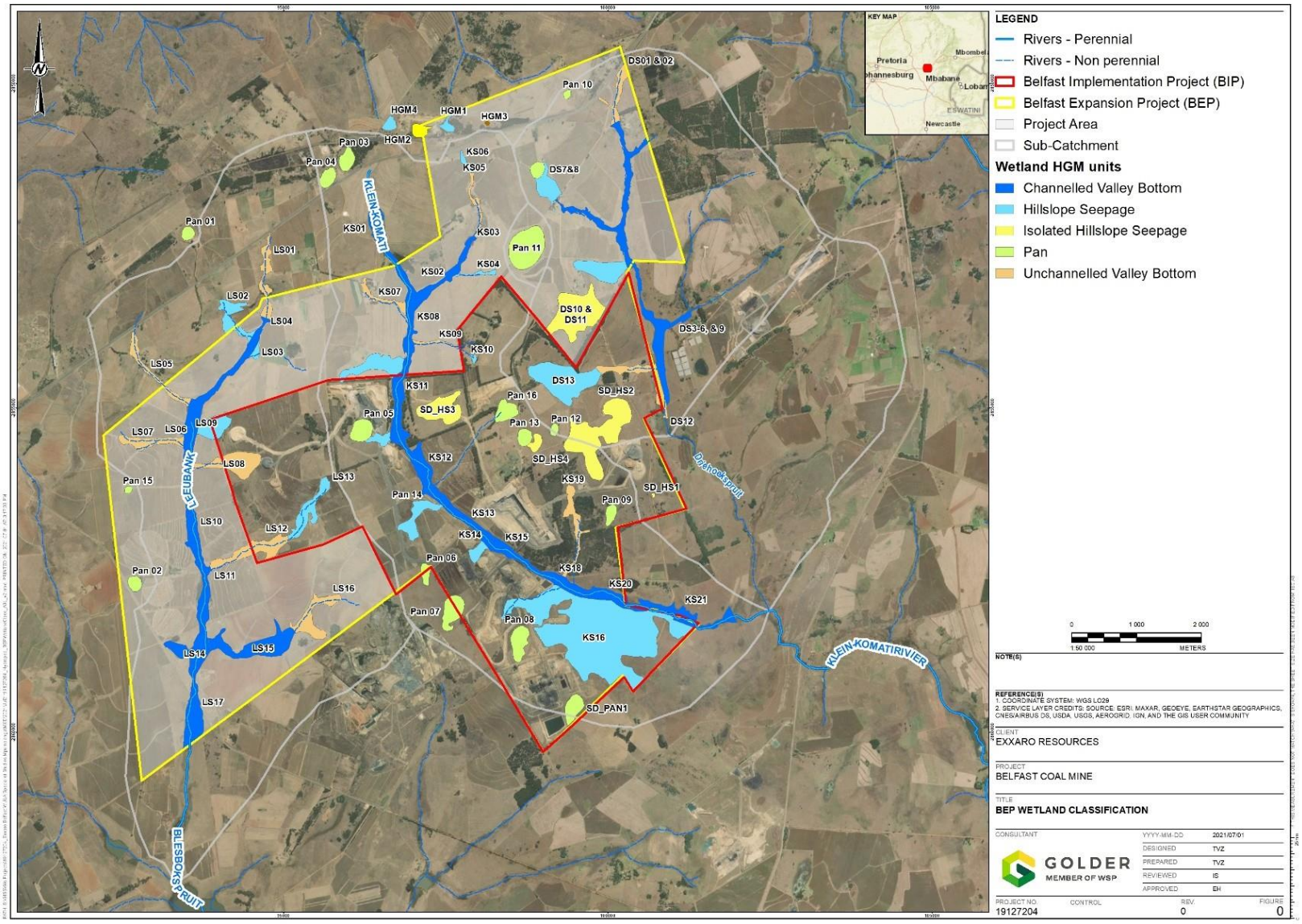

Figure 20: Wetlands within the study area (Golder and Associates: Wetland Specialist Report, 2021)

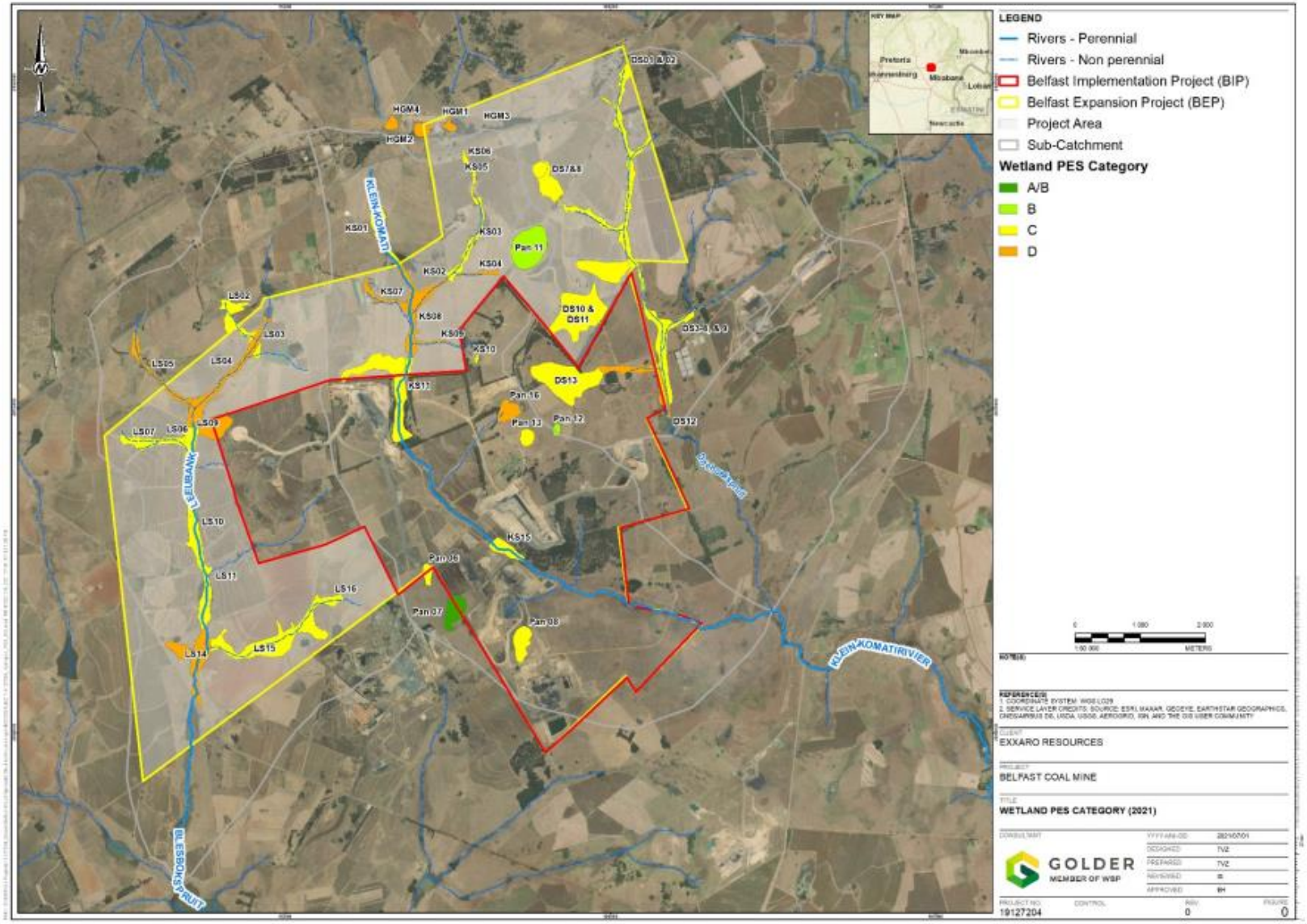

Figure 21: Wetland Present Ecological Status (PES) (Golder and Associates: Wetland Specialist Report, 2021)

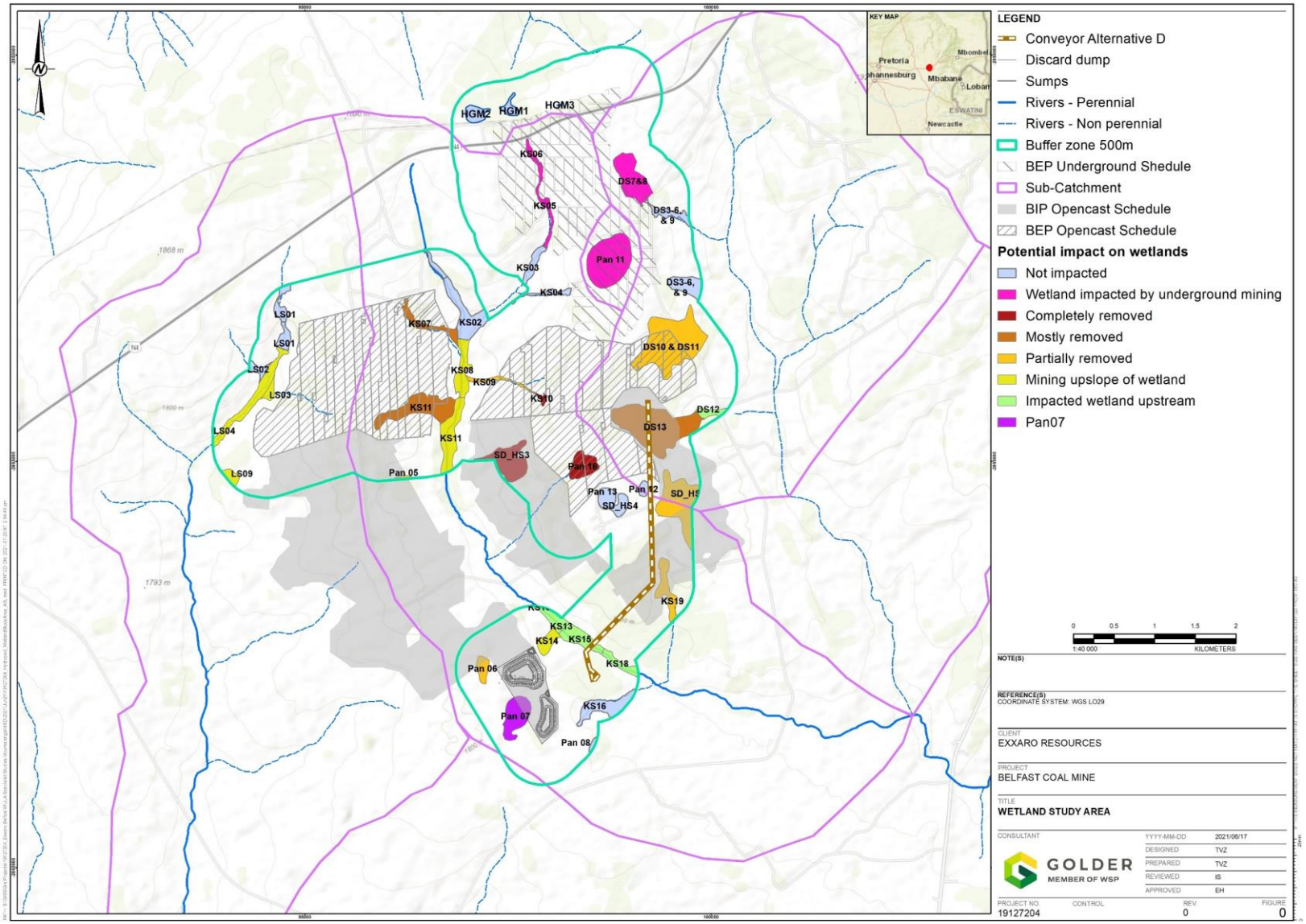

Figure 22: Potential impacts on wetlands (Golder and Associates: Wetland Specialist Report, 2021)

10.1.8 HYDROGEOLOGY

Based on the 1:250 000 geological map series (2528 Pretoria), the BEP area is underlain by sedimentary rocks of the Karoo Supergroup. The basement comprises pre-Karoo rocks of the Pretoria Group of the Transvaal Supergroup containing quartzite, shale, subgraywacke, and minor hornfels. Pre-Karoo diabase is present to the east of the site. The Karoo Supergroup comprises a sedimentary succession of sandstones, siltstone, shale, and coal seams. The coal seams are contained within the Vryheid Formation that forms part of the Middle Ecca Group. The sedimentary succession overlies the Dwyka formation, comprising diamictite and tillite at the base of the Karoo Supergroup. Igneous intrusive rocks (dolerite dykes/sills) of the late Karoo age invariably characterize the Mpumalanga coalfields; however, no dolerite intrusions were indicted at the proposed BEP area.

The numbers 2, 3, and 4 seams will be mined. However, the number 3 coal seam is described in the area and used mainly as a marker layer since it is not an economically mineable seam. Portions of the number 4 seam have been eroded and vary significantly in thickness and quality (due to weathering). A generalized vertical section of the sub-surface geology in the BEP area is presented in Figure 23 (Groundwater Complete August 2014).

10.1.8.1 Hydrocensus

A comprehensive hydrocensus of the BEP investigation area was conducted by Groundwater Complete during 2009 and repeated/updated during January 2014 by Aquatico Scientific Services, wherein fifty-one (51) boreholes, and eleven (11) fountains were surveyed.

According to Groundwater Complete (2009), groundwater is used mainly for domestic supply, stock watering, and small-scale irrigation at farmsteads. The groundwater levels measured during the 2009 hydrocensus range from 0.7 to 34.4 meters below ground level (mbgl) with an average of 8.4 mbgl. Hydrocensus borehole yields reported for the investigation area correspond with literature and regional yields ranging between 0.01 and 2.0 l/s (minor aquifer system). Widespread pollution or depletion of the groundwater resource will impact negatively not only on the resource but also on the existing groundwater users. Apart from the groundwater use, the aquifers in the area provide a broad base flow component to an abundance of surface watercourses that will be affected should adverse impacts occur on the quality or availability of the resource

The 2009 hydrocensus was repeated/updated in January 2014 by Aquatico Scientific Services for the 2014 Belfast update. The 2014 survey confirms groundwater use is similar to in 2009, as mainly being used for domestic and stock watering purposes. Eleven fountains were recorded during the survey (Bly01, Blyvoor01, Bv01, Ef02, EF04, Ef05, Lb05, Vaal01, Wt01, Wt5, and Z01). These are mostly used for livestock water. One of the springs is used for domestic purposes. Also recorded during the 2014 hydrocensus survey are ten mine monitoring boreholes drilled in 2009 and 2 wells (Z05, Z08). Regional static groundwater levels around the BEP area vary between 0.2 mbgl and

approximately 35 mbgl. (Groundwater Complete - August 2014). The hydrocensus boreholes are shown in Figure 23

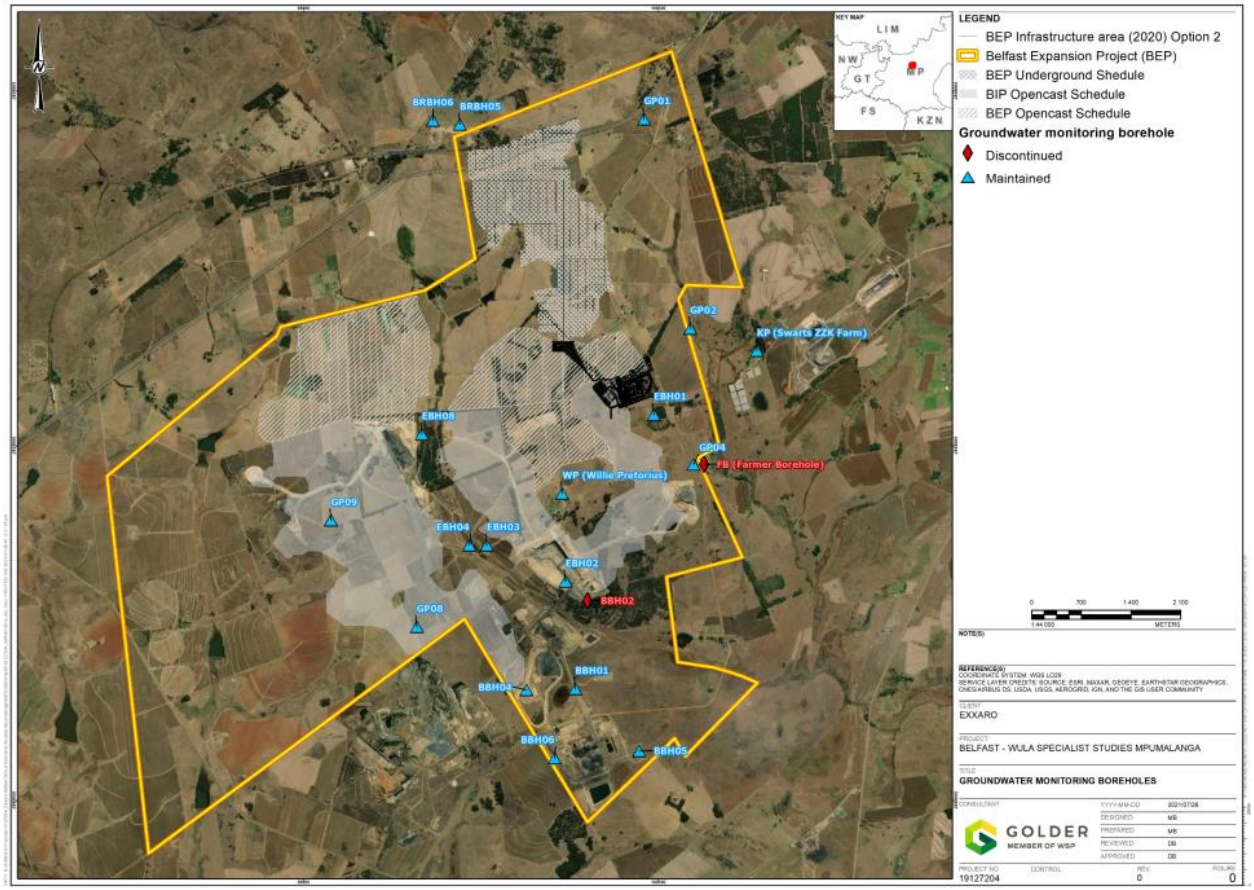

Figure 23: Hydrocensus boreholes (Golder and Associates: Groundwater Specialist Report, 2021)

10.1.9 SITES OF ARCHAEOLOGICAL AND CULTURAL SIGNIFICANCE

The Phase 1 Archaeological and Cultural Heritage Impact Assessment for the proposed project identified the following key archaeological features:

- A graveyard;
- Historical farmhouse complexes;
- Stonewalling;
- Place of worship; and
- Historical households.

The assessment revealed a gravesite, some historical structures, stone walls, and a place of worship within the proposed BEP study area (For ease of reference, a table detailing the finds on page 32 of the Heritage Specialist Report). The identified gravesite (cemetery) is known to Exxaro, and it belongs to mine workers. It is demarcated by a fence and is currently active. There are about 30 graves positioned westward; five of them have headstones, while some are marked by stones.

In South Africa and elsewhere burial sites and their contents are accorded the highest heritage accolades, principally by their relationship with human beings. Section 36 of the National Heritage Resources Act (3) states that no person may, without a permit issued by SAHRA or a provincial heritage resources authority: destroy, damage, alter, exhume, remove from its original position or otherwise disturb any grave or burial ground older than 60 years which is situated outside a formal cemetery administered by a local authority. If the grave is less than 60 years of age it is protected against any damage, altering or exhumation by the Human Tissue Act, 1983 (Act 65 of 1983) as well as local regulations.

Historical farmhouse complexes were also noted in the study area. Most of them were built from sunburnt earth bricks, roofed by corrugated iron sheets and steel bars. Most of the farmhouses have old rusty farm equipment on the premises. There was also an old historical household in the study area.

Historical stonewalls were also noted and documented. Some appear to be cattle kraal, and some ovis/capra. Some of the historical stonewalling has collapsed. The farmhouse complexes and historical stonewalling have a medium significance value of over 60 years of age, and most importantly, their historical, social and aesthetic value. These structures are considered heritage situates in the more extensive history of the region. According to Section 34 (1) of the National Heritage Resources Act, no person may alter or demolish any structure or part of it, which is older than 60 years without a permit, issued by the relevant provincial heritage resources in this case, Mpumalanga Heritage Resources Authority (MPHRA). Section of the same Act also protects the demolition or altering of any structure in the Republic of South Africa for its cultural significance or other special value. An old Historical church was also noted in the area. It could not be established if the church was still active. The church is protected by Section 3 of the National Heritage Resources Act 1999 (Act 25 of 1999). The identified features are mapped out and shown in Figure 24.

Although the heritage and archaeological specialist study identified archaeological features, none of them are directly affected by the proposed BEP project.

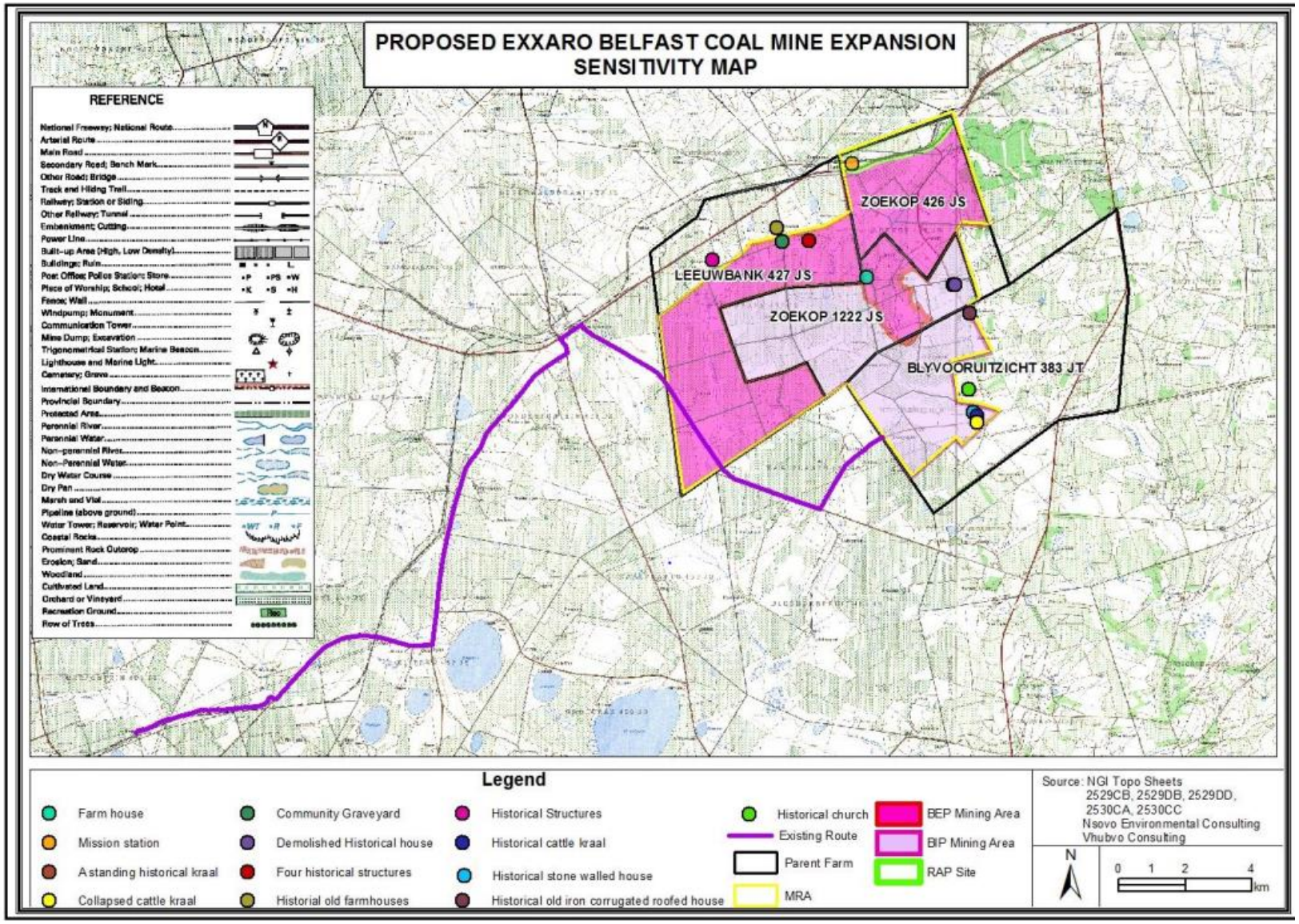

Figure 24: Archaeological findings in relations to the proposed development options (Vhubvo Archaeo-Heritage Consultant Cc., 2021)

10.1.10 AIR QUALITY AND POLLUTION

The project is situated in the Mpumalanga Province, in the Nkangala District Municipality, which has not been formally declared as an Air Quality Priority Area in terms of Section 18(1) of the National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004) (AQA). No air quality listed activities require an Atmospheric Emissions Licence associated with the proposed project.

According to the Air Quality Impact Assessment Specialist Study, it is assumed that the primary impacting sources are dust generated from road transport on the mine, MRF, opencast, and wind-blown dust from exposed surfaces. A secondary source is the materials handling to load and offload the conveyor systems. However, there are few sources of air pollutants within the immediate proposed area. The motor vehicles along the road on the study area boundary, resulting in elevated ambient concentrations of particulates and Nitrogen Oxides (NO2) at times. Sources identified in the immediate vicinity of the study area and proposed project area have been listed below:

- Vehicle Exhaust Gases;
- Veld Fires;
- Loading and Offloading Raw Materials;
- Wind Erosion as a result of ROM Material and Topsoil Stockpiles Dust;
- Material Handling (Loading, Hauling, and Tipping); and
- Other fugitive dust sources such as wind erosion of exposed areas.

10.1.11 VEGETATION STRUCTURE AND COMPOSITION

The Study Area is in the grassland biome, which covers approximately 28% of South Africa and is the dominant biome of the eastern subcontinent's central plateau and inland areas (SANBI, 2013). Grasslands are typically situated in moist, summer rainfall regions that experience between 400 mm and 2000 mm per year. Vegetation consists of a dominant field layer comprising grasses and herbaceous perennials, with no woody plants present. The vegetation structure in BEP is described below.

Vegetation Communities in the study area

Outside of areas that have been completely transformed/developed by mining and other anthropogenic activities, four main vegetation communities are present in the study area. All four communities are relevant to the proposed Project's aboveground infrastructure footprints. A description of each community is presented below, along with representative photographs. The moist grassland and wetland communities' delineation is based on existing wetland delineations.

Moist Grassland and Wetlands

This broad vegetation community is associated with moist soils in drainage valleys, artificial dams pans and seep zones in the study area (Figure 5). Disturbance levels vary, with some moist grassland and wetland portions modified by

farming activities and others in generally good condition. In undisturbed areas, vegetation structure is low- to short, closed grassland (sensu. Edwards 1983). Seasonally and temporally moist areas are generally grass-dominated, with species like *Agrostis eriantha, Arundinella nepalensis, Eragrostis gummiflua, E. plana, Leersia hexandra, Paspalum dilatatum*, Pennisetum sphacelata* and *Setaria sphacelata* dominant or very common. In more permanently moist areas, species such as *Typha capensis* and *various Cyperaceae, including inter alia; Cyperus denudatus, Eleocharis species, Juncus effusus*, Juncus lomatophyllus* and *Schoenoplectus brachyceras* are common (*denotes alien species). The vegetaion types are shown in the vegetation map presented in Figure 25.

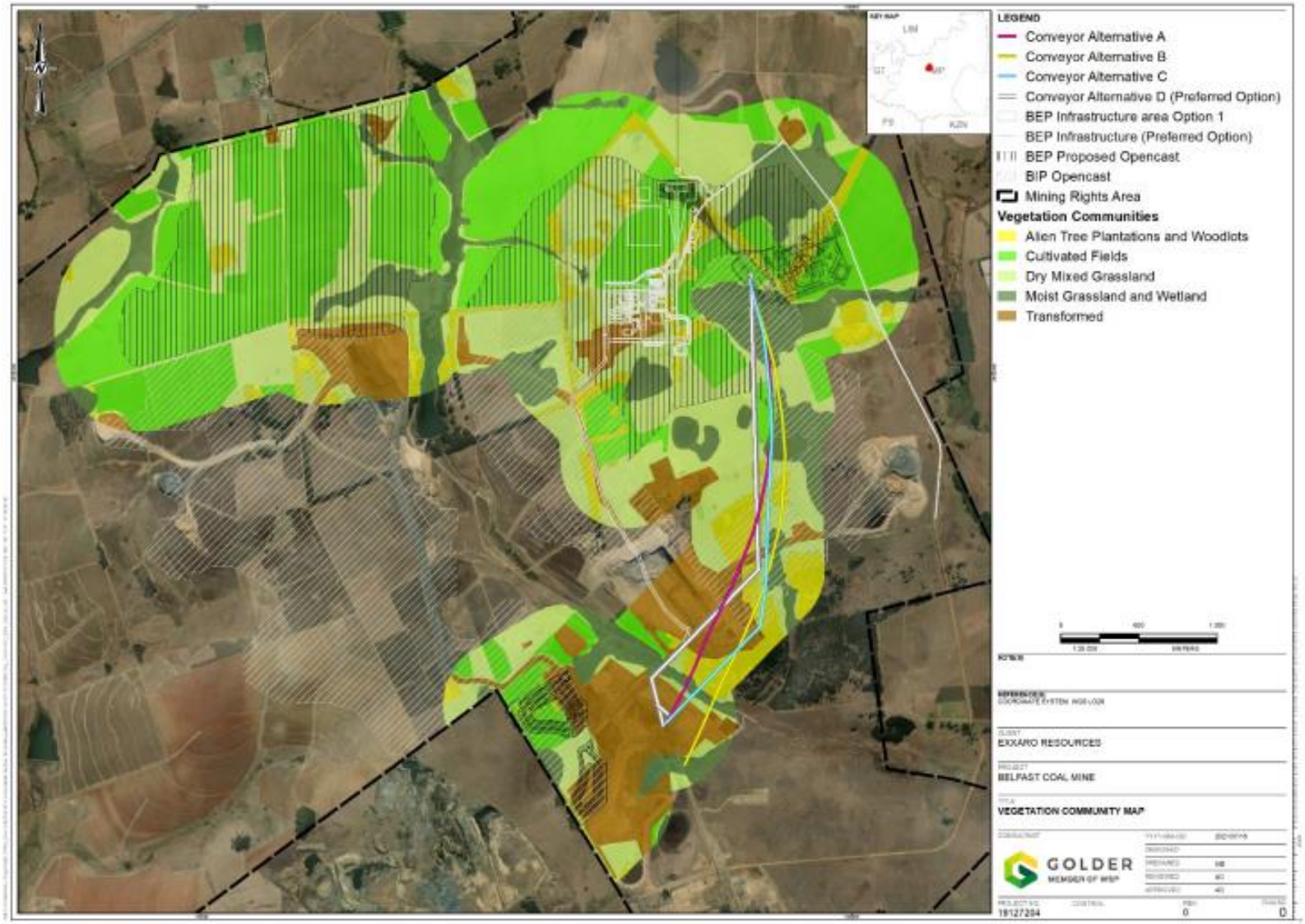

Figure 25: Vegetation Map of the proposed study site (Golder and Associates: Terrestrial Ecology Specialist Report, 2021)

10.1.12 SOIL AND LAND CAPABILITY

The dominant soils (**Figure 26**) occurring within the BEP project area are Hutton, Avalon, Lichtenburg, Mispah, and Glencoe forms, and the sub-dominant soil forms were identified as Katspruit, Ermelo, Westleigh, and Dresden. Most of the extent of the BEP project area can be broadly classified as ideal for agriculture (with minor limitations) and grazing, and wilderness land uses. The soils, as mentioned above, are considered ideal for agricultural cultivation due to the following:

- Deep, well-drained soil characteristics.
- Texture and structure allow for effective rooting depth.
- Good water holding/storage capacity; and nutrient holding capacity.

The land capability classes are presented in **Table 26** and map shown in **Figure 27**.

Table 26: Land Capability classes for soil forms identified within the study area (Scientific Aquatic Services, 2021)

Soil Form	Land capability	Area (ha)	Percentage
Lichtenburg	Arable (Class II)	146.8	3,87
Hutton		363.7	9,59
Ermelo		57.4	1,51
Glencoe		110.8	2,92
Clovelly		103.5	2,73
Lichtenburg/Glencoe		20.9	0,55
Lichtenburg/Hutton		510.8	13,47
Hutton/Bainsvlei		105.8	2,79
Hutton/Bloemdal		24.3	0,64
Avalon	Arable (Class III)	771.9	20,36
Avalon/Glencoe		83.0	2,189
Bainsvlei		57.6	1,52
Bainsvlei/Bloemdal		180.4	4,76
Wasbank	Grazing (Class V - Wetlands)	46.9	1,24
Westleigh		166.52	4,39
Wasbank/Longlands		83.8	2,21
Longlands/Westleigh		53.7	1,42
Katspruit		397.5	10,49
Katspruit/Rensburg		50.1	1,32
Katspruit/Kroonstad		3.1	0,08
Kroonstad		3.2	0,08
Manguzi		1.1	0,03

Longlands		31.1	0,82
Dresden	Grazing (Class VI)	142.2	3,75
Mispah		245.6	6,48
Mispah/Dresden		11.6	0,31
Witbank	Wilderness (Class VIII)	17.7	0,47
Total Enclosed Area		3791.0	100

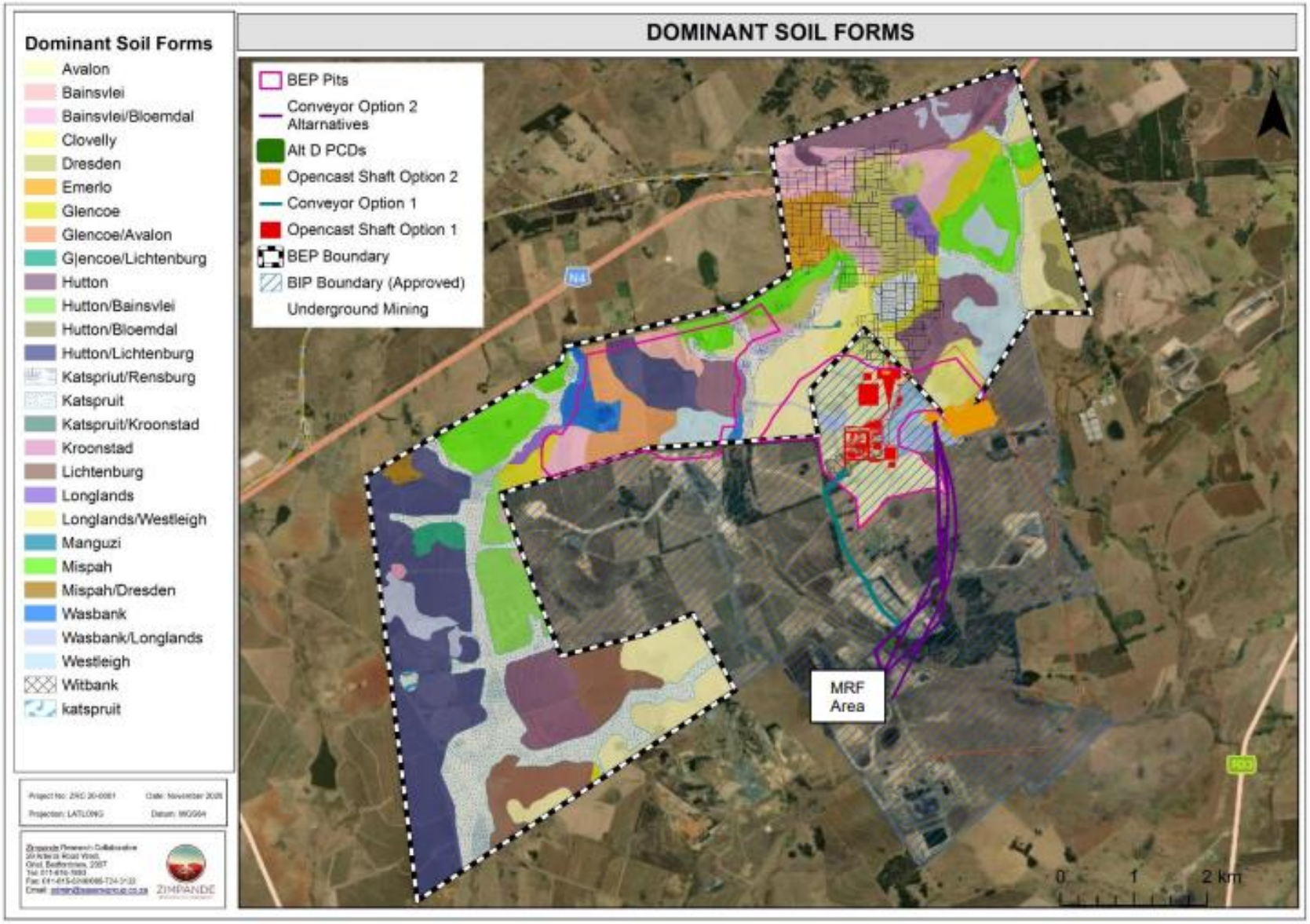

Figure 26: Dominant soil form in the study area (Zimpande Research Collaborative: Soil, Land Use and Land Capability Assessment Report, 2021)

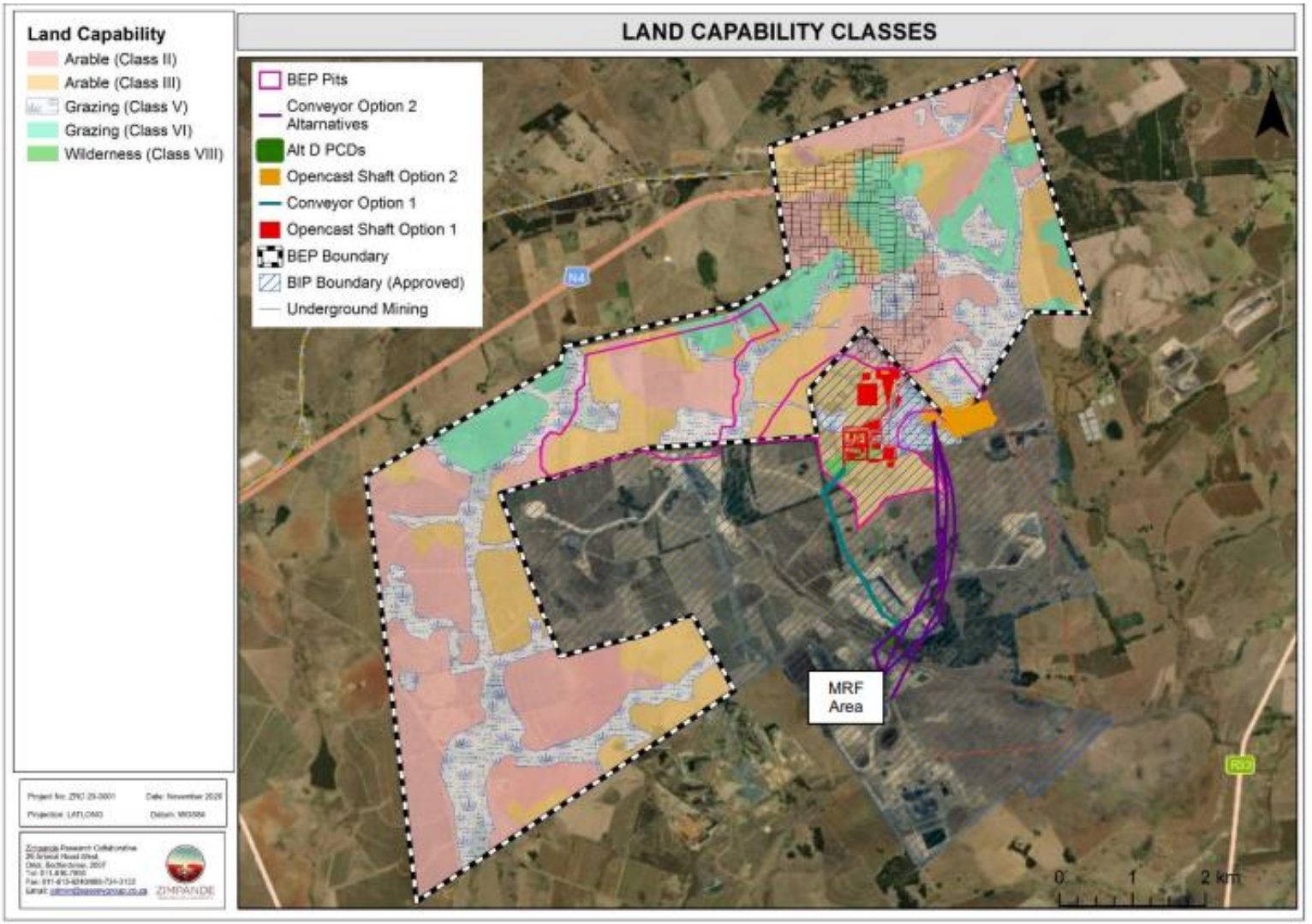

Figure 27: Land capability classes within the study area (Zimpande Research Collaborative: Soil, Land Use and Land Capability Assessment Report, 2021)

10.1.13 SENSORY ASPECTS

10.1.13.1 Noise

In terms of the Noise Regulations, a noise disturbance is created when the prevailing ambient noise level is exceeded by 7.0dBA or more. Noise is part of our daily exposure to different sources, part of daily living. Some of these physical attributes may be part of the ambient levels that people get used to without noticing the higher levels. Two aspects are important when considering the potential impacts of a project include the following:

- The increase in the noise levels, and;
- The overall noise levels will be created by the proposed activities.

The proposed BEP mine expansion project will take place in an area with other mining activities and feeder roads with a continuous flow of traffic during the day and intermittent traffic flow during the night. The prevailing ambient noise level in the vicinity of the different expansion footprint areas was made up out of mining activity noises, agricultural noises, and traffic noise. The potential noise impact will be low during the construction and decommissioning phases. Implementing noise mitigatory measures will ensure that the impact will remain low. The noise impact during the project's operational phase will be moderate during some of the activities and will remain moderate after the implementation of mitigatory measures.

However, the potential noise intrusion from the mining activities can be controlled using approved acoustic screening measures, state-of-the-art equipment, sound noise management principles, and compliance to the Noise Regulations of 1994 and the International Finance Corporation's Environmental Health and Safety Guidelines.

10.1.13.2 Visual Aspects

The study area consists of large areas of agricultural land used for commercial purposes. There are residential settlements, including small towns and farming communities; however, the landscape is degraded around these settlements. Mining is one of the key land uses and contributes significantly to the visual degradation of parts of the study area.

Within the receiving environment, specific viewers (visual receptors) experience different views of the visual resource and value it differently. They will be affected because of alterations to their views due to the proposed project. The visual receptors included in this study are:

- Residents;
- Tourists; and
- Motorists.

The study area is moderately populated, with a lower population in the rural settlements and farming communities, to higher populations in the towns. The closest town is Belfast and is 9km to the north. A possible visual impact to residents could be the traffic loading on surrounding roads, with large volumes of 30-ton interlink trucks transporting coal to the railway siding. Associated dust and noise could exacerbate the impact. The residents close to the mine may experience a moderate degree of visual intrusion by the proposed expansion of the mine.

The entire study area is considered to have low tourism potential, primarily because of mining developments and human settlement activities. There is also no major thoroughfare to prominent tourist destinations. The temporary exposure to possible unsightly views of the construction camps and the associated activity will be minimal and localised. The proposed new developments will only impact tourists along primary transportation routes. The severity of the visual impact of the mining activities on tourists will be low, causing a low visual impact.

The major routes in the study area are the N4 and the R33, connecting the towns, mines, and farms. The secondary road network in the study area carries a much lower volume of motorists. Most of the roads are gravel roads used by local residents. The trucks used to transport coal to the railway sidings may affect motorists on surrounding roads. Even though most motorists using these routes are assumed to be associated with the mines. Motorists' visual exposure to the new activities will be brief, and the severity of the visual impact will be low.

The visibility analysis associated with the proposed activities is presented in Figure 28.

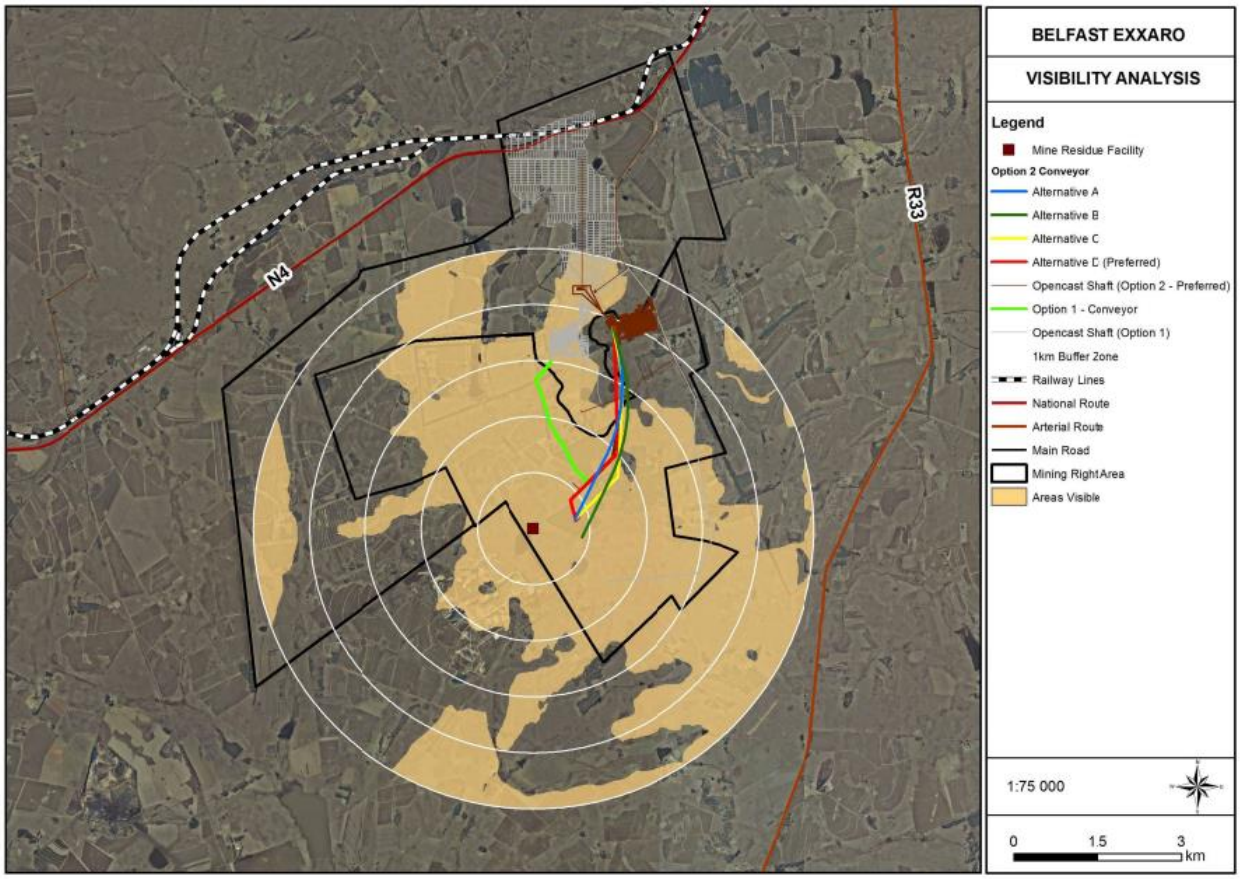

Figure 28: Visibility analysis associated with the proposed activities (Outline Landscape Architects: Visual Impact Assessment Report, 2021)

10.1.14 CLIMATE CHANGE IMPACT

According to the Climate change specialist report (2021), the climate change impacts of the proposed project are negligible. However, if the climate change impacts of the project's product are considered, a moderate impact is anticipated. The mining and combustion of coal will unavoidably add to South Africa's (or South Africa's trading partners). Climate change is a global impact and cannot be materially mitigated at the project scale. However, an aggressive offset program can reduce the project's net, direct carbon emissions to zero.

The scientific opinion suggests that the continued emission due to human activities of greenhouse gases, principally carbon dioxide and methane, may bring about significant and long-term changes to the functioning of the earth's atmosphere. Of great uncertainty still are the possible impacts and damage attributable to such climate change, although indications are that their scale could be significant. According to the White Paper on Energy, South Africa is responsible for 1,6% of global greenhouse gas emissions, and the country's energy sector is the single largest source of greenhouse gas emissions in Africa, being dependent on coal for more than 75% of the country's primary energy

needs during 1997. This level of emissions is also mainly a result of the high level of coal use by the electricity generation and synthetic fuels industries and the high level of industrialization producing high energy content products. To fulfill the national energy policy of making clean, affordable, and appropriate energy available to all population sectors, a balanced least-cost mix of energy supply is promoted. Therefore, coal will dominate other energy sources in South Africa for many years to come. Although the country is faced with obligations to reduce greenhouse gas emissions in the near future, international governance of this problem is evolving.

The Air Quality Specialist report highlighted that coal mining releases methane, a potent greenhouse gas. Methane is the naturally occurring product of the decay of organic matter as coal deposits are formed with increasing burial depths, rising temperatures, and rising pressure over geological time. A portion of the methane produced is absorbed by the coal and later released from the coal seam (and surrounding disturbed strata) during the mining process. Methane accounts for 10.55% of greenhouse gas emissions created through human activity. According to the Intergovernmental Panel on Climate Change, methane has a global warming potential 21 times greater than carbon dioxide over a 100-year timeline.

Further, the process of mining can release pockets of methane, and these gases may pose a threat to coal miners and be a source of air pollution. This is due to the relaxation of pressure and fracturing of the strata during mining activity, which raises safety concerns for the coal miners if not managed properly. The build-up of pressure in the strata can lead to explosions during (or after) the mining process if prevention methods, such as "methane draining," are not taken.

Climate change is unlikely to impact the mining industry directly. Regulations and management strategies are already in place to manage water usage, water conservation and demand strategies, and environmental issues relating to rehabilitation and the provision of rehabilitation guarantees. While a lack of access to water may affect some mining projects, most mining processes do not generally require potable water. Some mines are already installing water treatment units where high-quality water is required.

11 METHODOLOGY FOR ASSESSING THE SIGNIFICANCE OF POTENTIAL IMPACTS

The assessment of impacts is largely based on the Department of Environmental Affairs and Tourism's (1998) Guideline Document: Environmental Impact Assessment Regulations. The assessment will consider impacts arising from the proposed project's activities, both before and after the implementation of appropriate mitigation measures.

The impacts are assessed according to the criteria outlined in this section. Each issue is ranked according the nature of each impact will be assessed and described in relation to the extent, duration, intensity, significance, and probability

of occurrence. From these criteria, a significance rating is obtained, the method and formula are described Table 27. Where possible, mitigation recommendations are made and presented in tabular form.

Table 27: Methodology used in determining the significance of potential environmental impacts

Status of Impact
The impacts are assessed as either having a:
negative effect (i.e. at a `cost' to the environment),
positive effect (i.e. a `benefit' to the environment), or
Neutral effect on the environment.

Extent of the Impact
(**1**) Site (site only),
(**2**) Local (site boundary and immediate surrounds),
(**3**) Regional (within the City of Johannesburg),
(**4**) National, or
(**5**) International.

Duration of the Impact
The length that the impact will last for is described as either:
(**1**) immediate (<1 year)
(**2**) short term (1-5 years),
(**3**) medium term (5-15 years),
(**4**) long term (ceases after the operational life span of the project),
(**5**) Permanent.

Magnitude of the Impact
The intensity or severity of the impacts is indicated as either:
(**0**) none,
(**2**) Minor,
(**4**) Low,
(**6**) Moderate (environmental functions altered but continue),
(**8**) High (environmental functions temporarily cease), or
(**10**) Very high / Unsure (environmental functions permanently cease).

Probability of Occurrence
The likelihood of the impact actually occurring is indicated as either:
(**0**) None (the impact will not occur),
(**1**) improbable (probability very low due to design or experience)
(**2**) low probability (unlikely to occur),
(**3**) medium probability (distinct probability that the impact will occur),
(**4**) high probability (most likely to occur), or
(5) Definite.

Significance of the Impact

Based on the information contained in the points above, the potential impacts are assigned a significance rating (**S**). This rating is formulated by adding the sum of the numbers assigned to extent (**E**), duration (**D**) and magnitude (**M**) and multiplying this sum by the probability (**P**) of the impact.
S=(E+D+M)P

The significance ratings are given below
(**<30**) low (i.e. where this impact would not have a direct influence on the decision to develop in the area),
(**30-60**) medium (i.e. where the impact could influence the decision to develop in the area unless it is effectively mitigated),
(**>60**) high (i.e. where the impact must have an influence on the decision process to develop in the area).

12 DESCRIPTION OF THE ENVIRONMENTAL ISSUES AND POTENTIAL IMPACTS INCLUDING CUMULATIVE IMPACTS IDENTIFIED

This section describes the potential impacts of the proposed project on the receiving environment. Impacts associated with the relevant environmental components within the study area as identified have been assessed based on the and input from specialist studies undertaken and the EAPs opinion. Refer to the Tables below for the potential impacts identified. The potential impacts associated with the proposed project include impacts on:

- Biodiversity (flora and fauna).
- Soil, land use and land capability.
- Heritage.
- Wetland.
- Hydropedology.
- Hydrology.
- Traffic.
- Air quality.
- Socio-economic.
- Visual impacts.
- Topographical changes.
- Geological changes.
- Climate Change Impact.
- Geohydrology.
- Palaeontology.

12.1 SUMMARY POTENTIAL ENVIRONMENTAL IMPACTS IDENTIFIED

Potential environmental impacts identified during the Scoping phase are described in Table 28 below. This is not an exhaustive list but an insight into the potential impacts associated with the proposed project. The identified aspects and impacts will be assessed further and rated accordingly in the EIA Phase. It must be borne in mind that the EIA phase may identify more potential impacts that will be assessed and mitigation and management measures proposed. The mitigation and management measures will be detailed in the EMPr that will be prepared in the next phase.

Table 28: Potential Environmental Impact Identified

Aspect	Impact	Summary of the specialist findings and assessment of impact	Proposed Mitigation/Management Measures
Employment Skills and Training	Positive-No mitigation required	The Social Impact Assessment report (2021) highlighted that the over the construction phase, the project will lead to the creation of both direct and indirect jobs. The duration of construction is 24 months, which includes 4 months of detailed design and 16 months of manufacturing and construction (BVi Consulting Engineers Gauteng (Pty) Ltd, 2020, p. 65). With regard to the operational phase of the project, it is indicated that. "In terms of the Underground resources, the estimated amount of people will be: • Underground workers – 455 • Surface workers – 117	• Employment of skilled, semi-skilled and unskilled labours during the construction of proposed project. • When appointing subcontractors, preference should be given to appropriate subcontractors/SMMEs located in the surrounding communities, then in the municipal area, and then only to contractors located elsewhere or outside the province. • Exxaro must promote the creation of employment opportunities for women and youth. The positions reserved for the youth and women may only be filled with persons outside of these categories if it can be demonstrated that no suitable persons can be employed from these categories.

Aspect	Impact	Summary of the specialist findings and assessment of impact	Proposed Mitigation/Management Measures
		• Total workers – 572 It is assumed that the underground workers will work in two or three shifts, resulting in a maximum of 455/ 2 + 117 = 345 people on the mine during day shift. The proposed project will result in the extension of the existing contracts with opportunities to the skilled and semi-skilled personnel in the local community during the construction and operational phases. This impact will be positive and provincial in extent	
Hydropedology	Negative	According to the specialist studies, results from the two groundwater models show that the highest impact will be on the wetlands of the central sub-catchment. This catchment will be extensively mined and the reduction in flow to the wetlands in this Subcatchments is expected to be 34%. The reduction in flow to the wetlands in the western catchment is 10% - 20% and the flow reduction to the wetlands in the eastern sub-catchment is less than 5% The simulated reduction in flow is closely related to the reduction in area for the western and central catchments.	• No development should take place within the wetlands as well as the 32 m zone of regulation. • Water from clean water areas should be diverted and discharged back into the adjacent wetland systems in an attenuated manner. • Implementation of strict erosion control measures to limit loss of soil and sedimentation of the wetlands adjacent to the proposed project. • Alien Invasive Plant control and revegetation of selected areas should be undertaken to reinstate habitat for indigenous species as a minimum

Aspect	Impact	Summary of the specialist findings and assessment of impact	Proposed Mitigation/Management Measures
		However, the simulated flow reduction in the eastern catchment was much less than the percentage reduction in area. This can be explained by the position of the mining area in the catchment. All mining will be on the downstream part of the catchment and therefore the impact is much lower than expected when just considering the reduction in area. After mining, rehabilitation will take place in the form of shaping to be free draining. It was assumed that a soil cover will be placed on the opencast areas and that the area will be re-vegetated. It is recommended that the shaping should consider the pre-mined topography, specifically where wetlands were partially removed. The topography should at least be draining towards the remaining part of these wetlands. Where part of a wetland was removed by mining, the wetland should be rehabilitated by covering the wetland areas with responsive soils.	requirement as part of the onsite offset compensation mechanism. • At closure, reinstate the hydropedological characteristics to restore the functionality of the wetlands that will be lost during the construction and operational phases of the project as far as possible; • Excavation activities and removal of topsoil within the wetland and hydropedologically important soils should remain as small as possible and strict control of edge effects must occur.
Wetland impact assessment and	Negative	Construction and operation of the BEP infrastructure will result in the direct loss of wetland habitat due to vegetation and topsoil removal, followed by opencast mining. Indirect	The mitigation measures for the proposed BEP are summarised as follows:

Aspect	Impact	Summary of the specialist findings and assessment of impact	Proposed Mitigation/Management Measures
mitigation strategy		effects on adjacent wetland habitat include an interruption in hydrology to systems downstream of opencast mining areas, effects on water quality in affected systems, and erosion. Construction and operation of the BEP opencast area will result in the direct loss of approximately 51.17 ha of wetland habitat and disturbance of adjacent wetland habitats by construction activities and machinery. Since the direct loss of wetland habitat cannot be mitigated, these losses must be offset. Underground mining and construction/operation of the decline shaft also has the potential to reduce the groundwater supply to wetland systems. The impacts on wetlands are rated **medium to high** without the mitigation measures and with the implementation of the mitigation measures only direct loss of wetland habitat was rated **high**, the rest was rated **medium to low.**	• A 100 m buffer around wetlands must be clearly demarcated with semi-permanent fencing and maintained throughout the lifetime of the project to enable construction and operation workers to avoid the wetland areas outside the construction footprint. • The conveyor and haul road route should be selected to use the existing crossing of the Klein-Komati to minimise additional wetland loss. • Construction should be done in the dry season and completed by the wet season, so that appropriate water management systems are in place for stormwater management. • Pollution prevention measures for the protection of wetlands, rivers and streams from contamination with hydrocarbons, sediments and other chemicals to be implemented. • Erosion control and protection measures installed as part of the construction of the project will be adapted for the specific area and situation where signs of erosion appear.

Aspect	Impact	Summary of the specialist findings and assessment of impact	Proposed Mitigation/Management Measures
			• Clean water intercepted and diverted around the actively mined areas, to be reintroduced into the adjacent and downstream wetlands which will be partially/mostly lost, to supplement the flow lost as a result of removal of upstream/upslope recharge/interflow soils. The supplementation of clean water to these systems must be engineered in a way that avoids erosion of the watercourse and which aids in dispersion across most of the width of the downstream wetlands and should form part of the overall wetland rehabilitation/offset strategy for the Study Area. • Soil compacted in non-operational areas during construction activities should be ripped to break up the compacted soil surface and re-vegetated to aid infiltration and decrease run-off. • Topsoil stockpiles to be re-vegetated with non-invasive vegetation, in order to stabilise the soil, reduce run-off and minimise erosion into adjacent and downstream wetlands. No protected plants to be disturbed without the necessary permits in place.

Aspect	Impact	Summary of the specialist findings and assessment of impact	Proposed Mitigation/Management Measures
Terrestrial Biodiversity	Negative	The footprint of each proposed Project infrastructure component is characterized by a mosaic of vegetation communities/land units, including moist grassland and wetlands, dry mixed grasslands, alien tree plantations and woodlots, and cultivated fields. Eleven flora species of conservation concern have been recorded in the study area, and based on literature, up to 29 additional species of conservation concern occur in the broader region in which the study area is located and thus may be present in areas of undisturbed habitats (i.e., areas of moist grassland and wetlands, dry mixed grasslands). Several negative impacts on terrestrial ecology associated with the proposed Project have been identified. Of these, the loss and modification of natural habitat resulting from vegetation clearing and earthworks during construction is the primary impact of concern and will before mitigation have a high impact significance. With successful mitigation, impact significance can be reduced to moderate for all proposed infrastructure components.	Several management measures have been identified to mitigate the significance of the identified impacts. It is important that these are included in the EMPr for the proposed Project and that they are actively implemented during the appropriate Project phases. Key mitigation measures include, inter alia: • Limit vegetation clearing to the minimum area required for construction and operations. • Avoid clearing in moist grassland and wetland habitats, as far as possible. • Rehabilitate all disturbed areas and conduct ongoing alien invasive species control. • Conduct surveys for Red List and protected flora in the proposed Project development footprints, and • implement a relocation programme, prior to initiation of any construction activities.

Aspect	Impact	Summary of the specialist findings and assessment of impact	Proposed Mitigation/Management Measures
		Vegetation clearing and earthworks, coupled with other general project activities will also cause several additional impacts. These include the following: • Habitat fragmentation; • The loss of flora and fauna species of conservation concern; • The killing, injuring or disturbance of general fauna; and • The spread of alien invasive species. However, these can also be effectively mitigated through the application of the recommended management measures.	
Heritage	Negative	However, the proposed BEP and associated infrastructure will not affect the identified heritage resources, as the resources are not within the vicinity of the proposed BEP. If heritage resources are discovered during construction the proposed activity should cease and the area is demarcated by a danger tape and a professional archaeologist or MPHRA officer should be contacted immediately. The	Despite the fact that there is no presence of heritage resources in the proposed area, thus it is recommended that there is a need to exercise caution in case heritage resources are discovered during the construction and operational phases. This includes the following:

Aspect	Impact	Summary of the specialist findings and assessment of impact	Proposed Mitigation/Management Measures
		impacts of the proposed project on the project are rated **medium** before implementation of the mitigation measures and with the mitigation measures is rated **low**.	• The developer is further reminded that unavailability of archaeological materials on the preferred alternatives does not mean absentee. • If archaeological materials are unearthed, all activities within a radius of at least 10m of such indicator should cease and the area be demarcated by a danger tape. Accordingly, a professional archaeologist or a SAHRA officer should be contacted immediately. • Prior to construction, contractors should be given training on how to identify and protect archaeological remains that may be discovered during the project.
Palaeontology	Negative	A paleontological Impact Assessment was conducted for the proposed expansion of the Belfast Expansion Project (BEP). Based on the site survey, assessment and the lack of any previously recorded fossils from the area, it is extremely unlikely that any fossils would be preserved in the overlying soils. There is a small chance that fossils may occur below ground in the shales of the early Permian	

Aspect	Impact	Summary of the specialist findings and assessment of impact	Proposed Mitigation/Management Measures
		Vryheid Formation so a Fossil Chance Find Protocol should be added to the EMPr. The summary of the findings concerning the proposed activities and alternatives are discussed as follows: • The whole mining area (open cast and underground) could have fossils in the partings between the coal seams BUT their occurrence and distribution are impossible to predict. • All four above-ground conveyor route options are the same as far as palaeontology is concerned. These will be above ground so their impact on any fossils in the partings would be most unlikely. • The below-ground conveyor linked to Shaft 1 is along with an unspecified level (mined-out coal seam, or shale parting, or a combination) so the impact is unknown. • Shaft 2 is situated in moderately sensitive rocks of the Dwyka Group while Shaft 1 is in the very highly sensitive Vryheid Formation, but its footprint is much smaller than that of the general mining area.	

Aspect	Impact	Summary of the specialist findings and assessment of impact	Proposed Mitigation/Management Measures
		• Both options for the MRF are the same as far as palaeontology is concerned so no preference can be given. • Since there is a small to moderate chance that fossils occur in all these rocks, an FCFP must be implemented for all activities. If fossils are found during the drilling or excavations for the mining operations and proposed infrastructure, they should be rescued, and a palaeontologist must be contacted to investigate their scientific worth and make a representative collection.	
Noise	Negative	The proposed BEP expansion project will take place in an area where there are other mining activities and feeder roads with a continuous flow of traffic during the day and intermittent traffic flow during the night. The prevailing ambient noise level in the vicinity of the different expansion footprint areas was made up out of mining activity noises, agricultural noises, and traffic noise.	The following noise mitigation measures and recommendations are summarised below: • Construction activities to take place during day/night-time provided that the prevailing ambient noise level along the mine boundaries will not be exceeded. • Environmental noise monitoring monthly for the first year after which it can change to a quarterly basis.

<table>
<tr><th>Aspect</th><th>Impact</th><th>Summary of the specialist findings and assessment of impact</th><th>Proposed Mitigation/Management Measures</th></tr>
<tr>
<td></td>
<td></td>
<td>The potential noise impact will be low during the construction and decommissioning phases. The implementation of noise mitigatory measures will ensure that the impact will remain low. The noise impact during the operational phase of the project will be moderate during some of the activities and will remain moderate after the implementation of mitigatory measures.
The summary of the anticipated impacts are as follows:

<table>
<tr><th>Construction phase</th><th>Operation phase</th></tr>
<tr><td>• Clearing and stripping of topsoil and vegetation at the different mine expansion footprints</td><td>• Earth drilling</td></tr>
<tr><td>• Construction activities at the topsoil stockpile</td><td>• Hauling vehicles</td></tr>
<tr><td>• Construction activities at the</td><td>• Generator</td></tr>
</table>
</td>
<td>• Equipment and/or machinery which radiate noise levels between 85.0dBA and 90.0dBA to be acoustically screened off.
• Noise monitoring at the Shaft position footprint, the decline footprint in conjunction with the noise monitoring at the residential areas monthly for 2years after which the frequency can change to a quarterly basis.
• All noise sources within the footprint boundaries more than 85.0dBA must be acoustically screened off.</td>
</tr>
</table>

Aspect	Impact	Summary of the specialist findings and assessment of impact	Proposed Mitigation/Management Measures
		<table><tr><td>Shaft position footprint</td><td></td></tr><tr><td>• Construction activities at the waste rock dump</td><td>• Shaft position;</td></tr><tr><td>• Earthworks</td><td>• Conveyor;</td></tr><tr><td>• Construction activities at the haul roads</td><td>• MRF and Middle of the pit.</td></tr></table> The proposed BEP Mine expansion project will be in line with the environmental noise standards and guidelines provided that all the noise mitigatory measures are in place and that the Noise Impact Management Plan (NIMP) and Noise Monitoring Plan (NMP) for BEP mine are adhered to.	
Traffic	Negative	The study area (receiving environment) was defined based on the extent and type of the project activities, and the characteristics of the traffic expected to be generated as a result. Based on this, the boundaries of the study area are limited to the location of the following key intersections:	A Traffic Impact Assessment study (2021) indicated that "Based on the significance scores in impact assessment ratings (which shows very low impacts), the project can be authorised without the need to implement any mitigation measures". However, the specialist made the legal requirement and consideration as follows:

Aspect	Impact	Summary of the specialist findings and assessment of impact	Proposed Mitigation/Management Measures
		• Road D1110/N4; • N4/Road P15-1; and • Road P15-1/Road D383. The proposed project activities will have the following traffic characteristics: • Construction workers will commute to and from the site daily by either making use of public transport, transport provided by the contractor or private vehicles, and • Construction and delivery vehicles will travel to and from the site daily as required. • During the operational phase, employees will commute to and from the mine on a daily basis by either making use of public transport, transport provided by the mine or private vehicles. • Heavy vehicles hauling material will travel to and from the mine daily, and a General delivery vehicles will travel to and from the mine daily.	• All legal authorisations and permits must be obtained for the transportation of abnormal loads and hazardous materials on public roads. • Measures should be taken to ensure that all health and safety requirements regarding transportation activities are complied with. • This may include dust covers for hauling vehicles and dust control on all gravel roads. • It is proposed that flagmen and temporary warning signs be placed at all access points where heavy vehicles will access public roads during construction. • Controls should be in place to ensure that vehicles exiting the site are not overloaded.

Aspect	Impact	Summary of the specialist findings and assessment of impact	Proposed Mitigation/Management Measures
		Traffic operating conditions were determined and compared for the baseline, project construction phase, and project operational phase scenarios. By comparing the operating conditions for the different scenarios, it was concluded that the proposed project would have an insignificant traffic impact on the surrounding road network. No traffic problems or congestion are expected as a result of the project activities, provided that the mitigation measures are implemented. From a traffic engineering and transportation planning perspective, no vulnerabilities or sensitivities currently exists in the defined study area.	
Visual	Negative	Within the receiving environment, specific viewers (visual receptors) experience different views of the visual resource and value it differently. They will be affected because of alterations to their views due to the proposed project. The visual receptors which can be affected by the proposed projects are mentioned and described as follows: **1. Visual impact on residents** The study area is moderately populated, with a lower population in the rural settlements and farming	Mitigation aims to reduce or alleviate the intrusive contrast between the proposed project components and activities, and the receiving landscape to a point where it is acceptable to visual and landscape receptors. Therefore, the following mitigation measures must be adhered to: • Where areas are going to be disturbed through the destruction of vegetation, for example the establishment of the construction camp, the vegetation occurring in the area to be disturbed

Aspect	Impact	Summary of the specialist findings and assessment of impact	Proposed Mitigation/Management Measures
		communities, to higher populations in the towns. The closest town is Belfast and is 9km to the north. A possible visual impact to residents could be the traffic loading on surrounding roads, with large volumes of 30-ton interlink trucks transporting coal to the railway siding. Associated dust and noise could exacerbate the impact. The residents close to the mine may experience a **moderate degree of visual intrusion** by the proposed expansion of the mine. **2. Visual impact on tourists** The entire study area is considered to have low tourism potential, mostly because of mining developments and human settlement activities. There is also no major thoroughfare to prominent tourist destinations. The temporary exposure to possible unsightly views of the construction camps and the associated activity will be **minimal and localised**. **3. Visual impact on motorists** The major routes in the study area are the N4 and the R33, connecting the towns, mines and farms. The secondary road network in the study area carries a much lower volume	must be replanted with endemic, indigenous species, especially veld-grass and trees. • Avoid crossing over or through ridges, rivers, pans, or any natural features that have visual value • Where new access roads are required, the disturbance area should be kept to a minimum. A two-track dirt road will be the most preferred option • Shielding the sources of light by physical barriers (walls, vegetation, or the structure itself). • Directing light sources away from residential units and roads. • Limiting mounting heights of lighting fixtures.

Aspect	Impact	Summary of the specialist findings and assessment of impact	Proposed Mitigation/Management Measures
		of motorists. Many of the roads are gravel roads that are utilized by the local residents. Motorists on surrounding roads may be affected by the trucks used to transport coal to the railway sidings. Even though it is assumed most motorists using these routes are associated with the mines. Motorists' visual exposure to the new activities will be brief and the severity of the visual impact will be low. From the visual specialist's perceptive, the landscape and visual impacts occurring during the construction phase can be mitigated effectively. Rehabilitation of the disturbed areas may cause a reduction in the negative visual impact of the study area. Upon closure of the mine, and once rehabilitation has taken place, the visual aesthetics will significantly improve. Therefore, there is an anticipated low significance of visual impact for the proposed development.	
Soil and land Capability	Negative	The extent of arable soils to be disturbed by the proposed mining activities can be considered sufficient for viable cultivated large-scale commercial farming. It is	The soils are anticipated to be exposed to erosion, dust emission, and potential soil contamination impacts during the construction phase of the proposed development; and

Aspect	Impact	Summary of the specialist findings and assessment of impact	Proposed Mitigation/Management Measures
		acknowledged that the total avoidance of arable soils is not feasible however the impact should be restricted to the project footprint as far as practically possible. The land-use change will predominantly be a conversion from cultivated agriculture, grazing and wetlands to mining and related activities. However, at the closure phase, the land capability will, essentially, revert to the approved end land use (agriculture) albeit most likely at a reduced level of functionality. The main soil and land capability impacts associated with the proposed project are mentioned and described below as follows: • **Soil erosion** The proposed development footprint is located on a relatively flat to moderately sloping terrain, which may increase the erosion hazard. Most of the soils occurring within the various footprint areas are susceptible to soil erosion due to the sandy loam textural class and the moderately sloping terrain. The soils will become more susceptible to erosion during the construction phase once	these impacts may persist for the duration of the operational phase if not mitigated adequately. Subsequently, the following mitigation measures must be implemented: • Any disturbance of high potential agricultural soils must be actively avoided, should this be not feasible, the footprint of the proposed mining areas should be clearly demarcated to restrict the planned activities within infrastructure footprint as far as possible. • Bare soils adjacent to the infrastructural areas can be vegetated with an indigenous grass mix, if necessary, to re-establish a protective cover, to minimise soil erosion and dust emission. • Erosion control is regarded critical as most of the soils are susceptible to erosion, as they have finer particles, due their sandy texture and continuous tillage practices taking place. • The footprint of the proposed development and construction activities should be clearly demarcated to restrict vegetation clearing activities within the infrastructure footprint as far as practically possible.

Aspect	Impact	Summary of the specialist findings and assessment of impact	Proposed Mitigation/Management Measures
		the vegetation has been cleared and are if not vegetated when in stockpile areas before the rainy season; thus, exposed to wind and stormwater. This will most likely lead to: o Reduced soil fertility status of soils and subsequently loss of valuable arable land; o Reduced farm yields due to loss of arable land; and o Possible pollution and sedimentation of nearby water sources consequently affect the water quality for livestock. From the soil and land capability perceptive, the severity of this impact is anticipated to be Medium for most of the soils and with the appropriate mitigation measures the significance of this impact may be **low**. • **Soil compaction** Heavy equipment traffic during construction and activities is anticipated to cause soil compaction. The severity of this impact is anticipated to be High for most of the soils due to	• Compaction should be minimised by use of appropriate equipment and replacing soils to the greatest possible thickness in single lifts. • Heavy equipment movement over replaced soils should be minimized. • Soils should be replaced in catenal (i.e., position on the slope) locations like where they were stripped.

Aspect	Impact	Summary of the specialist findings and assessment of impact	Proposed Mitigation/Management Measures
		significant disturbance that could occur due to the sandy and clayey texture of these soils. The soils associated with the footprint areas will be most impacted due to sandy loam nature. The impact significance can be **medium to low**, should the proposed activities be restricted to access roads, vehicle hard stand areas and equipment and machinery laydown areas. Soil compaction will potentially lead to: o Increased bulk density and soil strength, o Reduced aeration; and o Lower infiltration rate. • **Soil Contamination** Contamination sources are mostly unpredictable and often occur as incidental spills or leaks during both the construction and operational phase. Thus, all the identified soils are considered equally predisposed to potential contamination. The significance of soil contamination is considered to be **high** for all identified soils without mitigation, largely depending on the nature, volume and/or concentration of the contaminant of concern as well as the	

Aspect	Impact	Summary of the specialist findings and assessment of impact	Proposed Mitigation/Management Measures
		rate at which contaminants are transported by water in the soil. However, with the implementation of the mitigation measures, the impacts will be rated **medium to low** during all phases of the project. • **Loss of Agricultural Land Capability** The potential loss of agricultural land capability is anticipated to be high in the footprint areas. This is based on the size of the footprint (>500 ha) where the proposed activities will occur. The proposed activities will occur on highly productive soils and may perhaps lead to a permanent change of land use if not properly mitigated. Thus, the loss of agricultural soils and agriculturally productive land will be somewhat significant considering the scarcity of arable soils in South Africa. The impacts can be lowered from **high to low** with the implementation of mitigation measures from the specialist. It is the opinion of the specialist that this study provides the relevant information required for the Environmental Impact Assessment phase of the project to ensure that appropriate	

Aspect	Impact	Summary of the specialist findings and assessment of impact	Proposed Mitigation/Management Measures
		consideration of the agricultural resources in the study area will be made in support of the principles of Integrated Environmental Management (IEM) and sustainable development.	
Social	Negative	A social impact assessment was undertaken to describe the social baseline conditions, identify the social impacts associated with the project and to propose appropriate optimisation and mitigation measures. Construction, operation, decommissioning and cumulative impacts were identified and assessed and have been briefly discussed below. The following social impacts will apply to the construction and operation phases of the project. • Air quality • Noise and vibration • Hazard exposure • Increase in crime • Increased risk of HIV infections • Influx of job seekers • Annoyance factor, access, and disruption of daily living patterns	• Communicate, through Community Leaders and Ward Councillors, regarding the job opportunities created by the project. • Develop and implement a local procurement policy which prioritises "locals first" to prevent the movement of people into the area in search of work. • Draw up a recruitment policy in conjunction with Community Leaders and Ward Councillors and ensure compliance with this policy. • Ensure that all discarded construction material that can be used to build informal structures is properly disposed of after construction. • Ensure that any temporary accommodation used to house construction workers is completely dismantled and properly disposed of after use.

Aspect	Impact	Summary of the specialist findings and assessment of impact	Proposed Mitigation/Management Measures
		• Disruptions to social and community infrastructure • Transformation of the sense of place • Traffic • Job creation and skills development • Local economic development. **Decommissioning** As the dynamics of the regional area and the country would have differed at the time of decommissioning, the impacts have not been identified however mine closure will result in significant negative impacts as such mitigation measures should be implemented. **Cumulative Impacts** The application of assessment criteria on a cumulative basis is a challenge as it needs to be considered over a range of development across the region and over an infinite time period. In addition, it should also be based on a sound understanding of the current regional state of the environment and based on robust scientific grounds. The cumulative impacts that have however been identified are therefore provisional: • Air pollution and dust	• Cooperate with local authorities to ensure all legislation preventing illegal settlement is enforced at all times. • Ensure that people have access to their properties as well as to social facilities at all times.

Aspect	Impact	Summary of the specialist findings and assessment of impact	Proposed Mitigation/Management Measures
		• Economic concerns (procurement; infrastructure; housing and agriculture) • Human health impacts • Infrastructure particularly road transportation and housing • Safety risks • Social and cultural concerns • Soil pollution • Water quality. It is the specialist's opinion that though the project is bound to be supported by the government, it should be noted that the benefits of the project are likely to extend over a limited period such that there is need for them to be assessed against any long-term environmental damage that may occur as a result of the project. In addition, the assessment of the cumulative impacts within the region can only be tackled nationally by an interdisciplinary team who will assess the environmental health and stability of the area; to quantify the long-term cost of environmental.	

Aspect	Impact	Summary of the specialist findings and assessment of impact	Proposed Mitigation/Management Measures
Surface water	Negative	The impacts assessment was conducted to assess both surface water quality and quantity impacts resulting from the proposed Belfast Expansion Project mine activities for the life of mine (Construction, Operation, Decommissioning and Closure as well as Post Closure phase). These impacts include but are not limited to the following: • **Siltation and/or contamination of surface water resources** During construction, the footprint clearance for the underground ramp area, conveyor/road stormwater infrastructure development open cast and MRF stormwater infrastructure development, will expose bare soil that could result in sheet wash into nearby watercourses during a precipitation event. In addition, dust can further be transported into watercourses or be deposited on infrastructure near watercourses thereby exacerbating the impact of siltation during rainfall events. these impacts of the expansion activities on the hydrology are **low** with and without mitigation measures.	The surface water mitigation measures are outlined as follows: • Ensure that clean and dirty water separation infrastructure is in place prior to the commencement of construction. • Prevent spillage of fuel and oils by using drip trays and storing hazardous substances and vehicles in bunded areas. • Design criteria should prevent the seepage of contaminated water to avoid lateral subsurface movement of contaminants into drainage lines. • The conveyor belt must be constructed across drainage lines and not along drainage lines. • Spanning across drainage lines is encouraged. • All new water storage facilities should be designed to in compliance with Regulation GN704 to prevent spillages. • All new water storage facilities should be lined to prevent the seepage of contaminated water to the groundwater.

Aspect	Impact	Summary of the specialist findings and assessment of impact	Proposed Mitigation/Management Measures
		• **Change in the hydrological regime (Construction phase)** The development of the underground ramp area, haul road between the underground area and the existing mine and new open cast pit will remove the drainage area from the catchment thereby changing the hydrological regime resulting in a potential reduction in flow to the catchment and a reduction in catchment yield. During the construction phase, the impact of the reduction in catchment yield starts off being low and increases with the increase in construction activity. The impact before mitigation is medium. The mitigation measures to divert clean flow around the future impacted areas change the impact to low. • **Deterioration of surface water quality and siltation of water resources** During the operation phase, the BEP will reduce the sub-catchment areas and runoff volumes. This impact refers to changes in water flow patterns caused by operational activities within watercourses. It is also associated with watercourse habitat loss, but focuses more on habitat modification, specifically regarding changes in water	• Implement adequate monitoring and measurement devices for proactive operational management to prevent spillages and decant.

Aspect	Impact	Summary of the specialist findings and assessment of impact	Proposed Mitigation/Management Measures
		movement. Water flow changes can also occur as a result of heavy motorised vehicles driving through watercourse and the need for access tracks in watercourses that have channels. Vehicle track entrenchment commonly occurs due to vehicles driving in wetlands with temporary, seasonal or permanent zones of wetness. This impact was rated medium and **low** without and with the implementation of mitigation measures respectively. • **Change in the hydrological regime (Operation phase)** The development of the underground ramp area, haul road between the underground area and the existing mine and new open cast pit will remove the drainage area from the catchment thereby changing the hydrological regime resulting in a potential reduction in flow to the catchment and a reduction in catchment yield. During the operational phase, the impact is the maximum of that experience during the construction phase. The impact before mitigation is medium. The mitigation measures to divert clean flow around the future impacted areas change the impact to **low**.	

Aspect	Impact	Summary of the specialist findings and assessment of impact	Proposed Mitigation/Management Measures
		• **Deterioration of ecological function in receiving surface water resources and wetland systems** During operation phase, the ecological functioning of the receiving surface water resources and wetland systems will be impacted by unauthorised discharges and plume migration due to spillages from contaminated water storage facilities, seepages through contaminated water storage facilities, spillages from the conveyor system mobilised by a rainfall event and inadequate decant management at Pit 5 resulting in contamination from the new MRF. The impact before mitigation is **medium and low** after mitigation. • **Adverse water quality in receiving surface and groundwater resource impacting of water users** During construction, the water quality in the receiving surface water resource will be impacted by unauthorised discharges and plume migration due to spillages from contaminated water storage facilities, seepages through contaminated water storage facilities, spillages from the conveyor system mobilised by a rainfall event and inadequate decant management at Pit 5 resulting in	

Aspect	Impact	Summary of the specialist findings and assessment of impact	Proposed Mitigation/Management Measures
		contamination from the new MRF. The impact before mitigation is **medium and low** after mitigation. • **Adverse water quality in receiving surface and groundwater resource and wetland systems (Closure phase)** The water quality in the receiving surface water resource will be impacted by inadequate rehabilitation of surface areas and inadequate decant management of the pits. The impact before mitigation is medium for the pit and MRF areas and is low after mitigation. For all other areas, the impact is low for both pre- and post-mitigation. The proposed mining activity being planned for this project will not alter or impede the flow of surrounding non-perennial rivers or surrounding tributaries within the study area. However, it was imperative that the above-identified direct/indirect impacts concerning the surface water and were identified, mitigated and managed to ensure the protection of the downstream receiving rivers.	
Groundwater	Negative	Three groundwater impacts were identified, as follows:	•

Aspect	Impact	Summary of the specialist findings and assessment of impact	Proposed Mitigation/Management Measures

		• Dewatering from:
		  ○ Underground mining resulting in reduction of baseflow to wetlands and streams - Mine designed to prevent subsidence;
		  ○ Underground mining related to impact on farmers boreholes;
		  ○ Opencast mining related to subsidence, reduction in baseflow to wetlands and streams; and
		  ○ Opencast mining related to impact on farmers boreholes.
		• Contamination
		  ○ During operations, contamination is contained in the underground workings and opencast pits due to dewatering. Contamination is mainly associated with the post closure phase and has not been evaluated for the operational phase
		• Recharge.
		
		The groundwater impact assessment was conducted, and the impacts were rated **High to medium** without mitigation
			• Sealing of monitoring boreholes to prevent contamination from surface pollutants.
			• Groundwater quality should be frequently sampled to establish if a contaminant plume will migrate.
			• The mining area extent should be kept to a minimum.
			• Dewatering should stop as soon as the mining activities cease.
			• Dewatering volumes should be monitored frequently throughout the mine life span to note deviations from the predicted inflows as simulated from the updated model as soon as possible.

Aspect	Impact	Summary of the specialist findings and assessment of impact	Proposed Mitigation/Management Measures
		measures and **medium to low** with the mitigation measures.	
Air Quality	Negative	Emissions to air during the construction and operation of a mine of this nature are generally limited to dust, smoke emissions from heavy machinery and vehicles, and a wide range of trace gases given off during the drying of solvents and similar processes resulting from activities associated with routine construction and maintenance. Of these, dust is by far the most significant potential polluter. The degree to which dust becomes a polluter is in direct relation to four factors: • The nature of the area to be exposed by surface clearing (including total area, shape relative to prevailing winds and height of dumps etc.); • The moisture content of the soil and by association, the average rainfall for the area; • The silt content and grading of the material exposed to the surface; and	A significant factor in fugitive dust emissions from mines is as a result of vehicular activity on disturbed ground. The proposed mitigation/ includes the following: • Retaining the existing access road between the site and the Rietkuil siding decreasing unnecessary additional emissions. • Speed control on all transport routes be strictly enforced; • The roads be surfaced with a dust retardant material to limit wheel-entrained dust; and • Dust fallout monitoring must be implemented, specifically on the southwest side to which most entrained dust will disperse. • Monitoring of fence-line fallout dust; • Spraying of haul roads with dust retardant; • Strictly enforced speed limits on haul roads and waste dumps; and • Limiting of transfer of material

Aspect	Impact	Summary of the specialist findings and assessment of impact	Proposed Mitigation/Management Measures
		• Activities taking place on that surface (transport, loading, blasting and entrainment by the passage of vehicles). Mining operations result in a significant total area of previously protected material becoming exposed to the elements. Depending on the silt content and grading of the various layers of material and the efficacy of mitigation measures in place, significant dust emissions could result While there will likely be an impact on the air quality of the surrounding area, particularly to the southwest of the site, the modelling evidence suggests that particulate matter and fallout dust levels may exceed national standards and must be actively mitigated. **Dust fall out** Dust fallout is expected from open cast mining and underground mining, however the impact is rated medium before and after mitigation for the former and low before and after mitigation for the latter. **Air Emissions**	

Aspect	Impact	Summary of the specialist findings and assessment of impact	Proposed Mitigation/Management Measures
		Air emission is rated same as air quality for both opencast and underground mining.	
Climate Change	Negative	The immediate climate change impacts of the project itself are negligible. However, if the climate change impacts of the *product* of the project are considered, a moderate impact is anticipated. The mining and combustion of coal will unavoidably add to South Africa's (or South Africa's trading partners') global climate impact. Climate change is a global issue and cannot be materially mitigated at the project scale. An aggressive offset program can reduce the net, direct carbon emissions of the project to zero. The climate change impacts were rated medium with and without mitigation measures for both opencast and underground mining.	The following is recommended: • Implementation of energy efficiency programmes, wherever possible; • Use of renewable energy, wherever possible; and • Purchasing of carbon offset products (or the implementation of auditable carbon offset programs) to offset the remainder of the net carbon emissions of the immediate project.
Climate	Neutral	Based on the climate change assessment conducted , the eastern summer rainfall region of South Africa is expected to experience warming over the coming years as a result of global climate change. With this, seasonal variability in rainfall, in particular, is expected to increase, with wetter wet periods and more extreme droughts forecast. With this	N/A

Aspect	Impact	Summary of the specialist findings and assessment of impact	Proposed Mitigation/Management Measures
		in mind, it is worth noting that historical flood lines may need to be reassessed and decisions on the placement of infrastructure are made extremely conservatively. Local climate conditions do not appear to be of significant concern to the proposed project. On a broader scale, the project will have no direct significant impact on local and/or global climate change. The associated indirect impacts will be assessed in detail during the EIA phase.	
Waste	Negative	Naturally, the inhabitation of the land will result in the accumulation of various forms of waste in the area. The aesthetic value of the area would decrease if such waste were not collected and disposed of appropriately. Waste material will be generated during the construction phase. Such waste may accumulate from the worker's campsite or from litter left around the work area by the construction staff. Other waste substances may accumulate from cement bags amongst other construction materials. The impact of waste is definite and will last for the duration of the construction phase as well as the operational phase, although reduced. It should also be noted that the nature of	**Solid Waste Management:** • Waste must be separated at source (e.g., general, scrap metals and hazardous waste). • An adequate number of scavenger proof refuse bins must be provided at the construction site and must be clearly labelled (general/ hazardous, etc.) according to waste streams. • All waste must be transported in an appropriate manner and disposed of at a licensed waste disposal facility. Proof of safe disposal must be kept on site. • The Contactor may not dispose of any waste and/or construction debris by burning or burying.

Aspect	Impact	Summary of the specialist findings and assessment of impact	Proposed Mitigation/Management Measures
		the proposed activity results in mining waste that will be deposited in the MRF, hence the proposed expansion of the MRF.	• Waste bins must be emptied on call based on inspection such that they do not overfill. • The Contractor must maintain 'good housekeeping' practices and ensure that all work sites and the construction camp are kept tidy and litter-free. **Liquid Waste Management:** • An adequate number of suitable waste containers with lids must be provided at the construction site. • All waste must be transported in an appropriate manner and disposed of at a licensed waste disposal site. • All requirements of the NEMWA, supporting policies and guidelines must be adhered.
Tourism	Neutral	The entire study area is considered to have low tourism potential, mostly because of the environmental degradation caused by the mining developments and human settlements. There is also no major thoroughfare to prominent tourist destinations. The temporary exposure to possible unsightly views of the construction camps and the associated activity will be minimal and localised. The proposed new developments will only have an impact on	No mitigation measures are required.

Aspect	Impact	Summary of the specialist findings and assessment of impact	Proposed Mitigation/Management Measures
		tourists in near proximity to the mine, which will be mostly along main transportation routes. The severity of the visual impact of the mining activities on tourists will be low, causing a low visual impact.	

The following section presents the impacts and the significance as rated by the specialists as well as the EAP. The Tables below highlight the significance of the identified impacts for both the construction and operational phases of the project. In some cases, the decommissioning phase was also assessed, however, impacts of this phase, as well as rehabilitation and closure, will be comprehensively addressed in the EIA phase.

12.2 CUMULATIVE IMPACTS

Cumulative impacts concerning an activity mean the past, present and reasonably foreseeable future impacts of an activity, considered together with the impacts of activities associated with that activity, that may not be significant but may become significant when added to the existing and reasonably foreseeable impacts eventuating from similar or diverse activities (DEA, 2014 EIA Regulations). This section provides cumulative impacts ratings associated with the proposed project, which include the waste generation, traffic, socio-economic and visual impacts. Additional cumulative impacts will be assessed during the EIA phase. It also outlines the mitigation measures of each rated cumulative impact as follows:

12.2.1 WASTE GENERATION

During the construction phase of the proposed pillar extraction, MRF, and conveyor belt, there will be a variety of waste material produced within the study area. The waste generation impact rating and the proposed mitigation measures are provided in the table below as follows:

12.2.2 VISUAL IMPACT

The proposed activity will change the visual character of the area particularly considering that the proposed site is located next to regional roads. Given the undulating topography of the site and the proximity to these routes, the impact can be considered definite and long term. The cumulative impact will be higher than anticipated due to existing mines. The visual cumulative impacts and mitigation measures within the proposed study area are provided as follows:

12.2.3 TRAFFIC IMPACT

During the construction phase, increased heavy vehicle traffic should be expected. Without management, such increased traffic loads may negatively impact existing traffic flow. Further unmanaged construction vehicles may decrease road safety for other road users and uncontrolled movement of construction vehicles may result in unnecessary impacts to the environment through vegetation and habitat destruction. The traffic impacts ratings and mitigation measures associated with the proposed project are presented in the table below as follows.

12.2.4 SOIL AND LAND CAPABILITY

It is worth noting that most of the area earmarked for development as part of the Belfast Expansion Project (BEP) is under intensive commercial agriculture, utilising irrigation systems in some instances to maximise the yield from the available land. The farms in the area are therefore under both rainfed and irrigated agriculture, with centre pivots as the irrigation mechanism being utilized in most instances where irrigation takes place. Not only is the area subject to intensive commercial agriculture but it is also utilized for sheep, cattle, and dairy farming supplying the local and regional areas.

According to the Agriculture, Rural Development, Land and Environmental Affairs department the areas with irrigation systems are classified as unique and high agriculture potential areas, especially since the yield of various crops is exponentially increased and of high importance with regards to food security. The soils within the BEP area can generally be classified as high potential soils due to their inherent physical properties (i.e. good drainage, sufficient depth) which are ideal for cultivation.

The land capability of the surrounding soils as well as the land potential is high due to adequate climatic conditions (i.e. rainfall, temperature) and appropriate slope which allows for intensive commercial agricultural practices. The proposed Mine Residue Facility (MRF) will be constructed over a backfilled opencast pit where soils have already been impacted through excavation and mechanical handling. Therefore, the impact of the proposed MRF is considered low from a soil and land capability point of view.

The cumulative loss from a soil and land capability point of view is anticipated to be moderate, provided that the key mitigation measures to enable the reinstatement of agricultural activities (of a different nature) post-closure are carefully implemented in line with the Exxaro net benefit objective to mining.

12.2.5 SOCIAL

Application of assessment criteria on a cumulative basis is somewhat problematic and unhelpful in that it needs to be considered over a range of development across the region and over an infinite time period. Mitigation measures would need to be considered on a cumulative basis and applied across all developments in the area. They would also need to be based on a sound understanding of the current regional state of the environment and based on robust scientific grounds.

12.2.6 WETLAND

The loss and fragmentation of the wetland ecosystems within the BEP study area will add to cumulative impacts on these ecosystems in the landscape in combination with the currently operating BIP opencast mine; reducing their extent, degradation of their condition, and subsequently limiting their ability to deliver ecosystem services. The direct

losses of wetlands cannot be mitigated outright, and as such the BEP will contribute to the cumulative rate of loss of wetlands and particularly pan habitats in the Mpumalanga Highveld ecoregion.

The effective implementation of the recommended mitigation measures, and in particular, the continual wetland monitoring and commitment to update the existing wetland offset strategy (WCS, 2014) to address the additional direct and indirect wetland losses that will be incurred as a result of the BEP development, will be key in ensuring that the Project's contribution to cumulative effects on wetlands are minimised, through protecting and conserving currently unprotected wetland habitat in off-site offsets as necessary, and rehabilitating remaining wetlands within the MRA to improve their condition and thus enhance their level of functioning and supply of ecosystem services in the landscape.

12.2.7 TERRESTRIAL

The cumulative impact of the progressive loss and disturbance of natural habitat associated with the expansion of the open pits and development of other Project infrastructure is likely to negatively affect the ability of the immediate landscape to maintain the ecological supporting role that contributes to the ecosystem dynamics of the broader landscape. This may negatively affect the long-term viability of local populations of flora and fauna species of conservation concern. The application of the mitigation measures will reduce the Project's impact on landscape ecology dynamics, yet some residual impacts will remain.

12.2.8 NOISE

Engineering control measures and topography can influence how the noise level is perceived by the occupants of nearby noise-sensitive areas. The cumulative noise level of the machinery and equipment will be 64.9dBA at 60m and 40.8dBA at 960m from the construction area if all the machinery operates in a radius of 30m at one time. This will seldom happen, and the cumulative noise level will therefore be lower.

The noise levels from the different mining activities will be added in a logarithmic manner as perceived at the noise-sensitive areas. The noise intrusion level will be calculated by subtracting the prevailing ambient noise level from the cumulative noise level. A central point was used for the alternative shafts, conveyors and the MRF to distances between the mining activities and the abutting noise receptors and such will be reflected in the noise intrusion tables for the construction and operational phases of the project.

12.2.9 DUST

Cumulative dust impacts are anticipated from the addition of this project to additional activities in the area but will not exceed the sum of their separate parts. In addition, all dust impacts directly related to the mine are expected to cease with the cessation of activities and eventual rehabilitation of the site.

There is an existing dust load in the environment, and for this reason, mine management should be aggressive in their mitigation of dust emissions in order to prevent impacts on the environment that, when combined with the base-level dust in the area, or from adjacent sources, result in dust fall that exceeds national standards.

12.2.10 CLIMATE CHANGE

A moderate cumulative impact is anticipated from the indirect climate change impact of the project, as it is anticipated that the addition of carbon to the atmosphere resulting from the sale and subsequent combustion of the product of the mine will contribute to the total carbon emissions of the planet, regardless of where this combustion ultimately takes place (Air Quality Report, 2021).

There is an existing dust load in the environment, and for this reason, mine management should be aggressive in their mitigation of dust emissions in order to prevent impacts on the environment that, when combined with the base-level dust in the area, or from adjacent sources, result in dust fall that exceeds national standards.

13 PLAN OF STUDY FOR EIA

The Scoping phase is fundamental as it allows for the identification of potential impacts on the environment, as well as facilitation of the process of compiling the EIA and Environmental Management Programme (EMPr). This report incorporates information from the client, specialist studies, site visits, literature reviews as well as previous environmental studies conducted in the area; it, therefore, provides a comprehensive baseline of the environment of the study area.

This Scoping Process has followed the appropriate standards and procedure for the EIA application, as set out in the NEMA and the EIA Regulations of April 2017. The study includes a description of the various alternatives and indicates those alternatives, which should be pursued as part of the detailed assessment of the EIA process. The impact significance of the proposed activity on the environment will be assessed in the EIA phase with the assistance of the various specialist studies.

The purpose of this section is to outline how the EIA for the proposed development will proceed during EIA phase. The detailed assessment phase of the EIA process entails the integration of the specialist studies for those potential impacts evaluated to be of significance. Relevant mitigation measures will be included in the EMPr. This section provides specific terms of reference and impact assessment methodology for utilisation by the specialist team and EAP. The Plan of Study for EIA is intended to provide a summary of the key findings of the Scoping Phase and to describe the activities to be undertaken during impact assessment. The Plan of Study provides the following:

- A description of the alternatives to be considered and assessed within the preferred site, including the option of not proceeding with the activity;

- A description of the aspects to be assessed as part of the environmental impact assessment process;
- Aspects to be assessed by specialists;
- A description of the proposed method of assessing the environmental aspects, including a description of the proposed method of assessing the environmental aspects including aspects to be assessed by specialists;
- A description of the proposed method of assessing duration and significance;
- An indication of the stages at which the competent authority will be consulted;
- Particulars of the public participation process that will be conducted during the EIA process;
- A description of the tasks that will be undertaken as part of the environmental impact assessment process; and
- Identification of suitable measures to avoid, reverse, mitigate or manage identified impacts and to determine the extent of the residual risks that need to be managed and monitored.

13.1 A DESCRIPTION OF THE ALTERNATIVES TO BE CONSIDERED AND ASSESSED WITHIN THE PREFERRED SITE, INCLUDING THE OPTION OF NOT PROCEEDING WITH THE ACTIVITY

The scoping phase assessed site, route and structural alternatives of the Conveyor belt, opencast shaft options, and Mine Residue Facility. These alternatives will be assessed further during the EIA. The preferred site and route alternatives will be the alternative with the least environmental impacts as well as providing the most benefits to the socio-economy. Further additional alternatives that the applicant may provide, suggested by I&APs or other stakeholders, recommended by the specialist and considered feasible by the EAP, as well as the No-Go Alternative.

13.1.1 OPENCAST SHAFT OPTIONS

Two options of the opencast shafts have been assessed, Option 1 entails one alternative of the conveyor belt and option 2 entails four different conveyor alternatives (i.e., Alternative A, B, C and D). Most specialists recommended Option 2, although the Soil and agricultural specialist recommended Option 1 its merits. From a mining perspective, this option will have a significant impact on the life of mine, thus weakening the viability of the whole project. With that in mind and based on the outcome of the comparative analysis and information currently available, Open Shaft Option 2 is more preferred than Option 1.

Although both options are feasible, the scoping phase recommends Option 2, however, both these options of opencast are viable and will be assessed during the EIA phase. It is recommended that the impacts on agriculture for the remaining option be scrutinized to ensure the least impact, as highlighted in the attached Zimpande Research Collaborative (2021) report.

13.1.2 CONVEYOR BELT ROUTE ALTERNATIVES

The scoping phase assessed two route alternatives i.e., the first conveyor route linking with the opencast shaft option 1 and the second conveyor route linking to the opencast shaft option 2. The second conveyor route has four alternatives. These alternatives are presented as follows:

Alternative 1	Colour in the map	Alternative 2	Colour in the maps
One conveyor (Option 1 Conveyor)	Lime	Conveyor Alternative A	Pink
		Conveyor Alternative B	Yellow
		Conveyor Alternative C	Light blue
		Conveyor Alternative D	White

13.1.3 UNDERGROUND MINING COAL RECLAIM AND TRANSPORTATION OPTIONS

Various options detailed in Section 8.1.3 will be implemented to reclaim the stockpile and transfer the ROM material to the overland conveyor belt to enter the plant. The proposed options are feasible, and none is preferred over the other; therefore, the EIA will provide more detail.

13.1.4 NO GO ALTERNATIVE

Under GN R.982, consideration must be given to the option not to act. This alternative is usually considered when the proposed development is envisaged to have significant adverse environmental impacts that mitigation measures cannot ameliorate effectively.

13.2 BASED ON THE ENVIRONMENTAL IMPACT ASSESSMENT CONDUCTED BY THE EAP AND THE SPECIALIST CONVEYOR ALTERNATIVE D IS PREFERRED. A DESCRIPTION OF THE ASPECTS TO BE ASSESSED AS PART OF THE ENVIRONMENTAL IMPACT ASSESSMENT

The following are aspects that have been identified and briefly describes as part of the Scoping Report. Further detailed assessment will be undertaken during the EIA phase:

- Biodiversity (flora and fauna).
- Soil, land use and land capability.
- Heritage.
- Wetland.
- Hydropedology.
- Hydrology.
- Traffic.
- Air quality.

- Socio-economic.
- Visual impacts.
- Climate Change Impact Assessment.
- Aquatic.
- Geohydrology.
- Paleontology.
- Closure and Rehabilitation Plan.

13.3 ASPECTS TO BE ASSESSED BY THE SPECIALISTS

The draft scoping report considered, fifteen (15) specialist studies. The specialist reports are attached herein as Appendix C. The studies assessed all the alternatives and will continue during the EIA phase. Additional studies that may become necessary during the EIA phase will be undertaken accordingly.

13.4 A DESCRIPTION OF THE PROPOSED METHOD OF ASSESSING THE ENVIRONMENTAL IMPACTS

The description of the proposed method of assessing the duration and significance is included in Table 27 above.

13.5 AN INDICATION OF THE STAGES AT WHICH THE COMPETENT AUTHORITY WILL BE CONSULTED

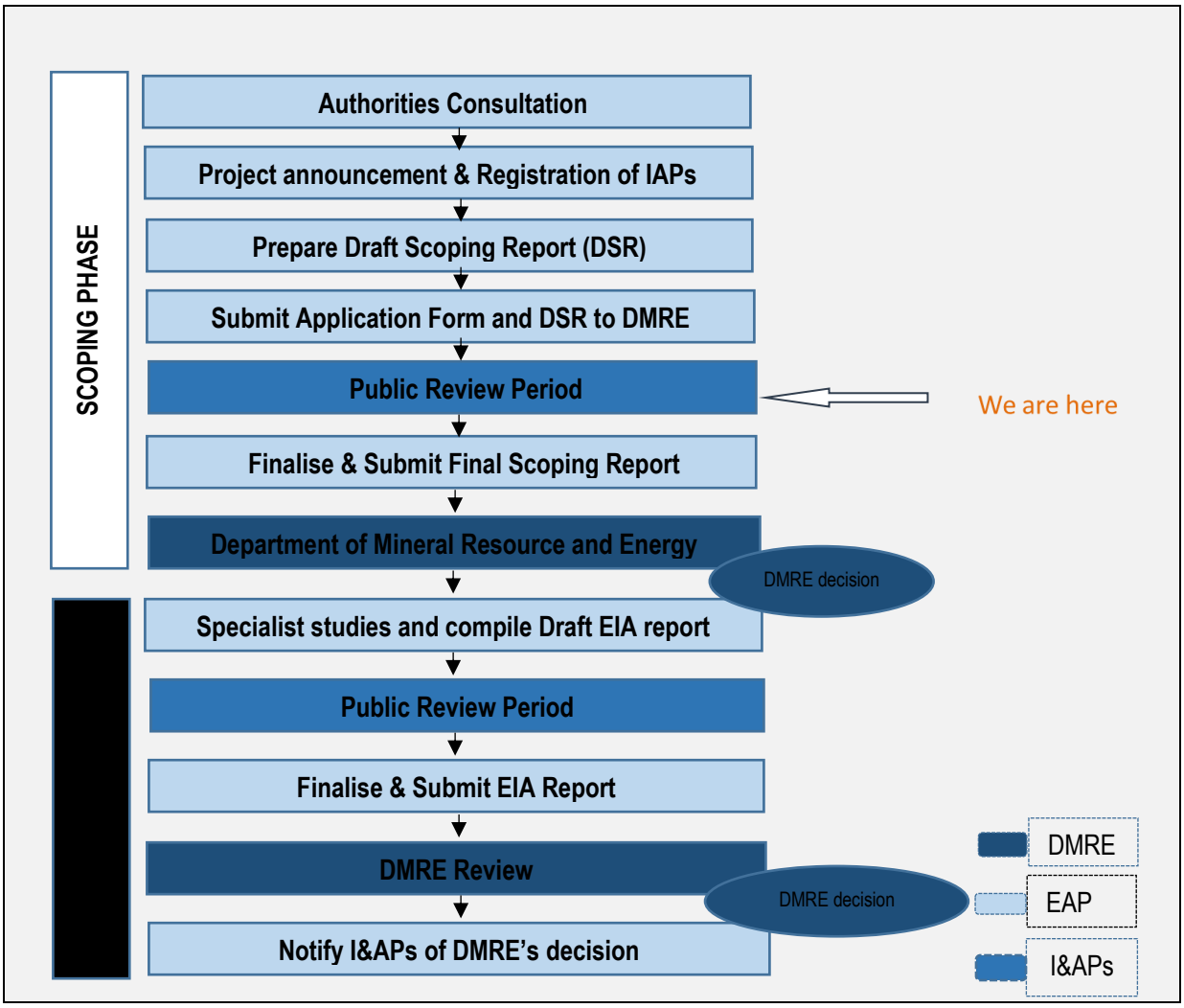

Figure 29: The different stages at which the Competent Authority will be consulted.

13.6 SCOPING PHASE

The draft Scoping Report will be submitted to DMRE for review and comment. The EAP will consider the comments and prepare responses. In addition, the report will be sent to all stakeholders for 30 days review and comment, of which any comments or issues raised will be addressed appropriately. The Final Scoping Report will be submitted to the DMRE for consideration.

13.7 ENVIRONMENTAL IMPACT ASSESSMENT PHASE

The draft Environmental Impact Report (EIR) will be prepared and distributed for public review and comments. Further, copies of the draft EIR will be submitted to the DMRE and stakeholders for comment. The final EIR which includes all comments received, specialist reports and recommendations will be submitted to DMRE for decision making.

The database of stakeholders developed during the scoping process will be used as a basis to ensure that those stakeholders involved in the Scoping Phase also participate in the EIA phase. The database will also be expanded to include I&APs that wish to be involved in the process. Registered I&APs will be informed of the availability of the draft EIR for review and will be given 30 days to provide their comments. The comments received will be incorporated into an updated Comments & Response Report (CRR).

Additional public consultation will take place in the form of public meetings and focus group meetings as appropriate. The purpose of the public meetings would be to present the findings of the draft EIR as well as the alternatives considered to the relevant stakeholders, registered I&APs and the affected landowners. The EAP will use this forum to provide more information about the proposed development including the specialist input, and to provide the stakeholders with the opportunity to further comment on the proposed development. If the comments and issues raised highlight information that changes or influences the impact evaluation provided in the draft EIR, the necessary amendments will be made to the report. The Final EIR will be submitted to the DMRE, subsequent to the second phase of public consultation.

13.8 PARTICULARS OF THE PUBLIC PARTICIPATION PROCESS THAT WILL BE CONDUCTED DURING THE ENVIRONMENTAL IIMPACT ASSESSMENT PROCESS

The database of stakeholders developed during the scoping process will be used as a basis to ensure that those stakeholders involved in the Scoping Phase also participate in the EIA phase. The database will also be expanded to include I&APs that wish to be involved in the process. Registered I&APs will be informed of the availability of the draft EIR for review and will be given 30 days to provide their comment. The comments received during the review period will be incorporated into an updated Comments & Response Report.

Further public consultation will take place in the form of public meetings and focus group meetings as appropriate. The purpose of the public meetings would be to present the findings of the draft EIA Report as well as the alternatives considered to the relevant stakeholders, registered I&APs and the affected landowners. Nsovo will use this forum to provide more information about the proposed development including the specialist input, and also to provide the stakeholders with the opportunity to further comment on the proposed development. In the event that the comments and issues raised highlight information that changes or influences the impact evaluation provided in the draft EIA Report, the necessary amendments will be made, and the final EIA Report will be compiled and submitted to the DMRE.

13.8.1 ADVERTISING

The commencement of the EIA process i.e., the Scoping Phase will be advertised in a local newspaper in English, Seswati, isiZulu, Afrikaans and isiNdebele. The proposed project will be further announced publicly through the following forms of information sharing:

- Newspaper adverts providing a description of the proposed development and location, as well as contact details of where more information can be obtained and announcing the availability of the draft Report for review and comment;
- A2 and A3 notices in English, Seswati, isiZulu, Afrikaans and isiNdebele will be placed at conspicuous locations within the study area; and
- Letters and emails will be sent to key stakeholders.

Further advertising will take place during the EIA phase and will relate to the availability of the reports for public review and announcement of public meetings that will be held at strategic locations that accessible to allow for maximum attendance.

13.8.2 INTERACTION WITH DMRE AND PROVINCIAL DEPARTMENTS

Interaction with DMRE and other provincial authorities with jurisdiction on the proposed development undertaken during the Scoping Phase will continue into the EIA Phase of the project. Further interaction will occur in the following manner:

- Submission of the final Scoping Report to DMRE;
- A consultation meeting with various stakeholders and I&APs as appropriate, to discuss the findings of the Draft EIR;
- Submission of the Draft EIRs following a public review period; and
- Notification of registered I&APs of the EA once it is issued.

The draft EIR will be reviewed by I&AP's, authorities and key stakeholders. Furthermore, the report will also be published and the made available on Nsovo (EAP) website for public review. The Table 29 below shows some of the key stakeholders to be consulted:

Table 29 : I&AP's, authorities and key stakeholders to review draft EIR.

- Mpumalanga Department of Agriculture and Rural Development and Land Administration
- Mpumalanga Department of Water and Sanitation;
- Mpumalanga Department of Transport and Public Works;
- Mpumalanga Heritage Resources Agency;
- South African Heritage Resource Agency;
- Wildlife and Environmental Society of South Africa;
- Eskom SOC Limited – Transmission
- Nkangala District Municipality
- Emakhazeni Local Municipality
- Mpumalanga Tourism and Parks Agency (MTPA)

13.8.3 DEVELOPING A STRATEGY AND RESOLVING KEY ISSUES

A strategy for addressing and resolving key issues is to be developed and will include:

- Details on all assessments and investigations carried out;
- Use of the public participation meetings to present the findings of the reports and test the acceptability of priority issues and mitigations;
- Openly and honestly relating both positive and negative impacts of the proposed development during the public meetings; and
- Allowing the public to understand the consequences of the proposed development on the area and their livelihoods.

13.9 A DESCRIPTION OF THE TASKS THAT WILL BE UNDERTAKEN AS PART OF THE ENVIRONMENTAL IMPACT ASSESSMENT

The section below indicates the tasks that will be undertaken as part of the EIA process.

13.9.1 PREPARATION OF THE DRAFT EIR AND EMPR

The draft EIR and EMPr will be prepared as per Appendices 3 and 4 of the 2014 EIA Regulations and will include input from the specialist studies. **Contents of the draft EIR (Appendix 3) will include the following:**

- Details and expertise of the EAP;
- Location of the activity;

- A plan which locates the proposed activity or activities applied for as well as associated structures and infrastructure at an appropriate scale;
- A description of the scope of the proposed activity;
- A description of the policy and legislative context within which the proposed development is located and an explanation of how the proposed development complies with and responds to the legislation and policy context;
- A motivation for the need and desirability for the proposed development, including the need and desirability of the activity in the context of the preferred location;
- A motivation for the preferred development footprint within the approved site;
- A full description of the process followed to reach the proposed development footprint within the approved site;
- A full description of the process undertaken to identify, assess and rank the impacts the activity and associated structures and infrastructure will impose on the preferred location through the life of the activity;
- An assessment of each identified potentially significant impact and risk including (i) and (vii) as per the Regulations;
- A summary of the findings and recommendations of specialist reports;
- Environmental Impact Statement inclusive of (i) to (iii) as per the Regulations;
- Recommendations from the specialist reports, the recording of proposed impact management objectives, and the impact management outcomes for the development for inclusion in the EMPr as well as for inclusion as conditions of authorisation;
- The final proposed alternatives which respond to the impact management measures, avoidance, and mitigation measures identified through the assessment;
- Aspects which were conditional to the findings of the assessment either by the EAP or specialist which are to be included as conditions of authorisation;
- A description of any assumption, uncertainties and gaps in knowledge which relate to the assessment and mitigation measures proposed;
- A reasoned opinion as to whether the proposed activity should or should not be authorised, and if the opinion is that it should be authorised, any conditions that should be made in respect of that authorisation;
- The period for which the environmental authorisation is required and the date on which the activity will be concluded, and the post construction monitoring requirements finalised;
- The undertaking under oath by the EAP in relation to (i) and (iv) as per the regulations;
- An indication of any deviation from the approved Scoping Report, including the Plan of Study including (i) and (ii) as per the Regulations;

Contents of the EMPr (Appendix 4) will include the following:

- An EMPr must comply with Section 24N of the Act and include - details of the EAP who prepared the EMPr; and the expertise of that EAP to prepare an EMPr, including a curriculum vitae;
- A detailed description of the aspects of the activity that are covered by the EMPr as identified by the project description;
- A map at an appropriate scale which superimposes the proposed activity, its associated structures, and infrastructure on the environmental sensitivities of the preferred site, indicating any areas that any areas that should be avoided, including buffers;
- A description of the impact management objectives, including management statements, identifying the impacts and risks that need to be avoided, managed and mitigated as identified through the environmental impact assessment process for all phases of the development including (i) to (v) of the 2014 EIA Regulations as amended;
- A description of proposed impact management actions, identifying the manner in which the impact management outcomes contemplated above will be achieved, and must, where applicable, include actions as indicated on (i) to (iv) of the EIA 2014 Regulations as amended.
- The method of monitoring the implementation of the impact management actions contemplated above;
- The frequency of monitoring the implementation of the impact management actions contemplated above;
- An indication of the persons who will be responsible for the implementation of the impact management actions;
- The time periods within which the impact management actions contemplated above must be implemented;
- The mechanism for monitoring compliance with the impact management actions contemplated above;
- A program for reporting on compliance, considering the requirements as prescribed by the Regulations;
- An environmental awareness plan describing the manner in which-
    - (i) the applicant intends to inform his or her employees of any environmental risk which may result from their work; and
    - (ii) risks must be dealt with in order to avoid pollution or the degradation of the environment.
- Any specific information that may be required by the competent authority.

13.9.2 PUBLIC PARTICIPATION PROCESS

The public participation process will be undertaken as indicated in Section 9 above.

13.9.3 PREPARATION OF THE FINAL EIA REPORT AND EMPR

The final EIR and EMPr will be prepared as per Appendices 3 and 4 of the 2014 EIA Regulations as amended, further, it will be submitted to DMRE in hard copy and electronic version (USB) and will include the following:

13.9.4 IDENTIFY SUITABLE MEASURES TO AVOID, REVERSE, MITIGATE OR MANAGE IDENTIFIED IMPACTS AND TO DETERMINE THE EXTENT OF THE RESIDUAL RISKS THAT NEED TO BE MANAGED AND MONITORED

The aspects that will be assessed have been identified and their potential impacts and mitigation measures are indicated on Sections 12 and will be elaborated further in the EMPr. The proposed method of assessing environmental aspects is included on Table 27.

14 UNDERTAKING UNDER OATH OR AFFIRMATION BY THE EAP

In undertaking the draft Scoping phases of the project the EAP has taken into consideration the requirements stipulated in the EIA 2014 Regulation as amended, as well as other relevant Acts and Regulations. The EAP hereby confirm that with the information available at the time of preparing the Scoping Report and the reports prepared by the specialists, the following has been considered in preparing this report:

The correctness of the information provided in the report;

The inclusion of comments and inputs from stakeholders and interested and affected parties; and

Any information provided by the EAP to the interested and affected parties and any responses by the EAP to comments or inputs made by interested and affected parties.

Refer to **Appendix F** for the Declaration of the EAP, CV, Qualifications and Professional Registration Certificates.

14.1 AN UNDERTAKING UNDER OATH OR AFFIRMATION BY THE EAP IN RELATION TO THE LEVEL OF AGREEMENT BETWEEN THE EAP AND INTERESTED AND AFFECTED PARTIES ON THE PLAN OF STUDY FOR UNDERTAKING THE ENVIRONMENTAL IMPACT ASSESSMENT

The draft Plan of Study for EIA, as detailed above, forms part of the draft Scoping Report that will be made available to I&APs and Organs of State for a 30 days review and comment period. Comments/issues raised will be addressed and included in the Issues and Response Report. No agreement between the EAP and I&APs is in place.

14.2 WHERE APPLICABLE, ANY SPECIFIC INFORMATION REQUIRED BY THE COMPETENT AUTHORITY

No specific information required by the authority; should it be required it will be included accordingly. Comments on the draft Scoping Report will be addressed accordingly in the final Scoping Report.

14.3 ANY OTHER MATTER REQUIRED IN TERMS OF SECTION 24(4) (A) AND (B) OF THE ACT.

This Report has been prepared in terms of NEMA, its respective 2014 EIA Regulations as well as other various Acts. Information that is required by the NEMA has been included in the Draft Scoping Report and will also be included in the EIA phase.

15 DESCRIPTION OF ANY ASSUMPTIONS, UNCERTAINTIES AND KNOWLEDGE GAPS

15.1 ASSUMPTIONS AND LIMITATIONS

It is assumed that technical data supplied by the client was correct and valid at the time of compilation of specialist studies and the Draft Scoping Report. Furthermore, it is assumed that the alternatives presented by the client are feasible.

15.1.1 PUBLIC PARTICIPATION PROCESS

Given the magnitude of the project and the various extent and portions of farms in the area of which some are private and not easily accessible, it is likely that some I&APs were not reached. However, effort was made as part of the process to advertise on local media as well as placing of notices at noticeable places within the communities.

15.1.2 LITERATURE REVIEWS IS VIEWED AS CORRECT

The compilation of the reports was based on various literature reviews and specialist input which were viewed as correct at the time. However, it is acknowledged that there might be some gaps in knowledge with regards to the literature reviewed although conceited efforts were made to attain as much information as possible.

15.1.3 HERITAGE AND PALAEONTOLOGY STUDY

It is possible that the Phase 1 HIA and Palaeontology may have missed heritage resources in the project area, as some heritage structures may lie below the surface and may only be exposed once development commence.

15.1.4 VEGETATION ASSESSMENT

There is a key difference between the approach of the ecological consultant and that of the ecological researcher. In consultancy, judgements must be made and advice provided that is based on the best available evidence, combined with collective experience and professional opinion. The available evidence may not be especially good, potentially leading to over-simplification of ecological systems and responses, and do contain a considerable deal of uncertainty.

15.1.5 HYDROPEDOLOGY STUDY

Hydropedological science and research is rapidly evolving and there are currently no standard methods to assess and/or model the recharge capacity of soils, as a result, the findings of this assessment are therefore a mix of qualitative and quantitative results and based on the specialist's training, opinion and experience with the hydrological properties of the identified soil types.

Hydropedological investigations are limited in the degree to which hydropedological losses can be quantified, with no standard method of approach to quantify the impact significance of various activities on the hydropedological drivers of wetland systems. For the purpose of the assessment, a model was developed using basic hydrological principles in efforts to quantify the percentage loss of hydrological drivers due to the proposed activities. Although the model outcomes correlate with expected results and results obtained using other methods, the model used remains untested.

The wetlands presented in this document was sourced from a wetland assessment undertaken by Golder in July 2021, as provided by the proponent. Verification of soil characteristics at selected points was undertaken during a field assessment by the hydropedological consultants. It should however be noted that not all the boundaries of the wetlands were confirmed, thus the specialist assumes that the soil data provided is accurate. This approach was deemed sufficient to provide the relevant data to appropriately describe the wetland recharge mechanisms of the region.

16 FATAL FLAWS

No fatal flaws or highly significant impacts were identified during the scoping phase that would necessitate substantial redesign or termination of the project. Potential negative impacts have been identified and where the impacts were detrimental to the environment, alternatives were proposed together with mitigation measures. The route alternatives of conveyor belts and opencast shaft options have been assessed by specialist and the preference rated accordingly.

The main impacts are outlined below, and recommended mitigation measures and a summary of site suitability and residual impacts will further be assessed in detail during the EIA phase. Such potential impacts include the following:

- Impacts on flora and fauna;
- Impacts on Wetlands;
- Impacts on water resources (Hydrology);
- Impacts on Hydropedology;
- Impacts on soil and land capability;
- Impacts on heritage and archaeology;
- Impacts on palaeontology;
- Visual impact to neighbouring communities, road users and tourist;
- Impacts on the topography as a result of pillar extraction;

Impact on air quality due to the discard and the associated roads;

Impact on noise;

Impact on the geology of the area;

Climate change impact; and

Traffic impact.

The subsequent EIA phase will provide a detailed assessment of the identified aspect, rate the significance accordingly and propose mitigation measures as applicable. Based on all the findings and assessment of impacts by the EAP. All alternatives, together with the no-go option will therefore be assessed further in the EIA phase, taking into consideration the specialist studies that have been recommended as part of the PPP; following which the preferred corridor will be selected.

17 CONCLUSION

The Scoping Study was undertaken as dictated by the NEMA and the EIA Regulations of December 2014 as amended and associated regulations. This report has comprehensively addressed the baseline environment, which will form the backdrop of the impact assessment. The information provided has been supported by specialist studies undertaken and attached hereto. Further, it allowed for identifying critical issues and concerns based on input from the relevant stakeholders, I&Aps, and the EAP's professional judgment based on experience and expertise in the field.

Various alternatives for the MRF, conveyor belts alternatives, opencast shaft options, open pit, and underground mining methods have been proposed. The primary objective was to assess the suitability of each option for the intended use and assess the suitability of each option for the associated impacts. The alternatives have been proposed, and the primary objective was to assess the suitability of each alternative for the intended use and desired outcome, as well as to assess the overall project development in the environment. Consequently, the EIA phase will only assess the following alternatives:

- Opencast Shaft Options 1 and 2.
- Conveyor belts alternatives linked with Opencast Shaft Option 1 and 2. This alternative has four options within it namely Alternative A, B, C, and D.
- Underground Mining Coal Reclaim and Transportation options
- No Go Option.

Further, the report will be subjected to a 30-day comment and review period to allow more input from stakeholders and I&APs. The comments received will be considered and comprehensively addressed through email correspondence, calls, meetings, and inclusion in the report. The subsequent EIA phase will provide a detailed assessment of the identified issues, rate the significance accordingly, and propose mitigation measures as applicable.

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