



ENVIRONMENTAL & ENGINEERING

DRAFT REPORT

EYETHU COAL (PTY) LTD – BLESBOKLAAGTE COLLIERY

DRAFT ENVIRONMENTAL IMPACT ASSESSMENT REPORT

REPORT REF: 19-756 AUTH DRAFT EIA EMP

DMR REF: MP30/5/1/2/2/10058MR

VERSION BB



Updated- 22/7/2020

DOCUMENT AND QUALITY CONTROL

Document No:	19-756 AUTH DRAFT EIA EMP			
AA – draft	21/07/2020	Riana Panaino		First draft for review / comments
BB – draft	22/07/2020	Vernon Siemelink		Technical Review
CC– draft		Leoni le Roux		Quality review
DD– draft		Riana Panaino		Final Review
Approved for Distribution:				
0.0	21/07/2020	Vernon Siemelink		Final report

QUALITY CONTROL BY:

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EAP - was independent and performed the work relating to the application in an objective manner, even if this

results in views and findings that are not favourable to the application; have expertise in conducting environmental impact assessments or undertaking specialist work as required, including knowledge of the Act, these Regulations and any guidelines that have relevance to the proposed activity; ensure compliance with these Regulations;

Take into account, to the extent possible, the matters referred to in regulation 18 when preparing the application and any report, plan or document relating to the application; disclose to the proponent or applicant, registered interested and affected parties and the competent authority all material information in the possession of the EAP and, where applicable, the specialist, that reasonably has or may have the potential of influencing-

The findings, results, observations, conclusions and recommendations provided in this report are based solely on the information provided to Eco Elementum (Pty) Ltd by the Client and other external sources (including previous site investigation data and external scientific studies). The opinions expressed herein apply to the site conditions and features which existed at the time of commencement of the investigations and production of this report.

The author has utilised his/her best scientific and professional knowledge in preparing this report and the content herein contained is and remains confidential in nature, save where otherwise ordered by a Court of law.

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DECLARATION OF INDEPENDANCE

I, Riana Panaino, declare that;

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



21/07/2020

Signature

Mrs. Riana Panaino

BSc Hons Biodiversity and Conservation

IAIA Member

Pr.Sci.Nat

Date



EXECUTIVE SUMMARY

Project Background and Process

ITEM	DETAIL
Type of mineral	Coal
Mining method	Strip and Rollover Mining Techniques
Depth of the mineral below surface	Average depth 13.97 m
Geological formation	<p>Certain portions of the farm Blesboklaagte 296 JS is underlain by the Vryheid Formation sediments, situated in the northern part of the main Witbank Coalfield. The coal bearing strata in the Witbank Coalfield are contained within the Vryheid Formation of the Ecca Group. The coal seams are shallow and relatively flat lying and slightly undulating with a southwesterly dip in some areas.</p> <p>Borehole data revealed the existence of one coal seam associated with the sediments of the Vryheid Formation. Seams are numbered 5 to 1 with the no 5 seam being the highest in the sequence. Seams preserved in the area are only the no. 2 seam out of the normal 5 found coal seams in the Witbank area.</p> <p>The No 2 seam varies in thickness between 3 and 7 meters. Seven distinct bands or zones are recognised although some of these may be locally absent. The basal zone 1 is thin, in persistent and dull; whereas zone 2 is bright and often has a low phosphorous content.</p> <p>Boreholes drilled in the proposed opencast area intersected the Number 2 coal seam between 8.50m and 11.30m below surface. The Number 2 coal seam sub crops along the north and west due to erosion. The eastern limit is the R544</p> <p>A 30 m buffer pillar is proposed between the opencast workings and the tar road. The thickness of the Number 2 seam and depth below surface is correlated in all boreholes. Continuity of the coal seam was therefore demonstrated by the drilling information.</p>
Life of mine	4 Years.
Production rate	600 000 tons per annum
Saleable Product	Mining will consist of the removal of coal from the No. 2 coal seam, the ROM will be transported to an off-site beneficiation plant where the ROM will be processed to be sold to Eskom Holdings Ltd.
Target Market	Eskom

Legal Requirements

The intention to undertake mining activities requires an application for a Section 102 amendment in terms of the Minerals and Petroleum Resources Development Act, Act No. 28 of 2002 (MPRDA). An application for Environmental Authorisation (EA) was submitted simultaneously, as per the requirements of the National Environmental Management Act, Act No. 107 of 1998 (NEMA) and the NEM: Waste Act, Act No. 59 of 2008 (NEM:WA); read with the requirements of the MPRDA.

In terms of the NEMA and other applicable laws, it is required that the environmental and social impacts associated with mining activities be assessed to identify any potential negative and / or positive consequences as result thereof. Following which measures must be proposed to avoid or minimise these impacts.



Impact Assessment Summary

Impact	Phase	+	SBM	SAM	Mitigation measures	Action Plan
Heritage						
Destruction of possible sub-surface heritage material within the sensitive area	Construction and Operation	Negative	Med	Med	Monitor sub-surface material	Monitoring
Noise						
Increased Noise levels	Operation	Negative	High	Med	Construct a Noise Barrier between the main noise source noise sensitive receivers Equipment Maintenance Implement Road rules.	<ul style="list-style-type: none"> A noise barrier in the form of a berm, tree break or similar noise fence should be constructed on the mine boundary Construction and mining-related machinery and vehicles must be serviced on a regular basis to ensure noise suppression mechanisms are effective e.g. installed exhaust mufflers. Switching off equipment when not in use. Fixed noise producing sources such as generators, pump stations and crushers to be to be either housed in enclosures or barriers put up around the noise source void the use of engine compression brakes when approaching the site entrance or driving through or in the vicinity of the adjacent town. All access roads will be signposted and speed limited to minimise transport noise. Equipment with lower sound power levels would be used in preference to noisier equipment. The on-site road network will be well maintained to limit body noise from empty trucks travelling on internal roads
Ecological Impacts						
Flow alterations due to erosion and sedimentation	Construction and Operation	Negative	Med	Med	<ul style="list-style-type: none"> Rehabilitation of the disturbed areas; Limiting in-stream sedimentation; Minimising pollutants entering the watercourse Erosion control measures must be employed where required.	<ul style="list-style-type: none"> Design and implementation of a suitable stormwater system; Implement a programme for the clearing/eradication of alien species including long term control of such species; A 50 m buffer implemented for the wetland system; Water quality monitoring must take place every month during operational phases; and Wetland monitoring and biomonitoring must take place bi-annually. A topsoil stripping and stockpiling guideline must be completed to ensure rehabilitation success. Attenuation measures must include, but are not limited to - the use of sand bags, erosion control blankets, and silt fences. Long term attenuation measures, such as attenuation/infiltration trenches, swales must be established to control stormwater from hardened surfaces Vegetation clearing must be undertaken as and when necessary in phases. Install sediment barriers (silt catchers and Reno mattresses) along any drainage areas to prevent the migration of silt. Exposed soils must be rehabilitated as soon as practically possible to limit the risk of erosion. All roads need to be maintained and any erosion ditches forming along the road filled and compacted. Demarcate wetland areas to avoid unauthorised access. No washing of any equipment in close proximity to a watercourse is permitted. No releases of any substances that could be toxic to fauna or faunal habitats within the channels or any watercourses is permitted. Spillages of fuels, oils and other potentially harmful chemicals must be cleaned up immediately and contaminants properly drained and disposed of using proper solid/hazardous waste facilities Portable toilets must be placed on impervious level surfaces that are lipped to prevent spillage. The general consensus is that they should be within 30 m to 50 m of a work face Re-instate indigenous vegetation (grasses and indigenous trees) in disturbed areas.
Pollution of watercourse	Construction, Operation	Negative	Med	Med		
Spread of alien vegetation	Operational, Closure and Decommissioning	Negative	Med-High	Med		
Air Quality						



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Impact	Phase	+ -	SBM	SAM	Mitigation measures	Action Plan
Fugitive dust (containing TSP (total suspended particulate) will give rise to nuisance impacts as fallout dust, as well as PM10 and PM2.5 (dust with a size less than 10 microns, and dust with a size less than 2.5 microns) giving rise to health impacts	Decommissioning Phase	Negative	Med	Med	Minimise exposed surface duration The area of disturbance must be kept to a minimum Avoid Dust Creation	Revegetation of exposed areas Demarcate areas of movement Spreading of soil must be performed on less windy days. Keep soil moist using sprays or water tanks, using wind breaks. Speed restrictions should be imposed and enforced Exhaust pipes of vehicles should be directed so that they do not raise dust.
Visual						
Potential visual impact on Road and Land users	Operation, Decommissioning and Closure	Negative	Med-High	Med	The visual impact can be minimized creating a visual barrier. Minimise areas of operation	Creating a Berm between the opencast pits and the town of Witbank and Planting Indigenous vegetation Perform concurrent rehabilitation as mining progresses
Soils, Land Use, Land Capability and Hydrogeology						
Destruction of arable and grazing land capability	Construction Phase	Negative	High	Med-High	No mitigation possible	Establish agricultural projects with in the larger mining right area
Social Economic						
Employment and income opportunity	Construction and Operation Phase	Positive	Med	Med	Maximise Employment Opportunities, Skills and Enterprise Development	Prioritise local labour in the recruitment process as part of the company's own recruitment policy or as part of contractor management plan during operations Put a procurement strategy as well as a contractor management plan (if relevant) in place to ensure that 100% local employment target in terms of unskilled labour is met Up-skill the local labour force as per an updated SLP Develop a database of goods and services that could potentially be outsourced to the local community Establish a supplier development programme as part of the Local Economic Development component of the SLP Where local contractors are used, put a contractor management plan in place to ensure that the local employment and procurement targets of the operations are met
Job losses	Decommissioning and Closure	Negative	Med-High	Med	Minimise the negative economic impacts related to mine closure	As per the requirements of the SLP develop mechanisms to assist employees, prior to retrenchment date in the transition phase after closure of the operations including portable skilled development programmes during the operational phase of the mine, providing assistance in accessing available and suitable jobs with other local mines or companies etc.
Decrease/termination of community investment funds and support to local communities	Decommissioning and Closure	Negative	Med-High	Med		Focus on non-core related local supply links during the operational phases of the mine to facilitate easier transitioning of local suppliers to other costumers Plan community projects with an exit strategy of which beneficiaries are aware of The risk of ADM should be mitigated as per the ground water management plan Rehabilitate mining area as soon as possible to prevent to prevent high losses in agricultural potential Investigate the potential for a housing development as a high value post-closure land-use as well as a community priority as part of a final rehabilitation plan

Summary of Comments Received

Interested and Affected Parties List the names of persons consulted in this column, and Mark with an X where those who must be consulted were in fact consulted	Date Comments Received	Issues raised	EAPs response to issues as mandated by the applicant
Affected Parties			
Landowner/s			



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Interested and Affected Parties List the names of persons consulted in this column, and Mark with an X where those who must be consulted were in fact consulted	Date Comments Received	Issues raised	EAPs response to issues as mandated by the applicant
Sudden Impact Inv 76 Pty Ltd	x	Lease Agreement with consent to mine	
Jumbo Van der Merwe Trust	x	Lease Agreement with consent to mine	
Landowners or lawful occupiers on adjacent properties			
Kassie Volschenk	x	Email: 2019-09-18 He is part owner of a portion of Blesboklaagte and would like to confirm if the mining will impact on his portion. As he lives in Witrivier and wouldn't want to drive through unnecessarily	A Map was sent of the relevant portions to be impacted upon, and we requested the details of the portion owned by him
Kassie Volschenk	x	Email: 2019-09-18 He responded with a map of his portion (portion 62), and stated that it does not look like he will be influenced. He is looking for the mining company that will affect his property, as he wants to sell.	We confirmed that he will not be influenced, and that we also do not know who the correct contact would be for that portion.
Kruger, Hilmer	x	Notification sent via sms, refer to proof of sms notification in Appendix 2	
Barnard James Flanagan	x	Notification sent via email and sms, refer to proof of sms notification in Appendix 2	
Nelesh Ashokkumar Rama	x	Notification sent via email and sms, refer to proof of sms notification in Appendix 2	
Rivertrans cc		No contact details available	
AM Matou - Pap en Vleis shop	x	Letter: 2019-09-02 Acknowledged blasting within the 500m radius notification. No further comments.	Applicant notified and consulted the shop owner regarding future blasting activities and the actions that will be put in place for the safety of residents and occupiers.
H Mnisis	x	Letter: 2019-09-02 Acknowledged blasting within the 500m radius notification. No further comments.	Applicant notified and consulted the resident regarding future blasting activities and the actions that will be put in place for the safety of residents and occupiers.
VV Tshabalala	x	Letter: 2019-09-02 Acknowledged blasting within the 500m radius notification. Raised concerns regarding Coal Dust	Applicant notified and consulted the resident regarding future blasting activities and the actions that will be put in place for the safety of residents and occupiers. Mitigation will be in place to avoid the spread of dust from site. Such measures include: -dust suppression -avoiding blasting during windy periods
MG Magane	x	Letter: 2019-09-02 Acknowledged blasting within the 500m radius notification. No further comments.	Applicant notified and consulted the resident regarding future blasting activities and the actions that will be put in place for the safety of residents and occupiers.
Evatis Lekhuzo	x	Letter: 2019-09-02 Acknowledged blasting within the 500m radius notification. No further comments.	Applicant notified and consulted the resident regarding future blasting activities and the actions that will be put in place for the safety of residents and occupiers.
MR KF Senoamadi	x	Letter: 2019-09-03 Acknowledged blasting within the 500m radius notification. No further comments.	Applicant notified and consulted the resident regarding future blasting activities and the actions that will be put in place for the safety of residents and occupiers.
Municipal councillor			
Municipality	x	Letter: 2019-12-11 The Emalahleni Local Municipality has no objection regarding the abovementioned activity by the mine within and or in close proximity of the municipal infrastructure provided that all safety aspects and below conditions are adhered to. The schedule and time table for execution of activities be submitted to the municipality, Municipal rights and services are acknowledged and respected at all times. 1. The 100 meters mining and prospective restriction either side (servitude) of the center of the water pipeline must be adhered to. 2. The applicant (Mine) accepts all the costs with regard to deviation, disturbance and or interruption of municipal service and to reinstate the service to its original condition/status. 3. The applicant (Mine) will adhere to all relevant environmental legislation.	Consent request for blasting within 500m of a municipal water pipeline, and mining within 100m of a municipal water pipeline
Organs of state (Responsible for infrastructure that may be affected Roads Department, Eskom, Telkom, DWA)			
ESKOM	x	Letter: 2020-02-11 This notice affects the existing Eskom Distribution lines, Churchill-Vulcan 132kV, Randcarbide-Vulcan 132kV.	Consent request for blasting within 500m of a powerline.



Interested and Affected Parties List the names of persons consulted in this column, and Mark with an X where those who must be consulted were in fact consulted	Date Comments Received	Issues raised	EAPs response to issues as mandated by the applicant
		<p>Eskom Distribution will raise no objection to the proposed Blasting operations provided Eskom's rights and services are acknowledged and respected at all times.</p> <p>There is a 15.5 meters building and tree restriction on either side of the Centre line of 132kV power lines, which must be adhered to in all future development and or construction Eskom's rights are protected by Servitude.</p> <p>Further to the above the conditions as per letter must be adhered to and accepted in writing before any development and or construction</p>	<p>The applicant takes note of the conditions and will abide by them.</p>
<p>Department of Public Works, Roads and Transport</p>	<p>x Letter: 2019-04-07</p>	<p>1. Your application dated 03 July 2019 has reference.</p> <p>2. The department has no objection regarding the above mentioned activity provided the minimum safety factor in respect of all numbered roads is above the minimum of 2.</p> <p>3. Acceptance letter regarding the following factors must be forwarded to this department before commencing with the activities:</p> <p>4. COSTS</p> <p>4.1 The applicant accepts all costs with regard to the deviation, the restoration of the existing road, the surveying and monitoring and reporting according to the conditions herein, should be required.</p> <p>5. GENERAL CONDITIONS</p> <p>5.1 The applicant safeguards the Premier and exempts him from any claims of loss of whatever nature that may be put forward or be suffered by any person, including legal costs of whatever nature, as a result of the undermining and / or deviation and related matters.</p> <p>5.2 The Department shall reserve the right to ask the applicant for security in the form of a cash deposit or a surety from a financial institution as was agreed for such as amount as he may reasonably decide upon. This shall, if applicable, be rendered before a start is made with the mining activities that may influence the existing road. Such cash deposit shall be repaid, or the surety bond shall be cancelled when The Department has satisfied himself that all the conditions of this agreement have been met.</p> <p>5.3 If any dispute of disagreement of whatever nature should arise with regard to fulfilment of the conditions contained herein, The Department shall reserve the right to cancel any previous agreement and to incur such repair costs with regard to the existing road as he deems necessary, for recovery from the applicant or the guarantors (as in 5.2). In such event mining activities that may influence the existing road shall be discontinued.</p> <p>6. SPECIFIC CONDITIONS FOR ROAD P 100-1</p> <p>6.1 The road must be inspected at a regular interval by a responsible person, and the necessary steps taken to repair the road at the shortest possible time, should it become necessary, to maintain a safe road surface.</p> <p>6.2 At this stage it will not be necessary to undertake the survey of the road, as mentioned in paragraph 3.3 above. The right to request this at a later stage, is maintained, should it become necessary.</p> <p>6.3 The necessary equipment to speedily repair the road, should it become necessary, must be available at all times.</p> <p>6.4 The permission is granted in terms of the Advertising on Roads and Ribbon Development Act, (Act 21 of 1940 as amended) and the Road</p>	<p>Consent request to blast within 500 meters from provincial road p 100-1 03544) and surface structures and objects to be protected in terms of the Mine Health And Safety Act, 1996 (Act 29 Of 1996).</p> <p>The applicant takes note of the conditions and will abide by them.</p>



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		Ordinance, (Ordinance 22 of 1957) and does not exempt you from the provisions of any other law. No undermining operations may continue, before a copy of mining permit has been provided to our office. 7. ACCEPTANCE OF CONDITIONS No mining activities that might have an influence on the road may take place without written acceptance of all the conditions contained and such compliance with the same as may be applicable.	
Transnet	x Letter: 2019-10-16	Although Transnet SOC Ltd {Registration No 1990/000900/30} has no objection to the proposed blasting by Eyethu Coal closer than 500m from Transnet buildings and structures over portions of the farm Blesboklaagte No. 296IS, we have to refute and object to the position of the mining boundary, as shown on the "Blast Radius Plan". The mining area cannot be within Transnet land We suggest a new plan and application showing the mine boundary outside the Transnet 100 m restricted area. Please note that according to Regulation 17 (6) (a) of the Mine Health and Safety Act of 1996, no mining or blasting activities are allowed on, or within 100 metres of any railway reserve of Transnet SOC Ltd.	Consent request to blast within 500 meters from Transnet buildings and structures. The applicant acknowledges that the mining Right area traverses the Transnet line and servitude, however no mining will be undertaken on the Eastern side of the Road, and therefore no mining will be undertaken within the 100m reserve of the Transnet railway.
Other Competent Authorities affected			
Mpumalanga Tourism and Parks Agency - Phumla Nkosi	X Email, official letter, 10 October 2019	With reference to your correspondence MP 30/5/1/2/2 (10058) EM of date 10/09/2019, received on the 16th September herewith our comments: MTPA has no objection to this application but has the following concerns: In terms of the MBSP, terrestrial biodiversity assessment, parts of these portions have the status of CBA Irreplaceable and CBA Optimal areas that needs to be avoided. The MTPA acknowledges the fact that the environment could have changed in a few years and that the area could have been degraded to such an extent that ground truthing of the PES is needed.	This comment is noted
		1. The MTPA therefor requires that an Ecological study is done	An Ecological Study was undertaken and presented in the EIA
		2. A botanical survey is required for the proposed mining site and immediate adjacent natural areas. All the species of conservation concern (Protected plants) should be marked for rescue purposes.	An Botanical Study was undertaken and presented in the EIA, along with management plans for species of conservation concern, should any be present
		3. A thorough rehabilitation plan designed to prevent AMD entering the natural system as well as the prevention of the re-colonization by exotic vegetation should be implemented.	A Rehabilitation plan was compiled to assist with preventing and treating decant. An Alien Invasive Management plan was also form part of the EMP.
		4. An Active water purification system must be investigated and must address the possible pollution through AMD decanting, underground pollution plume, storm water pollution from discard dumps, overflow from pollution control facilities and leachates. Clean water must be provided back into the natural system.	Eyethu will investigate all possible water treatment options along with the DWS.

Reasoned Opinion

The project can be recommended for approval with conditions contained in this report.



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Definition of Terms

Audit	a systematic, independent and documented review of operations and practises to ensure that relevant requirements are met. Qualified professionals with relevant auditing experience should conduct audits and, where possible, independent external auditors should also be used.
Borehole	is a narrow shaft bored in the ground, either vertically or horizontally. A borehole may be constructed for many different purposes, including the extraction of water or other liquid (such as petroleum) or gases (such as natural gas), as part of a geotechnical investigation, environmental site assessment, mineral exploration, temperature measurement, as a pilot hole for installing piers or underground utilities, for geothermal installations, or for underground storage of unwanted substances, e.g. in Carbon capture and storage.
Clean Water	clean water is any water that has maintained the chemical, physical, and biological integrity of the waters by preventing point and nonpoint pollution sources.
Compliant	a full achievement of the performance requirement of a particular condition of the license or programme.
Conservation	in relation to a water resource means the efficient use and saving of water, achieved through measures such as water saving devices, water-efficient processes, water demand management and water rationing;
Construction	the time period that corresponds to any event, process, or activity that occurs during the Construction phase (e.g., building of site, buildings, and processing units) of the proposed project. This phase terminates when the project goes into full operation or use.
Corrective Action Plan	an action plan developed by the proponent, contractor, or facility owner and approved by the external auditor that describes how the contractor or facility owner intends to resolve the non-conforming item. The Corrective Action Plan should be specific, measurable, achievable, realistic, and timely.
Director-General	means the Director-General of the Department;
Effluent	is defined by the <u>United States Environmental Protection Agency</u> as "wastewater - treated or untreated - that flows out of a treatment plant, sewer, or industrial outfall. Generally refers to wastes discharged into surface waters". The Compact Oxford English Dictionary defines effluent as "liquid waste or sewage discharged into a river or the sea". Effluent in the artificial sense is in general considered to be <u>water pollution</u> .
Environmental Audit Report	a summary report prepared after an environmental audit that describes the attributes of the audit and the audit findings and conclusions.
Environmental Authorisation	is an environmental authorisation issued by a state department.
Environmental Component	an attribute or constituent of the environment (i.e., air quality; marine water; waste management; geology, seismicity, soil, and groundwater; marine ecology; terrestrial ecology, noise, traffic, socio-economic) that may be impacted by the proposed project.
Environmental Impact	a positive or negative condition that occurs to an environmental component as a result of the activity of a project or facility. This impact can be directly or indirectly caused by the project's different phases (i.e., Construction, Operation, and Decommissioning).
Environmental Management Plan	An Environmental Management Plan (EMP) can be defined as "an environmental management tool used to ensure that undue or reasonably avoidable adverse impacts of the construction, operation and decommissioning of a project are prevented; and that the positive benefits of the projects are enhanced".
Groundwater	is the <u>water</u> located beneath the earth's surface in <u>soil pore</u> spaces and in the <u>fractures</u> of <u>rock formations</u> . A unit of rock or an unconsolidated deposit is called an <u>aquifer</u> when it can yield a usable quantity of water. The depth at which soil pore spaces or fractures and voids in rock become completely saturated with water is called the <u>water table</u> . <u>Groundwater is recharged</u> from, and eventually flows to, the surface naturally; natural discharge often occurs at <u>springs</u> and <u>seeps</u> , and can form <u>oases</u> or <u>wetlands</u> .
Non-conformance	constitutes a non-compliance or an action plan or initial actions taken without tangible deliverables. Non-conformance may also be associated with activities breaching legislation. Non-Conformance findings therefore have a high priority and mitigation measures are mandatory.
Operation	the time period that corresponds to any event, process, or activity that occurs during the Operation (i.e., fully functioning) phase of the proposed project or development. (The Operation phase follows the Construction phase, and then terminates when the project or development goes into the Decommissioning phase.)



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Partially Compliant	achievement with shortcomings (such as documented proof and or work in progress) and achievement where there is an obvious shortcoming in the delivery of the performance requirement.
Pollution	is the introduction of <u>contaminants</u> into the natural environment that cause adverse change. Pollution can take the form of <u>chemical substances</u> or <u>energy</u> , such as noise, heat or light. <u>Pollutants</u> , the components of pollution, can be either foreign substances/energies or naturally occurring contaminants. Pollution is often classed as <u>point source</u> or <u>nonpoint source pollution</u> .
Protection	in relation to a water resource, means - <ul style="list-style-type: none"> (a) Maintenance of the quality of the water resource to the extent that the water resource may be used in an ecologically sustainable way; (b) Prevention of the degradation of the water resource; and (c) the rehabilitation of the water resource;
Proponent	the person, company, or agency that is the primary responsible party for a development project and that is the permit applicant/holder for the project.
Rehabilitation	is the act of restoring something to its original state;
Responsible Authority	in relation to a specific power or duty in respect of water uses, means - <ul style="list-style-type: none"> (a) if that power or duty has been assigned by the Minister to a catchment management agency, that catchment management agency; or (b) if that power or duty has not been so assigned, the Minister;
Water Resource	includes a watercourse, surface water, estuary, or aquifer;
Wetland	means land which is transitional between terrestrial and aquatic systems where the water table is usually at or near the surface, or the land is periodically covered with shallow water, and which land in normal circumstances supports or would support vegetation typically adapted to life in saturated soil.



Abbreviations

AEL	Atmospheric Emissions License in terms of NEM:AQA
AMD	Acid Mine Drainage
ASTM	American Standard for Testing and Materials (followed by protocol number)
BA	Basic Assessment (process or report)
BID	Background Information Documents
CARA	Conservation of Agricultural Resources Act (Act 43 of 1983) as amended
CBD	Central Business District
COP	Codes of Practice
C-Plan	Conservation Plan (specifically Mpumalanga Conservation Plan)
DMC	Dense Medium Circuit (associated with processing plant)
DMR	Department of Mineral Resources
DO	Dissolved Oxygen
DWS	Department of Water Affairs and Sanitation
EA	Environmental Authorisation in terms of NEMA
EAP	Environmental Assessment Practitioner
ECA	Environmental Conservation Act (Act 73 of 1989) as amended
EIA	Environmental Impact Assessment (process or report)
EIA Regulation	Environmental Impact Assessment Regulation published under NEMA
EIS	Ecological Importance and Sensitivity
EMPr	Environmental Management Programme Report
GDP	Gross Domestic Product
GIS	Geographical Information Systems
GN	General Notice (issued under an Act, providing notice or information)
GNR	General Notice Regulation (issued under an Act, providing instruction)
HSTP	Human Settlement Plan
I&AP	Interested and Affected Parties
IAIA SA	International Association of Impact Assessment South Africa
IDP	Integrated Development Plan
IWUL	Integrated Water Use License
IWULA	Integrated Water Use License Application
IWWMP	Integrated Water and Waste Management Plan
LED	Local Economic Development
LoM	Life of Mine
MHSA	Mine Health and Safety Act (Act 29 of 1996) as amended
MPRDA	Mineral and Petroleum Resources Development Act (Act 28 of 2002) as amended
MR	Mining Right in terms of the MPRDA
MRA	Mining Right Application in terms of the MPRDA
NAEIS	National Atmospheric Emissions Inventory System
NEA	National Energy Act, Act 34 of 2008
NEM:AQA	National Environmental Management: Air Quality Act (act 59 of 2008) as amended



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NEM:BA	National Environmental Management: Biodiversity Act (Act 10 of 2004) as amended
NEM:PAA	National Environmental Management: Protected Areas Act (Act 57 of 2003) as amended
NEM:WA	National Environmental Management: Waste Act (Act 39 of 2004) as amended
NEMA	National Environmental Management Act (Act 107 of 1998) as amended
NFEPA	National Freshwater Ecological Priority Areas
NHRA	National Heritage Resources Act (Act No. 25 of 1999) as amended
NPAES	National Protected Area Expansion Strategy
NWA	National Water Act (Act 35 of 1998) as amended
PCD	Pollution Control Dam
PDA	Potential Development Area (in terms of the SDF)
PES	Present Ecological State (usually followed by category A-F)
PM10/5/2.5	Particulate Matter up to 10/5/2.5 micrometers
POI	Points of Interest
PPP	Public Participation Process
RoD	Record of Decision (for specific application)
RWD	Return Water Dam
RWQO	Resource Water Quality Objectives
SCC	Species of Conservation Concern
S&EIR	Scoping and Environmental Impact Reporting process
S&LP	Social and Labour Plan
SACNASP	South African Council for Natural Scientific Professions
SAHRA	South African Heritage Resource Agency
SAMRAD	South African Mineral Resources Administration System
SANBI	South African National Biodiversity Institute
SANS	South African National Standard (followed by standard number)
SASS5	South African Scoring System version 5 (in terms of aquatic invertebrate assessments)
SAWIS	South African Waste Information System
SDF	Spatial Development Framework (specifically LLM)
SEMA	Specific Environmental Management Acts
SMME	Small and Medium and Micro Enterprise
SOP	Standard Operating Procedure
SPLUMA	Spatial Planning and Land Use Management Act (Act No.16 of 2013)
Stats SA	Statistics South Africa
Tph	Tons per hour
WMA	Water Management Area
WML	Waste Management License in terms of NEM:WA





mineral resources

Department:
Mineral Resources
REPUBLIC OF SOUTH AFRICA

DRAFT ENVIRONMENTAL IMPACT ASSESSMENT REPORT And ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT

SUBMITTED FOR ENVIRONMENTAL AUTHORIZATIONS IN TERMS OF THE NATIONAL ENVIRONMENTAL MANAGEMENT ACT, 1998 AND THE NATIONAL ENVIRONMENTAL MANAGEMENT WASTE ACT, 2008 IN RESPECT OF LISTED ACTIVITIES THAT HAVE BEEN TRIGGERED BY APPLICATIONS IN TERMS OF THE MINERAL AND PETROLEUM RESOURCES DEVELOPMENT ACT, 2002 (MPRDA) (AS AMENDED).

NAME OF APPLICANT: **Eyethu Coal (Pty) Ltd**
TEL NO: **(087) 654 1541**
FAX NO:
POSTAL ADDRESS:
PHYSICAL ADDRESS: **37 Schonland Drive,
Ferrobank,
Emalaheni**
FILE REFERENCE NUMBER SAMRAD: **MP30/5/1/2/2/10058MR**



1. . IMPORTANT NOTICE

In terms of the Mineral and Petroleum Resources Development Act (Act 28 of 2002 as amended), the Minister must grant a prospecting or mining right if among others the mining “will not result in unacceptable pollution, ecological degradation or damage to the environment”.

Unless an Environmental Authorisation can be granted following the evaluation of an Environmental Impact Assessment and an Environmental Management Programme report in terms of the National Environmental Management Act (Act 107 of 1998) (NEMA), it cannot be concluded that the said activities will not result in unacceptable pollution, ecological degradation or damage to the environment.

In terms of section 16(3)(b) of the EIA Regulations, 2014, any report submitted as part of an application must be prepared in a format that may be determined by the Competent Authority and in terms of section 17 (1) (c) the competent Authority must check whether the application has taken into account any minimum requirements applicable or instructions or guidance provided by the competent authority to the submission of applications.

It is therefore an instruction that the prescribed reports required in respect of applications for an environmental authorisation for listed activities triggered by an application for a right or a permit are submitted in the exact format of, and provide all the information required in terms of, this template. Furthermore, please be advised that failure to submit the information required in the format provided in this template will be regarded as a failure to meet the requirements of the Regulation and will lead to the Environmental Authorisation being refused.

It is furthermore an instruction that the Environmental Assessment Practitioner must process and interpret his/her research and analysis and use the findings thereof to compile the information required herein. (Unprocessed supporting information may be attached as appendices). The EAP must ensure that the information required is placed correctly in the relevant sections of the Report, in the order, and under the provided headings as set out below, and ensure that the report is not cluttered with uninterpreted information and that it unambiguously represents the interpretation of the applicant.



PART A: SCOPE OF ASSESSMENT AND ENVIRONMENTAL IMPACT ASSESSMENT REPORT

Details of Applicant

Table 2.1: Applicant Details

Applicant Name:	Eyethu Coal (Pty) Ltd
Registration No.:	2003/010416/07
Contact Person:	Pandelani Alfred Mugudamani
Telephone:	(087) 654 1541
Fax:	086 529 2236
E-mail:	pamela@eyethucoal.comv
Postal Address:	P.O Box 439, Witbank, 1035
Physical Address:	37 Schonland Drive, Ferrobank, Emalaheni



3. CONTACT PERSON AND CORRESPONDENCE ADDRESS

3.a DETAILS OF

3.a.i Details of the EAP

Name of the practitioner	Riana Panaino
Tel Number	012 807 0383
Fax Number	086 714 5397
Email Address	riana@ecoe.co.za

3.a.ii Expertise of the EAP.

3.a.ii.1 The qualifications of the EAP

The EAP has an Honours degrees in Biodiversity and Conservation, is SACNASP Registered, and has more than 10 years' experience in Environmental Consulting.

3.a.ii.2 Summary of the EAP's past experience.

2008, 2009, 2010

Matla, Mpumalanga, South Africa

Matla Wetland Monitoring and Management Plan for Matla coal mine. Responsibilities included: weekly site visits and reporting of findings during the construction of the Matla river diversion and assisted in compilation of the wetland management plan

2009

Eskom DPSS, Freestate/KwaZulu Natal, South Africa

Assisted in the capture of fish for genetic sampling to map distribution patterns between two different catchments.

2016

Exxaro NBC Project

Project Consultant, coordination, BA and EMP report compilation as well as public consultation of the various aspects on this project.

2016

Exxaro Coal Central Eloff Project, Mpumalanga, South Africa

Project Consultant, coordination and EIA and EMP report compilation as well as public consultation of the various aspects on this project.

2015

Exxaro Belfast Project, Mpumalanga, South Africa

Environmental Control Officer

2015

Exxaro Matla Project, Mpumalanga, South Africa

Project Consultant, coordination and EIA and EMP report compilation as well as public consultation of the various aspects on this project.



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2015

Exxaro UCG Project, Limpopo, South Africa

Project Management, coordination and public consultation of the various aspects on this project.

2014

Quantum Crushing and Screening, KwaZulu-Natal, South Africa

Project Management, coordination and BA and EMP report compilation as well as public consultation of the various aspects on this project.

2013

Glencore Rietvly – Northwest, South Africa

Project Management, coordination and BA and EMP report compilation as well as public consultation of the various aspects on this project.

2012

Jacomynspan, Northern Cape, South Africa

Project Management, coordination and EIA and EMP report compilation as well as public consultation of the various aspects on this project.

2012

Bighorn Substation, Northwest, South Africa

Project assistance, coordination and report compilation as well as public consultation of the various aspects on this project.

2012

Otjozondou, Namibia

Environmental Impact Assessment Report Compilation

2012

Leeuwpan, Mpumalanga, South Africa

Project Management, coordination and EIA and EMP report compilation as well as public consultation of the various aspects on this project.

2008

Lonmin Akanani, Limpopo, South Africa

Project assistance, coordination and report compilation of the various studies done on this project.

2012

Schoongezicht, Mpumalanga South Africa

Ecological studies with responsibilities that included wetland input for the IWULA. Wetland delineation, classification and characterisation were done on the wetlands found during this study.

2012

Mooiplaats, Mpumalanga South Africa

Ecological studies with responsibilities that included wetland input for the IWULA. Wetland delineation, classification and characterisation were done on the wetlands found during this study.



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2011Kromdraai Pipeline, Mpumalanga, South Africa

Ecological studies with responsibilities that included wetland input for the project EIA. Wetland delineation, classification and characterisation were done on the wetlands found during this study.

2010New Vaal Life Expansion, Freestate, South Africa

Ecological studies with responsibilities that included wetland input for the project EIA. Wetland delineation, classification and characterisation were done on the wetlands found during this study.

3.b DESCRIPTION OF THE PROPERTY**Table 3.1: Location of the property**

Farm Name:	Portion 55 of the farm Blesboklaagte 296JS Portion 216 of the farm Blesboklaagte 296JS Portion 264 of the farm Blesboklaagte 296JS
Application area (Ha)	137.7165 ha
Magisterial district:	Emalahleni Local Municipality Nkangala District Municipality
Distance and direction from nearest town	Situated about 5 kilometers northwest of Emalahleni.
21 digit Surveyor General Code for each farm portion	T0JS00000000029600055 T0JS00000000029600216 T0JS00000000029600264

Table 3.2: Summary of Surface Right Owners

Farm	Portion	Surface Right owner	Title Deed
BLESBOKLAAGTE 296 JS	55 (RE)	JUMBO VAN DER MERWE TRUST	T8297/2008
BLESBOKLAAGTE 296 JS	216 (RE)	SUDDEN IMPACT INV 76 PTY LTD	T7925/2008
BLESBOKLAAGTE 296 JS	264	TRANSNET	unknown



3.c LOCALITY MAP

(Nearest town, scale not smaller than 1:250000 attached as Annexure 3)

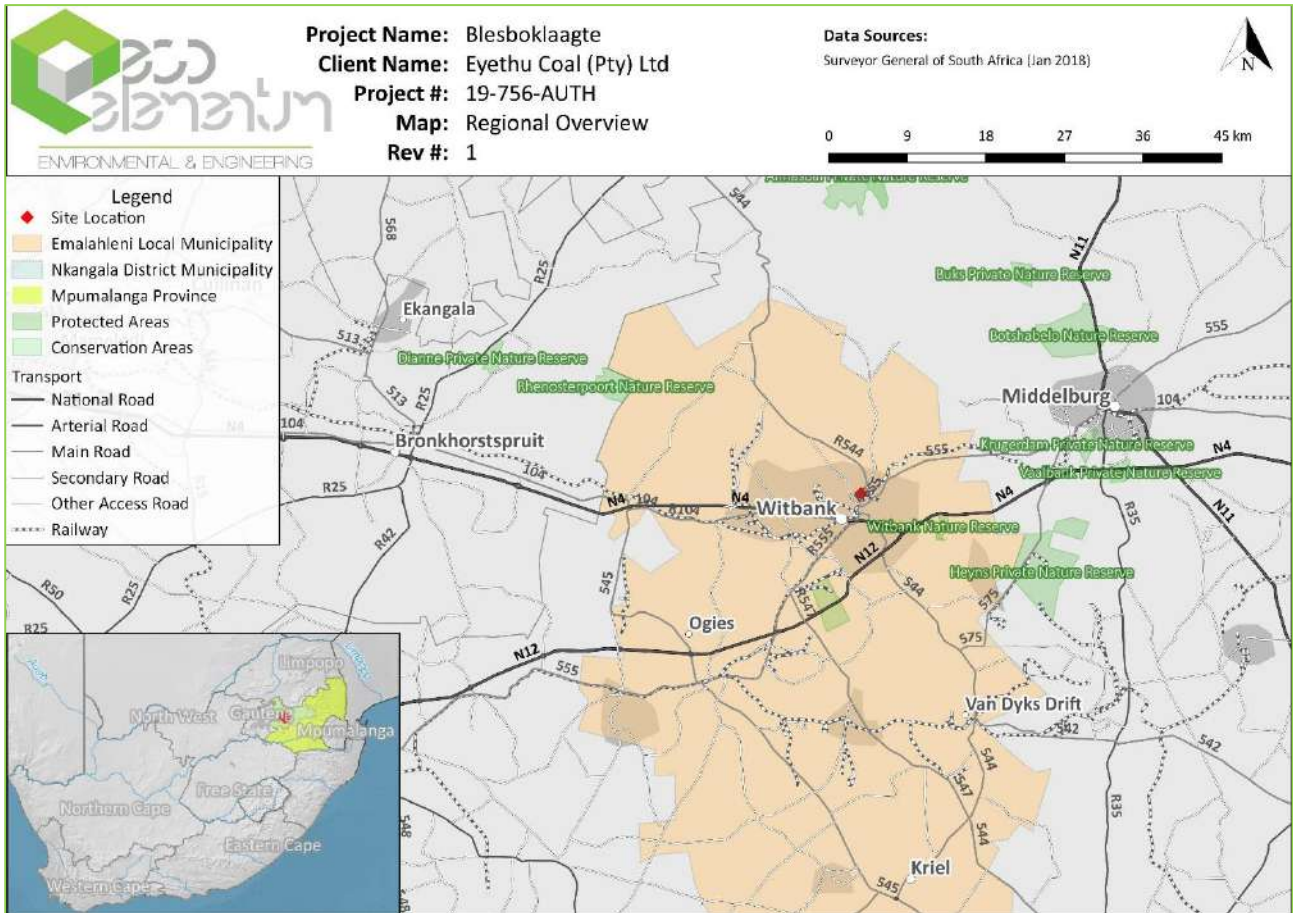


Figure 3.1: Regional Overview



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Figure 3.2: Local setting



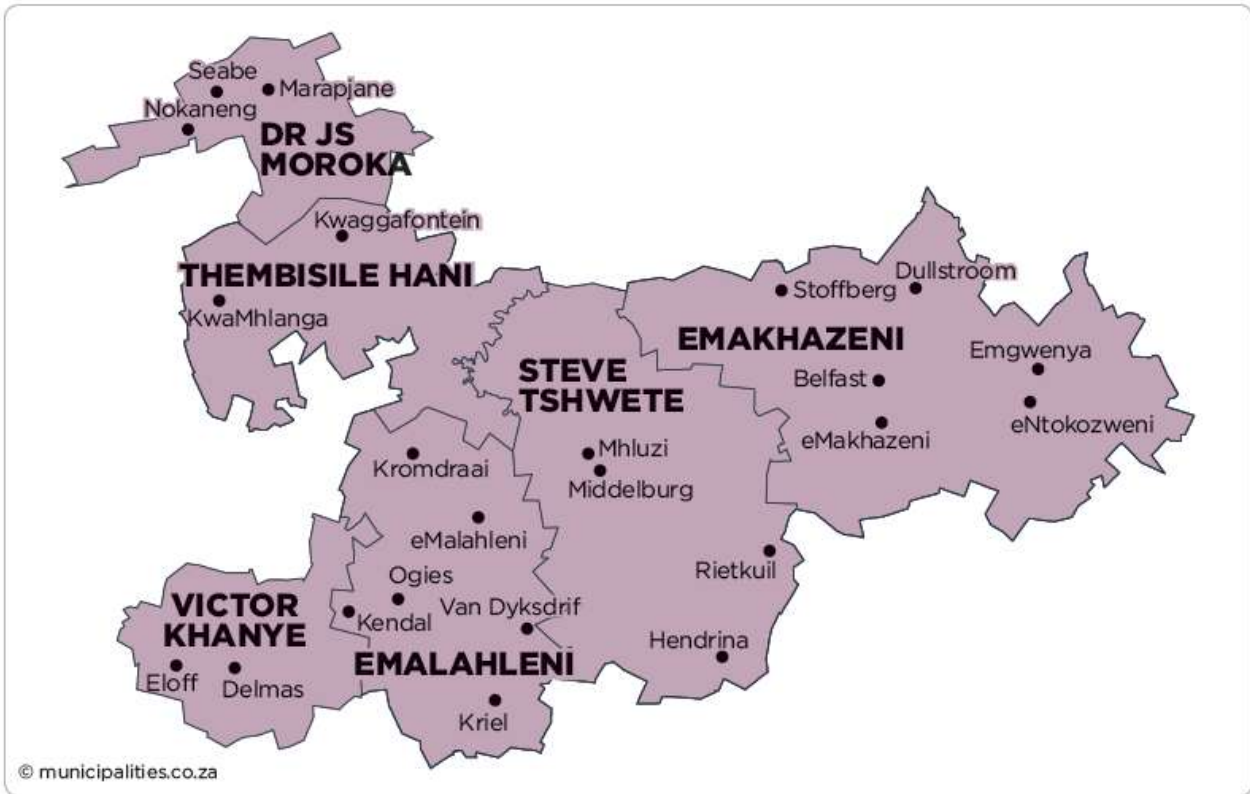


Figure 3.3: Nkangala District Municipality

3.d DESCRIPTION OF THE SCOPE OF THE PROPOSED OVERALL ACTIVITY

Provide a plan drawn to a scale acceptable to the competent authority but not less than 1: 10 000 that shows the location, and area (hectares) of all the aforesaid main and listed activities, and infrastructure to be placed on site – please refer to Annexure 4.

Table 3.3: Description of the Overall Activity

ITEM	DETAIL
Type of mineral	Coal
Mining method	Strip and Rollover Mining Techniques
Depth of the mineral below surface	Average depth 13.97 m
Geological formation	<p>Certain portions of the farm Blesbokaagte 296 JS is underlain by the Vryheid Formation sediments, situated in the northern part of the main Witbank Coalfield. The coal bearing strata in the Witbank Coalfield are contained within the Vryheid Formation of the Ecca Group. The coal seams are shallow and relatively flat lying and slightly undulating with a southwesterly dip in some areas.</p> <p>Borehole data revealed the existence of one coal seam associated with the sediments of the Vryheid Formation. Seams are numbered 5 to 1 with the no 5 seam being the highest in the sequence. Seams preserved in the area are only the no. 2 seam out of the normal 5 found coal seams in the Witbank area.</p> <p>The No 2 seam varies in thickness between 3 and 7 meters. Seven distinct bands or zones are recognised although some of these may be locally absent. The basal zone 1 is thin, in persistent and dull; whereas zone 2 is bright and often has a low phosphorous content.</p>



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ITEM	DETAIL
	<p>Boreholes drilled in the proposed opencast area intersected the Number 2 coal seam between 8.50m and 11.30m below surface. The Number 2 coal seam sub crops along the north and west due to erosion. The eastern limit is the R544</p> <p>A 30 m buffer pillar is proposed between the opencast workings and the tar road. The thickness of the Number 2 seam and depth below surface is correlated in all boreholes. Continuity of the coal seam was therefore demonstrated by the drilling information.</p>
Life of mine	4 Years.
Production rate	600 000 tons per annum
Saleable Product	Mining will consist of the removal of coal from the No. 2 coal seam, the ROM will be transported to an off-site beneficiation plant where the ROM will be processed to be sold to Eskom Holdings Ltd.
Target Market	Eskom

3.d.i Listed and Specified Activities

Section 16 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002) requires, upon request by the Minister that an Environmental Management Plan be submitted and that the applicant must notify and consult with Interested and Affected Parties (I&APs).

Section 37 of the MPRDA confirms that the principles set out in the NEMA apply to all prospecting and mining operations and must be carried out in accordance with the generally accepted principles of sustainable development Section 24 of the NEMA requires that activities, which may impact on the environment must obtain an environmental authorisation from a relevant authority before commencing with the activities.

Such activities are listed under Regulations Listing Notice 1 Government Notice (GN) 983, Listing Notice 2 GN 984 and Listing Notice GN 985 (dated 4 December 2014 as amended in 2017) of NEMA. The proposed mining activity triggers are listed in Table 3.4.



Table 3.4: Listed and Specified Activities

NAME OF ACTIVITY	Aerial extent of the Activity Ha or m ²	LISTED ACTIVITY	APPLICABLE LISTING NOTICE (GNR 544, GNR 545 or GNR 546)	WASTE MANAGEMENT AUTHORISATION
Listing Notice 1 (GNR 983)				
Storm water management infrastructure for the separation of clean and dirty water.	n/a	X	9 The development of infrastructure exceeding 1 000 metres in length for the bulk transportation of water or storm water- (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 storm water or storm water drainage inside a road reserve or railway line reserve; or (b) where such development will occur within an urban area.	
Dirty water channels and return water pipelines on site and at the plant area.	n/a	X	10 The development and related operation of infrastructure exceeding 1 000 metres in length for the bulk transportation of sewage, effluent, process water, waste water, return water, industrial discharge or slimes- (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 the bulk transportation of sewage, effluent, process water, waste water, 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.	
Offices, Workshops, change house, Ablution facilities, Plant area, PCD.	~2ha	X	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 metres or more; where such development occurs- (a) within a watercourse; (b) in front of a development setback; or (c) if no development setback exists, within 32 metres of a watercourse, measured from the edge of a watercourse; - excluding-	



NAME OF ACTIVITY	Aerial extent of the Activity Ha or m ²	LISTED ACTIVITY	APPLICABLE LISTING NOTICE (GNR 544, GNR 545 or GNR 546)	WASTE MANAGEMENT AUTHORISATION
			(aa) the development of infrastructure or structures within existing ports or harbours that will not increase the development footprint of the port or harbour; (bb) where such development activities are related to the development of a port or harbour, in which case activity 26 in Listing Notice 2 of 2014 applies; (cc) activities listed in activity 14 in Listing Notice 2 of 2014 or activity 14 in Listing Notice 3 of 2014, in which case that activity applies; (dd) where such development occurs within an urban area; (ee) where such development occurs within existing roads, road reserves or railway line reserves; or (ff) the development of temporary infrastructure or structures where such infrastructure or structures will be removed within 6 weeks of the commencement of development and where indigenous vegetation will not be cleared.	
Potable water containers for offices, change house and ablution facilities.	n/a	X	13 The development of facilities or infrastructure for the off-stream storage of water, including dams and reservoirs, with a combined capacity of 50 000 cubic metres or more, unless such storage falls within the ambit of activity 16 in Listing Notice 2 of 2014.	
Diesel Storage on Site.	n/a	X	14 The development and related operation of facilities or infrastructure, for the storage, or for the storage and handling, of a dangerous good, where such storage occurs in containers with a combined capacity of 80 cubic metres or more but not exceeding 500 cubic metres.	
Site clearance for construction purposes, box cut excavation.	Less than 10ha	X	19 The infilling or depositing of any material of more than 10 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 10 cubic metres from a watercourse; but excluding where such infilling, depositing, dredging, excavation, removal or moving- (a) will occur behind a development setback; (b) is for maintenance purposes undertaken in accordance with a maintenance management plan; (c) falls within the ambit of activity 21 in this Notice, in which case that activity applies; (d) occurs within existing ports or harbours that will not increase the development footprint of the port or harbour; or (e) where such development is related to the development of a port or harbour, in which case activity 26 in Listing Notice 2 of 2014 applies.	
Haul Roads for coal transport on site.	3ha	X	24 The development of a road-	

NAME OF ACTIVITY	Aerial extent of the Activity Ha or m ²	LISTED ACTIVITY	APPLICABLE LISTING NOTICE (GNR 544, GNR 545 or GNR 546)	WASTE MANAGEMENT AUTHORISATION
			(i) for which an environmental authorisation 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 13,5 meters, or where no reserve exists where the road is wider than 8 metres; but excluding a road- (a) which is identified and included in activity 27 in Listing Notice 2 of 2014; (b) where the entire road falls within an urban area; or (c) which is 1 kilometre or shorter.	
Listing Notice 2 (GNR 984)				
Diesel Storage on Site.	n/a	X	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 500 cubic metres.	
Stockpiles and Pollution Control Dams will trigger Section 21 (g) application.	~5ha	X	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, excluding- (i) activities which are identified and included in Listing Notice 1 of 2014; (ii) activities which are included in the list of waste management activities published in terms of section 19 of the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008) in which case the National Environmental Management: Waste Act, 2008 applies; (iii) the development of facilities or infrastructure for the treatment of effluent, polluted water, wastewater or sewage where such facilities have a daily throughput capacity of 2 000 cubic metres or less; or (iv) where the development is directly related to aquaculture facilities or infrastructure where the wastewater discharge capacity will not exceed 50 cubic metres per day.	Category B: Activity 10, 11
Site clearance for construction purposes.	100ha	X	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.	
A Mining Right amendment for the Mining of coal will be applied for.	~35ha	X	17 Any activity including the operation of that activity which requires a mining right as contemplated in section 22 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002), including-	



NAME OF ACTIVITY	Aerial extent of the Activity Ha or m ²	LISTED ACTIVITY	APPLICABLE LISTING NOTICE (GNR 544, GNR 545 or GNR 546)	WASTE MANAGEMENT AUTHORISATION
			(a) associated infrastructure, structures and earthworks, directly related to the extraction of a mineral resource; or (b) the primary processing of a mineral resource including winning, extraction, classifying, concentrating, crushing, screening or washing; but excluding the secondary processing of a mineral resource, including the smelting, beneficiation, reduction, refining, calcining or gasification of the mineral resource in which case activity 6 in this Notice applies.	
The opencast mining of coal.	~55ha	X	19 The removal and disposal of minerals contemplated in terms of section 20 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002), including- (a) associated infrastructure, structures and earthworks, directly related to prospecting of a mineral resource; or (b) the primary processing of a mineral resource including winning, extraction, classifying, concentrating, crushing, screening or washing; but excluding the secondary processing of a mineral resource, including the smelting, beneficiation, reduction, refining, calcining or gasification of the mineral resource in which case activity 6 in this Notice applies.	Category B: Activity 10, 11



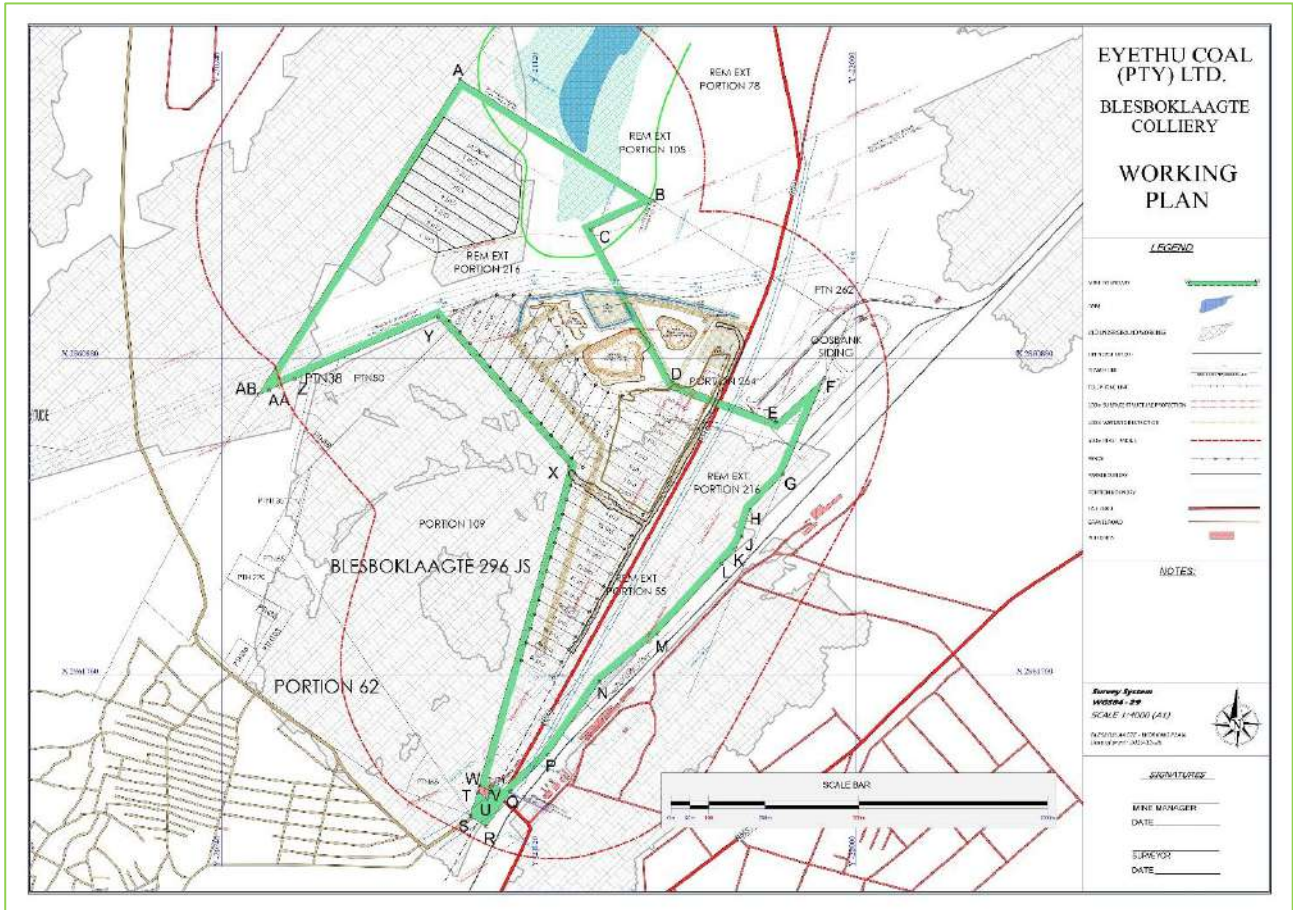


Figure 3.4: Site Layout

3.d.ii Description of The Activities to Be Undertaken

Infrastructure requirements

- Security access point;
- Access roads;
- Electrical supply – (Eskom);
- Water storage facility;
- Water management facility;
- Workshop;
- Change-house;
- Laundry;
- Offices;
- Weighbridge.

Process description

Mining will consist of the removal of coal from the No. 2 coal seam, the ROM will be transported to an off-site beneficiation plant where the ROM will be processed to be sold to Eskom Holdings Ltd.

During the construction phase infrastructure will be erected on site. This phase will take approximately 6 months to complete and will consist of the following:

- Construction of mine infrastructure, i.e. diesel tanks, workshops, haul roads, etc.
- Preparation of the topsoil, subsoil and overburden stockpiling area;



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- Construction of water catchment trenches;
- Excavation of initial box-cuts,
- Construction of the pollution control dams,
- Formation of the topsoil, subsoil and overburden stockpiles,

During the operational phase opencast mining will be conducted. This phase will take approximately 3 years to complete and will consist of the following:

- Systematic removal of the coal seams by opencast mining methods (See Attachment 3 - Mining Layout Plan);
- Transporting and Stockpiling of ROM
- Disposal of mine affected water into the pollution control dams.
- Transporting of coal products
- Utilization of mine infrastructure

The decommissioning phase is taken to begin once all economically exploitable coal reserves have been extracted. This phase of the mine is expected to take not more than three years.

- Removal of all mine infrastructure;
- Filling of all remaining voids and final shaping of the rehabilitated opencast pit;
- Removal of the carbonaceous layer from the product stockpiling area and haul roads;
- Ripping of all infrastructure areas; and
- Seeding of ripped and rehabilitated surfaces

The mine closure phase will be dedicated to the maintenance of rehabilitated areas as well as compiling a closure plan.

Mining Method - Open Cast Mining

Opencast mining using the truck and shovel lateral sequential rollover mining method will be undertaken. Mining will commence from the initial box cut. A haul road that will be extended from the nearby existing road will be used as access to the mining area.

The soft overburden will be removed by mechanical methods. The hard overburden will be drilled and blasted and then removed by mechanical methods. The coal will be drilled and blasted prior to removal.

Replacement of overburden materials into the mining pit will be according to the following sequence:

1. Placement of hard overburden at base of pit;
2. Placement of soft overburden;
3. Final cover of topsoil (minimum 500 mm)

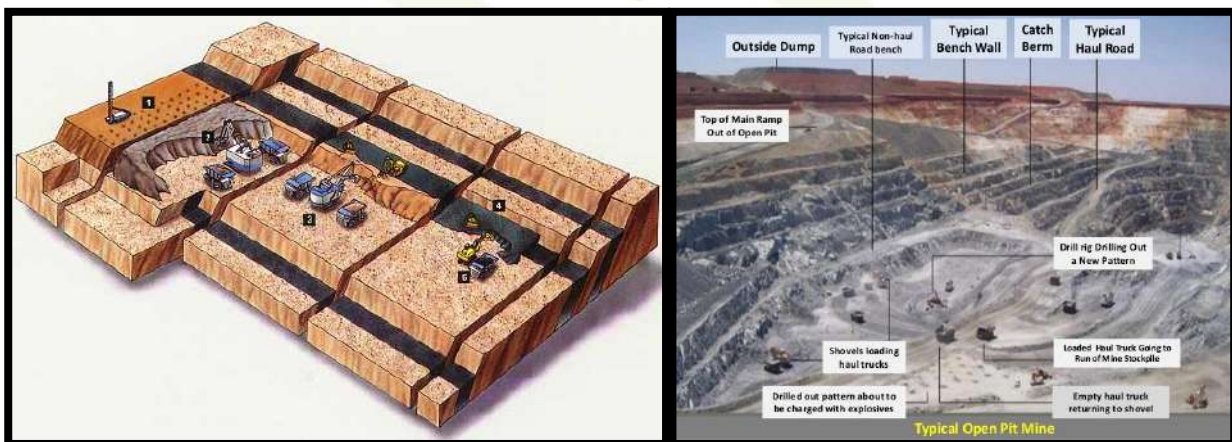


Figure 3.5: Typical Opencast Concurrent Roll Over Rehabilitation Mining Technique



Run of Mine Coal and Coal Beneficiation

No Processing shall be done on site. Thus no plant will be constructed, coal will be transported by road to the Eyethu existing beneficiation plant.



3.e POLICY AND LEGISLATIVE CONTEXT

Table 3.5 outlines the legislation and guidelines that are considered to be applicable to the proposed project; and which were considered at the time of compiling this report.

Table 3.5: Applicable legislation and guidelines

APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT (a description of the policy and legislative context within which the development is proposed including an 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);	REFERENCE WHERE APPLIED
<p>National Environmental Management Act (107 of 1998)</p> <p>The NEMA provides the overarching legislation for environmental governance in South Africa, giving effect to Section 24 of the Constitution of the Republic of South Africa. NEMA sets out the fundamental principles of Integrated Environmental Management that must be adhered to in order to ensure sustainable development.</p>	<p>Section 28 of the NEMA includes a far-reaching general “Duty of Care” which stipulates the need to protect the environment from degradation and pollution.</p> <p>In terms of the listed activities, an S&EIR process is required.</p> <p>An Application for Environmental Authorisation and Mining Right has been made to the DMR.</p>
<p>Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002)</p> <p>To make provision for equitable access to and sustainable development of the nation's mineral and petroleum resources; and to provide for matters connected therewith.</p>	<p>Section 102- The project requires a mining right amendment from the DMR.</p> <p>A section 102 Mining Right amendment was lodged with the DMR.</p>
<p>NEMA Environmental Impact Assessment (EIA) Regulations, 2014 (as amended)</p>	<p>In terms of the listed activities, an S&EIR process is required. The process will be followed in terms of the “one environmental system”</p> <p>An Application for Environmental Authorisation and Mining Right has been made to the DMR.</p>
<p>The South African Constitution</p> <p>In terms of Section 24, of the Constitution of the Republic of South Africa (108 of 1996), everyone has the right to an environment that is not harmful to their health or well-being and to have the environment protected, for the benefit of present and future generations, through reasonable legislation and other measures that prevent pollution and ecological degradation, promote conservation and secure ecologically sustainable development and use of natural resources while prompting justifiable economic and social development.</p>	<p>Applied at potential impacts identification as well as mitigation measures and public participation.</p> <p>An open and participatory public participation process will be followed. An EMP and awareness plan will be designed according to the issues raised during this process.</p>
<p>National Environmental Management: Biodiversity Act, 2004</p> <p>The National Environmental Management: Biodiversity Act (Act 10 of 2004) (NEM:BA) provides for listing of threatened or protected species.</p>	<p>The fauna and flora prevailing in the proposed project site will be handled in terms of this Act and relevant ecological studies have already been initiated.</p> <p>The mining footprint will be guided by the results of the ecological studies where possible. Permits will be applied for where and when necessary should any red data species be relocated.</p>
<p>National Environmental Management: Waste Act</p> <p>The objectives of NEM:WA involve the protection of health, wellbeing and the environment by providing reasonable measures for the minimization of natural resource consumption, avoiding and minimizing the generation of waste, reducing, recycling and recovering waste, and treating and safely disposal of waste as a last resort. In terms</p>	<p>In terms of the list of Section 19 waste management activities, an S&EIR process is required. The process is part of the “one environmental system”.</p> <p>GNR 633 includes the establishment or reclamation of a</p> <p>In terms of GN718 of 2009, under NEMWA, various Category B waste management activities are applicable to the proposed mining operation. The impacts and associated</p>



<p>APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT (a description of the policy and legislative context within which the development is proposed including an 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);</p>	<p>REFERENCE WHERE APPLIED</p>	
<p>of the NEMWA, all waste management activities must be licensed.</p> <p>A distinction is made between Category A waste management activities, which require a basic assessment, and Category B activities, which require a full EIA, and Category C waste management activities which do not require a waste management license but compliance with relevant requirements or standards.</p> <p>According to Section 44 of the Act, the licensing procedure must be integrated with an EIA process in accordance with the Regulations GNR 982.</p>	<p>residue stockpile or residue deposit, resulting from prospecting or mining activities as a listed activity.</p>	<p>management and/or mitigation measures will be included in the EIA phase of the project.</p>
<p>National Heritage Resources Act (Act No. 25 of 1999)</p> <p>The protection and management of South Africa's heritage resources are controlled by the National Heritage Resources Act (Act No. 25 of 1999) (NHRA). The enforcing authority for this act is the South African National Heritage Resources Agency (SAHRA).</p>	<p>A Heritage and Paleontological study has been initiated to identify and assess the project in terms of heritage and paleontological resources. This is mandatory in terms of Section 38 of the NHRA.</p>	<p>The Heritage Report will be uploaded on the SAHRIS website for comment and the development guided by any findings of the Report.</p>
<p>National Water Act (Act No. 36 of 1998)</p> <p>The NWA is the primary regulatory legislation, controlling and managing the use of water resources as well as the pollution thereof. This act provides for fundamental reformation of legislation relating to water resource use.</p> <p>GN 704- Regulations on use of water for mining and related activities aimed at the protection of water resources.</p>	<p>An IWUL amendment will be submitted to DWS for consideration for the following Section 21 water uses including:</p> <ul style="list-style-type: none"> (a) abstraction from a borehole. (c) and (i) mining activities within 500 m from a wetland. (g) dust suppression, coal stockpiling, mine residue stockpiling and dirty water dams. (j) abstraction from the open pit 	<p>The DWS will provide comment and an application will be lodged for their review prior to the undertaking of any water use activities on site.</p> <p>Management Principles will be applied to the mining operations as per GN704.</p>
<p>National Environmental Management: Air Quality Act, 2004 (Act no.39 of 2004); and applicable Regulations, Standards and Notices published in terms of NEMAQA</p> <p>The promulgation of this Act marked a turning point in the approach to air pollution control and governance in South Africa, introducing the philosophy of Air Quality Management, in line with international policy developments and the environmental right, i.e. Section 24 of the Constitution (Act No. 108 of 1996).</p>	<p>Dust monitoring on site during operations</p>	<p>As part of the EMP dust suppression methods will be used.</p>
<p>Mine Health and Safety Act, 1996 (Act No. 29 of 1996);</p> <p>The Mine Health and Safety Act (Act No. 29 of 1996) (MHSA) aims to provide for protection of the health and safety of all employees and other personnel at the mines of South Africa.</p>	<p>Health and Safety Policy of mine to be guided by this Act.</p>	<p>Risk Impact Assessment to be conducted.</p>
<p>Mpumalanga Spatial Development Framework (SDF)</p>	<p>Used to identify the municipality's long term spatial development plans. SDF to be considered in terms of the need and desirability.</p>	<p>The SDF should be consulted as part of the Socio-Economic Study's Scope of Work.</p>



APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT (a description of the policy and legislative context within which the development is proposed including an 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);	REFERENCE WHERE APPLIED
<p>National Development Plan (2012)</p> <p>The National Development Plan outlines what we should do to eradicate poverty, increase employment and reduce inequality by 2030. The Plan has the target of developing people’s capabilities to be to improve their lives through education and skills development, health care, better access to public transport, jobs, social protection, rising income, housing and basic services, and safety.</p>	<p>Used to identify project Need and Desirability and alignment with National Policy.</p> <p>To form part of the project background and socio-economic evaluation.</p>
<p>Promotion of Access to Information Act, 2000 (Act No. 2 of 2000) (PAIA)</p> <p>PAIA recognises that everyone has a right of access to any information held by the state and by another person when that information is required to exercise or protect any right.</p>	<p>The S&EIR process is aligned with the PAIA and therefore fair and open public participation is undertaken.</p> <p>NEMA Public Participation Process will be followed as per the 2014 EIA Guidelines.</p>
<p>Conservation of Agricultural Resources Act (act no. 43 of 1983) (CARA)</p> <p>CARA provides for control over the utilization of the natural agricultural resources in order to promote the conservation of the soil, the water sources and the vegetation and the combating of weeds and invader plants.</p>	<p>Principles of the Act to be included in the relevant specialist’s Scope of Work.</p> <p>Mine Closure and Rehabilitation strategy to be informed by CARA and stakeholder engagement process.</p>

Legal Requirements

The intent to mine requires the various applications and subsequent approvals prior to commencement. Refer to **Table 3.4** and **Table 3.5** in the previous sections. To this effect, an integrated environmental application process was followed by means of S&EIR. A S&EIR process typically has three phases as illustrated by Figure 3.6 below. The report is the final step in the environmental assessment phase, before authorisation can take place.



Figure 3.6: S&EIR flow diagram

3.f NEED AND DESIRABILITY OF THE PROPOSED PROJECT

- The area falls within the Mpumalanga coal fields and as such the economy of the surrounding area is predominantly based on coal mining (and associated services such as coal hauling); agriculture; forestry and timber processing. Coal mining is the third biggest employer in South Africa (Stats S.A).
- The mining industry is identified as one of the key components toward Rapid Economic Growth in order to reduce poverty and minimise unemployment Growth (State of the Nation Address, 2019). The key issues include:



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- The need for a strong capable state;
- Cost reduction for businesses and consumers;
- The need for reindustrialisation and a revitalised mining sector;
- Faster growth in tourism;
- Improved infrastructure;
- Better support for small businesses; and
- Marked reduction in unemployment
- The mining sector contributes significantly to the GDP (22% of the provincial economy) followed by manufacturing at 12%, construction at 3%, and agriculture at 3%.
- The activity of mining has numerous social and economic benefits in local, regional and national context. These include:
 1. Job creation
 2. Skills development
 3. SMME development
 4. Local economic development
 5. Contribution to local and national tax income (royalties, companies' tax etc.)
 6. Contribution to the national gross domestic product, and
 7. Future business opportunities.
- The production of goods, supply of services or construction of infrastructure results in expenditure within a regional economy which has knock-on effects and results in additional expenditure which contributes to the regional economy.
- At the second South Africa Investment Conference in 2019, over 70 companies made investment commitments of R364 billion in industries as diverse as advanced manufacturing, agro-processing, infrastructure, **mining**, services, tourism and hospitality. This shows that mining remains a source of investment into the country.

3.g MOTIVATION FOR THE PREFERRED DEVELOPMENT FOOTPRINT WITHIN THE APPROVED SITE INCLUDING A FULL DESCRIPTION OF THE PROCESS FOLLOWED TO REACH THE PROPOSED DEVELOPMENT FOOTPRINT WITHIN THE APPROVED SITE.

Refer to Annexure 4 where the final layout plan is provided in terms of the motivation provided below.

3.g.i Details of the development footprint alternatives considered.

a) The Property or Location

The site location is limited to the Current Mining Right Area, which is constrained by the location of other mining houses and residential areas. The resource location further restricts the infrastructure layout. The area has also been impacted by historic shallow underground mining and large sections have already been transformed from its natural state. Therefore, no alternative properties were considered.

b) The Type of Activity to Be Undertaken

Opencast or underground mining are the alternatives for the activity to be undertaken. The Area was previously mined underground however it was very shallow mining and large pillars were left to avoid subsidence. The only way to optimally remove the remaining coal resource will be via Open Cast mining. The rehabilitation of the open pits will also ensure a safer more stable surface area removing the risk of sinkholes from historic mining activities.

The current state of most of the land also does not lend itself to farming, and therefore coal mining was chosen as the economically preferred alternative.

c) The Design or Layout of the Activity

The infrastructure and mining layout is constrained by the mining right boundary, the location of other mining houses and residential areas. The resource location and the presence of a provincial road on the site further restrict the layout options.



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d) The Technology to Be Used in The Activity

The technology proposed will be the most economically viable technology for the proposed operation.

List of Major Equipment that will impact on fuel cost:

- 1 x Dozer (60ton);
- 2 x Hydraulic Excavators (85 ton);
- 6 x Articulated Dump Trucks (40 ton);
- 1 x Front End Loader (16ton);
- 1 x Grader (17 ton).
- 1 x Drill Rig (18ton)

An alternative would be to undertake beneficiation on site, however, this would be costly for a mine with such a short lifespan, and would also require more space and thereby possibly sterilising some of the mineable resource.

Thus, no beneficiation will take place on site, and therefore no further technology alternatives will apply.

e) Operational aspects of the activity

Opencast Rollover mining is the preferred alternative for mining, as majority of the coal had previously been mined underground.

The other alternatives would be beneficiation on site or off site. Due to the limited space available on site, the preferred alternative will be to transport ROM off site for further beneficiation. Therefore, no beneficiation plant will be required on site.

f) The Option of Not Implementing the Activity

The option of not approving the activities will result in a significant loss of revenue and job creation to, and within the municipality. Most of the land does not currently lend itself to crop farming due to the disturbed nature caused by historic mining activities, and therefore coal mining is a more viable economic alternative.

Rehabilitation after opencast mining will also ensure a safer more stable surface area removing the risk of sinkholes from historic mining activities, which would still be a present risk should the mine not be implemented.

3.g.ii Details of The Public Participation Process Followed

Section 41 of NEMA Regulation 982 (specifically Chapter 6) set out the Legal and Regulatory Requirement for Public Participation. The Public Participation Process (PPP) aims to involve the authorities and I&APs in the project process, and determines their needs, expectations and perceptions which in turn ensures a complete and comprehensive environmental study. An open and transparent process will/has been followed at all times and is based on reciprocal dissemination of information. The following was/will be undertaken during the PPP:

- Identification of Interested and Affected Parties (IAPs);
- Consultation with selected landowners;
- Notification of IAPs regarding the proposed project via newspaper advert (in the Witbank News); the placing of 4 x site notices at conspicuous places, the sending of notices to affected parties via email (in the form of Background Information Documents) and sms'.
- A public information meeting (open day) with IAPs was held on 4 October 2019 at the eMalahleni Main Library;
- Gathering comments, issues and concerns from IAPs;
- Responding to IAP comments, issues and concerns;
- Compilation and submission of results of consultation report to the DMR; and
- Providing IAPs with the opportunity to review and comment on the Draft Scoping and EIA Reports

Refer to the PPP report in Appendix 2 for the full details of the PPP carried out to date.

Summary Of Landowner Consultation And Public Participation

Adjacent Landowners



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Adjacent landowners were identified through windeed and other projects in the surrounding areas. These landowners were then notified of the project via email and sms notification. Adjacent landowners were further invited to comment on the project / reports, and to attend the Public Open Days where questions can be asked and answered and concerns raised.

Interested and Affected Parties

All other interested and affected parties (I&APs) were notified through the placement of site notices around the Project Area, and Advertisements placed in the Witbank News. I&APs were invited to comment on the Draft Reports and also to attend the Public open days.

Commenting Authority Consultation

Commenting Authorities were provided with a copy of the Draft Reports and urged to give comments on the project. The following Commenting Authorities were provided with reports:

Department	Attention to
Department: Water Affairs - Bronkhorstspuit	Musa Lubambo
Mpumalanga Provincial Government DARDLEA	Ms. S.P. Xulu (HOD)
Nkangala District Municipality	Pierre Rossouw
eMalahleni LM	Erald Nkabinde
Mpumalanga Tourism and Park Agency	Komilla Narasoo
Department of Roads and Transport	Mr Mxolisi Cyril Dlamini
Department of Agriculture forestry and fisheries	Doreen Sithole
Mpumalanga Economic Development & Tourism	Mr PS Mohlala
Department of Mineral Resources (Competent Authority)	Registry



3.g.iii Summary of issues raised by I&APs

Table 3.6: Summary of the issues raised by the various I&APs and the EAP's response/feedback thereto

Interested and Affected Parties List the names of persons consulted in this column, and Mark with an X where those who must be consulted were in fact consulted	Date Comments Received	Issues raised	EAPs response to issues as mandated by the applicant	Section reference in this report where the issues and or response were incorporated.
Affected Parties				
Landowner/s				
Sudden Impact Inv 76 Pty Ltd	x	Lease Agreement with consent to mine		
Jumbo Van der Merwe Trust	x	Lease Agreement with consent to mine		
Lawful occupier/s of the land				
NA				
NA				
Landowners or lawful occupiers on adjacent properties				
Kassie Volschenk	x	Email: 2019-09-18 He is part owner of a portion of Blesboklaagte and would like to confirm if the mining will impact on his portion. As he lives in Witrivier and wouldn't want to drive through unnecessarily	A Map was sent of the relevant portions to be impacted upon, and we requested the details of the portion owned by him	Appendix 2, Section 3.b and 3.c
Kassie Volschenk	x	Email: 2019-09-18 He responded with a map of his portion (portion 62), and stated that it does not look like he will be influenced. He is looking for the mining company that will affect his property, as he wants to sell.	We confirmed that he will not be influenced, and that we also do not know who the correct contact would be for that portion.	N/A
Kruger, Hilmer	x	Notification sent via sms, refer to proof of sms notification in Appendix 2		
Barnard James Flanagan	x	Notification sent via email and sms, refer to proof of sms notification in Appendix 2		
Nelesh Ashokkumar Rama	x	Notification sent via email and sms, refer to proof of sms notification in Appendix 2		
Rivertrans cc		No contact details available		
AM Matou - Pap en Vleis shop	x	Letter: 2019-09-02 Acknowledged blasting within the 500m radius notification. No further comments.	Applicant notified and consulted the shop owner regarding future blasting activities and the actions that will be put in place for the safety of residents and occupiers.	Appendix 2
H Mnisis	x	Letter: 2019-09-02 Acknowledged blasting within the 500m radius notification. No further comments.	Applicant notified and consulted the resident regarding future blasting activities and the actions that will be put in place for the safety of residents and occupiers.	Appendix 2
VV Tshabalala	x	Letter: 2019-09-02 Acknowledged blasting within the 500m radius notification. Raised concerns regarding Coal Dust	Applicant notified and consulted the resident regarding future blasting activities and the actions that will be put in place for the safety of residents and occupiers. Mitigation will be in place to avoid the spread of dust from site. Such measures include:	Appendix 2 Section 3.g.viii



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Interested and Affected Parties List the names of persons consulted in this column, and Mark with an X where those who must be consulted were in fact consulted	Date Comments Received	Issues raised	EAPs response to issues as mandated by the applicant	Section reference in this report where the issues and or response were incorporated.
			-dust suppression -avoiding blasting during windy periods	
MG Magane	x Letter: 2019-09-02	Acknowledged blasting within the 500m radius notification. No further comments.	Applicant notified and consulted the resident regarding future blasting activities and the actions that will be put in place for the safety of residents and occupiers.	Appendix 2
Evatis Lekhuzo	x Letter: 2019-09-02	Acknowledged blasting within the 500m radius notification. No further comments.	Applicant notified and consulted the resident regarding future blasting activities and the actions that will be put in place for the safety of residents and occupiers.	Appendix 2
MR KF Senoamadi	x Letter: 2019-09-03	Acknowledged blasting within the 500m radius notification. No further comments.	Applicant notified and consulted the resident regarding future blasting activities and the actions that will be put in place for the safety of residents and occupiers.	Appendix 2
Municipal councilor				
Municipality	x Letter: 2019-12-11	The Emalahleni Local Municipality has no objection regarding the abovementioned activity by the mine within and or in close proximity of the municipal infrastructure provided that all safety aspects and below conditions are adhered to. The schedule and time table for execution of activities be submitted to the municipality, Municipal rights and services are acknowledged and respected at all times. 1. The 100 meters mining and prospective restriction either side (servitude) of the center of the water pipeline must be adhered to. 2. The applicant (Mine) accepts all the costs with regard to deviation, disturbance and or interruption of municipal service and to reinstate the service to its original condition/status. 3. The applicant (Mine) will adhere to all relevant environmental legislation.	Consent request for blasting within 500m of a municipal water pipeline, and mining within 100m of a municipal water pipeline	Appendix 2
Organs of state (Responsible for infrastructure that may be affected Roads Department, Eskom, Telkom, DWA)	x			
ESKOM	x Letter: 2020-02-11	This notice affects the existing Eskom Distribution lines, Churchill-Vulcan 132kV, Randcarbide-Vulcan 132kV. Eskom Distribution will raise no objection to the proposed Blasting operations provided Eskom's rights and services are acknowledged and respected at all times. There is a 15.5 meters building and tree restriction on either side of the Centre line of 132kV power lines, which must be adhered to in all future	Consent request for blasting within 500m of a powerline. The applicant takes note of the conditions and will abide by them.	Appendix 2



Interested and Affected Parties List the names of persons consulted in this column, and Mark with an X where those who must be consulted were in fact consulted	Date Comments Received	Issues raised	EAPs response to issues as mandated by the applicant	Section reference in this report where the issues and or response were incorporated.
		<p>development and or construction Eskom's rights are protected by Servitude. Further to the above the conditions as per letter must be adhered to and accepted in writing before any development and or construction</p>		
Department of Public Works, Roads and Transport	x Letter: 2019-04-07	<p>1. Your application dated 03 July 2019 has reference. 2. The department has no objection regarding the above mentioned activity provided the minimum safety factor in respect of all numbered roads is above the minimum of 2. 3. Acceptance letter regarding the following factors must be forwarded to this department before commencing with the activities: 4. COSTS 4.1 The applicant accepts all costs with regard to the deviation, the restoration of the existing road, the surveying and monitoring and reporting according to the conditions herein, should be required. 5. GENERAL CONDITIONS 5.1 The applicant safeguards the Premier and exempts him from any claims of loss of whatever nature that may be put forward or be suffered by any person, including legal costs of whatever nature, as a result of the undermining and / or deviation and related matters. 5.2 The Department shall reserve the right to ask the applicant for security in the form of a cash deposit or a surety from a financial institution as was agreed for such as amount as he may reasonably decide upon. This shall, if applicable, be rendered before a start is made with the mining activities that may influence the existing road. Such cash deposit shall be repaid, or the surety bond shall be cancelled when The Department has satisfied himself that all the conditions of this agreement have been met. 5.3 If any dispute of disagreement of whatever nature should arise with regard to fulfilment of the conditions contained herein, The Department shall reserve the right to cancel any previous agreement and to incur such repair costs with regard to the existing road as he deems necessary, for recovery from the applicant or the guarantors (as in 5.2). In such event mining activities that may influence the existing road shall be discontinued. 6. SPECIFIC CONDITIONS FOR ROAD P 100-1 6.1 The road must be inspected at a regular interval by a responsible person, and the necessary steps taken to repair the road at the shortest</p>	<p>Consent request to blast within 500 meters from provincial road p 100-1 03544) and surface structures and objects to be protected in terms of the Mine Health And Safety Act, 1996 (Act 29 Of 1996).</p> <p>The applicant takes note of the conditions and will abide by them.</p>	Appendix 2



Interested and Affected Parties List the names of persons consulted in this column, and Mark with an X where those who must be consulted were in fact consulted	Date Comments Received	Issues raised	EAPs response to issues as mandated by the applicant	Section reference in this report where the issues and or response were incorporated.
		<p>possible time, should it become necessary, to maintain a safe road surface.</p> <p>6.2 At this stage it will not be necessary to undertake the survey of the road, as mentioned in paragraph 3.3 above. The right to request this at a later stage, is maintained, should it become necessary.</p> <p>6.3 The necessary equipment to speedily repair the road, should it become necessary, must be available at all times.</p> <p>6.4 The permission is granted in terms of the Advertising on Roads and Ribbon Development Act, (Act 21 of 1940 as amended) and the Road Ordinance, (Ordinance 22 of 1957) and does not exempt you from the provisions of any other law.</p> <p>No undermining operations may continue, before a copy of mining permit has been provided to our office.</p> <p>7. ACCEPTANCE OF CONDITIONS</p> <p>No mining activities that might have an influence on the road may take place without written acceptance of all the conditions contained and such compliance with the same as may be applicable.</p>		
Transnet	x Letter: 2019-10-16	<p>Although Transnet SOC Ltd {Registration No 1990/000900/30} has no objection to the proposed blasting by Eyethu Coal closer than 500m from Transnet buildings and structures over portions of the farm Blesboklaagte No. 2961S, we have to refute and object to the position of the mining boundary, as shown on the "Blast Radius Plan". The mining area cannot be within Transnet land</p> <p>We suggest a new plan and application showing the mine boundary outside the Transnet 100 m restricted area.</p> <p>Please note that according to Regulation 17 (6) (a) of the Mine Health and Safety Act of 1996, no mining or blasting activities are allowed on, or within 100 metres of any railway reserve of Transnet SOC Ltd.</p>	<p>Consent request to blast within 500 meters from Transnet buildings and structures.</p> <p>The applicant acknowledges that the mining Right area traverses the Transnet line and servitude, however no mining will be undertaken on the Eastern side of the Road, and therefore no mining will be undertaken within the 100m reserve of the Transnet railway.</p>	Appendix 2 Figure 3.4
Communities				
Dept. Land Affairs	x 2019/09/16	Draft Scoping and EIA Reports were sent to the DARDLEA for comment. No comments received to date.		
Traditional Leaders		None identified within or adjacent to the project		



Interested and Affected Parties List the names of persons consulted in this column, and Mark with an X where those who must be consulted were in fact consulted	Date Comments Received	Issues raised	EAPs response to issues as mandated by the applicant	Section reference in this report where the issues and or response were incorporated.
Dept. Environmental Affairs	x	2019/09/16	Draft Scoping and EIA Reports were sent to the DARDLEA for comment. No comments received to date.	
Other Competent Authorities affected	x			
Mpumalanga Tourism and Parks Agency - Phumla Nkosi	x	<p>Email, official letter, 10 October 2019</p> <p>With reference to your correspondence MP 30/5/1/2/2 (10058) EM of date 10/09/2019, received on the 16th September herewith our comments: MTPA has no objection to this application but has the following concerns: In terms of the MBSP, terrestrial biodiversity assessment, parts of these portions have the status of CBA Irreplaceable and CBA Optimal areas that needs to be avoided. The MTPA acknowledges the fact that the environment could have changed in a few years and that the area could have been degraded to such an extent that ground truthing of the PES is needed.</p>	This comment is noted	
		1. The MTPA therefor requires that an Ecological study is done	An Ecological Study was undertaken and presented in the EIA	Section 3.g.iv.1.a Appendix 3
		2. A botanical survey is required for the proposed mining site and immediate adjacent natural areas. All the species of conservation concern (Protected plants) should be marked for rescue purposes.	An Botanical Study was undertaken and presented in the EIA, along with management plans for species of conservation concern, should any be present	Section 3.g.iv.1.a Appendix 3
		3. A thorough rehabilitation plan designed to prevent AMD entering the natural system as well as the prevention of the re-colonization by exotic vegetation should be implemented.	A Rehabilitation plan was compiled to assist with preventing and treating decant. An Alien Invasive Management plan was also form part of the EMP.	Appendix 3 Appendix 1
		4. An Active water purification system must be investigated and must address the possible pollution through AMD decanting, underground pollution plume, storm water pollution from discard dumps, overflow from pollution control facilities and leachates. Clean water must be provided back into the natural system.	Eyethu will investigate all possible water treatment options along with the DWS.	Appendix 3
OTHER AFFECTED PARTIES				
N/A				
INTERESTED PARTIES				
N/A				



3.g.iv The Environmental Attributes Associated with The Sites

3.g.iv.1 Baseline Environment

3.g.iv.1.a Type of Environment Affected by the proposed activity

The following specialist studies have been undertaken as part of the EIA process.

Table 3.7: List of Specialists

Specialist Study	Appointed Specialist	Company
Socio-Economic Impact Study	Ingrid Snyman	Batho Earth (Pty) Ltd
Air quality	Neel Breitenbach	Eco Elementum (Pty) Ltd
Aquatic Ecology	Joppie Schrijvershof	Oasis Environmental Specialists (Pty) Ltd
Visual Impact Assessment	Neel Breitenbach	Eco Elementum (Pty) Ltd
Noise Assessment	Henno Engelbrecht	Eco Elementum (Pty) Ltd
Blasting and Vibration	Marica Pretorius	Big C Rock Engineering
Ecological	Joppie Schrijvershof	Oasis Environmental Specialists (Pty) Ltd
Geo-hydrological	Elida Naude	Eco Elementum (Pty) Ltd
Surface water	Krug Hamman / Werner Kussel	Eco Elementum (Pty) Ltd
Wetland	Joppie Schrijvershof	Oasis Environmental Specialists (Pty) Ltd
Heritage, Archaeological, and Paleo	Tobias Coetzee	Mr. Tobias Coetzee
Soils, land use and land capability	Mariné Pienaar	Terra Africa



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Climate and Air Quality

Information for this field were taken from the Air Quality Impact Assessment for Blesboklaagte Colliery done by Eco Elementum (Pty) Ltd

Climate

Based on an evaluation of the meteorological data simulations run from the global NEMS weather model at ~30 km resolution from 1985 to current of the project area. The following deductions can be made from Figure 3.7; in the summer months' maximum average daily temperatures are predicted to be 25°C to 27°C on average with a maximum of 32°C possible during hot days, dropping to a predicted 9°C to 14°C on average at night and 2°C minimum on cold nights. During winter months the average day time temperature are predicted in the 18°C to 23°C range while cold winter night time temperatures predicted to drop to -3°C.

Falling in a summer rainfall area, the location is predicted to receive the most precipitation in the summer months of October to March overall. November to January are predicted the highest rainfall months with between 89 mm to 100 mm predicted per month during these months. February, March and October is predicted to receive 53 mm to 66 mm precipitation. All other months are predicted to receive less than 26 mm precipitation on average during the month.

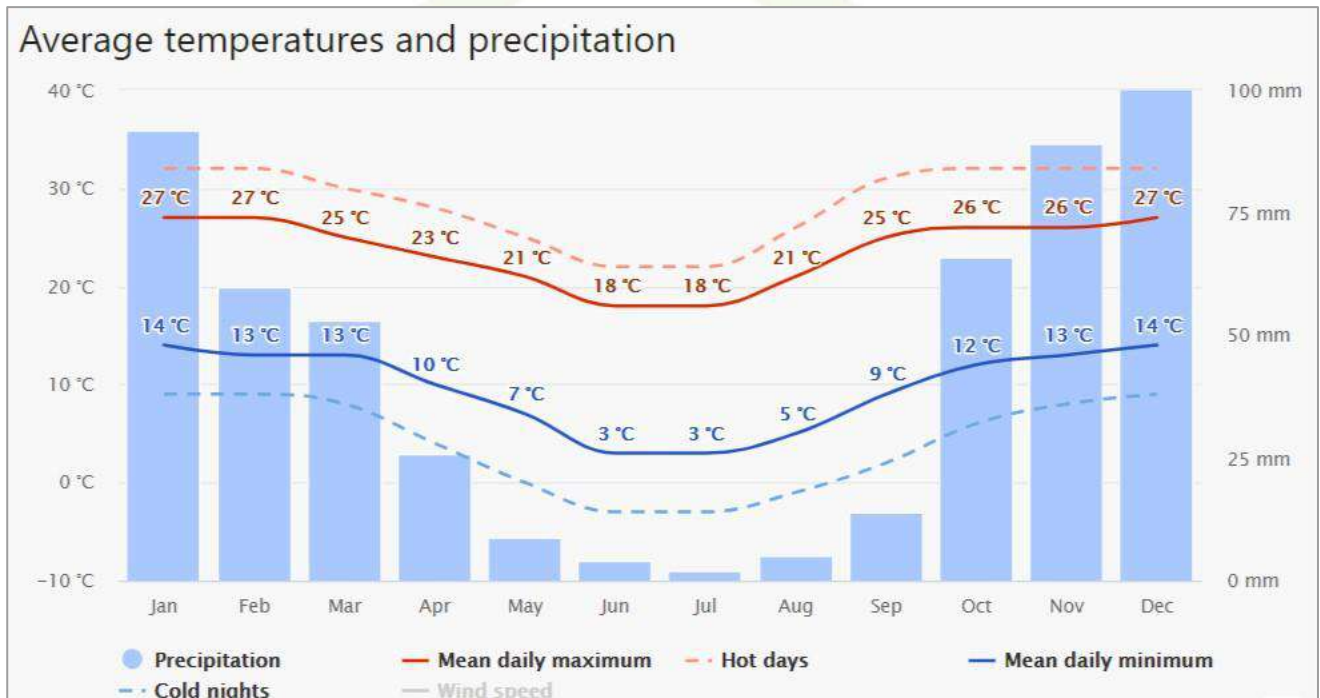


Figure 3.7: Temp and precipitation simulation results from the NEMS model for the Blesboklaagte project area (1985 - current).



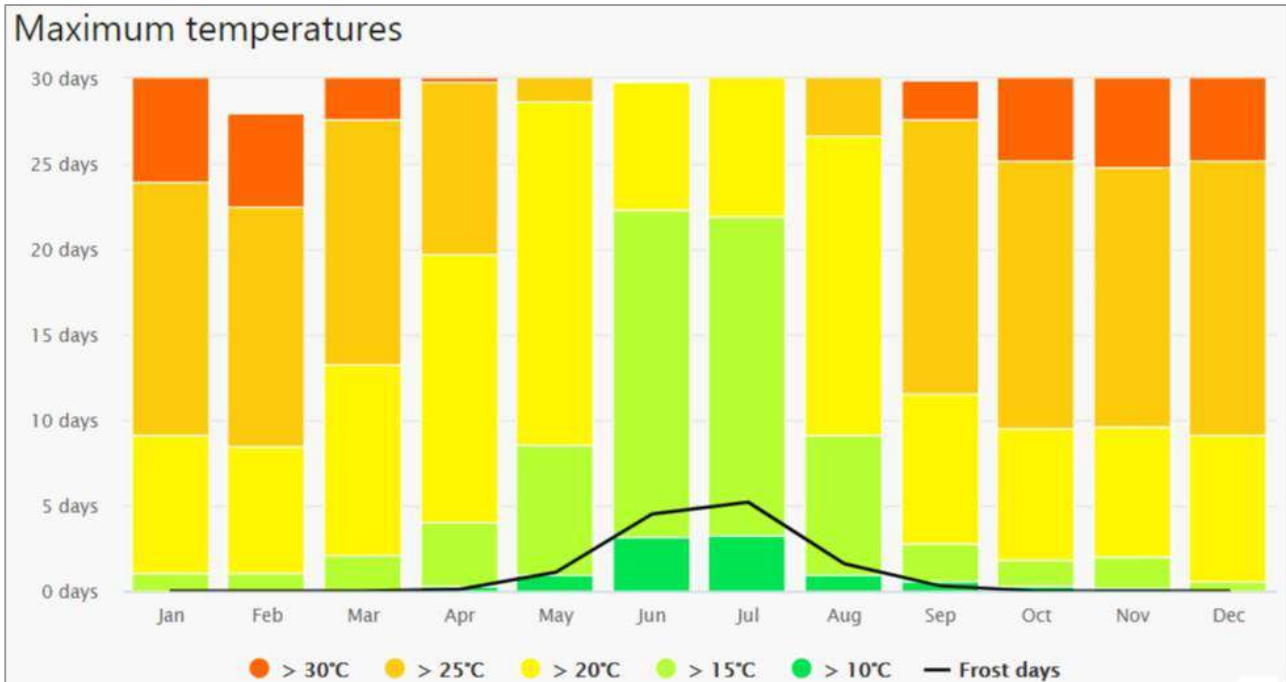


Figure 3.8: Maximum temperatures as simulated from the NEMS 30 km model for the proposed Blesboklaagte project area (1985 – current).

The total precipitation predicted at the Blesboklaagte project area is shown in Figure 3.9 below.

The highest precipitation days are predicted during the months of October to March. During these months' precipitation is predicted to only occur 13 to 21 days on average. The rest of the year precipitation is predicted to occur less than 6 days per month.

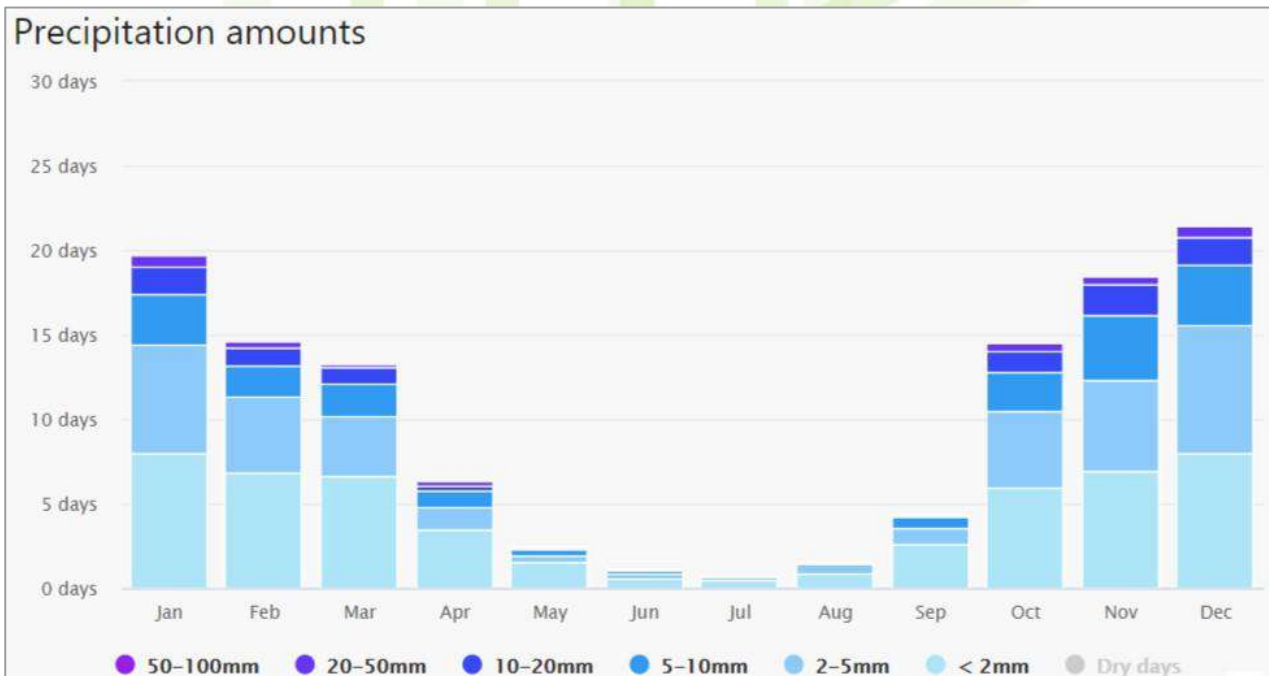


Figure 3.9: Day count of total daily precipitation per month for the proposed Blesboklaagte project area for the period 1985 – current.



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Baseline Air Quality

The following baseline information was sourced from the **Baseline Assessment, Problem Analysis and the Air Quality Management Plan for the Highveld Priority Area (2011)**.

The Highveld area in South Africa is associated with poor air quality, and elevated concentrations of criteria pollutants occur due to the concentration of industrial and nonindustrial sources (Held et al, 1996; DEAT, 2006). The Minister of Environmental Affairs and Tourism, Martinus van Schalkwyk, therefore, declared the Highveld Priority Area (HPA) on 23 November 2007. The priority area covers 31 106 km², including parts of Gauteng and Mpumalanga Provinces, with a single metropolitan municipality, three district municipalities, and nine local municipalities (Figure 3.10).

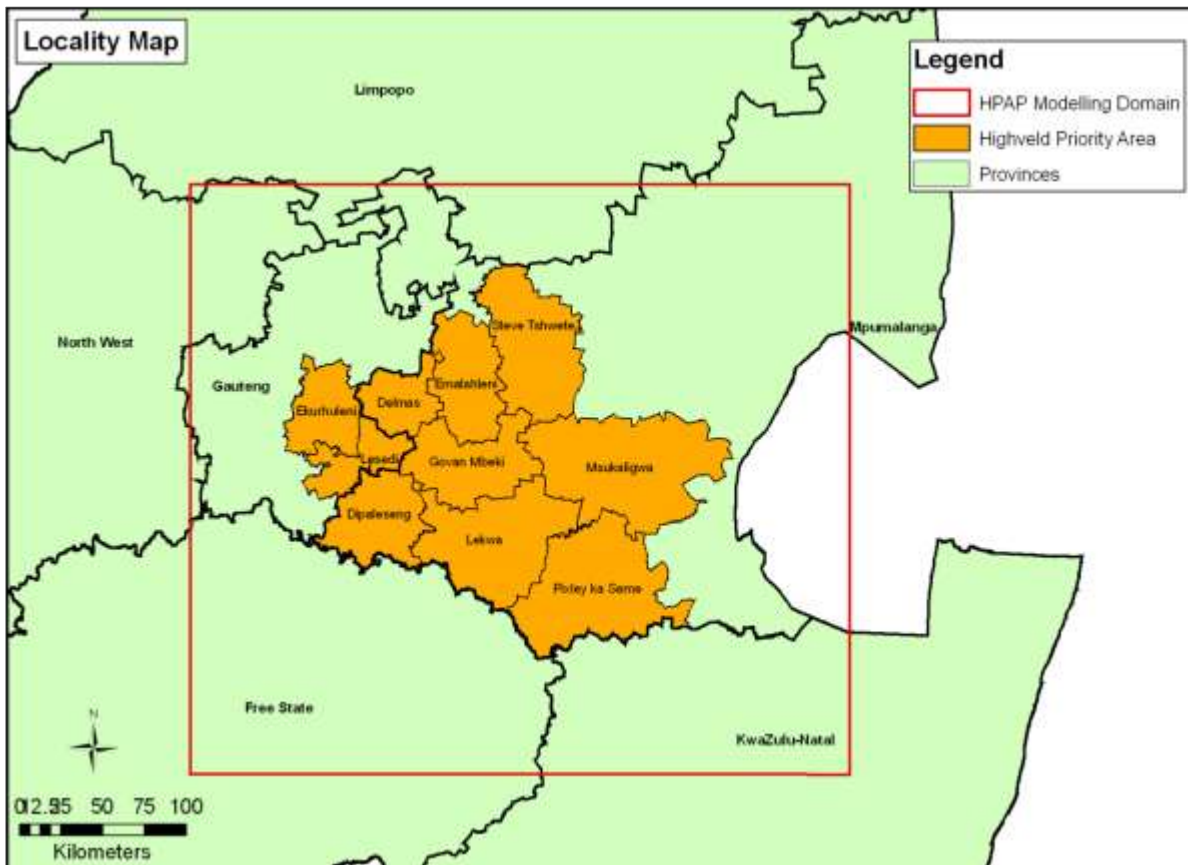


Figure 3.10: Highveld Priority Areas (HPA)

The total estimated annual emissions of fine particulate matter (PM₁₀) on the HPA is 279 630 tons, of which approximately half is attributed to particulate entrainment on opencast mine haul roads. The emission of PM₁₀ from the primary metallurgical industry accounts for 17% of the total emission, with 12% of the total from power generation. By contrast, power generation contributes 73% of the total estimated oxides of nitrogen (NO_x) emission of 978 781 tons per annum and 82% of the total estimated sulphur dioxide (SO₂) emission of 1 633 655 tons per annum. The emission inventory for industrial sources was relatively complete and included all industries on the HPA with scheduled processes in terms of the APPA. Industrial sources in total are by far the largest contributor of emissions in the HPA, accounting for 89% of PM₁₀, 90% of NO_x and 99% of SO₂. Major industrial source contributors were grouped into the following categories:

- Power Generation
- Coal Mining
- Primary Metallurgical Operations
- Secondary Metallurgical Operations
- Brick Manufacturers
- Petrochemical Industry



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- Ekurhuleni Industrial Sources
- Mpumalanga Industrial Sources

Table 3.8: Total emission of PM₁₀, NO_x and SO₂ from the different source types on the HPA (in tons per annum), and the percentage contribution for each source category

Source Category	PM ₁₀ t/a	%	NO _x t/a	%	SO ₂ t/a	%
Ekurhuleni MM Industrial (incl. Kelvin)	8909	3,00	15 636	2	25 772	2
Mpumalanga Industrial	684	0,00	590	0	5 941	0
Clay Brick Manufacturing	9708	3,00	-		9 963	1
Power Generation	34373	12,00	716 719	73	1 337 521	82
Primary Metallurgical	46805	17,00	4 416	0	39 582	2
Secondary Metallurgical	3060	1,00	229	0	3 223	0
Petrochemical	8246	3,00	148 434	15	190 172	12
Mine Haul Roads	135766	49,00	-		-	-
Motor vehicles	5402	2,00	83 607	9	10 059	1
Household Fuel Burning	17239	6,00	5 600	1	11 422	1
Biomass Burning	9438	3,00	3 550	0	-	-
TOTAL HPA	279630	99*	978781	100	1633655	101*

* Total Percentage does not count to 100% due to rounding of figures.

Ambient air quality

Most of the HPA experiences relatively good air quality, but ambient air quality standards for SO₂, PM₁₀ and ozone (O₃) concentrations are exceeded in nine extensive areas. These “hot spots” are illustrated in Figure 3.10 by the number of modelled exceedances of the 24-hour SO₂ and PM₁₀ standards, and are confirmed by ambient monitoring data (Table 3.9). The air quality hot spots result mostly from a combination of emissions from the different industrial sectors and residential fuel burning, with motor vehicle emissions, **mining** and cross boundary transport of pollutants into the HPA adding to the base loading.

Available monitoring confirms that the areas of concern are in the vicinity of **Witbank 2**, Middelburg, Secunda, Ermelo, Standerton, Balfour, and Komati where exceedances of ambient SO₂ and PM₁₀ air quality standards occur (Table 3.9).

Table 3.9: Exceedances at HPA sites based on historic and new monitoring data

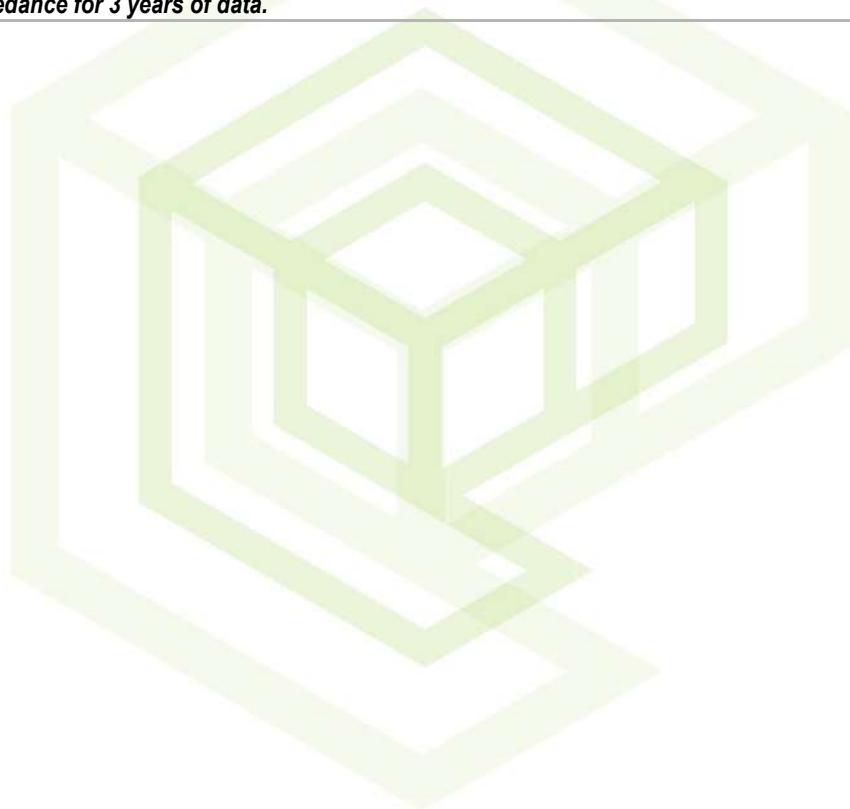
Municipality	Area	NO ₂ 1-hr (88)	O ₃ 8-hr (11)	PM ₁₀ 24-hr (4)	SO ₂ 24-hr (4); 1-hr (88)
Emalahleni LM	Kendal 2	1	58		34; 343
	Phola	0		3	7; 27
	Witbank	37	9	9	4; 51
	Witbank 2		17	25	1; 11
Steve Tshwete LM	Columbus				
	Komati 2			26	1; 14
	Hendrina	1	22	3	1; 2
	Middelburg	71	60	7	1; 4
	Middelburg 2		1	7	0; 1
Govan Mbeki LM	Sasol Club	1		0	0; 25
	Langverwacht	1		0	2; 78
	Bosjesspruit				2; 27



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Municipality	Area	NO ₂ 1-hr (88)	O ₃ 8-hr (11)	PM ₁₀ 24-hr (4)	SO ₂ 24-hr (4); 1-hr (88)
	Elandsfontein	0	73	3	4; 33
	Leandra				6; 114
	eMbalenhle	2	4	39	0; 1
Msukaligwa LM	Camden	0	24	1	0; 4
	Ermelo	1	73	22	21 ; 10
Pixley Ka Seme LM	Amersfoort				
	Majuba 1				4; 87
	Majuba 2				
	Verkykkop	0	46	0	1; 7
Lekwa	Standerton	4	10	29	1; 6
Dipaleseng	Balfour		29	8	0; 4

NB. - Row 1: The averaging period for the relevant pollutant's standard is represented below the pollutant and following the allowed frequency of exceedance in brackets - Exceedances in bold are greater than the permitted frequency in the standard for the monitoring period. The permitted frequency of exceedance varies according to period for which data is presented at each monitoring site, and for Eskom and Sasol stations must be assessed against a cumulative permitted frequency of exceedance for 3 years of data.



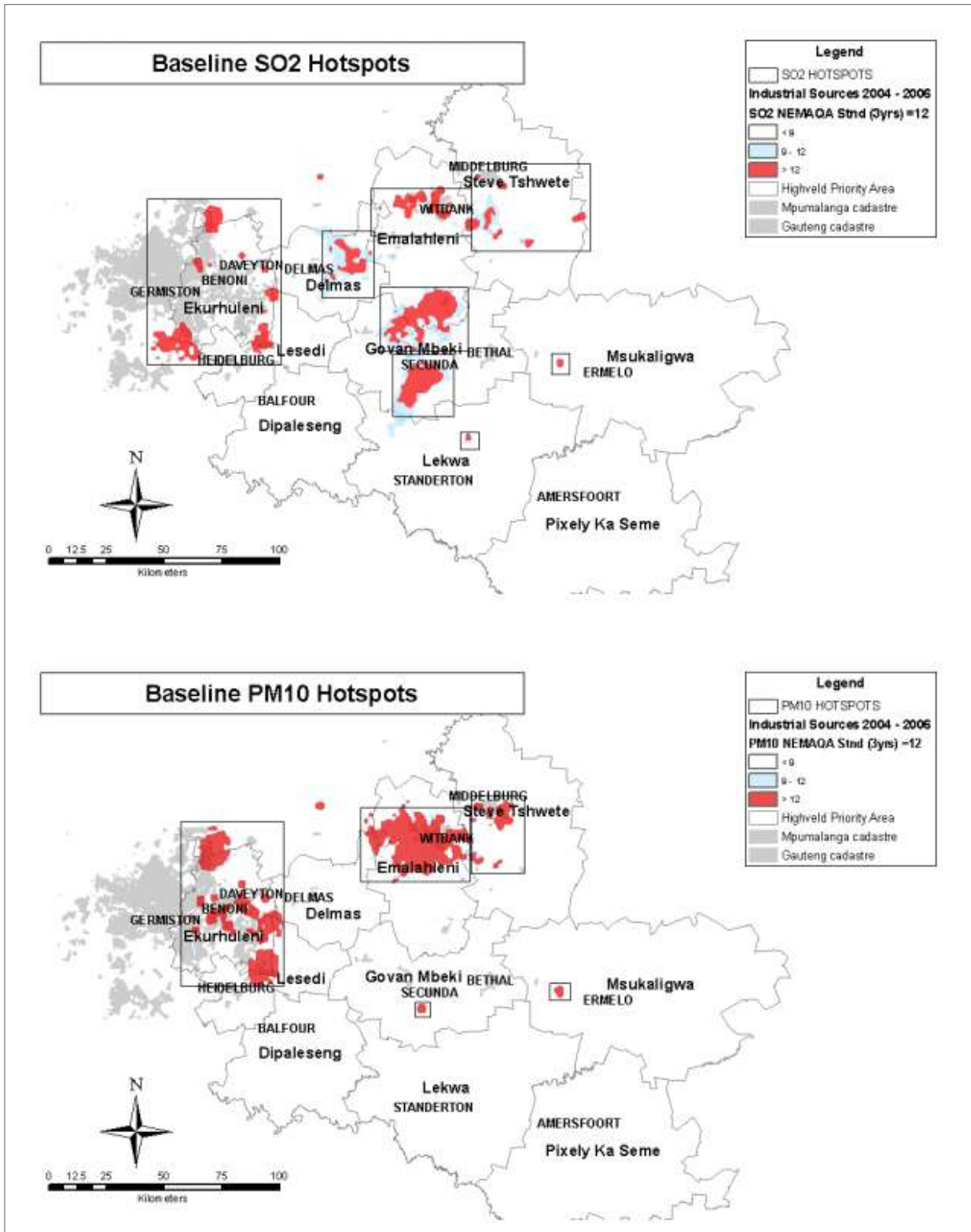


Figure 3.11: Modelled frequency of exceedance of 24-hour ambient SO₂ and PM₁₀ standards in the HPA, indicating the modelled air quality Hot Spot areas

Site-Specific Dispersion Potential

A period wind rose for the site is presented in Figure 3.13 below. Wind roses comprise of 16 spokes which represents the direction from which winds blew during the period. The colours reflect the different categories of wind speeds. The dotted circles provide information regarding the frequency of occurrence of wind speed and direction categories.



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Based on an evaluation of the meteorological data simulations run from a global NEMS weather model at ~30 km resolution from 1985 to current of the project area. The following deductions regarding the prevailing wind direction and wind frequency can be assessed. Looking at Figure 3.13 below, the predominant wind direction is predicted to occur mainly from the east and east-north-east as well as north-west and west-north-west more than 1350 and 1370 hours per year, respectively, with wind speeds higher than 5 km/h.

From Figure 3.12, at the site, calm conditions with wind speeds of 12 km/h or less, are predicted 2-9 days per month throughout the year. 12-19 km/h winds are predicted 10-16 days per month through the year. Wind speeds of more than 19 km/h are predicted to occur 7-17 days per year on average.

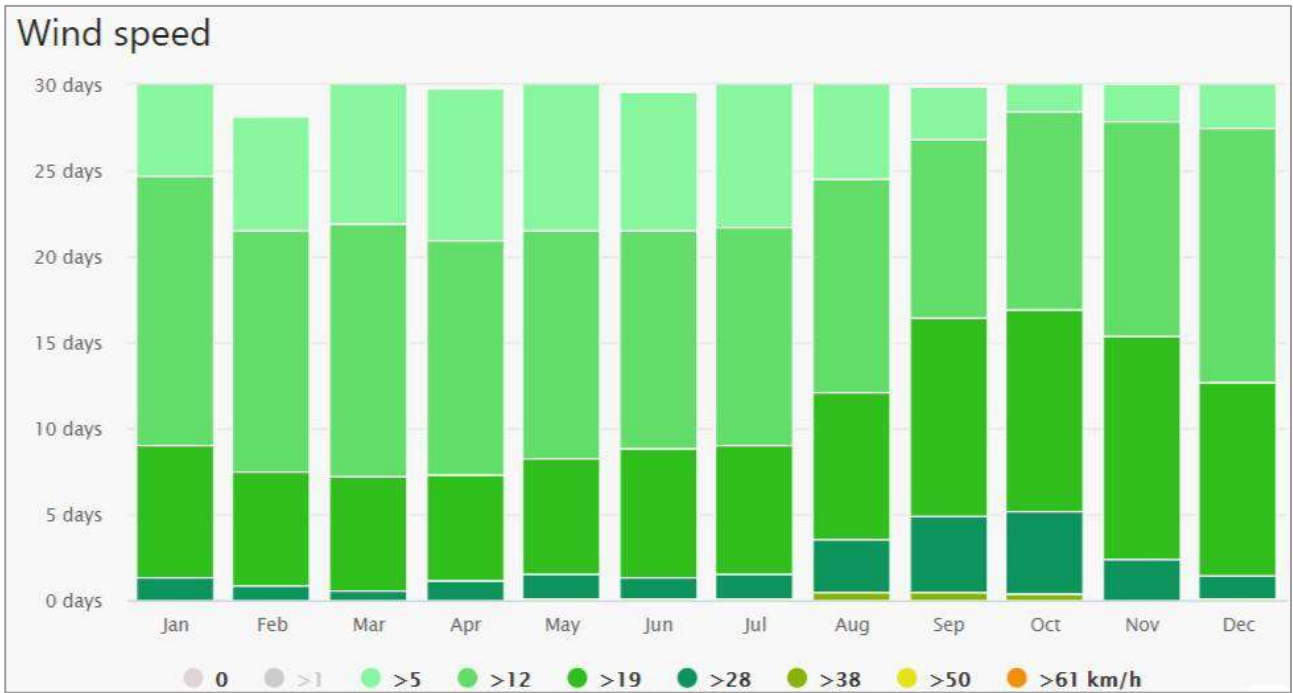


Figure 3.12: Wind Class Frequency Distribution per month.



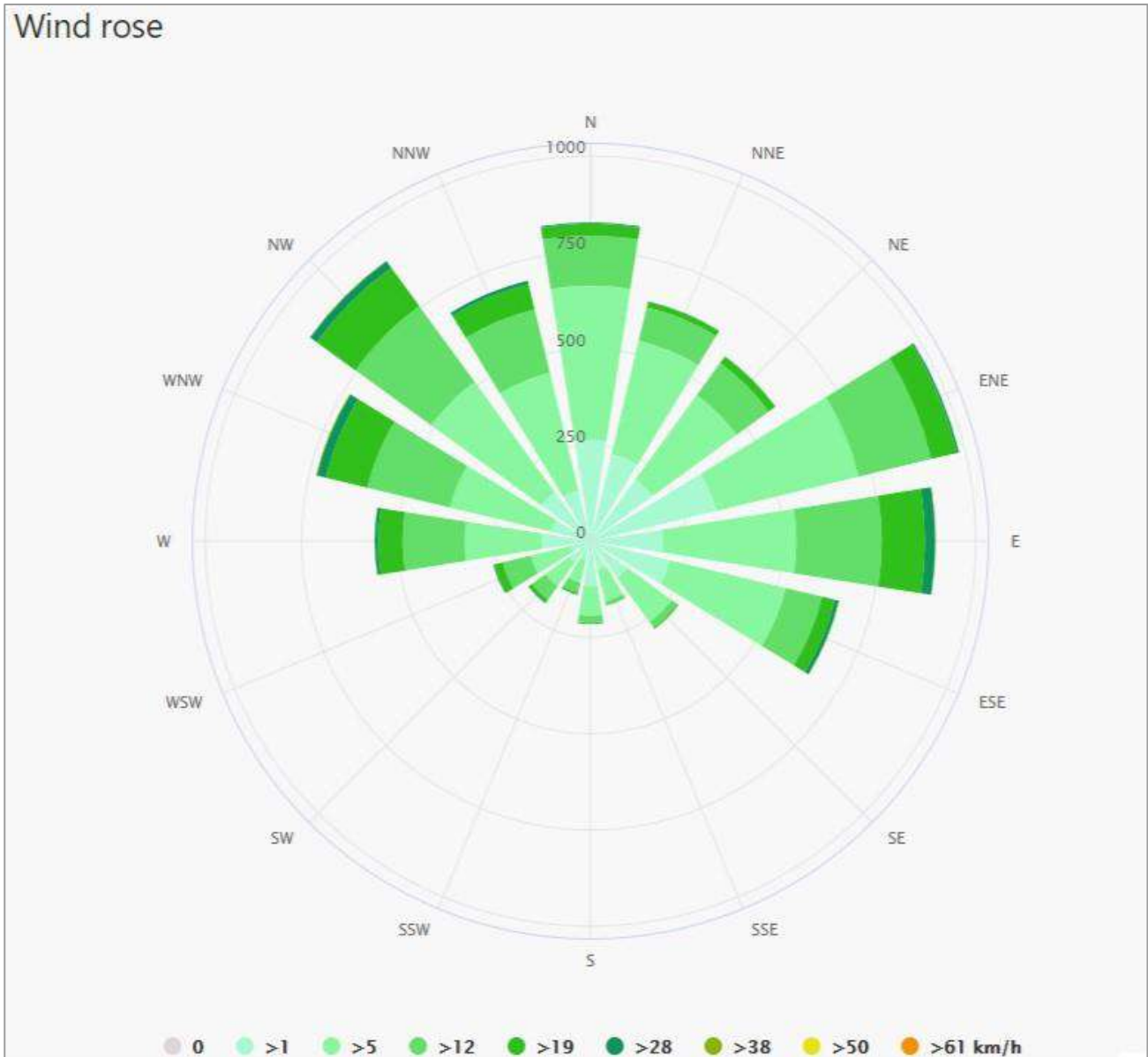


Figure 3.13: NEMS 30 km simulation model wind rose for the proposed Blesboklaagte project area for the period 1985 to current.

Topography

Eastern Highveld Grassland is characterised by slightly to moderately undulating plains, including some low hills and pan depressions with an altitude 1 520–1 780 m.



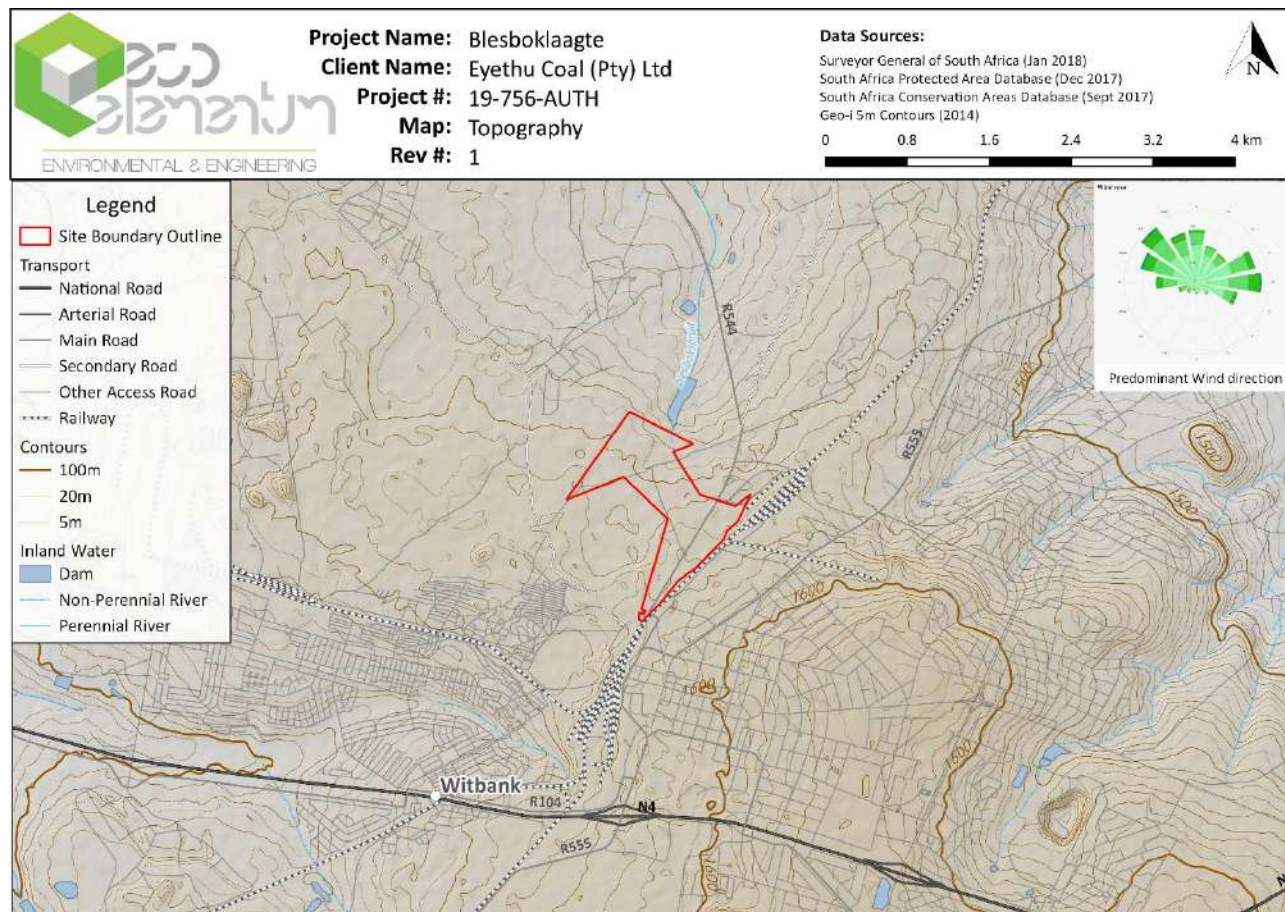


Figure 3.14: Topography of the area

Soil Classification and Land Capability

Soil, land use, land capability and agricultural potential study for the Blesboklaagte colliery project, Mpumalanga (Terra Africa, 2020).

Land capability and agricultural potential:

The land capability of an area is the combination of the inherent soil properties and the climatic conditions as well as other landscape properties such as slope and drainage patterns that may inhibit agricultural land use or result in the development of specific land functionality such as wetlands. Land capability affects the socio-economic aspects of human settlements and determine the livelihood possibilities of an area. Baseline land capabilities are also used as a benchmark for rehabilitation of land in the case of project decommissioning.

In order to determine the high-level land capability classification of the Blesboklaagte Colliery Mining Right Area, the site boundaries of the area were superimposed on the Land Capability Classification Raster Data obtained from DAFF (DAFF, 2017). The new system developed by DAFF consists of fifteen land capability classes. Following the newly released GN320 of NEMA, land capability values of 1 to 5 is considered to be land with low sensitivity to a proposed new development. Land capability values of 6 to 7 is considered to be of medium sensitivity to proposed new developments.

Following the spatial depiction of the site boundaries and proposed surface disturbance footprints (North Pit, South Pit and Infrastructure Area) over the land capability raster data, the area mostly includes land with Moderate (Class 08) to Moderate-High (Class 10) land capabilities.

For consideration of the South African Chamber of Mines Land Capability Classification System, the ENPAT data was used to determine into which category the site mainly falls. The land capability classification criteria that was developed by the South African Chamber of Mines and originally published in 1981 in the Guidelines for the rehabilitation of land disturbed by surface coal mining in South Africa. These criteria remained unaltered in the 2007 guidelines and are outlined in Table 3.10.



Table 3.10: Pre-Mining Land Capability Requirements

Criteria for Wetland	<ul style="list-style-type: none"> • Land with organic soils or • A horizon that is gleyed throughout more than 50 % of its volume and is significantly thick, occurring within 750mm of the surface.
Criteria for Arable Land	<ul style="list-style-type: none"> • Land, which does not qualify as a wetland, • The soil is readily permeable to the roots of common cultivated plants to a depth of 750mm, • The soil has a pH value of between 4,0 and 8,4, • The soil has a low salinity and SAR, • The soil has a permeability of at least 1,5-mm per hour in the upper 500-mm of soil • The soil has less than 10 % (by volume) rocks or pedocrete fragments larger than 100-mm in diameter in the upper 750-mm, • Has a slope (in %) and erodibility factor (K) such that their product is <2,0, • Occurs under a climatic regime, which facilitates crop yields that are at least equal to the current national average for these crops, or is currently being irrigated successfully.
Criteria for Grazing Land	<ul style="list-style-type: none"> • Land, which does not qualify as wetland or arable land, • Has soil, or soil-like material, permeable to roots of native plants, that is more than 250-mm thick and contains less than 50 % by volume of rocks or pedocrete fragments larger than 100-mm, • Supports, or is capable of supporting, a stand of native or introduced grass species, or other forage plants, utilizable by domesticated livestock or game animals on a commercial basis.
Criteria for Wilderness Land	<ul style="list-style-type: none"> • Land, which does not qualify as wetland, arable land or grazing land.

According to the criteria indicated in Table 9 and following the Mpumalanga ENPAT data, the entire Blesboklaagte Colliery Mining Right Area can be classified as land with arable land capability. It should be noted that this data does not take any recent developments into consideration and therefore the areas already impacted upon by coal mining activities as well as the area fenced-off by Anglo Coal, is still considered to have arable land capability according to this spatial data.

Land Types

According to the land type classification data, the entire Blesboklaagte Colliery Mining Right Area only consists of one land type i.e. Land Type Bb13 (Figure 3.15) . To the far east of the site, a small area of Land Type Fa8 is present but that is more than 1000m away from the site and not considered relevant for the discussion of typical soil profiles of the Blesboklaagte Colliery study area. The land type data sheet for Land Type Bb13 is dated 10 November 2006 and the inventory was conducted by J.L. Schoeman of the Land Type Survey Staff of the ARC – Institute for Soil, Climate and Water.

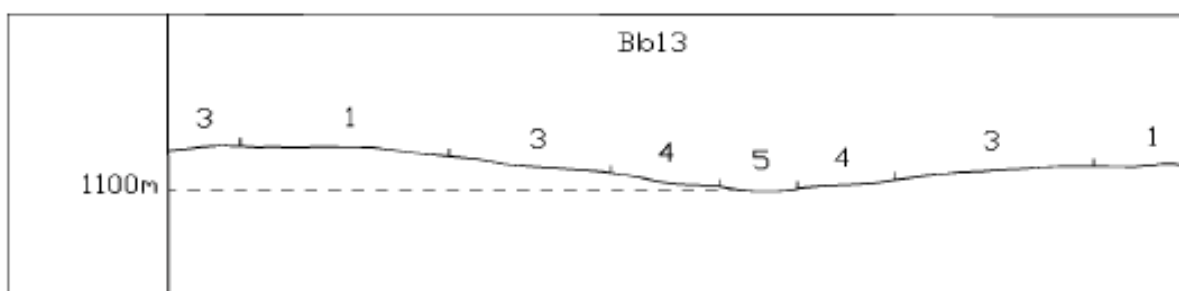


Figure 3.15: Terrain form sketch of Land Type Bb13

Land Type Bb13 consists of four different terrain units that reflect the different hillslope positions in slightly undulating landscapes (Figure 5). For this land type, an estimated 40% of the area consists of hilltop (or crest) positions where the slope ranges between 0 and 4%. The crest positions consist of a mixture of medium-deep to deep profiles of the Clovelly, Avalon, Glencoe and Hutton forms. An estimated 45% of the total land type area consists of mid-slope positions (Terrain unit 3) where the slope ranges between 2 and 6%. This terrain unit consists of a similar mixture of soil forms.



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Approximately 10% of the entire area estimated to consist of Land Type Bb13, consist of upper valley-bottom positions where the water infiltration rate may be restricted and water flow in a lateral direction may contribute water to the valley bottom areas (Terrain unit 5). The dominant soil forms of Terrain unit 4 are that of the Avalon, Longlands and Kroonstad forms and the average slope ranges between 1 and 3%.

The valley bottom position (an estimated 5% of this land type), is dominated by the Katspruit and Kroonstad forms (approximately 70% likelihood of being present) while the remaining 30% may consist of the Longlands and Fernwood forms. The average slope of this terrain unit ranges between 0 and 1%.

The textural analysis from the land type data sheet indicate that the clay content of the orthic A horizons range between 6 and 25% clay fractions, depending on the soil form. The average subsoil clay content ranges between 8 and 25%.

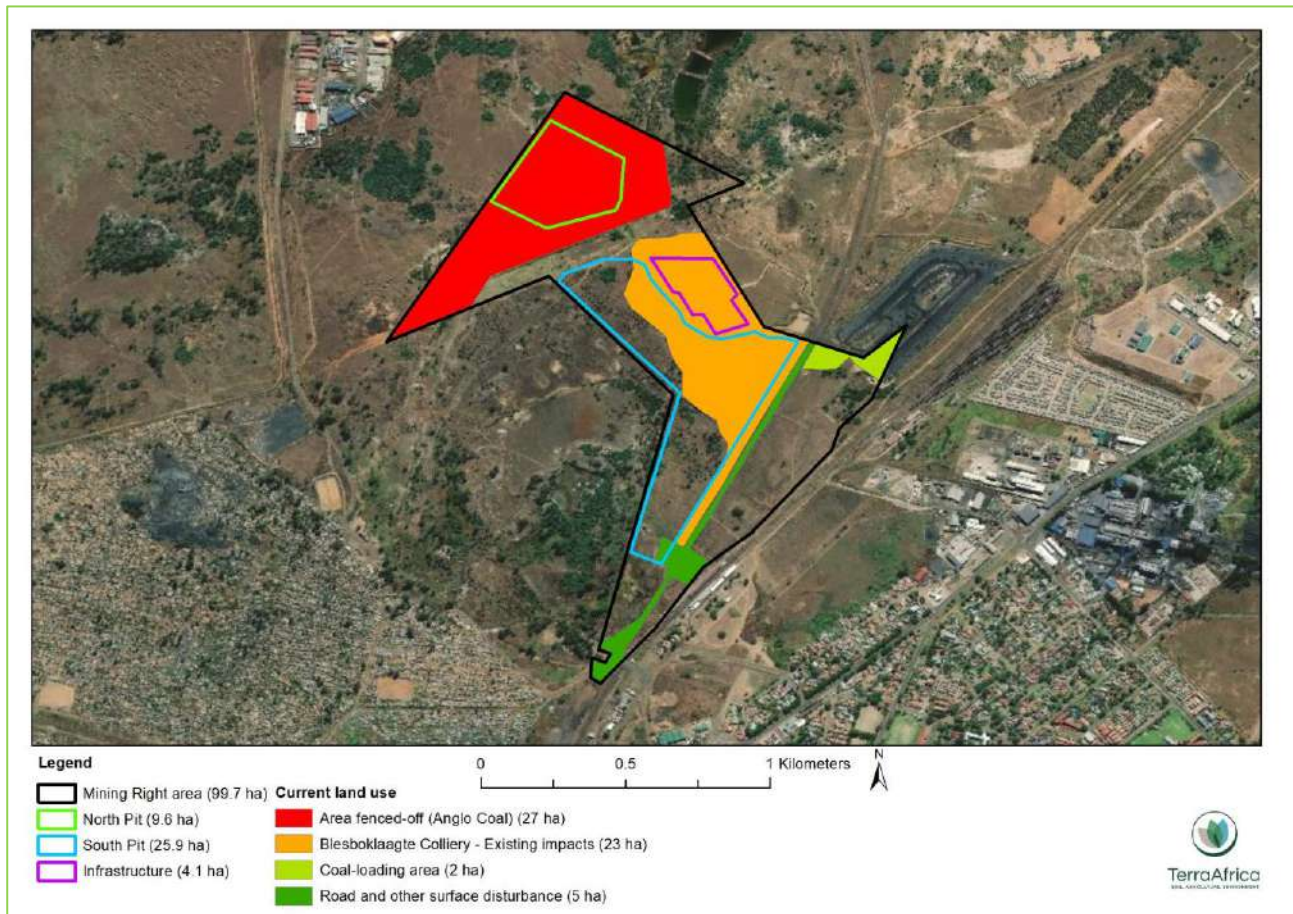


Figure 3.16: Current land use map of the Blesboklaagte Colliery Mining Right Area

Land Use

As indicated by Figure 3.17, the area is not currently used for any crop production. The Blesboklaagte Colliery area currently consists of a mixture of land uses that include the following:

- Existing coal mining operations towards the middle of the Mining Right Area.
- A fenced-off area that are prone to subsidence caused by the spontaneous combustion of the underground coal resource
- Part of a coal-loading facility along the eastern boundary of the Mining Right Area
- A road traversing through the area (the R544)
- Several informal structures that are used for trading as well as housing purposes
- Illegal waste dump areas
- Natural areas where a mixture of indigenous and alien vegetation grows and through which several footpaths traverses.



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The surrounding land use include several formal and informal settlements, industrial areas (such as Klarinet located to the north-west of the site) as well as other mining developments. A main railway line also runs along the eastern boundary of the Blesboklaagte Colliery area in a north-south direction.

In order to determine whether historical land uses within the propose Blesboklaagte Mining Right Area included any previous crop production activities, historical aerial photography obtained from Google Earth was analysed. The result shows that no field crop blocks or centre pivot irrigated crop production areas are present in this area during December 2010 (Figure 14). However, the landscape in the area where the proposed Infrastructure and South Pit areas will be located, show faint historical plough lines which may indicate that the area might have been used for crop production in the years before 2010.

From the December 2010 aerial imagery, it is evident that the most eastern corner of the Mining Right Area was already occupied by the coal loading facility and that the area right north-east outside the Blesboklaagte Colliery area has already been subject to surface disturbance and vegetation removal.



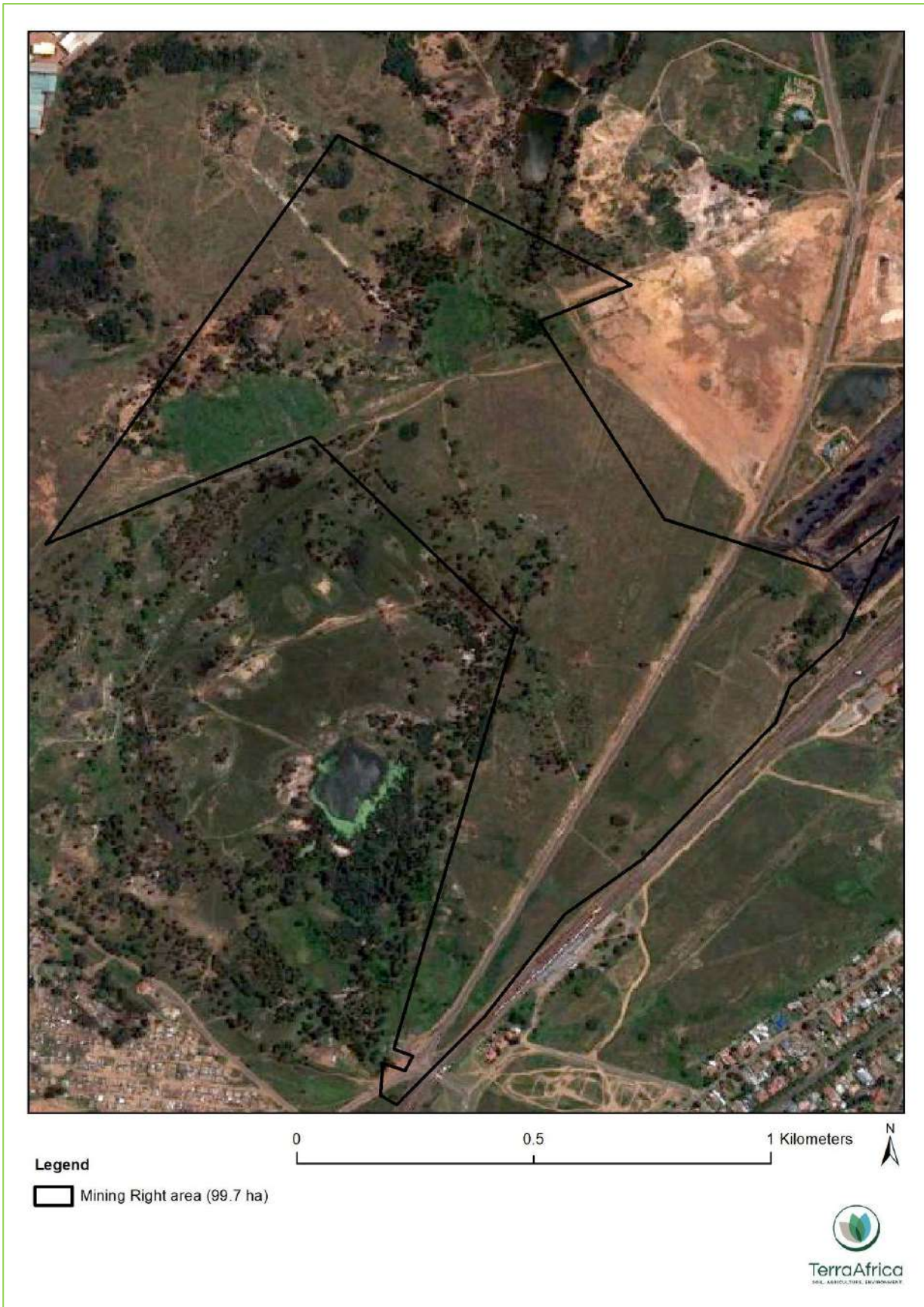


Figure 3.17: Historical land use of the Blesboklaagte Colliery Mining Right Area (dated 18 December 2010)



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Surface Water

According to DWAF's water management area delineations, Blesboklaagte Colliery's mining right area falls within the Olifants water management area, delineated as water management area No. 4, which subsequently falls under the B Primary drainage area. The Olifants water management area is divided into four major river catchments i.e. the Elands, Wilge, Steelpoort and Olifants catchments. The proposed Blesboklaagte Colliery falls within the Olifants catchment. Within the Olifants catchment, the proposed Blesboklaagte Colliery occurs within the B11 and B11K tertiary and quaternary drainage regions respectively, which drains into the Blesbokspruit. See Figure 3.18 for the location of the mine in relation to the tertiary and quaternary drainage regions.



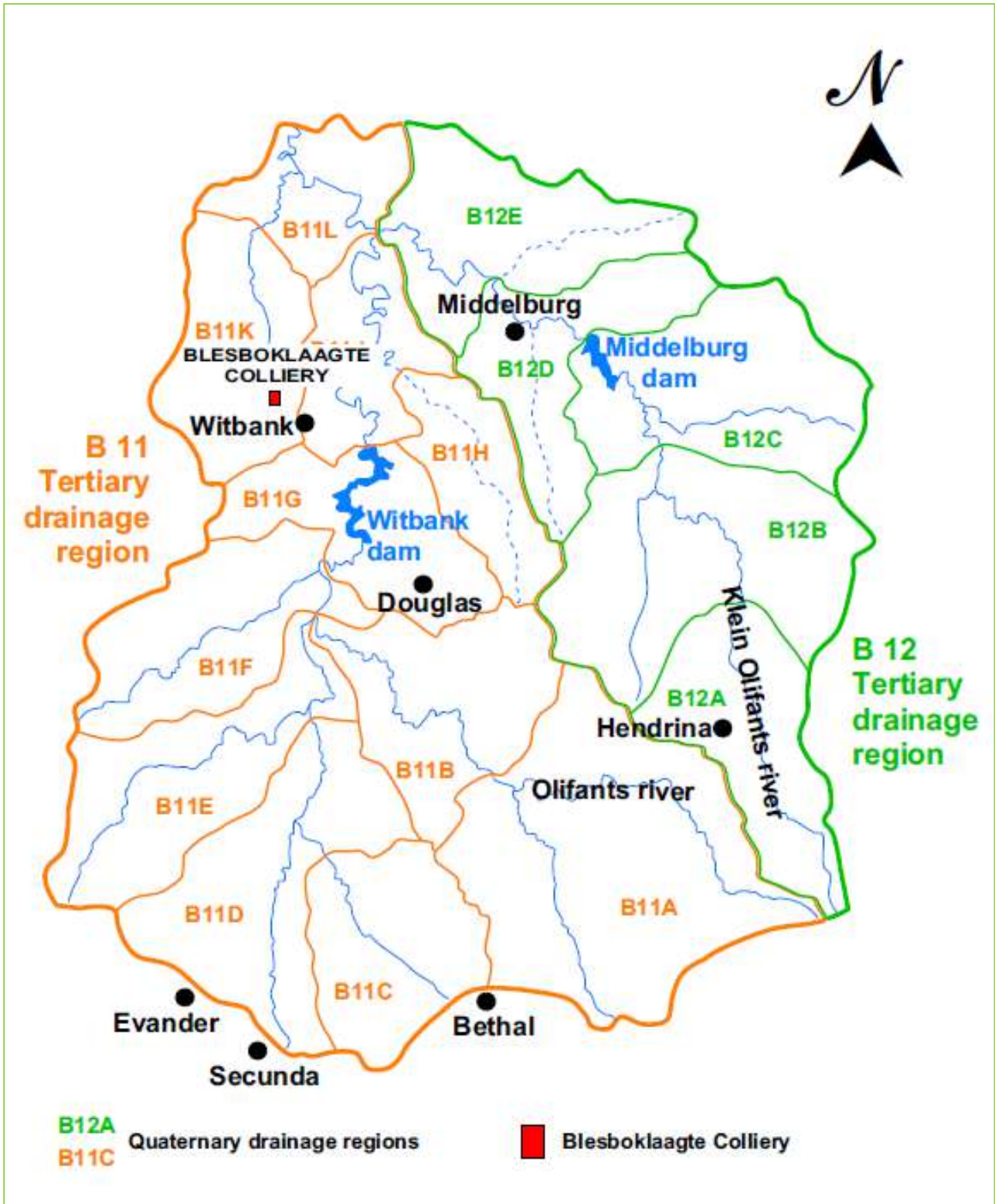


Figure 3.18: Tertiary and quaternary drainage regions

The Affected Sub-Catchment

The potentially affected catchment is the origin of the Blesbokspruit as depicted in Figure 3.19. The catchment area of the affected stream measures approximately 1486 ha.

This stream has, despite the winter season; shown strong flows which suggest that it receives water from a source probably decant water from the old underground workings to the west of the proposed mining area. The Blesbokspruit conflues with the Klipspruit



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several kilometres to the north of the mining area. The Klipspruit which drains a number of small streams eventually drains into the Olifants River upstream of the Loskop Dam.

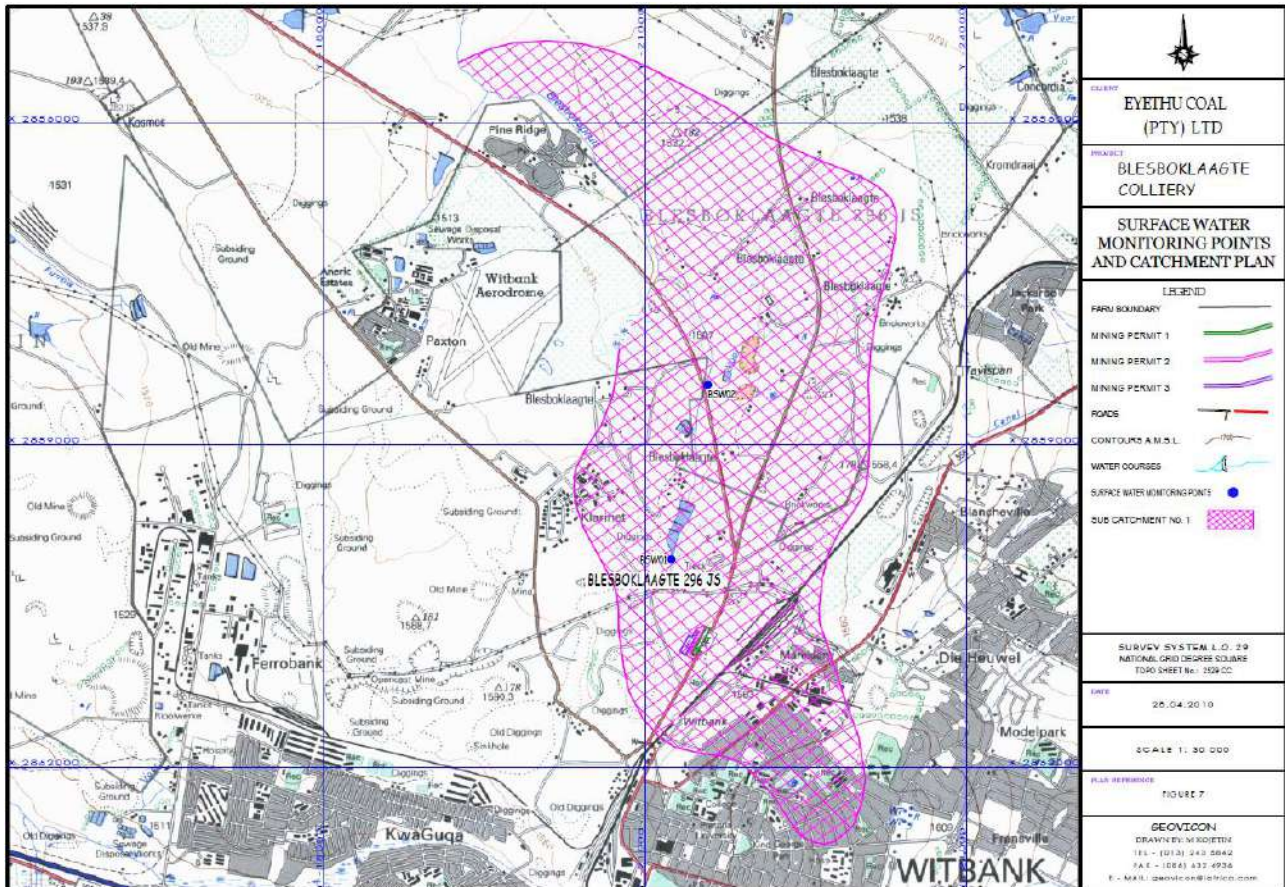


Figure 3.19: Sub-catchment of Blesbokfontein Colliery

Surface Water Quality

The water quality of the Blesbokspruit, approximately 1 km upstream of the mining site (BSW 01) is slightly of good quality but shown signs of unacceptable pH readings, manganese and Aluminium. The low pH can be ascribed to the seepage water emanating from the old underground workings, whereas the high concentration of Manganese and Aluminium can be attributable the local geology.

The quality of the water downstream of the proposed mining area (BSW 02) can be described as very poor and is typical of water contaminated by coal mining activities. The levels of certain indicator constituents are elevated well above the SANS. Refer to Table 3.11

Table 3.11: Surface water quality results

Constituents (mg/l)	SANS Standard – 241 (2005) Class I	BSW01 Up-stream Blesbokspruit	BSW02 Downstream Blesbokspruit
Total Dissolved Salts (TDS)	< 1000	484	1262
E. Conductivity (mS/m)	< 150	79	176
pH	5.0 – 9.5	3.50	3.86
Total hardness (as CaCO ₃)	Ns	161	458
Calcium hardness (as CaCO ₃)	Ns	95	244
Magnesium hardness (as CaCO ₃)	Ns	66	214
Calcium as Ca	< 150	38	98
Magnesium as Mg	< 70	16	52
Sodium as Na	< 200	61	91
Potassium as K	< 50	4	10
Alkalinity (as CaCO ₃)	Ns	0	0
Chloride as Cl	< 200	90	108



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Constituents (mg/l)	SANS Standard – 241 (2005)	BSW01 Up-stream Blesbokspruit	BSW02 Downstream Blesbokspruit
	Class I		
Sulphate as SO ₄	< 400	187	788
Fluoride as F	< 1.0	< 0.20	< 0.20
Iron as Fe	< 0.20	< 0.01	42
Manganese as Mn	< 0.10	2.05	8
Aluminium as Al	< 0.30	2	49
Suspended solids (SS)	Ns	4	156
Nitrate as N	< 10	0.2	0.23

NS: Not specified

Groundwater

Groundwater Levels

The groundwater levels varied between a minimum of 3.4 m and a maximum of 16.7 m with 11 m as the average depth to water level. Water levels within the planned mining rights area are relatively stable, even though seasonal fluctuation should be expected due varying recharge potential influenced by seasonal rainfall patterns. Groundwater flow is mainly from topographical high to low areas, eventually draining westerly and north-westerly towards the Blesbokspruit.

Table 3.12: Groundwater level statistics

Name	Longitude	Latitude	Elevation (m)	SWL (mbgl)	SWL (mamsl)	Name	Longitude	Latitude	Elevation (m)	SWL (mbgl)	SWL (mamsl)
		Monitoring Borehole				Exploration Borehole					
BH1	29.18521	-25.9222	1561.318			BW9	29.20903	-25.8552	1557.55	7.6	1549.95
BH01A	29.18522	-25.9222	1562.886	12.43	1550.456	BW10	29.20998	-25.8563	1560.30	6.23	1554.07
BH01B	29.18521	-25.9222	1563.704			BW12	29.21142	-25.8571	1561.84	10.48	1551.36
BH23	29.18667	-25.9056	1563.952			BW17	29.21275	-25.857	1564.01	10.6	1553.41
WC01	29.18086	-25.8926	1520.23	3.4	1516.83	BW29	29.21384	-25.8589	1567.64	14.6	1553.04
BH12	29.20878	-25.8546	1555.911	7.67	1548.241	BW28	29.21432	-25.8579	1565.99	14.83	1551.16
BH11	29.20786	-25.8553	1558.43	10.7	1547.73	BW40	29.21424	-25.8572	1562.18	8.37	1553.81
BH10	29.20652	-25.8554	1558.529	15.96	1542.569	BW42	29.2153	-25.8567	1560.97		
BH09	29.20595	-25.8559	1558.368	10.08	1548.288	BW46	29.21465	-25.8563	1561.75	9.42	1552.33
ANGLOBH01	29.2058	-25.8555	1558.936	14.85	1544.086	BW45	29.21398	-25.8561	1559.32	8.9	1550.42
BH08	29.20458	-25.856	1560.934	13.53	1547.404	BW23	29.21143	-25.8533	1551.46		
BHN03	29.20478	-25.8564	1560.593			BW30	29.21329	-25.8599	1570.22	10.6	1559.62
BH07	29.20442	-25.8568	1560.769	12.94	1547.829	BW31	29.21212	-25.8596	1566.84	16.77	1550.07
BH06	29.20431	-25.858	1559.813	11.53	1548.283	BW35	29.21071	-25.8617	1567.71		
BH05	29.20409	-25.858	1560.569	13.01	1547.559	BW34	29.21081	-25.8631	1571.22		
BH02	29.20411	-25.8589	1559.107	10.81	1548.297	Average depth to water level			11.05	1548.78	
BH01	29.20378	-25.8591	1559.794	12.43	1547.364	Minimum water level			3.40	1516.83	
BH03	29.2062	-25.8598	1557.285	5.94	1551.345	Maximum water level			16.77	1559.62	
BH04	29.21033	-25.8628	1566.256	13.5	1552.756	Number of nomalous water level			None	None	



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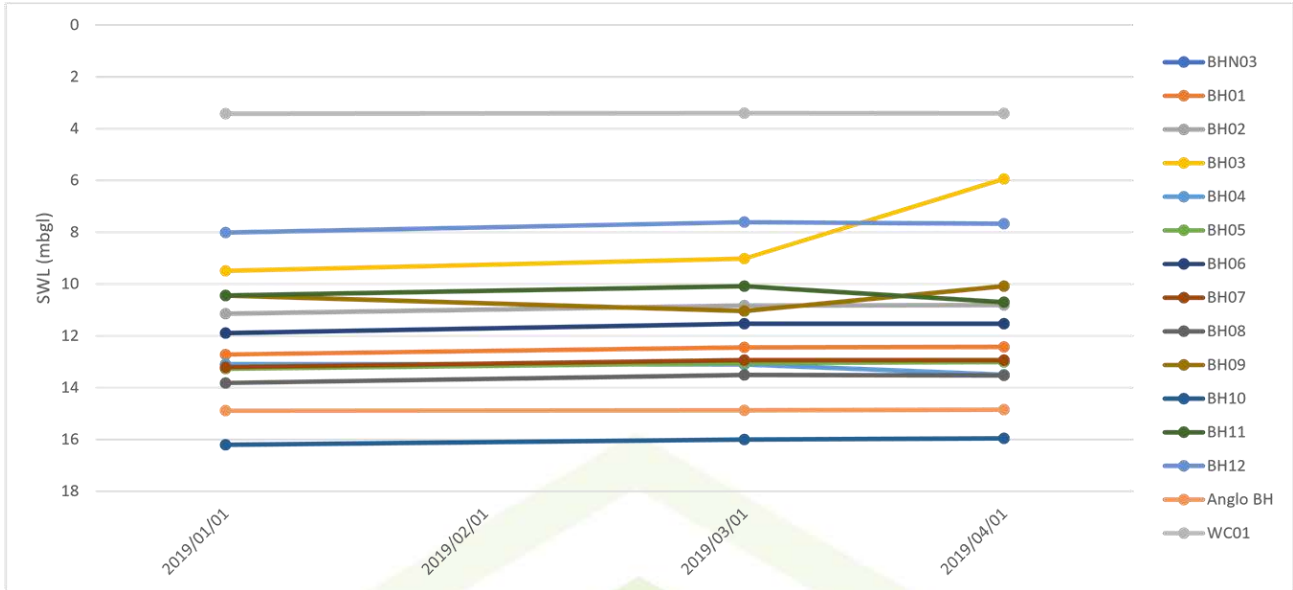


Figure 3.20: Groundwater level changes

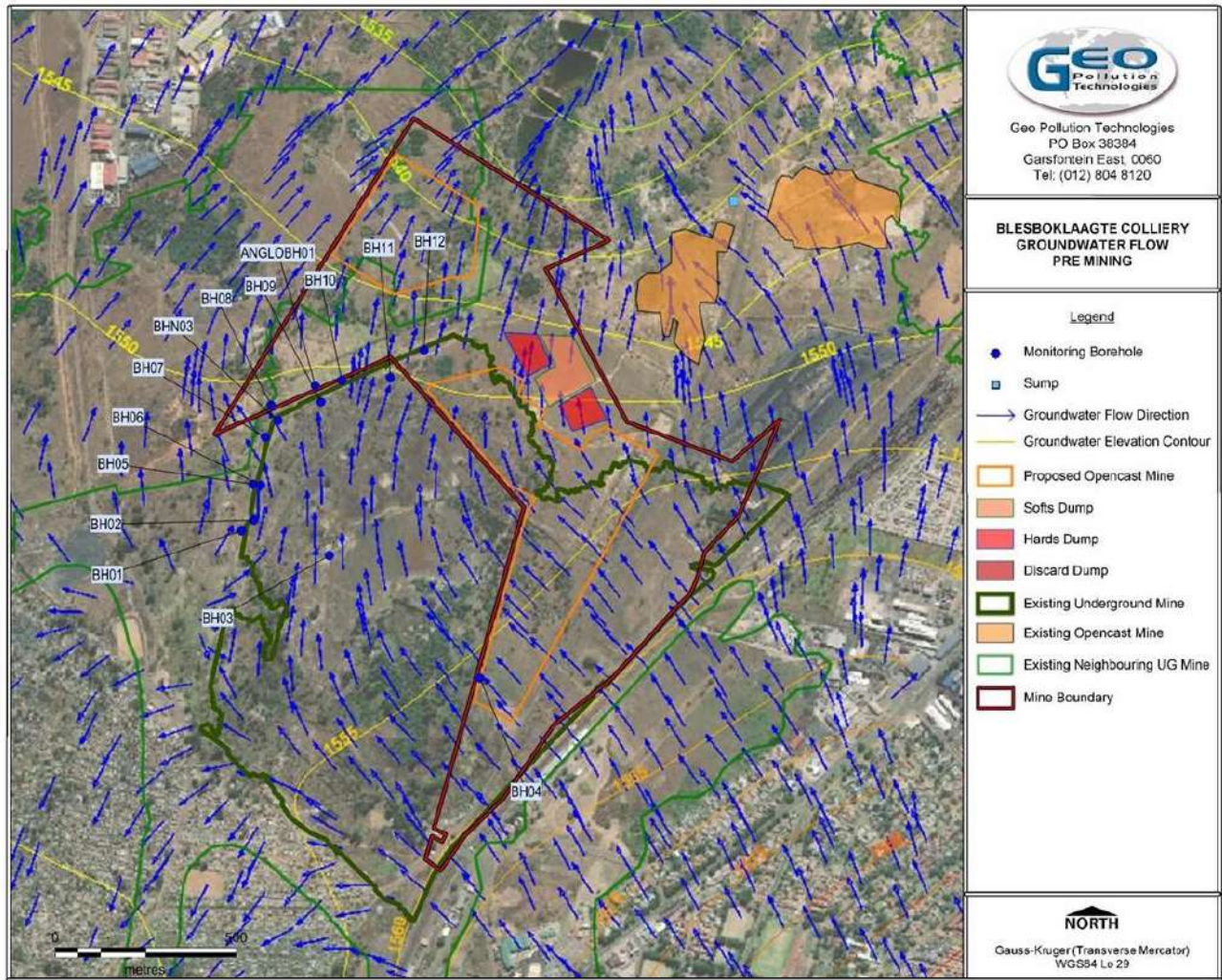


Figure 3.21: Groundwater flow (pre-mining of proposed opencast sections)



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Water Quality

The results of the screening for groundwater were flagged against the SANS 241-1:2015 drinking water guidelines; the following observations were made:

- pH is acidic (<5) in samples, BW9 and BW12 (which intersect old underground mining sections).
- Combined nitrate and nitrite concentration exceeds the maximum allowable limit in samples BW12 and BW28.
- Iron concentration exceeds the maximum allowable limit in samples, BW9 and BW12.
- Aluminium concentration exceeds the maximum allowable limit in samples, BW9 and BW12.
- Manganese concentration exceeds the maximum allowable limit in samples, BW9 and BW12.
- Samples, BW9 and BW12 show acidic pH, metal mobilisation and high proportions of SO4²⁻, Cl⁻ and Na⁺, indicative of solute enrichment due to acid mine drainage in the defunct underground mine workings.

Table 3.13: Water qualities compared to SANS 241-1:2015 guidelines for human consumption

SANS 241-1:2015 Guidelines	Risk	BW9	BW12	BW28	Tolerable Limit	Maximum Limit
pH	Operational	2.9	2.72	5.6	5	9.7
EC (mS/m)	Aesthetic	109	130	5.62		170
TDS (mg/l)	Aesthetic	760	913	39.3		1200
Alkalinity (mg/l CaCO ₃)	Not determined	BDL	BDL	11.6		
Ca (mg/l)	Not determined	18.4	18.3	2.57		
Mg (mg/l)	Not determined	9.39	8.26	1.45		
Na (mg/l)	Aesthetic	45.8	55.1	3.22		200
K (mg/l)	Not determined	4.96	3.16	2		
Cl (mg/l)	Aesthetic	55.1	61.3	3.32		300
NH ₃ as N (mg/l)	Aesthetic	1.22	0.616	BDL		1.5
NO ₂ as N (mg/l)	Acute health	0.008	0.006	0.008		0.9
NO ₃ as N (mg/l)	Acute health	BDL	1.5	0.313		11
NO ₃ +NO ₂ (mg/l)	Acute health	0.541	6.68	1.4		1
PO ₄ as P (mg/l)	Not determined	0.017	0.049	0.002		
SO ₄ (mg/l)	Aesthetic/Acute health	313	318	6.34	500	250
F (mg/l)	Chronic health	1.06	4.26	0.112		
Fe (mg/l)	Aesthetic/Chronic health	25.8	11.9	BDL	0.3	2
Al (mg/l)	Operational	23.8	23.6	0.05		0.3
As (mg/l)	Chronic health	BDL	BDL	BDL		0.01
B (mg/l)	Chronic health	BDL	BDL	BDL		2.4
Ba (mg/l)	Chronic health	BDL	0.08	0.17		0.7
Cd (mg/l)	Chronic health	BDL	BDL	BDL		0.03
Cr (mg/l)	Chronic health	BDL	BDL	BDL		0.05
Cu (mg/l)	Chronic health	BDL	BDL	BDL		2
Mn (mg/l)	Aesthetic/Chronic health	0.73	0.47	0.16	0.10	0.4
Ni (mg/l)	Chronic health	BDL	0.05	BDL		0.07
Pb (mg/l)	Chronic health	BDL	BDL	BDL		0.01
Sb (mg/l)	Chronic health	BDL	BDL	BDL		0.02
Se (mg/l)	Chronic health	BDL	BDL	BDL		0.04
Zn (mg/l)	Aesthetic	0.20	0.30	BDL		5
Ag (mg/l)	Not determined	BDL	BDL	BDL		
Be (mg/l)	Not determined	BDL	BDL	BDL		
Bi (mg/l)	Not determined	BDL	BDL	BDL		
Co (mg/l)	Not determined	BDL	BDL	BDL		
Li (mg/l)	Not determined	0.05	0.05	BDL		
Mo (mg/l)	Not determined	BDL	BDL	BDL		
P (mg/l)	Not determined	0.08	0.10	0.12		
S (mg/l)	Not determined	128.00	127.00	2.13		
Si (mg/l)	Not determined	15.20	15.10	6.76		
Sn (mg/l)	Not determined	BDL	BDL	BDL		
Sr (mg/l)	Not determined	0.15	0.15	BDL		
Ti (mg/l)	Not determined	BDL	BDL	BDL		
Tl (mg/l)	Not determined	BDL	BDL	BDL		
V (mg/l)	Not determined	BDL	BDL	BDL		



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SANS 241-1:2015 Guidelines	Risk	BW9	BW12	BW28	Tolerable Limit	Maximum Limit
Ion Bal (%)	Not applicable	-4.54	-9.59	1.16		
pH or concentration deemed to present an unacceptable health risk for lifetime consumption						
BDL = Below detection limit						

Geology

The investigated area falls within the 2528 Pretoria 1:250 000 geology series map and is situated approximately 7.5 km directly north-west of eMalahleni, Mpumalanga.

The proposed mining area is characterised by consolidated sedimentary layers of the Karoo Supergroup. It consists mainly of sandstone, shale and coal beds of the Vryheid Formation of the Eccca Group and is underlain by the Dwyka Formation of the Karoo Supergroup. The Karoo Supergroup are underlain at depth by sandstone and conglomerates from the Wilge River Formation of the Waterberg Group. This again is underlain by the felsitic lavas of the Selons River Formations of the Rooiberg Group and granite from the Lebowa Granite Suite of the Bushveld Complex. Vaalian dolerite intrusions (also previously known as diabase) are expected to occur in the area in the form of dykes and sills.

The Eccca Group, which is part of the Karoo Supergroup, comprises of sediments deposited in shallow marine and fluvio-deltaic environments with coal accumulated as peat in swamps and marches associated with these environments. The sandstone and coal layers are normally reasonable aquifers, while the shale serves as aquitards. Several layered aquifers perched on the relative impermeable shale are common in such sequences.

The Dwyka Formation comprises consolidated products of glaciation (with high amounts of clay) and is normally considered to be an aquiclude.

The generally horizontally disposed sediments of the Karoo Supergroup are typically undulating with a gentle regional dip to the south. The extent of the coal is largely controlled by the pre-Karoo topography. Steep dips can be experienced where the coal butts against pre-Karoo hills. Displacements, resulting from intrusions of dolerite sills, are common. Abundant dolerite intrusions are present in the Eccca sediments. These intrusions comprise sills, which vary from being concordant to transgressive in structure, and feeder dykes. Although these structures serve as aquitards and tend to compartmentalise the groundwater regime, the contact zones with the pre-existing geological formations also serve as groundwater conduits. There are common occurrences of minor slips or faults, particularly in close proximity to the dolerite intrusives. Within the coalfield, these minor slips, displacing the coal seam by a matter of 1 to 2 metres, are likely to be commonplace.



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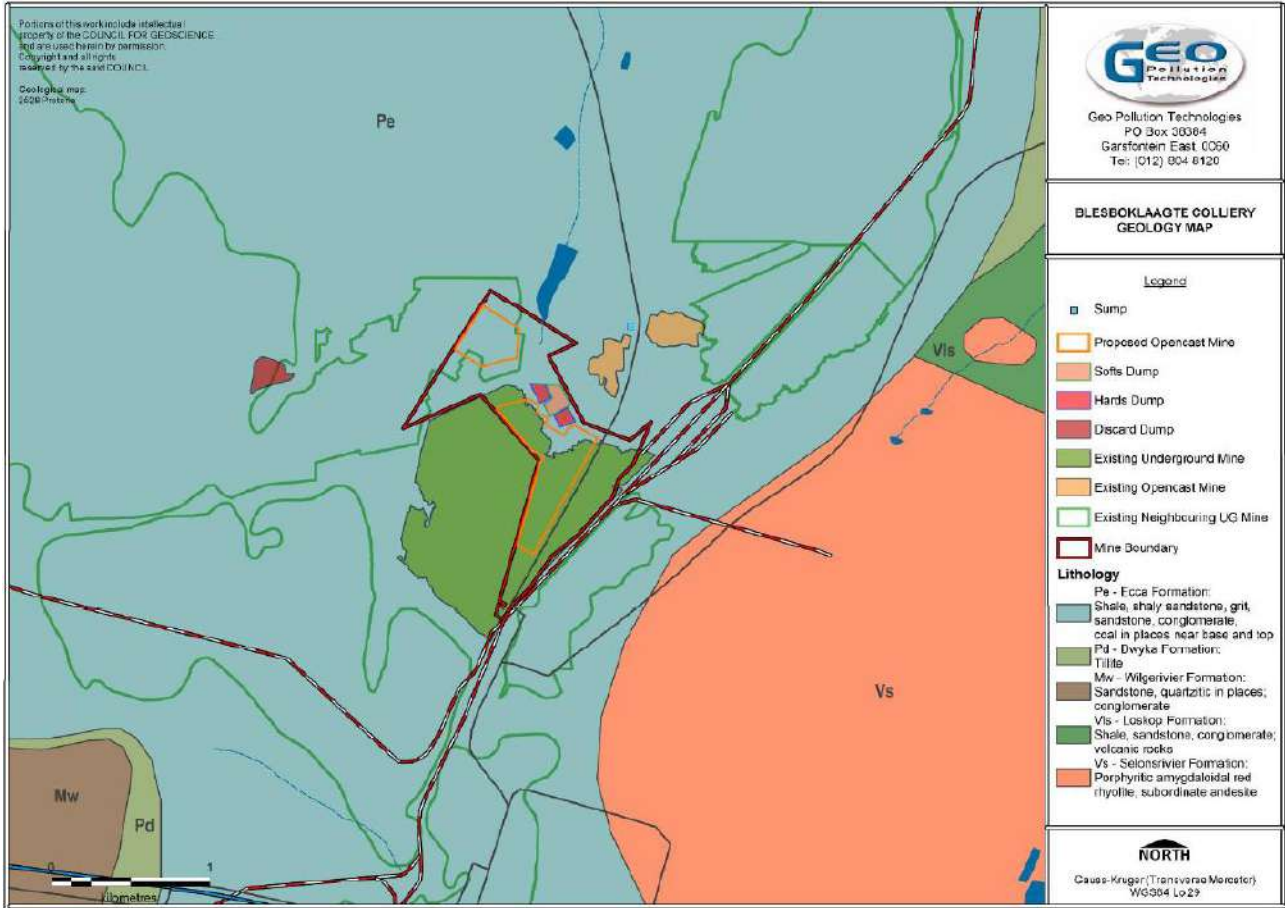



Figure 3.22: Geology of the area

Wetland Assessment

One channelled valley bottom wetland system (HGM 1) was identified within the study boundary (Figure 3.23). Channelled valley bottom wetlands are characterised by their location on valley floors and the presence of a channel flowing through the wetland. Dominant water inputs to these wetlands are from/into a channel, in this instance an upstream source, flowing through the wetland either as surface flows resulting from flooding or as subsurface flow. Water generally moves through the wetland as diffuse surface flow although occasionally as short-lived concentrated flows during flood events (Kotze *et al.*, 2008; Ollis *et al.*, 2013). A description of the channelled valley bottom wetland types is given in Table 3.14

Table 3.14: Wetland hydrogeomorphic (HGM) types (Kotze *et al.*, 2008).

HGM Unit	Description	Source of water maintaining the	
		Surface	Subsurface
Channelled Valley bottom 	Valley bottom areas with a well- defined stream channel but lacking characteristic floodplain features. May be gently sloped and characterised by the net accumulation of alluvial deposits or may have steeper slopes and be characterised by the net loss of sediment. Water inputs from main channel (when channel banks overspill) and from adjacent slopes.	***	* / ***

Precipitation is an important water source and evapotranspiration an important output in all of the above settings Water source:

* Contribution usually small

*** Contribution usually large



* / *** Contribution may be small or important depending on the local circumstances

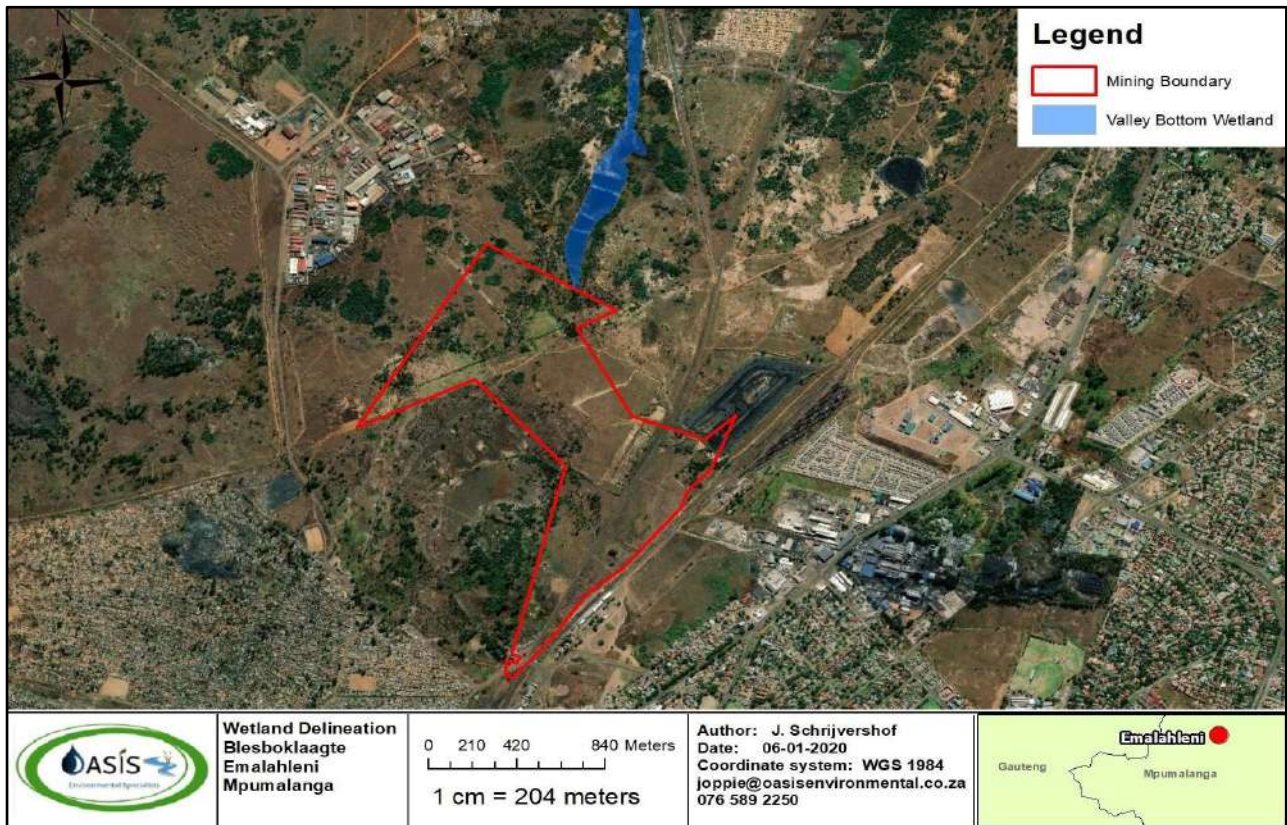


Figure 3.23: Blesboklaagte - Wetland delineation map

The Ecological Importance and Sensitivity (EIS) of the wetlands has generally been recorded as moderate to low and the Ecological Services as intermediate (Table 3.15 and Table 3.16). Although no red-data species were identified during the site investigation, the majority of channelled valley bottom systems usually, provide habitat for a number of floral and faunal species.

Table 3.15: Summary of the Ecological Services of the three wetland systems in proximity of Blesboklaagte

Condensed summary sheet	HGM 1	
	Overall score	Confidence rating
Flood attenuation	3	4
Streamflow regulation	1,3	3
Sediment trapping	3	2,1
Phosphate trapping	2	1
Nitrate removal	2	1
Toxicant removal	1	1
Erosion control	1	3
Carbon storage	2	3
Maintenance of biodiversity	1	2
Water supply for human use	1	3
Natural resources	1	3
Cultivated foods	1	4
Cultural significance	1	3



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Condensed summary sheet	HGM 1	
Tourism and recreation	1	3
Education and research	1	3
Threats	3	3
Opportunities	2	3
Overall	1,71	2,82

Note: <0.5 Low; 0.5-1.5 Moderately low; 1.5-2.5 Intermediate; 2.5-3.5 Moderately high; and >3.5 High

Table 3.16: Summary of the Ecological Importance and Sensitivity of the wetland system associated with the Blesboklaagte

Ecological Importance	Score (0-4)	Confidence (15)
Biodiversity support	0,83	3,33
Presence of Red Data species	0,5	3
Populations of unique species	0,8	3
Migration/breeding/feeding sites	1,2	4
Landscape scale	0,86	3
Protection status of the wetland	1	4
Protection status of the vegetation type	0,9	4
Regional context of the ecological integrity	0,7	4
Size and rarity of the wetland type/s present	0,5	3
Diversity of habitat types	1,2	3
Sensitivity of the wetland	1,33	2,33
Sensitivity to changes in floods	1,5	3
Sensitivity to changes in low flows/dry season	1,2	2
Sensitivity to changes in water quality	1,3	2
ECOLOGICAL IMPORTANCE & SENSITIVITY	1,01	2,89
HYDROLOGICAL/FUNCTIONAL IMPORTANCE	1,88	1,88
DIRECT HUMAN BENEFITS	1,67	4
OVERALL	1,5	2,92

None, Rating = 0 rarely sensitive to changes in water quality/hydrological regime; Low, Rating =1 One or a few elements sensitive to changes in water quality/hydrological regime; Moderate, Rating =2 some elements sensitive to changes in water quality/hydrological regime; High, Rating =3 Many elements sensitive to changes in water quality/ hydrological regime; Very high, Rating =4 Very many elements sensitive to changes in water quality/ hydrological regime

Wetland Health and PES

According to the functional assessment flood attenuation; sediment trapping; erosion control; the maintenance of biodiversity; and the provision of natural resources are the predominant attributes provided by these wetlands to the surrounding landscapes.

The channelled valley bottom wetland system was assessed in terms of health and was found to be categorised as seriously modified (Category E) (Table 3.17). Modifications to the systems and the resultant effect on the health of the wetlands is predominantly related to the extensive damming, mining, informal settlements, pollution, extensive alien invasive vegetation and erosion



Table 3.17: Summary of PES scores for the HGM Units within proximity of Blesboklaagte

Module	Impact Score	Category	Trajectory
Hydrology	6,5	E	↓
Geomorphology	5,9	D	↓
Vegetation	6,9	E	↓
Overall Score	6,44	E	↓

Extensive Eucalyptus infestation, damming, mining and erosion have had a negative impact on the basal cover of vegetation within the catchments associated with the channelled valley bottom wetland (Figure 20), leading to an increase in velocity entering the wetlands and the formation of erosion gullies in the majority of these systems. This results in a negative impact on the wetlands ability to maintain biodiversity.

Despite the modified nature of the wetlands they still provide a number of functions to the larger landscape, particularly with regard to flood attenuation; sediment trapping; erosion control; the maintenance of biodiversity; and the provision of natural resources (Figure 3.24).



Figure 3.24: Overall view for the valley bottom wetland (HGM 1) dammed up by several decanting dams occurring downstream in the Blesboklaagte project boundary.

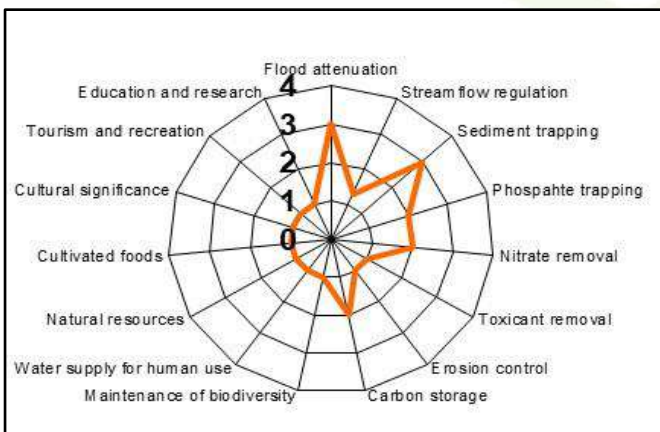


Figure 3.25: WET-Eco Services results for HGM 1.



Aquatics

A site assessment was conducted on the 22nd November 2019. The sampled site is illustrated in the Figure 3.26 and Figure 3.27 and the coordinates is provided in Table 3.18. During the site visit it was evident that alien invasive plant infestation and extensive mining activities affected water quality and were impacted by the upstream activities of the Blesbokspruit. It must be noted that the study sites had stagnant water in certain sections of the streams at the time at the assessment. Only a downstream site could be selected, due to the fact the Blesboklaagte Colliery occurring above the origin of the Blesbokspruit.

Table 3.18: Sample site coordinates

Site	Coordinates	
Site 1 (Downstream)	25°50'21.80"S	29° 12'51.49"E



Figure 3.26: Sample location for the Blesboklaagte Colliery downstream biomonitoring study site

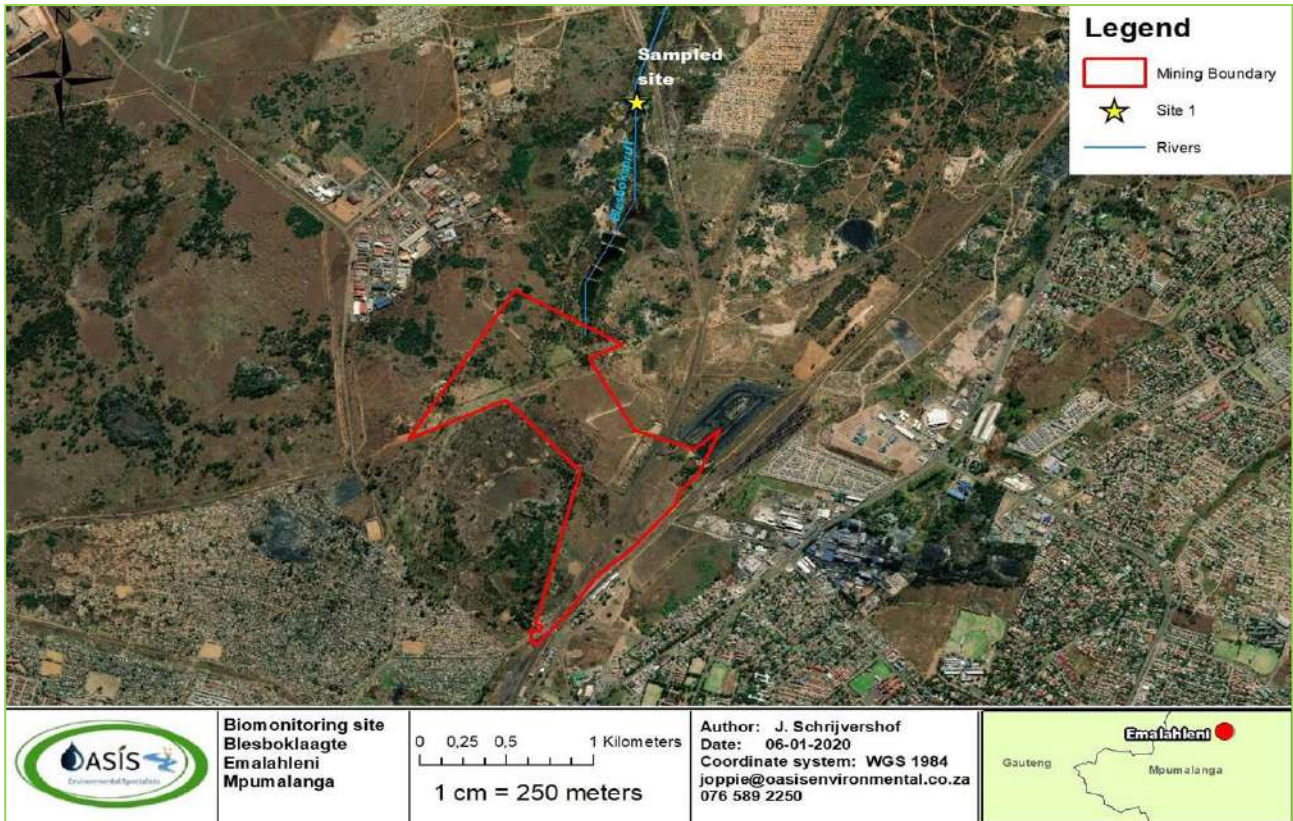


Figure 3.27: Blesboklaagte – Sample localities map

In situ water quality variables was within unacceptable limits compared to the Target Water Quality Ranges (TWQRs) for aquatic ecosystems of South Africa. The temperatures were relatively stable, where electrical conductivity levels were exceeding guideline levels and dissolved oxygen (DO) levels and pH were below guideline levels (Table 3.19).

It must be noted that in situ water quality testing cannot identify specific chemicals for the basis for the health determination of a river system.

Table 3.19: *In situ* water quality results

Constituents	Guideline values (TWQRs)	Sample point 1
pH	6.5-9,5	3,57
Temp (°C)	5-30	24,0
Conductivity (µS/cm)	<700	2644
Dissolved Oxygen (%)	>80%	1,1
Dissolved Oxygen (mg/L)	>6	0,08

The IHIA results recorded the site within a seriously modified state (Category E). A category of E indicates that the loss of natural habitat, biota and basic ecosystem functions is extensively transformed from reference conditions. The predominant cause for concern was erosion, alien invasive plants, mining and water quality.

The IHIA assesses the number and severity of anthropogenic impacts and the damage they potentially inflict on the habitat integrity of aquatic ecosystems. The results of the IHIA are presented below in Table 3.20.



Table 3.20: Overall IHIA instream and riparian results

INSTREAM CRITERIA	WEIGHT	Site 1	Score
Water abstraction	14	15	8,4
Flow modification	13	22	11,44
Bed modification	13	22	11,44
Channel modification	13	22	11,44
Water quality	14	22	12,32
Inundation	10	16	6,4
Exotic macrophytes	9	12	4,32
Exotic fauna	8	19	6,08
Solid waste disposal	6	15	3,6
TOTAL	100		24,56
RIPARIAN ZONE CRITERIA	WEIGHT	Site 1	Score
Indigenous vegetation removal	13	22	11,44
Exotic vegetation encroachment	12	22	10,56
Bank erosion	14	15	8,4
Channel modification	12	16	7,68
Water abstraction	13	15	7,8
Inundation	11	15	6,6
Flow modification	12	20	9,6
Water quality	13	22	11,44
TOTAL	100		26,48
OVERALL			25,52

The findings for the vegetation assessment revealed that riparian habitat of the area was seriously modified (Category E). The entire study area has, been disturbed as a result of mining, erosion, alien invasive plant species and damming in the marginal and non-marginal zones.

During this survey; no sensitive organisms was sampled. These results should be approached with caution as it is not a true representation of the site, due to a lack of suitable flow conditions as a result of upstream damming and water pollution.

Sampled invertebrates included the *Corixidae*, *Gerridae*, *Gyrinidae*, *Dytiscidae*, *Hydrophilidae*, *Culicidae* and *Chironomidae*.



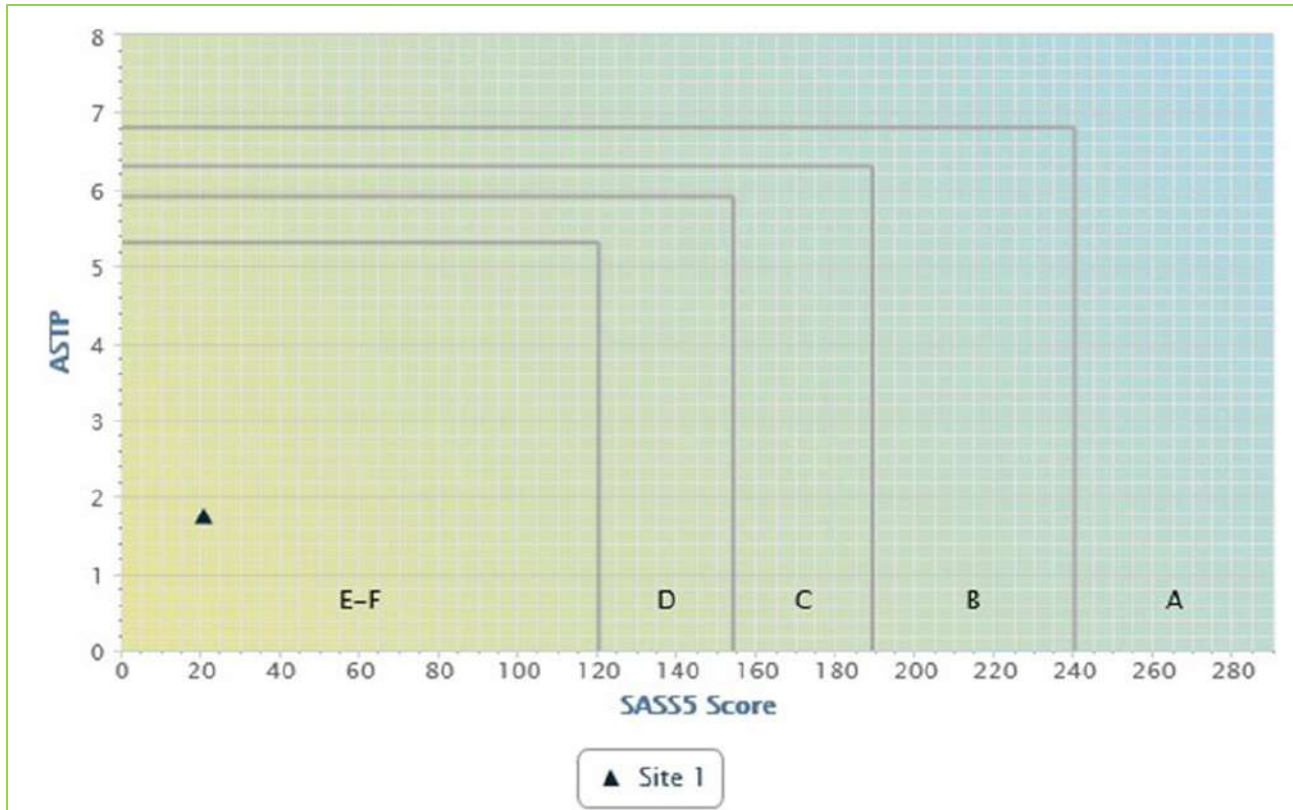


Figure 3.28: SASS 5 Classification using biological bands calculated from percentiles from Dallas (2007) for the sampled site at Blesboklaagte Colliery in accordance with the Highveld Upper Ecoregion as reference.

The SASS5 score were found to be in a seriously modified (Category E/F) (Figure 3.28). The presence of only highly pollution tolerant organisms indicates the pressure from extensive pollution upstream, with the complete absence of sensitive species.

Flora

Eastern Highveld Grassland

This vegetation type corresponds partially with Bankenveld and North-eastern Sandy Highveld according to the Acocks (1975) and also Moist Sandy Highveld Grassland as described by Low and Rebelo (1996).

This vegetation type occurs within the Gauteng and Mpumalanga Provinces on the plains in the areas between Belfast in the East and the eastern side of Johannesburg in the West and southwards to Bethal, Ermelo and West of Piet Retief.

The conservation status of this vegetation type is Endangered and the conservation target is 24%. By 2006 some 44% was already transformed primarily by cultivation, plantations, mining, urbanisation and building of dams. No serious invasions are reported, although *Acacia mearnsii* can become dominant in disturbed sites. Erosion is generally low. Only a small part of this vegetation type is conserved in the statutory nature reserves Nooitgedacht dam - and Jericho dam Nature Reserve of the Mpumalanga Tourism and Parks Agency and in Private Nature Reserves such as Holkrans, Kransbank and Morgenstond (Mucina and Rutherford, 2006).

Important plant species of this vegetation type are given in Table 3.21.



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Table 3.21: Important plant species of the Eastern Highveld Grassland

FAMILY	SPECIES	STATUS
POACEA	<i>Aristida aequiglumis</i>	D
POACEA	<i>A. congesta</i>	D
POACEA	<i>A. junciformis</i> subsp. <i>galpinii</i>	D
POACEA	<i>Brachiaria serrata</i>	D
POACEA	<i>Cynodon dactylon</i>	D
POACEA	<i>Digitaria monodactyla</i>	D
POACEA	<i>D. tricholaenoides</i>	D
POACEA	<i>Elionurus muticus</i>	D
POACEA	<i>Eragrostis chloromelas</i>	D
POACEA	<i>E. curvula</i>	D
POACEA	<i>E. racemosa</i>	D
POACEA	<i>E. sclerantha</i>	D
POACEA	<i>Heteropogon contortus</i>	D
POACEA	<i>Loudetia simplex</i>	D
POACEA	<i>Microchloa caffra</i>	D
POACEA	<i>Monocymbium ceresiiforme</i>	D
POACEA	<i>Setaria sphacelata</i>	D
POACEA	<i>Sporobolus africanus</i>	D
POACEA	<i>S. pectinatus</i>	D
POACEA	<i>Themeda triandra</i>	D
POACEA	<i>Trachypogon spicatus</i>	D
POACEA	<i>Tristachya leucothrix</i>	D
POACEA	<i>T. rehmannii</i>	D
POACEA	<i>Alloteropsis semialata</i> subsp. <i>eckloniana</i>	
POACEA	<i>Andropogon appendiculatus</i>	
POACEA	<i>A. schirensis</i>	
POACEA	<i>Bewisia biflora</i>	
POACEA	<i>Ctenium concinnum</i>	
POACEA	<i>Diheteropogon amplexans</i>	
POACEA	<i>Eragrostis capensis</i>	
POACEA	<i>E. gummiflua</i>	
POACEA	<i>E. patentissima</i>	
POACEA	<i>Harpochloa falx</i>	
POACEA	<i>Panicum natalense</i>	
POACEA	<i>Rendlia altera</i>	
POACEA	<i>Schizachyrium sanguineum</i>	
POACEA	<i>Setaria nigrirostris</i>	
POACEA	<i>Urelytrum agropyroides</i>	
ASTERACEAE	<i>Berkheya setifera</i>	D
ASTERACEAE	<i>Haplocarpha scaposa</i>	D
ACANTHACEAE	<i>Justicia anagalloides</i>	D
GERANIACEAE	<i>Pelargonium luridum</i>	D
EUPHORBIACEAE	<i>Acalypha angustata</i>	
FABACEAE	<i>Chamaecrista mimosoides</i>	
ASTERACEAE	<i>Euryops gilfillanii</i>	
ASTERACEAE	<i>E. transvaalensis</i> subsp. <i>setilobus</i>	
ASTERACEAE	<i>Helichrysum aureonitens</i>	
ASTERACEAE	<i>H. caespititium</i>	
ASTERACEAE	<i>H. callicomum</i>	
ASTERACEAE	<i>H. oreophilum</i>	
ASTERACEAE	<i>H. rugulosum</i>	
CONVOLVULACEAE	<i>Ipomoea crassipes</i>	
RUBIACEAE	<i>Pentania prunelloides</i> subsp. <i>latifolia</i>	
SCROPHULARIACEAE	<i>Selago densiflora</i>	
ASTERACEAE	<i>Senecio coronatus</i>	
ASTERACEAE	<i>Vernonia oligocephala</i>	
CAMPANULACEAE	<i>Wahlenbergia undulata</i>	
IRIDACEAE	<i>Gladiolus crassifolius</i>	
AMARYLLIDACEAE	<i>Haemanthus humilis</i> subsp. <i>hirsutus</i>	
HYPOXIDACEAE	<i>Hypoxis rigidula</i> var. <i>pilosissima</i>	
HYACINTHACEAE	<i>Ledebouria ovatifolia</i>	
ASPHODELACEAE	<i>Aloe ecklonis</i>	
RUBIACEAE	<i>Anthospermum rigidum</i> subsp. <i>pumilum</i>	
ASTERACEAE	<i>Stoebe plumosa</i>	



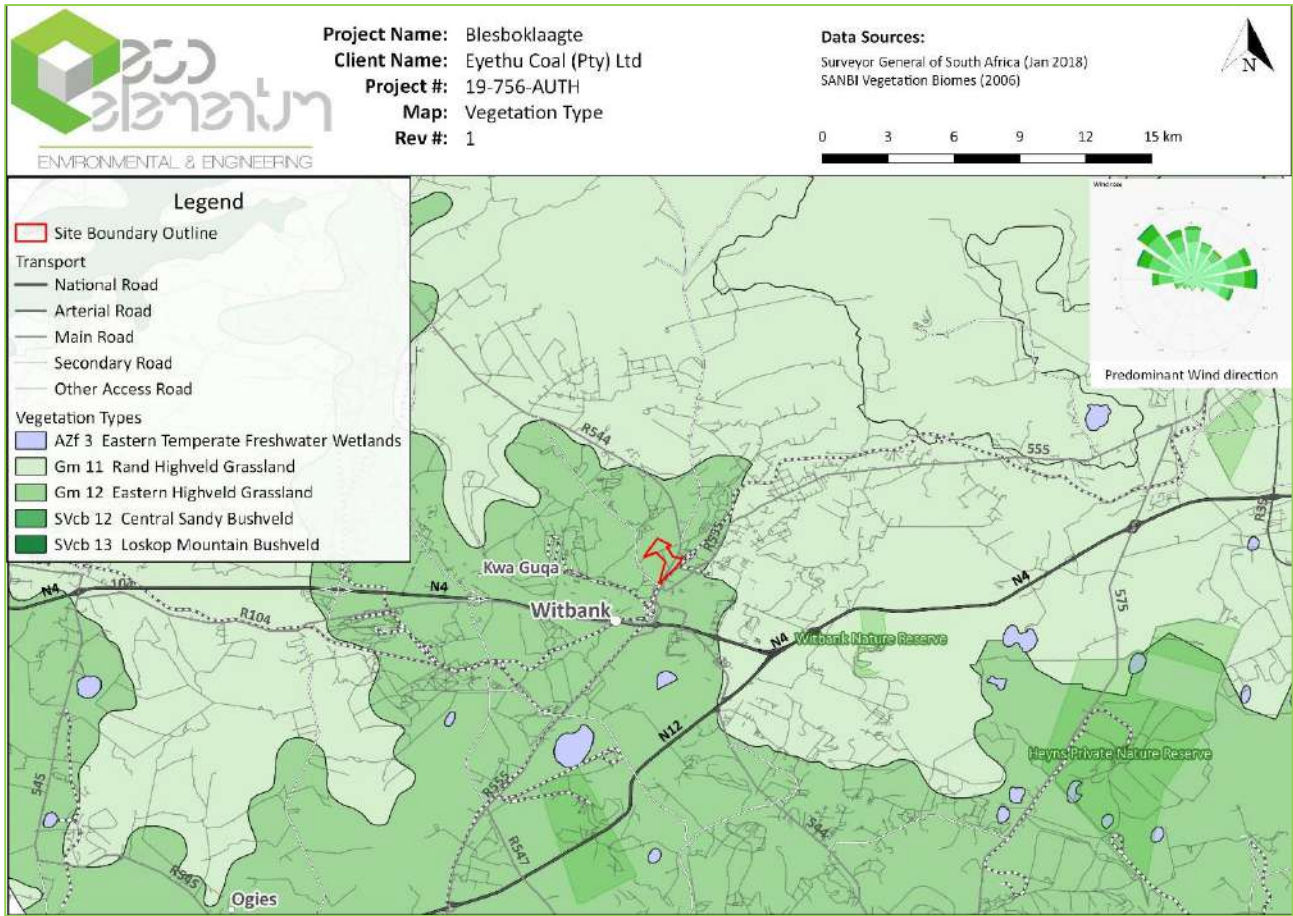


Figure 3.29: Vegetation type of the area

According to the Critical Biodiversity Areas datasets provided by SANBI (2019), the majority of the application area falls within CBAs as seen in Figure 3.30. These sections were confirmed to be transformed landscape during the site visit.

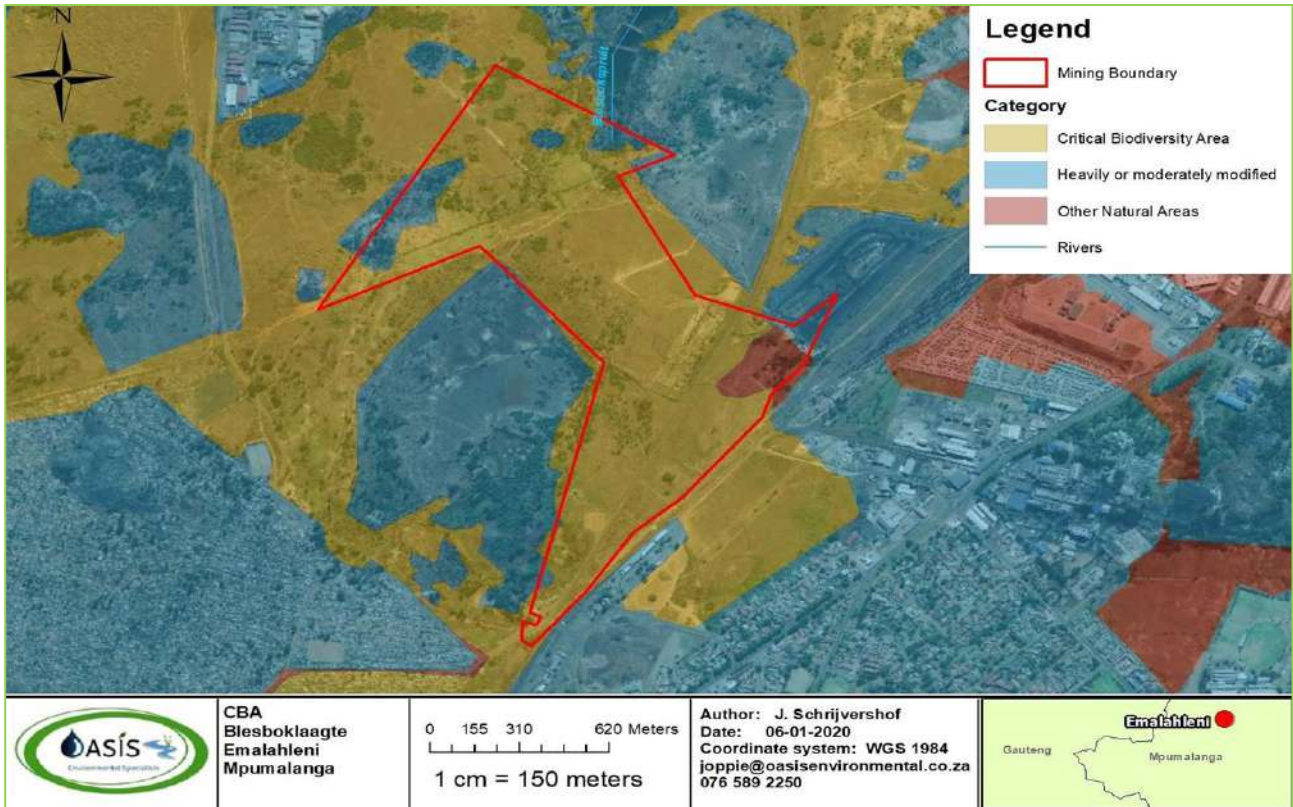


Figure 3.30: Critical Biodiversity Areas map

The majority of the study site consisted of alien invasive vegetation and very little indigenous vegetation. No red listed floral species were observed during the site visit.

Commonly observed grasses (dominant species) within the area of investigation comprised *Hyparrhenia hirta* (Thatching grass), *Melinos repens* (Natal red top) and *Pogonarthria squarrosa* (Herringboe grass). Beyond the reaches of the grasslands is extensive gumtree and black wattle invasion.

Fauna

Mammal species that were identified onsite included the yellow mongoose (*Cynictis penicillata*) and ground squirrel (*Xerus* spp.).

Bird species included White-fronted bee-eater (*Merops bullockoides*); Helmeted guinea fowl (*Numida meleagris*) Egyptian goose (*Alopochen aegyptiaca*) (Figure 24). Other species included Laughing dove (*Spilopelia senegalensis*), Indian myna (*Acridotheres tristis*), Southern red bishop (*Euplectes orix*) and Southern masked weaver (*Ploceus velatus*).

No red listed faunal species were observed during the site visit.

Heritage and Archaeological Resources

Table 3.22: Site coordinates & description

Site / Survey Point Name	Longitude	Latitude	Description
B-POI1	29.209124	-25.866563	Building
B-POI2	29.209426	-25.865687	Building
B-POI3	29.210570	-25.850833	Building
B-POI4	29.204352	-25.856094	Building
Sensitive area	29.209069	-25.855257	Possible sub-surface building remains



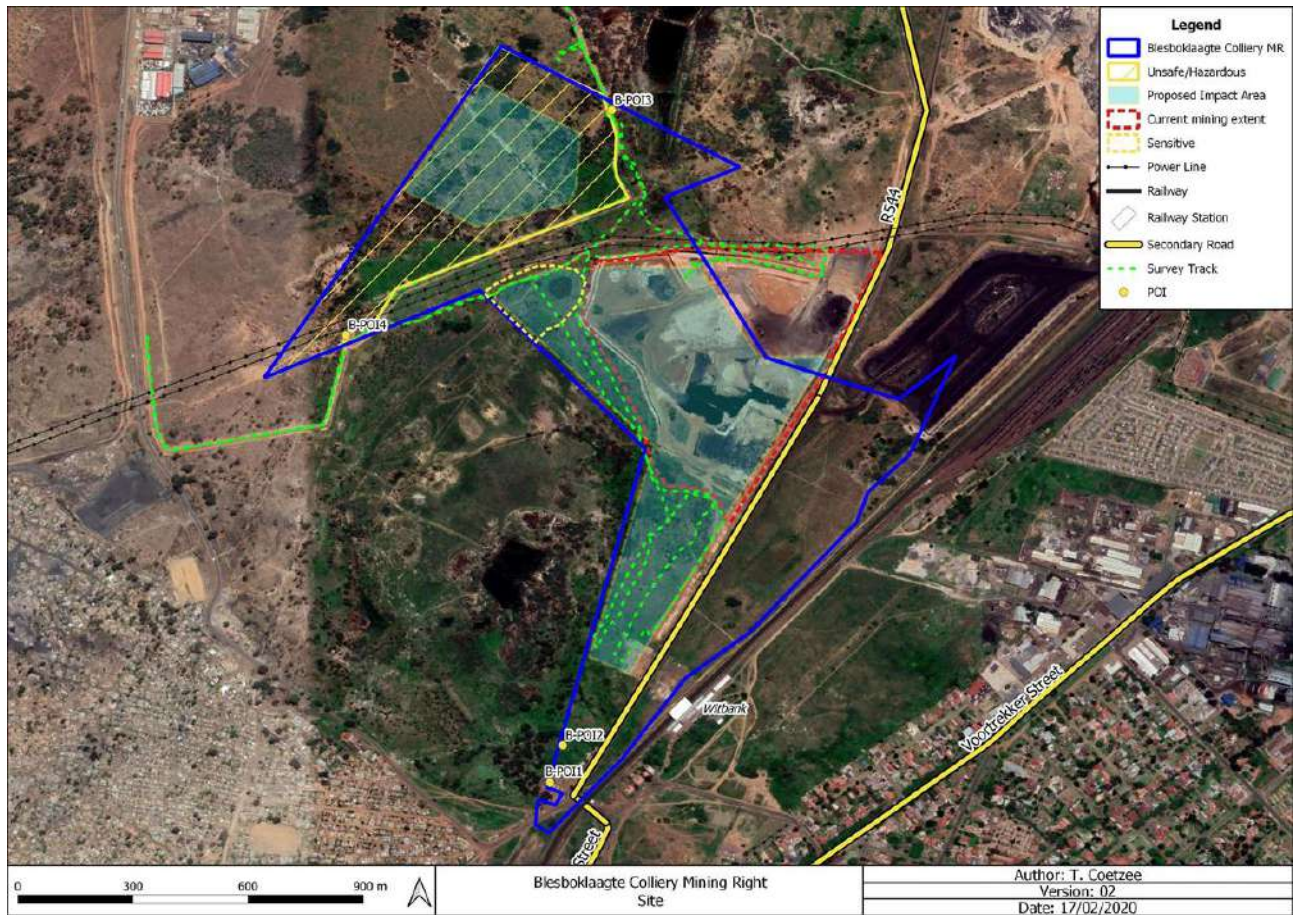


Figure 3.31: Study area with survey track on a 2020 aerial backdrop

The four buildings that were identified on the 1960 topographical map are at least 60 years of age and are therefore protected by the National Heritage Resources Act (Act No. 25 of 1999). However, these sites are not located within close proximity of areas demarcated for mining: Site B-POI1 and 2 are located near the southern corner of the proposed mining right area and approximately 240 m from the proposed southern pit. B-POI3 is located along the north-eastern boundary of the study area and about 102 m from the proposed northern pit. B-POI4 is located near the western corner of the proposed mining right area and roughly 400 m from the proposed northern pit. It should also be noted that sites B-POI1 and 2 could not be accessed. B-POI3 appears to be building foundation remains of which the extent could not be determined due to dense vegetation (Figure 3.32), while B-POI4's exact location could not be accessed due to the presence of sinkholes. Figure 3.33, however, indicates the general surroundings near B-POI4. By 1974, B-POI3 and 4 are no longer indicated on topographical maps. The 1996 topographical map no longer showed B-POI-2 while B-POI1 is labelled as a shop.

According to the topographical maps, a good chance exists that buildings B-POI3 and 4 were demolished between 1960 and 1974, while B-POI2 was most likely demolished between 1974 and 1996.

When the historical aerial photograph dating to 1943 are consulted, structures in the vicinity of B-POI1, 3 and 4 are slightly visible, while no structure is visible near B-POI2. Also, a few structures are visible within the demarcated southern pit's north-western corner (indicated as 'sensitive' on Figure 3.31). By 1962, the structures in the north-western corner of the proposed southern pit appear to have been demolished, while B-POI3 and 4 are barely visible, possibly indicating dilapidation. The uses of these building are not known, except for B-POI1, which appears to have been a shop in past years as well.

During the survey for the Klarinet Phase 2 Residential Development, Van Vollenhoven (2015) identified one site that might be of importance from a heritage perspective. The site consists of building foundation remains made from stone, but dense vegetation prohibited good visibility and the extent of the feature could not be determined. It was assumed that the feature was older than 60 years, but was rated to be of low significance. It was therefore recommended that a destruction permit be obtained should the need arise to demolish the structure, but also that sufficient recording was done during the survey.





Figure 3.32: Possible remains of site B-POI3



Figure 3.33: Possible location of site B-POI4

A high concentration of building remains on sections of Portions 55 and the remaining extent of Portion 216 were observed. Because no in-tact structures were observed during the pedestrian survey and no structures were detected on the historical maps/imagery, it is believed that the area is used as a dumping ground for building material (Figure 3.34).

During the Polafin Trading Coal Siding survey, a number of buildings were recorded that date to the early 1990's.



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It was advised that care be exercised when developing in the general area as cultural remains dating to the initial 1960's structures could have been unearthed. Due to the low level of preservation, recording done during the survey was deemed to be sufficient.



Figure 3.34: Building Rubble

No cemetery or burial ground were observed on the demarcated study area.

The studies by Van Vollenhoven (2014 & 2015) identified several graveyards, as well as single graves consisting of various types of materials. The study done by Coetzee (2017) recorded one possible grave consisting of a soil mound.

All sites should include a field rating in order to comply with section 38 of the National Heritage Resources Act (Act No. 25 of 1999). The field rating and classification in this report are prescribed by SAHRA.

Table 3.23: Field Ratings

Rating	Field Rating/Grade	Significance	Recommendation
National	Grade 1		National site
Provincial	Grade 2		Provincial site
Local	Grade 3 A	High	Mitigation not advised
Local	Grade 3 B	High	Part of site should be retained
General protection A	4 A	High/Medium	Mitigate site
General Protection B	4 B	Medium	Record site
General Protection C	4 C	Low	No recording necessary

Table 3.24: Individual site ratings

Site / Survey Point Name	Type	Rating	Field Rating / Grade	Significance	Recommendation
B-PO13	Building foundation	General Protection C	Grade 4 C	Low	No recording necessary



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Site / Survey Point Name	Type	Rating	Field Rating / Grade	Significance	Recommendation
Sensitive area	Possible sub-surface building remains	General Protection C	Grade 4 C	Low	No recording necessary

*B-POI1, 2 and 4 could not be accessed

Paleontological Resources

Regional Setting

The Karoo Supergroup is renowned for its fossil wealth. The Vryheid Formation (Pe, Pv), Ecca Group is rich in plant fossils such as the *Glossopteris* flora represented by stumps, leaves, pollen and fructifications (Appendix 1). This formation is early to mid-Permian (Palaeozoic) in age and consists of sandstone, shaly sandstone, grit, conglomerate, coal and shale. Coal seams are present in the Vryheid Formation within the sandstone and shale layers. Fossils are mainly present in the grey shale which is interlayered between the coal seams (Kent 1980, Visser 1989). Borehole logs in the coalfields show the following layers; soil, shale and sandstone, shale and sandstone interbedded, sandstone, coal, conglomerate reworked diamictite, Dwyka Tillite, and the Pre-Karoo Basement.

Fossils in South Africa mainly occur in rocks of sedimentary nature and not in rocks from igneous or metamorphic nature. Therefore, if there is the presence of Karoo Supergroup strata the palaeontological sensitivity can generally be LOW to VERY HIGH, and here locally **VERY HIGH** for the Vryheid Formation (SG 2.2 SAHRA APMHOB, 2012).

Noise

Table 3.25 depicts acceptable noise levels within districts according to the SANS 10103 guideline.

Table 3.25: Acceptable rating levels for noise in districts (SANS 10103, 2008)

Type of District	Equivalent continuous rating level ($L_{Req,T}$) for noise (dBA)					
	Outdoors			Indoors, with open windows		
	Day-night	Day-time	Night-time	Day-night	Day-time	Night-time
	$L_{R,dn,a}$	$L_{Req,d,b}$	$L_{Req,n,b}$	$L_{R,dn,a}$	$L_{Req,d,b}$	$L_{Req,n,b}$
RESIDENTIAL DISTRICTS						
a) Rural districts	45	45	35	35	35	25
b) Suburban districts with little road traffic	50	50	40	40	40	30
c) Urban districts	55	55	45	45	45	35
NON-RESIDENTIAL DISTRICTS						
d) Urban districts	60	60	50	50	50	40



Type of District	Equivalent continuous rating level ($L_{Req,T}$) for noise (dBA)					
	Outdoors			Indoors, with open windows		
	Day-night	Day-time	Night-time	Day-night	Day-time	Night-time
	$L_{R,dn,a}$	$L_{Req,d,b}$	$L_{Req,n,b}$	$L_{R,dn,a}$	$L_{Req,d,b}$	$L_{Req,n,b}$
with some workshops, with business premises, and with main roads						
e) Central business districts	65	65	55	55	55	45
f) Industrial districts	70	70	60	60	60	50

NOTE 1 If the measurement or calculation time interval is considerably shorter than the reference time intervals, significant deviations from the values given in the table might result.

NOTE 2 If the spectrum of the sound contains significant low frequency components, or when an unbalanced spectrum towards the low frequencies is suspected, special precautions should be taken and specialist advice should be obtained. In this case the indoor sound levels might significantly differ from the values given in columns 5 to 7.

NOTE 3 In districts where outdoor $L_{R,dn}$ exceeds 55 dBA, residential buildings (e.g. dormitories, hotel accommodation and residences) should preferably be treated acoustically to obtain indoor $L_{Req,T}$ values in line with those given in table 1.

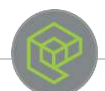
NOTE 4 For industrial districts, the $L_{R,dn}$ concept does not necessarily hold. For industries legitimately operating in an industrial district during the entire 24 h day/night cycle, $L_{Req,d} = L_{Req,n} = 70$ dBA can be considered as typical and normal.

NOTE 5 The values given in columns 2 and 5 in this table are equivalent continuous rating levels and include corrections for tonal character, impulsiveness of the noise and the time of day.

NOTE 6 The noise from individual noise sources produced, or caused to be produced, by humans within natural quiet spaces such as national parks, wilderness areas and bird sanctuaries, should not exceed a maximum Weighted sound pressure level of 50 dBA at a distance of 15 m from each individual source.

a The values given in columns 2 and 5 are equivalent continuous rating levels and include corrections for tonal character and impulsiveness of the noise and the time of day.

b The values given in columns 3, 4, 6 and 7 are equivalent continuous rating levels and include corrections for tonal character and impulsiveness.



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The probable community/group response to levels in excess of the acceptable rating levels are presented in Table 3.26, where $L_{Req,T}$ is the equivalent continuous A-weighted sound pressure level, in decibels (dBA), determined over a specific time period. 'A-weighted' is a standard weighting of the audible frequencies designed to reflect the response of the human ear to noise.

Table 3.26: Categories of community/group response (SANS 10103, 2008)

Excess ($\Delta L_{Req,T}$) ^a dBA	Estimated community/group response	
	Category	Description
0 – 10	Little	Sporadic complaints
5 – 15	Medium	Widespread complaints
10 - 20	Strong	Threats of action
>15	Very strong	Vigorous action

NOTE Overlapping ranges for the excess values are given because a spread in the community reaction might be anticipated.

a $\Delta L_{Req,T}$ should be calculated from the appropriate of the following:

- 1) $\Delta L_{Req,T} = L_{Req,T}$ of ambient noise under investigation MINUS $L_{Req,T}$ of the residual noise (determined in the absence of the specific noise under investigation);
- 2) $\Delta L_{Req,T} = L_{Req,T}$ of ambient noise under investigation MINUS the maximum rating level for the ambient noise given in table 1;
- 3) $\Delta L_{Req,T} = L_{Req,T}$ of ambient noise under investigation MINUS the typical rating level for the applicable district as determined from table 2; or
- 4) $\Delta L_{Req,T} =$ Expected increase in $L_{Req,T}$ of ambient noise in an area because of a proposed development under investigation.

The following section summarise the findings of the baseline noise sampling initiative undertaken during the daytime period on Thursday 2020/03/13.

Typical noise measurement location at the site;





Figure 3.35: Blesbokaagte Baseline Noise Measurements Sampling Locality Map

Table 3.27: Blesbokaagte Daytime Baseline Noise Measurement Results

SAMPLING SITE	CO-ORDINATE DESCRIPTION	BASELINE NOISE MEASUREMENT WEIGHTED AVERAGE SOUND PRESSURE LEVEL RESULTS (Leq)	OBSERVATIONS
BL-N-001	25°51'21.00"S 29°12'36.00"E	75.8 dBA	Continuous mining vehicle and machinery noise audible, tree leave movement noise and intermittent birdsong during sampling
BL-N-002	25°51'32.00"S 29°12'48.00"E	69.5 dBA	Intermittent mining vehicle and machinery noise, background public road noise audible
BL-N-003	25°51'24.00"S 29°12'56.00"E	87.6 dBA	Continuous mining vehicle and machinery noise as well as auxiliary public road noise audible
BL-N-004	25°51'16.00"S 29°12'50.00"E	74.3 dBA	Intermittent vehicle noise in close proximity to site boundary

Potential Identified Sensitive Receptors

Sensitive receptors which have been identified in the immediate vicinity of the study area and proposed project area have been listed below;

- Community homesteads



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- Farming operations, offices and homesteads on immediate and surrounding farms,
- The town of Ermelo

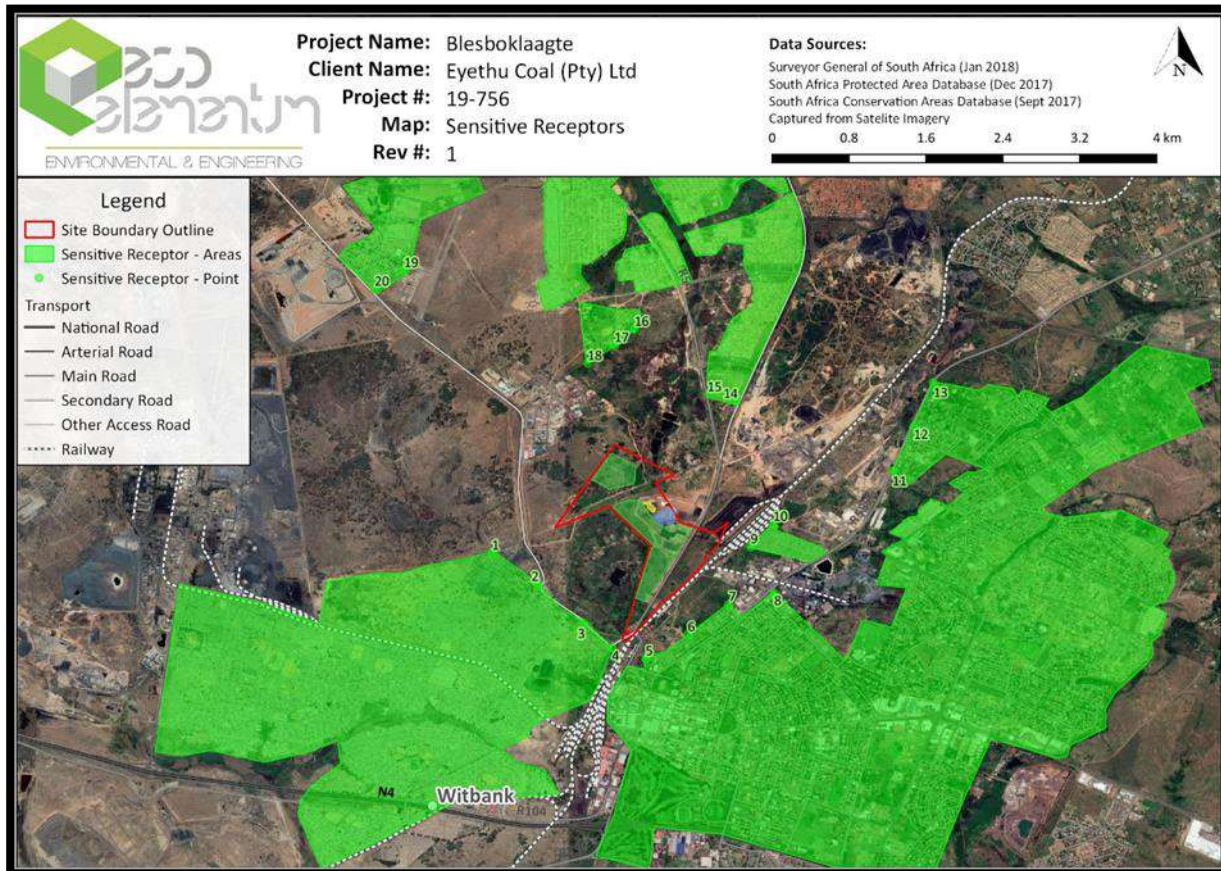


Figure 3.36: Sensitive receptors in the immediate vicinity of the mining boundary

From a desktop study of satellite imagery various sensitive receptors in the form of human habitation areas, consisting of the town of Witbank bordering the southern border of the proposed Blesboklaagte project area. It should be noted that the sensitive receptors in the area may differ from those identified as not all areas may have been identified from the imagery successfully.

Baseline Noise Impact Contributing Sources

Various noise influencing factors and sources exists in the region including;

- The main road network and supporting regional roads
- General vehicle noise on auxiliary roads in close proximity to the site
- Mining activities resulting in noise (mostly related to mining vehicles and machinery noise)
- Railway line and shunting of train trucks
- Existing additional mining operations in the vicinity of the site

Current results measured and obtained during the sampling initiative during the daytime period on Thursday 2020/03/13 by aid of handheld indicative active sampling equipment indicated elevated background ambient noise levels. Noise levels measured were within the 69.5 – 87.6 dBA range which is above the daytime 50dBA equivalent continuous rating level prescribed for *Residential Districts, Suburban districts with little road traffic*. This nature of the baseline noise is even above the *Non-Residential Districts, Industrial Districts* 70dBA outdoors daytime rating which is the highest acceptable level. Various existing noise factors influence the nature of the ambient noise character in the area and industrial, mining and residential activities are in very close proximity to each other throughout the Witbank area and therefore not entirely unique to the site. It should be noted that indicative samples were taken for a period of 30min at each sampling point and future continuous noise measurement would be required to fully understand the nature of this noise polluted region.

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The ambient noise levels emitted were primarily due to the existing mining and industrial activities, main and auxiliary roads in close proximity to the study area.

- All of the noise measurements sampling points were above the allowable limit as per SANS 10103:2008 of 50dB for Residential Districts, Suburban districts with little road traffic during daytime outdoors.

Socio-Economics

The project is situated in the northern part of the Emalahleni Local Municipality (ELM) (falls under the Nkangala District Municipality) between Emalahleni/Witbank City and Kromdraai. This part of ELM also hosts a steel industry hub.

The ELM's economy is dominated by mining, power generation as well as steel, vanadium and chrome processing. The rapid expansion of the local economy was based on the development of the coal and steel industries. This in turn attracted a large inflow of migrants to the area, but also led to the development of a range of business and social facilities reducing the dependency on Gauteng for all but the most specialised goods and services. The growth of the economy and population outpaced ELM's ability to absorb the population or provide basic services and housing. In addition, the area experiences high levels of environmental pollution from industrial and mining activities.

Blesboklaagte Colliery is situated in ELM Ward 15. The ward is situated west of the R544 and includes the Klarinet extensions 1 to 8 north-west and north of the Colliery. The southern part of the ward includes the eastern parts of Thushanang (part of the former black township areas in Ackerville and Lynville that was established to the west of the central town of former Witbank). The adjacent areas include ELM Ward 20 (to the east of the project), ELM Ward 14 (to the south and west) and Ward 12 (to the north).

The population growth rates in ELM were much higher (2.9% per annum) than the national average of 1.5% or the provincial rate of 1.4% between 2011 and 2016. This suggests in-migration into ELM by job seekers in search of job opportunities in the coal fields and other economic opportunities. The area surrounding the project area could be home to more than 47,000 people. The average household sizes in the ward where the Colliery is situated as well as Ward 12 south of the Colliery indicate to higher rates of in-migration in these areas.

There are relatively low percentages of females in ELM compared to provincial and national averages. This confirms high historic and sustained in-migration of dominantly male job seekers to ELM, which is also evident within the study area.

Population growth and household growth place pressure on municipal service delivery. Infrastructure is ageing and the municipality struggles to obtain funding to successfully attend to this issue. There is also an increase in the housing, water, waste and electricity backlogs in ELM with the housing and electricity backlogs being higher than the national and provincial averages. The municipality fared relatively better in terms of sanitation and waste services.

The ELM, however, is a provincial priority area in terms of the eradication of housing backlogs but various challenges hamper the implementation of the planned projects. There are three water treatment works (WTW) located in Witbank, Ga-Nala and Rietspruit respectively. The supply of these plants is insufficient to meet the water needs of ELM. This is worsened by the ageing distribution network requiring upgrades and intensive maintenance. The ELM's wastewater treatment works (WWTW), is overloaded due to increase demand and lack of expansion, ageing infrastructure and lack of proper maintenance.

ELM fared slightly better than the national average in terms of the matric pass rate (78%) as well as the percentage of school aged children enrolled in educational institutions. All three of the wards within the study area (Wards 15, 14 and 12) that lies to the west of the R544, however, shows lower education levels than the municipal and even the national and provincial averages. The adult population in Ward 20 to the east of the R544 by comparison shows above-average educational levels, also in terms of the municipal average. Close to 70% of the adult population in this ward would fall in the semi-skilled labour category (53%) or skilled labour category (14%).

The quality of primary health care services and facilities is of a concern in Nkangala District as is evident in the relatively low percentage of primary healthcare clinics in these districts that could be classified as Ideal Clinics. Emalahleni also receives much attention in academic reviews and media articles due to high levels of air pollution and related respiratory and cardiovascular health issues associated with the high level of coal-based power electricity, mining and industrial activities in the area.



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Of concern is that the per capita crime rate in Emalahleni is higher than the national and provincial averages and increased between 2010 and 2018. The highest increases were recorded in the Vosman area (directly west of Emalahleni) and Witbank precincts. The area also experienced a steady increase in service-delivery protests since 2008.

The unemployment rate for ELM was on par with the provincial rate in 2011. There were though slightly less discouraged work seekers in the municipal area than provincially since the expanded unemployment rate was significantly lower at 31% in 2011 than the provincial average of 38% and even the national average of 32%. However, the unemployment rate is much higher in Ward 15 where the Colliery is situated as well as in the adjacent wards west of the R544. The unemployment rate in Ward 20 east of the Colliery was significantly lower than the provincial and national average in 2011.

Despite increasing unemployment in ELM, in-migration is continuing, in turn contributing to a greater increase in unemployment. Corresponding to high unemployment levels and lower skill levels, poverty rates are higher in Ward 15 where the Colliery is located and Ward 14 to the south. Income levels in Ward 20 are significantly higher than the municipal average, indicating to the difference in economic status between the eastern and western sections of the Emalahleni/Witbank city area.

The ELM is the municipality with the largest economy in Mpumalanga Province with a dominance of the mining and electricity sectors in the Emalahleni economy in terms of output. The over-reliance of the ELM economy on the coal industry is of concern, especially in the light of the forecasted decline in the industry projected within the next decade. Current estimates are that the average LoM in the region will come to a close in 2030 with some 7.500 jobs at risk in the region over the medium term.

Key Findings

The project is relatively small relative to the ELM economy and mining industry in total.

A total number of 38 direct jobs are foreseen of which 55% (21 jobs) will be unskilled. Direct Income/Gross Value Added (GVA) from the project is estimated at a maximum of R78m in the second year. Apart from the direct economic impact of the mine it will also have flow-on impacts on the economy which could add another 104 to 137 jobs and a GVA of between R67m to R 90m to the economy over the three years' operations of the mine. The project will thus only be contributing 0.2% towards municipal output and employment and just below 1% towards ELM's mining output and employment. The direct jobs created by the mine represent only 1.5% of total formal employment in Ward 15 where the Colliery is located and 0.4% of formal jobs in Wards 12, 14 and 20 adjacent to the Colliery.

It should, however, also be noted that Phase 2 of Blesboklaagte Colliery will spend close to R4m (2017 prices) on human resource development over the three period, which will have positive impacts in terms of up-skilling the local labour phase within the local area surrounding the site and within the ELM.

The SLP for this project make provision for some R 5.2 m to the local community for local economic development over the three-year lifetime of the project i.e. R 1m for the first year (including Phase 1) and R1.8m per year for the remaining two years. This represents close to a 3.7% equity equivalent benefit to the local community, slightly lower than the 5% minimum target set by the 2018 Mining Charter. The SLP foresees that the funds will be spent on infrastructure projects according to the local communities' priorities and possibly an income generating project.

3.g.iv.1.b Description of The Current Land Uses

The land where Blesboklaagte Colliery is situated is used mainly for grazing purposes. Adjacent land is used for mining, industrial, residential and grazing purposes.

The R544 provincial roads occur along the east of the mining area. The Eskom Power Line also crosses the mining area on the western side.



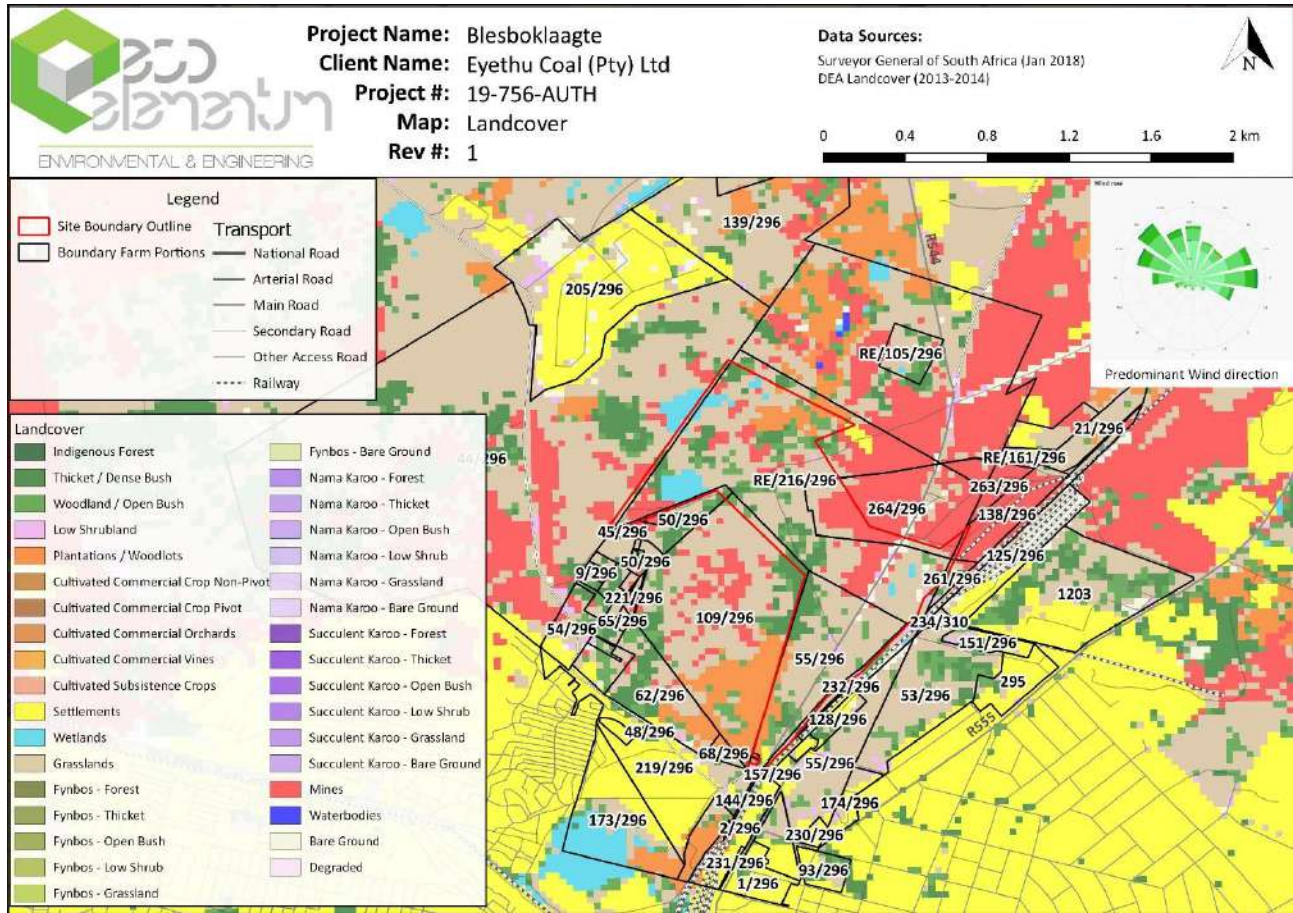


Figure 3.37: Landcover of the project area

Land Conversion

The land use patterns of the surrounding area are defined as a mixture between grazing, mining with intermittent residential and business use. Since the proposed new mining operations will consist of opencast mining, the land use in these areas will change from grazing to mining. The areas where the pit, site infrastructure and stock piles will be located will be sterilized from agricultural activities. However very little grazing areas remain as the area has become a place of illegal dumping and squatting.

3.g.iv.1.c Description of Specific Environmental Features and Infrastructure On the Site

The proposed infrastructure has been discussed under Heading 3.d.ii. The following is a summary of the identified sensitive environmental features and other structures on the proposed site:



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Specific Sensitive Environmental Features

No Specific sensitive environmental features were present on the proposed site. A wetland was identified outside of the side boundary; however, the wetland was of a highly degraded state.

Specific Infrastructure on site

Table 3.28: Specific Infrastructure Features associated with the site

Site / Survey Point Name	Longitude	Latitude	Description
B-POI1	29.209124	-25.866563	Building
B-POI2	29.209426	-25.865687	Building
B-POI3	29.210570	-25.850833	Building
B-POI4	29.204352	-25.856094	Building
Sensitive area	29.209069	-25.855257	Possible sub-surface building remains

Of the heritage features identified on site only B-POI4 and Sensitive Area could be assessed in on site. Both features received a low sensitivity rating.

3.g.iv.1.d Environmental Sensitivity and Current Land Use Map

Figure 3.38 below depicts the environmentally sensitive areas, in relation to, the proposed project infrastructure.

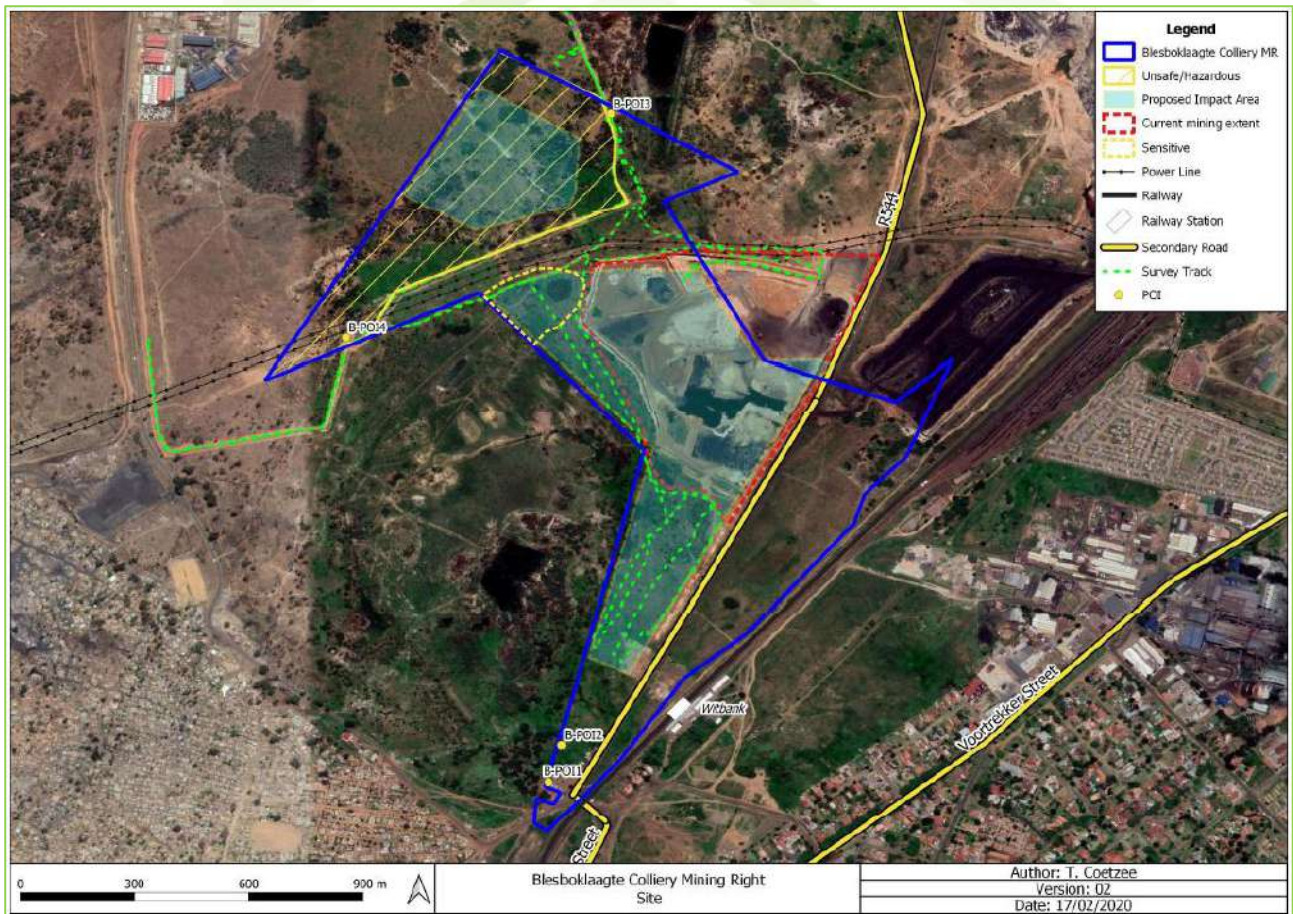


Figure 3.38: Areas of cultural sensitivity



3.g.v Summary of Impacts and Risks Identified by Specialists

This section summarises the main findings of various specialists' impact assessments with respect to the proposed project.

Air Quality Impacts

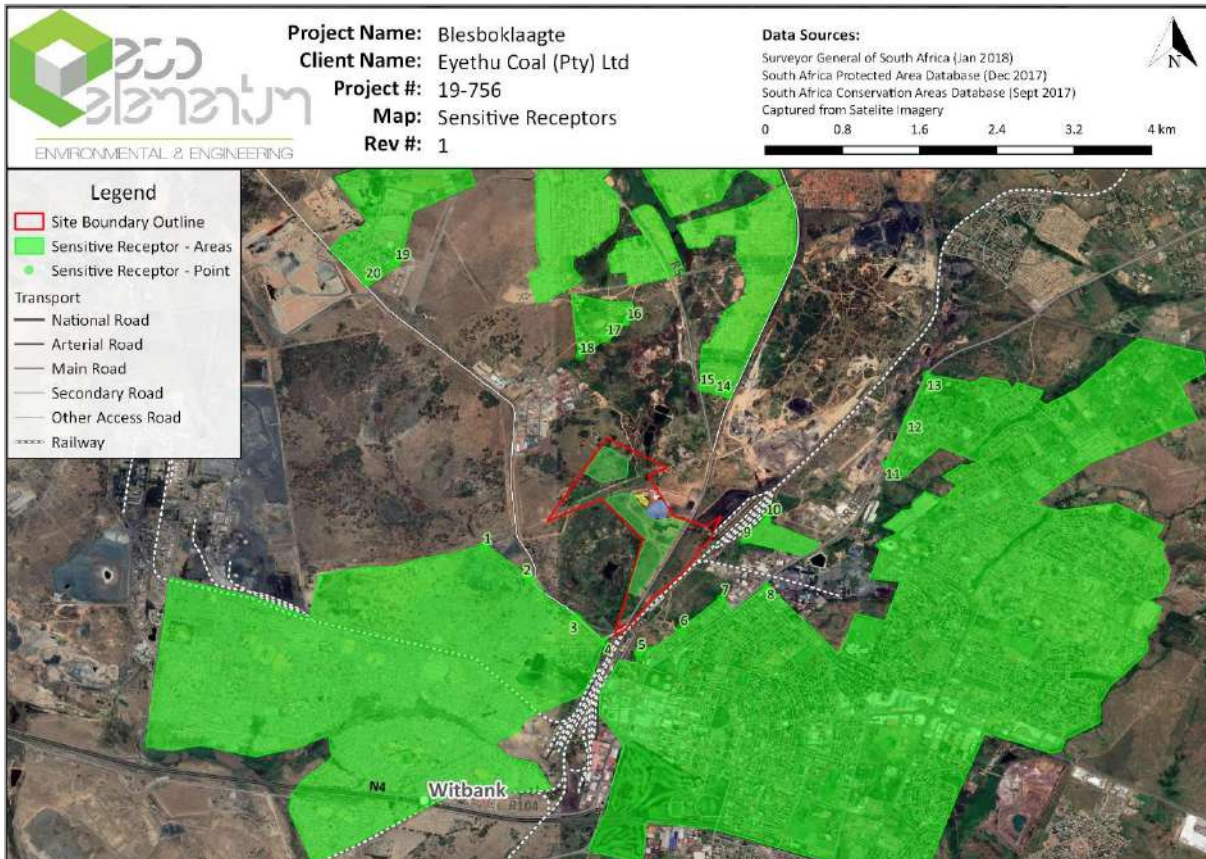
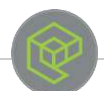


Figure 3.39: Sensitive receptors in the immediate area of the mining boundary.

<p>Site Clearing, removal of topsoil and vegetation</p>	<p>During this activity, a number of operations take place such as land clearing, topsoil removal, loading of material, hauling, grading, stockpiling, bulldozing and compaction. Initially, topsoil and subsoil will be removed with large scrapers. The topsoil will be stockpiled for rehabilitation in the infrastructure area. It is anticipated that each of the above mentioned operations will have its own duration and potential for dust generation. Fugitive dust (containing TSP (total suspended particulate, will give rise to nuisance impacts as fallout dust), as well as PM10 and PM2.5 (dust with a size less than 10 microns, and dust with a size less than 2.5 microns giving rise to health impacts)) It is anticipated that the extent of dust emissions would vary substantially from day to day depending on the level of activity, the specific operations, and the prevailing meteorological conditions. This activity will be short-term and localised, ceasing after construction activities. Material will be removed by using a bulldozer and then storing this material separately for use during rehabilitation at end of life of mine when the operation ceases. These construction sites are ideal for dust suppression measures as land disturbance from clearing and excavation generates a large amount of soil disturbance and open space for wind to pick up dust particles and deposit it elsewhere (wind erosion). Issues with dust can also arise during the transportation of the extracted material, usually by truck and shovel methods, to the stock piles. The dust can further be created by the entrainment from the vehicle itself or due to dust blown from the back of the bin of the trucks during transportation of material to and from stockpiles.</p>
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<p>Construction of surface infrastructure</p>	<p>During this phase, it is anticipated there will be construction of infrastructure. This will include, access roads, pipes, storm water diversion berms, change houses, admin blocks, drilling, blasting and development of box cut for mining, etc. Activities of vehicles on access roads, levelling and compacting of surfaces, as well localised drilling and blasting will have implications on ambient air quality. The above mentioned activities will result in fugitive dust emissions containing TSP (total suspended particulate, giving rise to nuisance impacts as fallout dust). Opencast mining will commence with the stripping of the vegetation for the initial box cut. Topsoil and overburden need to be removed and stockpiled separately by means of truck and shovel methods (front end loaders, excavators and haul trucks). Once the rock has been reached will blasting be required to further remove material to the point where the mineral can be extracted. Bulldozing, excavation, drilling and blasting operations will result in the emission of dust to atmosphere. The construction of roads take place through removing the topsoil and then grading the exposed surface in order to achieve a smooth finish for vehicles to move on. Temporary stockpiles will be created close to the edge of the road in order to be backfilled easily once the road has expired or need to be rehabilitated.</p>
<p>General transportation, hauling and vehicle movement on site.</p>	<p>Transportation of the workers and materials in and out of mine site will be a constant feature during the construction phase. This will however result in the production of fugitive dust (containing TSP, as well as PM10 and PM2.5) due to suspension of friable materials from earth roads. It is anticipated this activity will be short-term and localised and will cease once the construction activities are finalised. Haul trucks generate the majority of dust emissions from surface operations. Observations of dust emissions from haul trucks show that if the dust emissions are uncontrolled, they can be a safety hazard by impairing the operator's visibility. Substantial secondary emissions may be emitted from material moved out from the site during grading and deposited adjacent to roads. Passing traffic can thus loosen and re-suspend the deposited material again into the air. In order to minimize these impacts the stockpiles should be vegetated for the duration that it is exposed.</p>



Use and maintenance of access road. Dust from material handling - Inside and outside the pit area. Haul roads; for transporting the ROM to the offsite Processing plant. Wind erosion from stockpiles.	For the unmitigated Daily PM10 concentrations it was predicted to be higher than the 75 µg/m³ limit for 13 of the sensitive receptors. When comparing the Daily Mitigated PM10 modelled concentrations, the sensitive receptors exceeding the 75 µg/m³ limit dropped to 0 of the identified sensitive receptors. This as well is the highest levels predicted for a 24-hour period within the period. Due to site specific atmospheric conditions these exceedances may still occur within the limit of 4 per year. The annual average PM10 limit of 40 µg/m³ are predicted not to exceed at any of the identified sensitive receptors for the unmitigated or mitigated scenarios.																																																																																																													
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<p style="text-align: center;">Demolition & Removal of all infrastructure (incl. transportation off site)</p>	<p>During this activity, there is demolition of buildings and foundation and subsequent removal of rubbles generated. There is cleaning-up of workshops, fuels and reagents, removal of power and water supply, removal of haul and access roads. Potential for impacts during this phase will depend on the extent of demolition and rehabilitation efforts during closure as well as features which will remain.</p> <p>The impacts on the atmospheric environment during the decommissioning phase will be similar to the impacts during the construction phase. The process includes dismantling and demolition of existing infrastructure, transporting and handling of topsoil on unpaved roads in order to bring the site to its initial/rehabilitated state. Demolition and removal of all infrastructures will cause fugitive dust emissions. The impacts will be short-term and localised. Any implication or implications this phase will have on ambient air quality will cease once the activities are finalised.</p>
<p style="text-align: center;">Rehabilitation</p>	<p>During this activity, there is the reshaping and restructuring of the landscape. Since this is an opencast operation mainly, the area to be reconstructed will be limited to the opencast areas. Topsoil can be imported to reconstruct the soil structure. There is less transfer of soil from one area to other therefore negligible chances of dust through wind erosion. Profiling of dumps and waste rock dump to enhance vegetation cover and reduce wind erosion from such surfaces post mining.</p>

Soils, Land Use and Land Capability

Impacts anticipated include:

- Exposure of soil surface to erosion
- Soil compaction and reduced water infiltration capacity
- Destruction of in situ soil profiles
- Destruction of soil nutrient cycles and hydropedological functioning
- Soil chemical pollution
- Destruction of arable and grazing land capability

Surface Water

It can be deduced from the calculated figures in the groundwater model that the cumulative groundwater drawdown at the streams/wetlands close to the mine will have an impact. In particular, the upper reaches of the Blesbokspruit could be affected. However, decant from the defunct underground mine workings is currently occurring in this area. Thus, although the drawdown could affect the stream's base flow, historic mining at this site have already affected the flow in the stream, especially in terms of contaminated mine water inflows. Therefore, the effect of the mine on the stream could be positive in that poor-quality decanting will be reduced.

Groundwater

Construction Phase

This phase is not expected to influence the groundwater levels. With the exception of lesser oil and diesel spills, there are also no activities expected that could impact on regional groundwater quality.

Operational Phase

Impacts on Groundwater Quantity

During the operational phase, it is expected that the main impact on the groundwater environment will be de-watering of the surrounding aquifer. Water entering the mining areas will have to be pumped out to enable mining activities. This will cause a lowering in the groundwater table in- and adjacent to the mine.



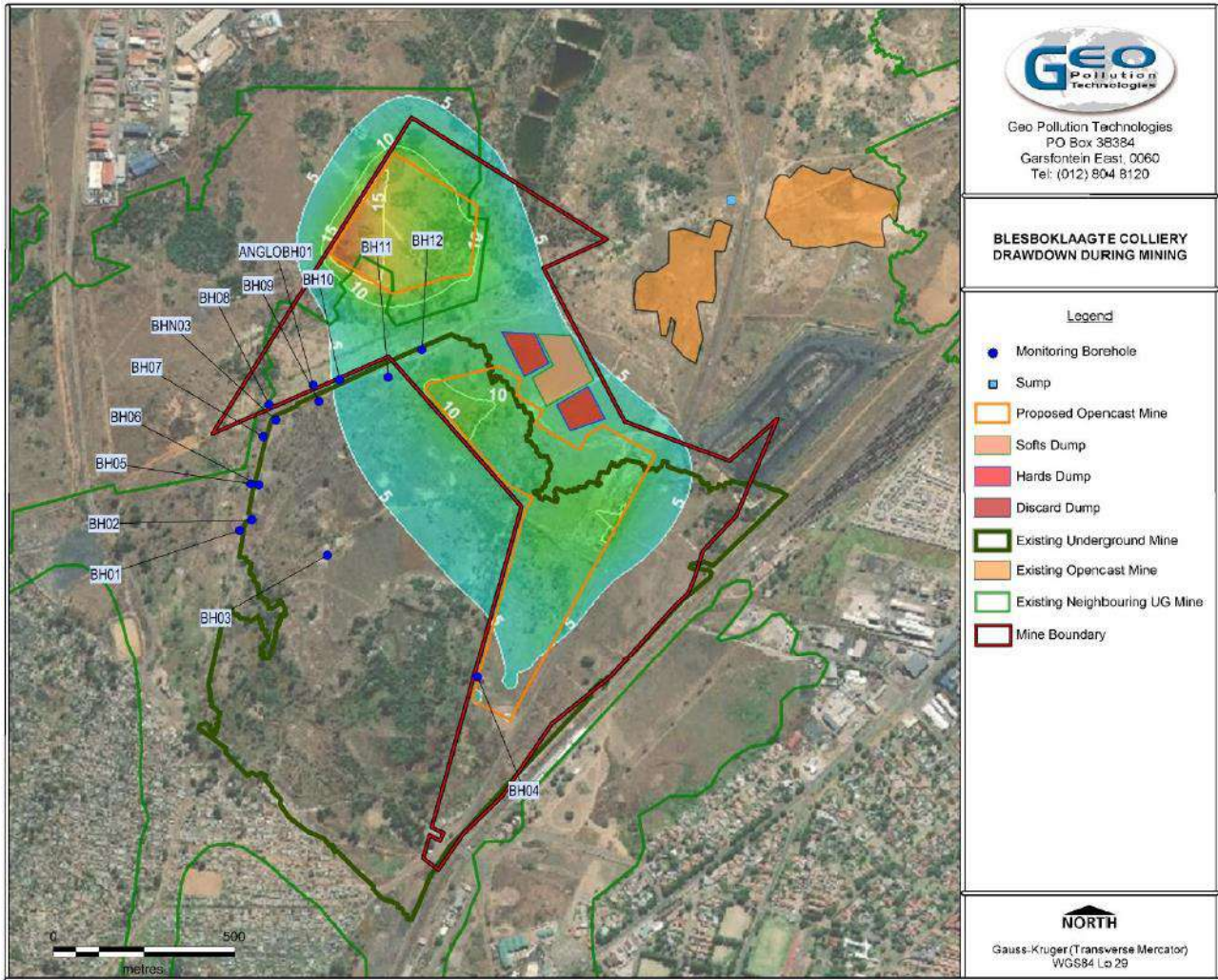


Figure 3.40: The simulated maximum drawdown cone

Impacts on Groundwater Quality

The flow in the aquifer will be directed towards the mine at this stage and very little groundwater pollution is thus expected. Additionally, current contaminated groundwater could also flow into the mine, temporary diverting the existing contaminant plume.



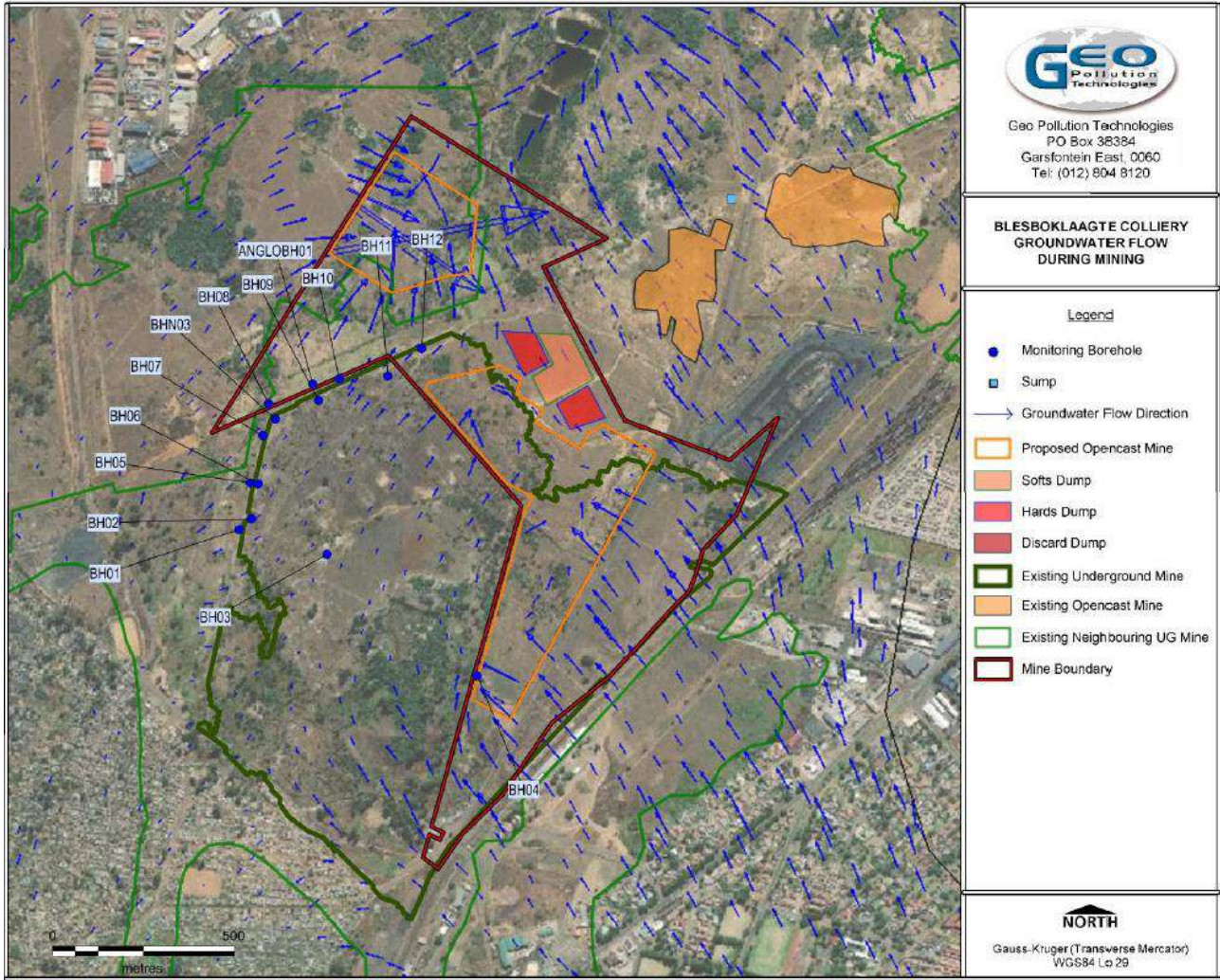


Figure 3.41: Flow direction during operation

Decommissioning Phase

Groundwater Quantity

After closure, the water table will rise in the mine to reinstate equilibrium with the surrounding groundwater systems. However, the mined areas will have a slightly larger hydraulic conductivity compared to the pre-mining situation.



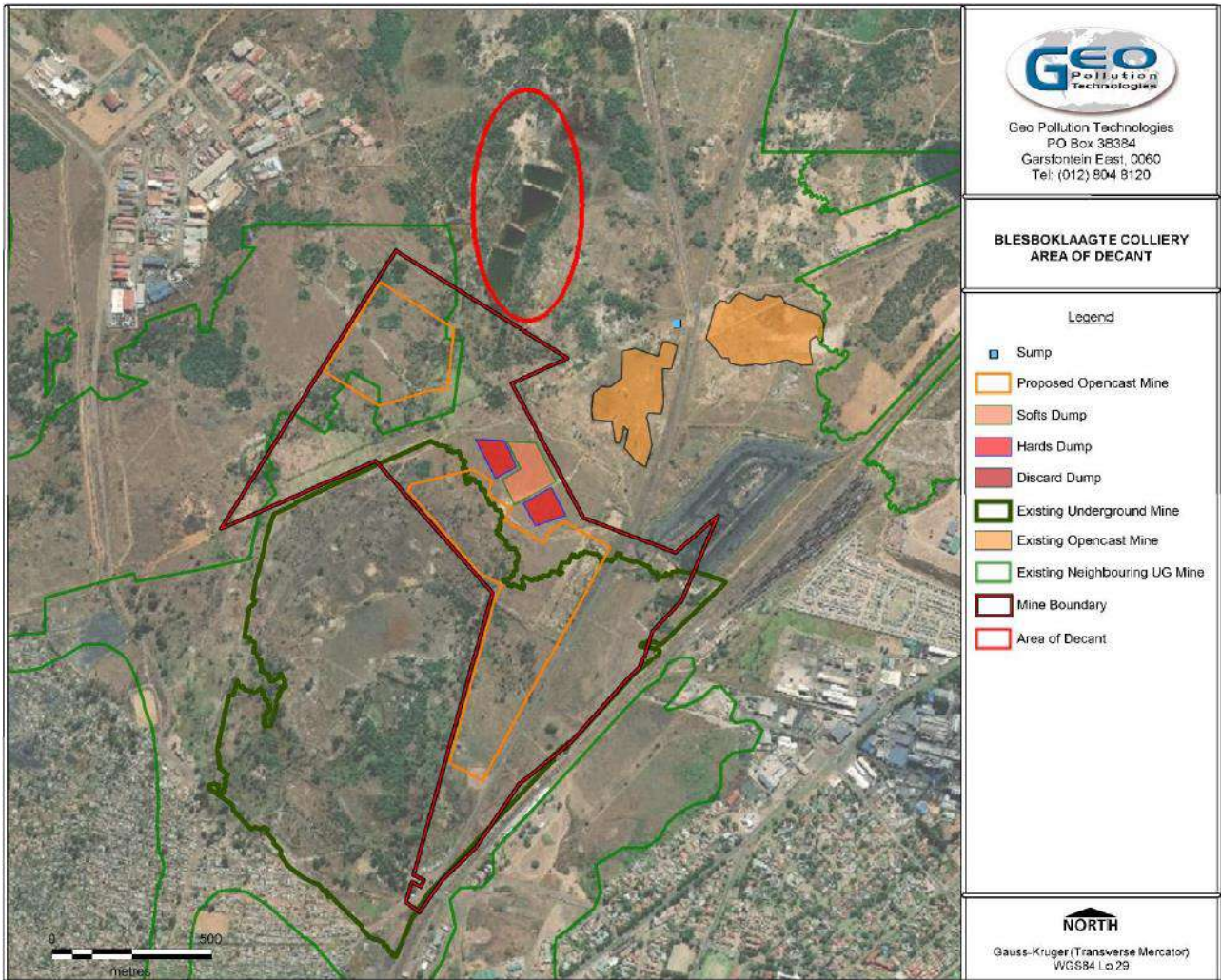


Figure 3.42: The potential decant point position.

Groundwater Quality

Once the normal groundwater flow conditions have been re-instated, polluted water could potentially migrate away from the mining areas. As some coal and discards will remain in the mine, this outflow will be contaminated as a result of acid or neutral mine drainage. As sulphate is normally a significant solute in such drainage, it has been modelled as a conservative (non-reacting) indicator of mine drainage pollution. A starting concentration of 2 000 mg/litre has been assumed as a worst case scenario, based on past experience in the same area.



Updated- 22/7/2020

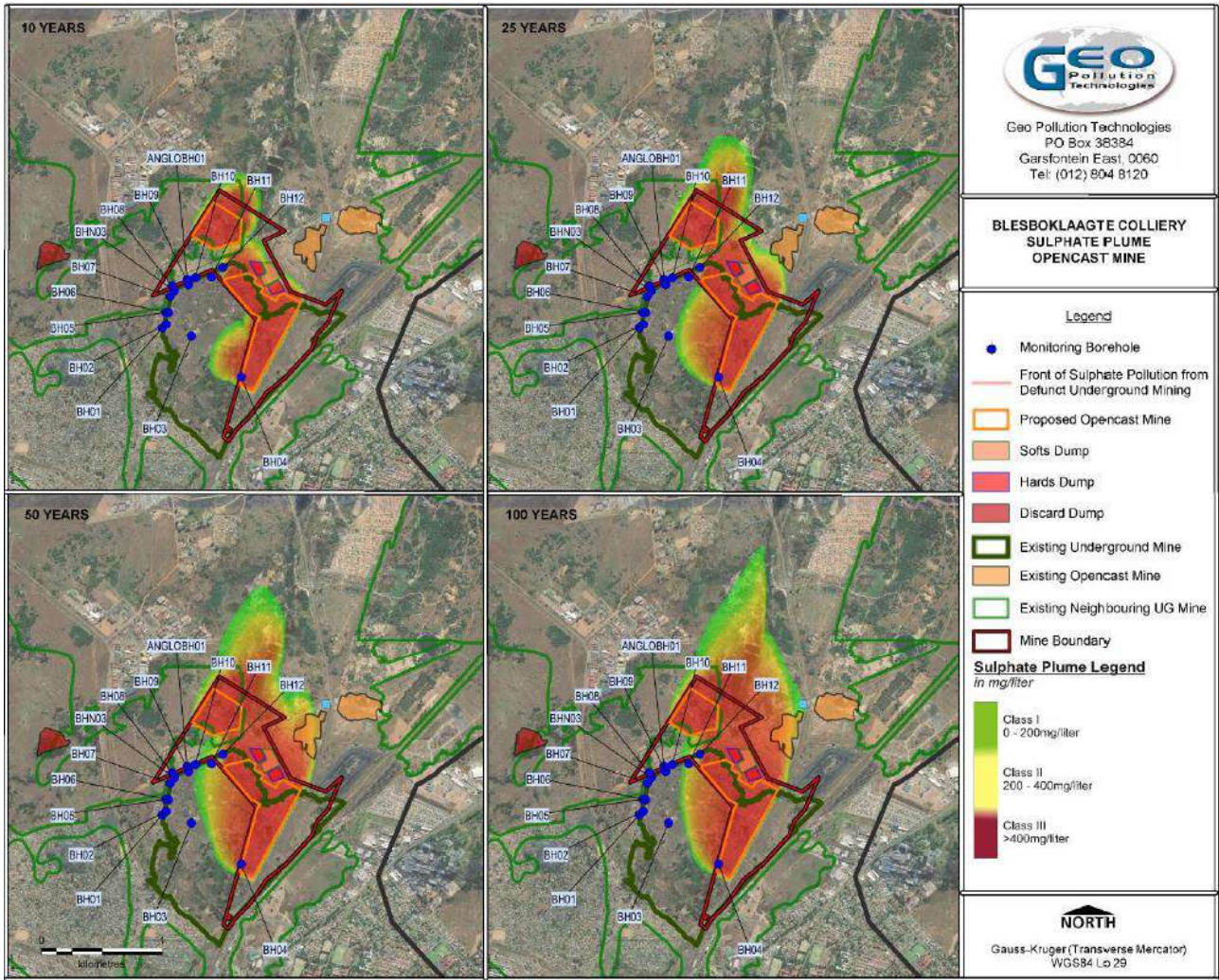


Figure 3.43: Model Simulated groundwater contamination plume post facility.



Cumulative Impact

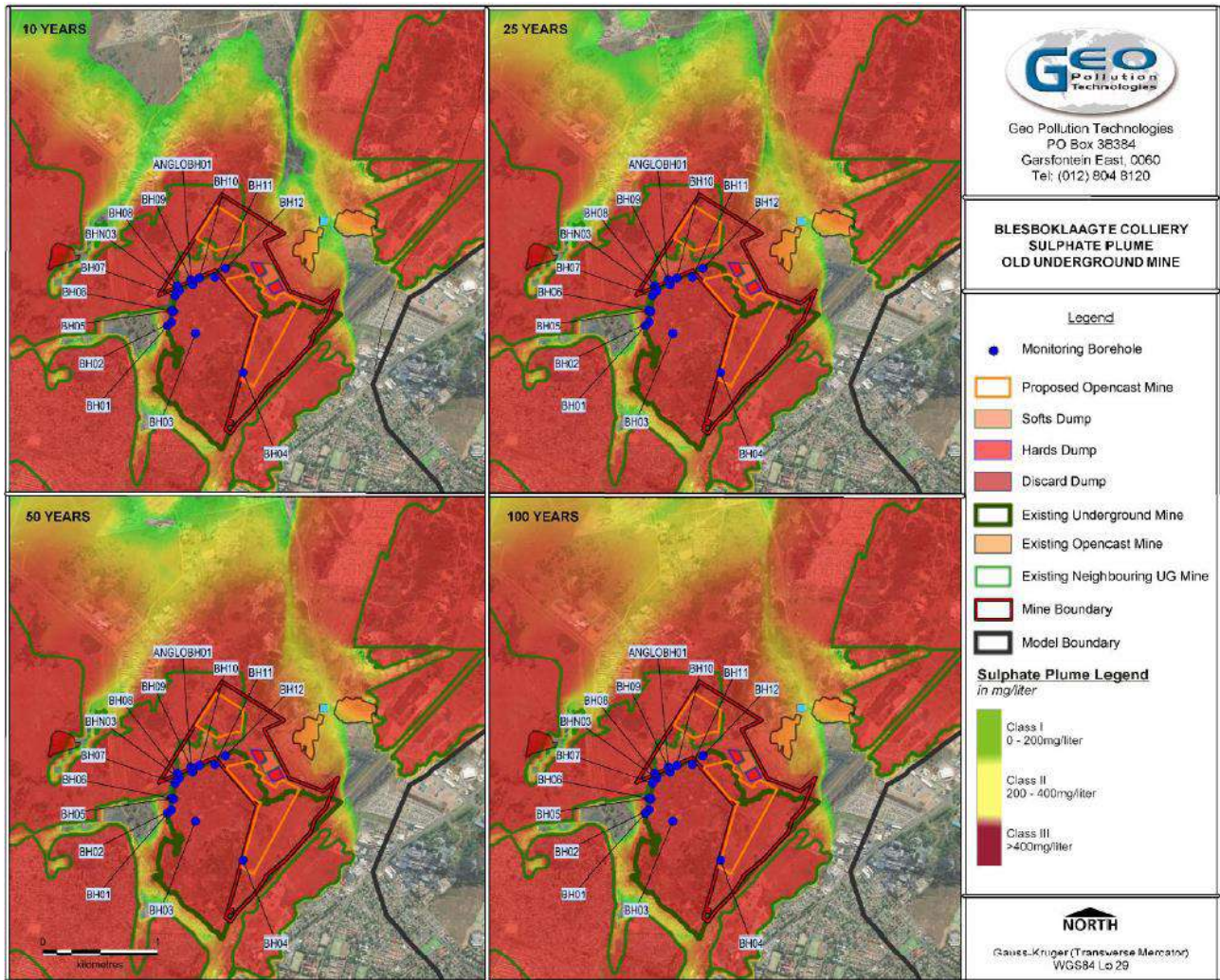


Figure 3.44: Model Simulated groundwater contamination plume – taking into account current impacts of the historical underground mining.

Wetlands and Aquatics

Construction phase

During the construction phase, areas that are targeted for the expanded opencast mining and new access roads, will be cleared of vegetation and the topsoil will be stripped. This will lead to sediments being washed downslope into wetland areas impacting on the biota and hydrodynamics of the wetlands. The increased runoff will increase the erosion potential and sediment carrying capacity of surface waters, especially during a storm event.

Construction/establishment activities associated with bulk earthworks (such as excavations, reshaping, back-filling and compaction) can alter natural patterns of surface runoff reaching water resources downslope/downstream. Excavations may impound and redirect/restrict water, starving downstream water resources. Infilling, compaction and rutting of soils caused by construction/establishment alter the patterns of diffuse surface and sub-surface flows by altering micro-topography and the permeability of soil profiles. Changes in flow patterns will affect hydrological functionality and ecosystem integrity. Increased runoff velocities linked to concentrated flow paths created during construction/establishment will lead to erosion and sedimentation. Should temporary damming and abstraction of water take place, a short-term reduction of flows to downstream habitat will also result in alterations of the sediment balance (Macfarlane et al., 2014).



Updated- 22/7/2020

Upgrading and construction/establishment of infrastructure will result in increased sediment runoff and sedimentation. Site preparation and all associated infrastructure will entail blasting, drilling, dewatering, clearing, grubbing, grading and ground preparation as well as the creation of containment facilities that will eliminate some stream reaches and intercept all surface run-off within the proposed area. Impacts associated with this activity include increased erosion and sediment deposition in the receiving aquatic environment far downstream.

Operational Phase

Increased sedimentation may occur as a result from the runoff from the waste rock dump. This has the potential to change habitat structure within the receiving environment and this will in turn result in changes in ecosystem function. Changes in habitat structure due to sedimentation would result in changes in the species composition. Water quality impairment has the potential to change ecosystem function, change community structure as species sensitive to water quality impairment are eliminated and tolerant species increase in number, this results in a loss of biodiversity of sensitive species.

Infrastructure construction/establishment/maintenance will introduce unnatural disturbance, enhancing the “edge effect” promoting establishment of disturbance-tolerant species, including further colonisation by alien invasive species in areas adjacent to the work servitude. While this impact is initiated during the construction/establishment phase the impacts will persist into the operational phase. Invasive alien plants have far reaching detrimental effects on native biota and has been widely accepted as being a leading cause of biodiversity loss. They typically have rapid reproductive turnover and are able to outcompete native species for environmental resources, alter soil stability, and promote erosion, change litter accumulation and soil properties. In addition, certain alien plants exacerbate soil erosion whilst others contribute to a reduction in stream flow thereby potentially increasing sediment inputs and altering natural hydrology of receiving watercourses. These impacts negatively affect areas that are largely natural (with low existing weed levels) greater than for areas already characterised by dense infestations of alien plants with low indigenous plant diversity (Macfarlane et al., 2014).

Flora & Fauna

Potential Construction Phase Impacts

The clearance of vegetation will result in the loss of Eastern Highveld Grassland vegetation. Impacts related to this loss can be minimised by restricting vegetation clearance and road construction to the designated areas, thereby minimising the footprint area and reducing the required rehabilitation effort. As disturbed areas are more susceptible to alien species encroachment, a pre-emptive Invasive Species Management Plan will reduce impacts related to AIP species spread. It should be noted that due to the degraded state of the environment, natural vegetation losses due to mining is expected to be minimal.

Potential Operational Phase Impacts

Topsoils and overburden will be stripped and stockpiled. Primarily the actual soil stripping footprint will temporarily lose its entire species assemblage, while secondarily, the stockpile area will undergo the same loss. Increased vehicle movement and associated human activities on the site can result in increased roadkill's and vegetation disturbance, particularly if the rules of the road are not followed. In addition, AIP species may also spread due to the level of expected soil disturbance. The increased vehicle movement can be seen as an additional vector for AIP species spread to and from the project area. Provision must also be made for unplanned impact events such as hydrocarbon spills and illegal poaching of fauna and flora species.



Updated- 22/7/2020

Potential Rehabilitation Phase Impacts

As rehabilitation will focus on alien invasive species eradication, this will temporarily lead to a reduction in habitat heterogeneity. Care must be taken to correctly apply topsoil to disturbed areas, without disturbing additional vegetation and ultimately increasing areas of potential invasion.

Heritage Sites

The following impacts are anticipated:

- Destruction of structure and graveyard
- Impacting on settlements

Noise, Blasting and Vibration

The following Noise intrusion level criteria are applicable:

Increase Δ -dBA	Assessment of impact magnitude	Color code
$0 < \Delta \leq 1$	Not audible	Green
$1 < \Delta \leq 3$	Very Low	Blue
$3 < \Delta \leq 5$	Low	Purple
$5 < \Delta \leq 10$	Medium	Orange
$10 < \Delta \leq 15$	High	Red-Orange
$15 < \Delta$	Very High	Red

Construction phase

The noise intrusion levels during the construction phase at opencast pit and infra-structure are illustrated in Table 3.29. The noise intrusion during the construction phase will be insignificant.

Table 3.29: Noise intrusion levels (in dBA) during construction phase

Position	Clearing and grubbing of the plant footprint	Construction activities at plant	Construction of the infra-structure	Civil construction activities	Construction of the overland conveyor	Construction of hauling roads	Cumulative Levels	Cumulative noise level - Daytime	Cumulative noise level - Night time	Intrusion noise level - daytime	Intrusion noise level - night time
A	3.0	3.0	3.0	5.0	4.5	4.4	21.2	39.1	36.8	0.1	0.1
B	8.1	8.1	8.1	10.1	8.7	9.1	22.6	40.4	36.9	0.1	0.2
C	8.0	8.0	8.0	10.0	9.0	8.8	27.8	40.5	37.2	0.2	0.5
D	3.4	3.4	3.4	5.4	5.6	5.6	18.1	40.3	36.8	0.0	0.1
E	-0.7	-0.7	-0.7	1.3	1.5	1.5	13.1	40.3	36.7	0.0	0.0
F	-3.4	-3.4	-3.4	-1.4	-1.0	-1.1	13.7	40.3	36.7	0.0	0.0

Operational phase

The calculated noise levels and subsequent noise intrusion levels at the abutting noise receptors during mining activities at the mine footprint (plant and open cast) will be illustrated in Table 3.30.

The mine activities will not be audible during the day and night after the implementation of the noise mitigatory measures. The threshold value of 7.0dBA will not be exceeded at any of the noise receptors.



Updated- 22/7/2020

Table 3.30: Noise intrusion levels (dBA) at the residential areas during pit activities

Position	Crushing activities	Screening activities	Pit activities	ROM	Hauling of material to the plant	Hauling of waste rock to the waste rock dump	Traffic	Emergency generator	Cumulative Levels	Cumulative noise level - Daytime	Cumulative noise level - Night time	Intrusion noise level - daytime	Intrusion noise level - night time
A	16.0	11.0	16.0	15.5	10.5	7.1	2.1	15.4	28.5	39.4	37.3	0.4	0.6
B	21.1	16.1	21.1	20.2	14.7	13.3	4.7	16.7	28.1	40.6	37.3	0.3	0.6
C	21.0	16.0	21.0	20.5	15.0	13.9	2.7	17.0	39.2	42.8	41.2	2.5	4.5
D	16.4	11.4	16.4	16.8	11.6	9.6	-0.6	13.6	26.8	40.5	37.1	0.2	0.4
E	12.3	7.3	12.3	12.5	7.5	4.8	-3.9	9.5	18.8	40.3	36.8	0.0	0.1
F	9.6	4.6	9.6	9.9	5.0	1.7	-5.8	7.0	18.4	40.3	36.8	0.0	0.1

Visual

Visibility is determined by a line of sight where nothing obscures the view of an object. Exposure is defined by the degree of visibility, in other words “how much” of it can be seen. This is influenced by topography and the incidence of objects such as trees and buildings that obscure the view partially or in total.

For the assessment of the visibility of the area, the viewshed has been calculated for the amount of surface infrastructure features that can be seen from any point on the map. The stockpile has been divided into multiple point to better assess how much of the stockpiles are visible.

The View Counts from the visibility section above is then further ranked based on distance from the centre of the proposed infrastructure site.

The visible infrastructure count is combined with the distance from the source ranking together with the VAC of the land cover types, the slope, aspect, ruggedness, relative elevation, landforms and slope position to get a quantitative Visual Exposure ranking of all the areas where it may be possible to see the proposed development.

Each identified sensitive receptor is then overlaid on the Visual Exposure Ranking and the value extracted to that pixel to give a quantitative ranking for each of the identified sensitive receptors. Ranking is done from 1 to 10, 1 being very low and 10 very high.

Due to fact that topographic modification can take place by agricultural, vegetation and other activities in the area, the viewshed is only a theoretical study. The viewpoints have been identified based on the sensitivity of the areas to visual disturbance and areas that can be negatively impacted by the related structures.



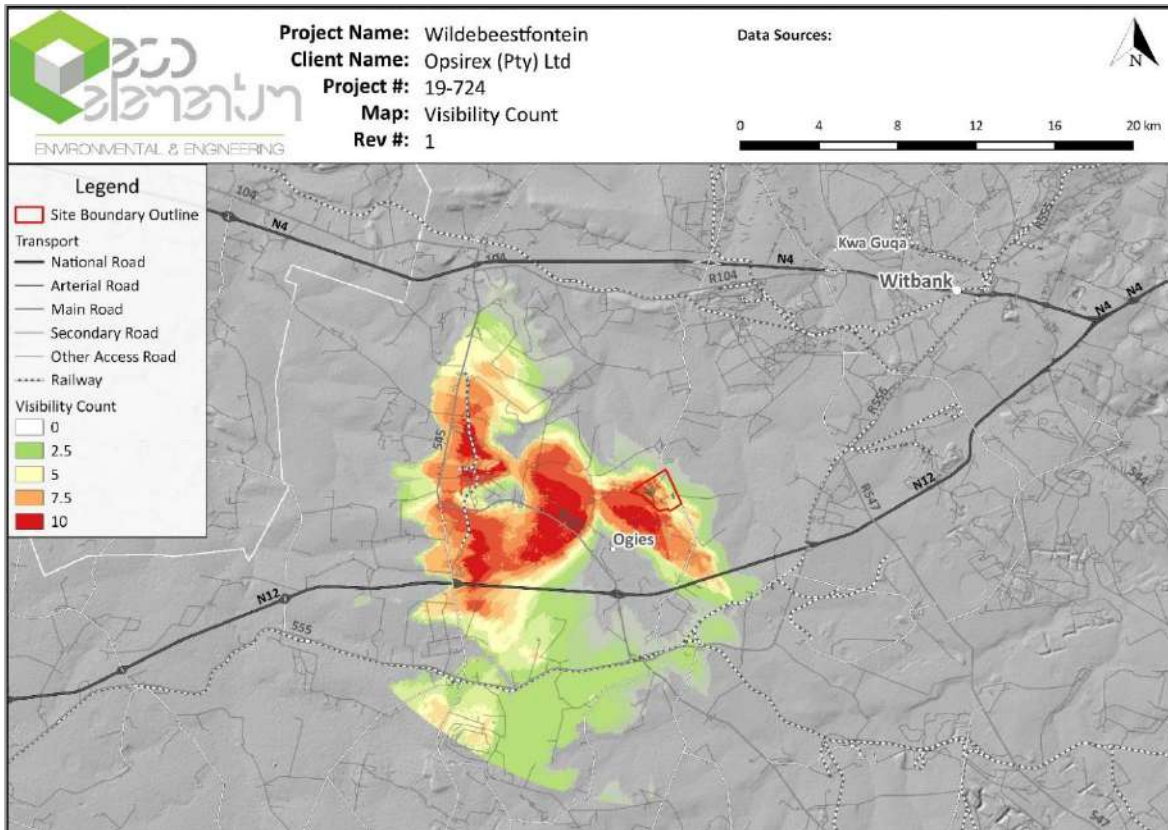


Figure 3.45: Viewshed of proposed Wildebeestfontein Coal project – Visibility Count (How many surface infrastructure locations can be seen from any location on the map)

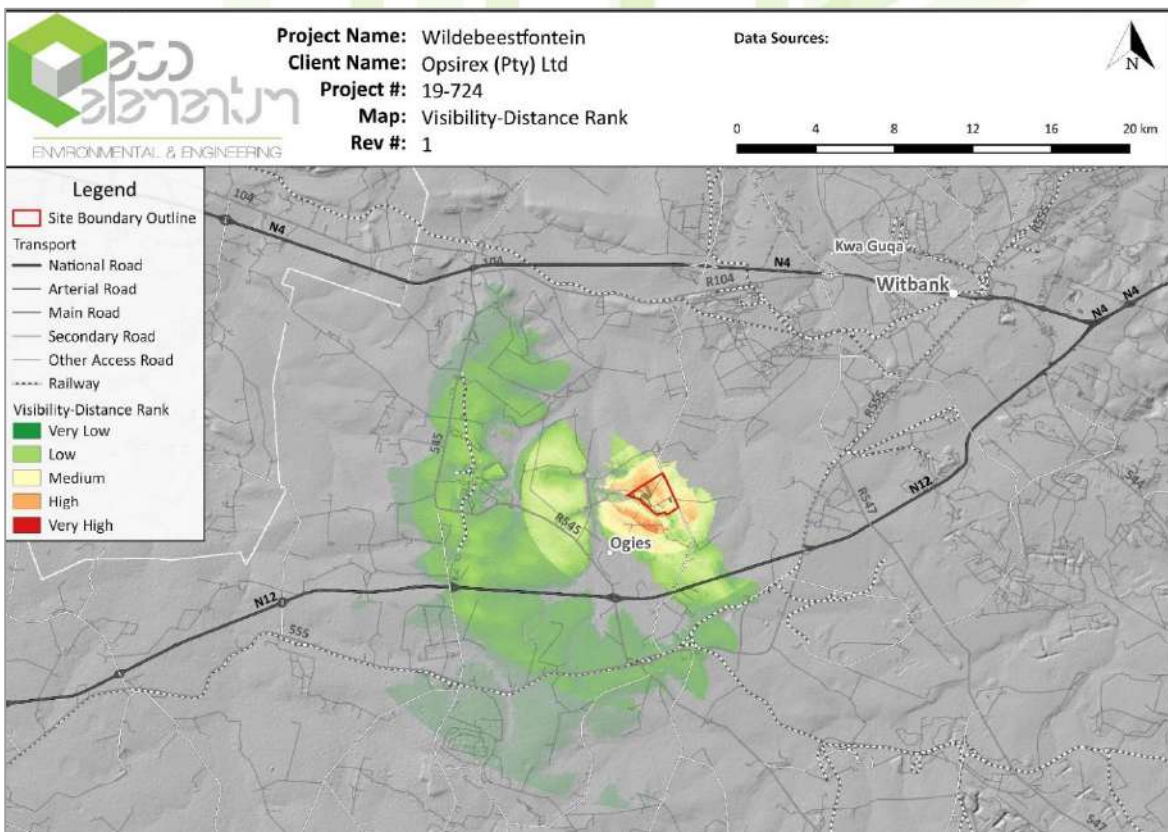


Figure 3.46: Viewshed of proposed Wildebeestfontein Coal project – Visibility-Distance Rank (How many surface infrastructure locations can be seen from any location on the map ranked according to distance from source)

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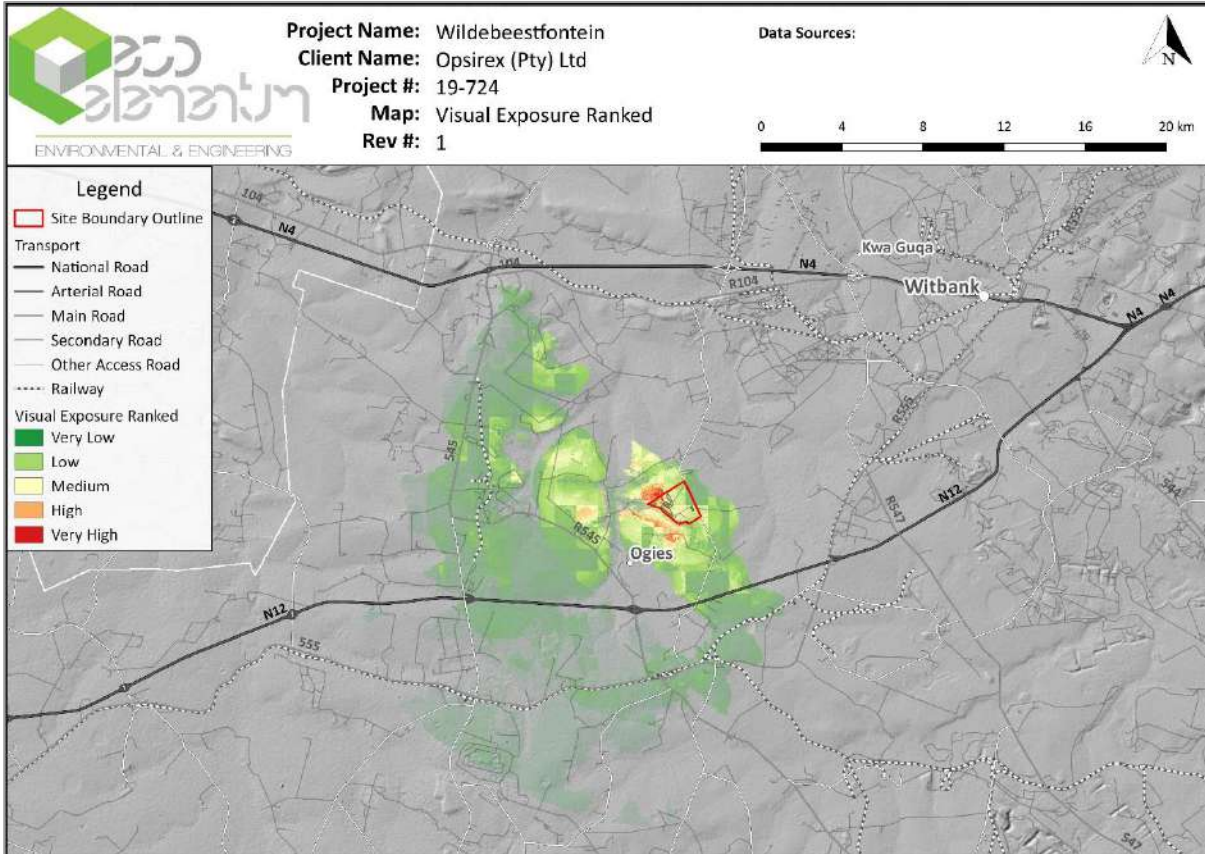


Figure 3.47: Visual Exposure ranking within a 15 km radius of the proposed Wildebeestfontein Coal project

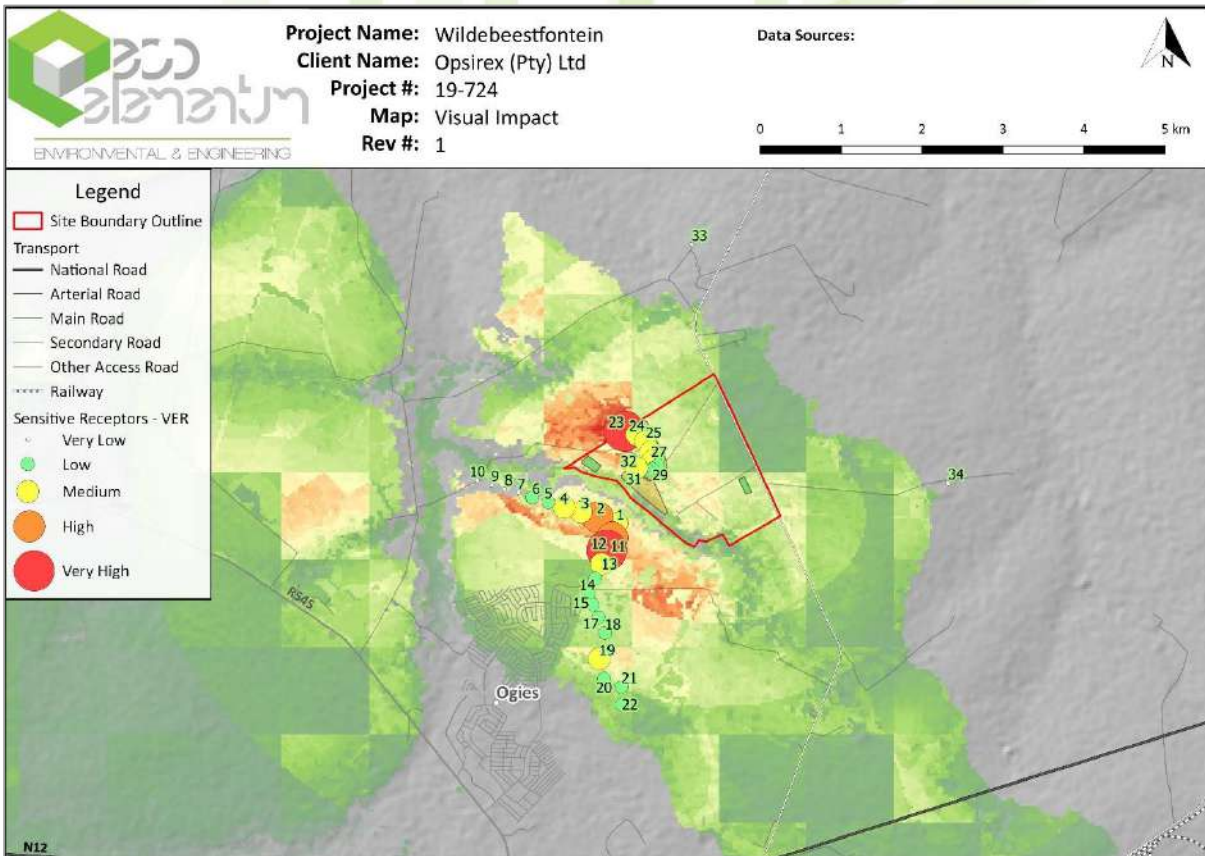


Figure 3.48: Viewpoint sensitive receptors overlaid on the Visual Exposure Ranking



Broad level Socio-Economic Environment

It is expected that the proposed Wildebeestfontein Mining Project will result in social changes which may positively and negatively affect communities within the study area. In terms of the social changes that have been assessed, the following social impacts are have been identified:

- Employment opportunities;
- Multiplier impacts on the local economy
- Change in movement patterns;
- Loss of agricultural land and infrastructure;
- Physical and economical displacement;
- Impacts on the local tourism industry
- Increased pressure on Municipal infrastructure;
- Increased social pathologies linked to influx of workers and job seekers;
- Increased nuisance factors and changed sense of place.

Although it is necessary to keep the complexity of social impacts in mind, it is also necessary to produce an SIA Report that will be accessible to a non-specialist audience and meet the requirements of the proponent, as well as international best practice. For this reason, predicted impacts have been categorised within the project phase (construction, operation and decommissioning) it is likely to originate, recognising that many impacts will span over more than one project phase.

3.g.vi Impact Assessment and Ranking Methodology

The following methodology was used to rank these impacts. Clearly defined rating and rankings scales were used to assess the impacts associated with the proposed activities. The impacts identified by each specialist study and through public participation were combined into a single impact rating table for ease of assessment.

Each impact identified was rated according the expected magnitude, duration, scale and probability of the impact.

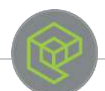
Table 3.31: Impact Criteria and Assigned Rating

Intensity (Magnitude)		ASSIGNED QUANTITATIVE SCORE
The intensity of the impact is considered by examining whether the impact is destructive or benign, whether it has a significant, moderate or insignificant		
(L)OW	The impact alters the affected environment in such a way that the natural processes or functions are not affected.	1
(M)EDIUM	The affected environment is altered, but functions and processes continue, albeit in a modified way.	3
(H)IGH	Function or process of the affected environment is disturbed to the extent where it temporarily or permanently ceases.	5
Duration		
The lifetime of the impact, that is measure in relation to the lifetime of the proposed development.		
(S)HORT TERM	The impact will either disappear with mitigation or will be mitigated through a natural process in a period shorter than that of the construction phase.	1
(SM) SHORT - MEDIUM TERM	The impact will be relevant through to the end of a construction phase.	2



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(M)MEDIUM	The impact will last up to the end of the development phases, where after it will be entirely negated.	3
(L)ONG TERM	The impact will continue or last for the entire operational lifetime (i.e. exceed 20years) of the development, but will be mitigated by direct human action or by natural processes thereafter.	4
(P)ERMANENT	This is the only class of impact, which will be non-transitory. Mitigation either by man or natural process will not occur in such a way or in such a time span that the impact is transient.	2
Spatial Scale/Extent		
Classification of the physical and spatial aspect of the impact		
(F)OOTPRINT	The impacted area extends only as far as the activity, such as footprint occurring within the total site area.	1
(S)ITE	The impact could affect the whole, or a significant portion of the site.	2
(R)EGIONAL	The impact could affect the area including the neighbouring Farms, the transport routes and the adjoining towns.	3
(N)ATIONAL	The impact could have an effect that expands throughout the country (South Africa).	4
(I)NTERNATIONAL	Where the impact has international ramifications that extend beyond the boundaries of South Africa.	5
Probability		
This describes the likelihood of the impact actually occurring. The impact may occur for any length of time during the life cycle of the activity. The classes are rated as follows:		
(I)MPROBABLE	The possibility of the Impact occurring is none, due to the circumstances or design. The chance of this Impact occurring is zero (0%)	1
(P)OSSIBLE	The possibility of the Impact occurring is very low, due either to the circumstances or design. The chance of this Impact occurring is defined as 25% or less	2
(L)IKELY	There is a possibility that the impact will occur to the extent that provisions must therefore be made. The chances of Impact occurring is defined as 50%	3
(H)IGHLY LIKELY	It is most likely that the Impacts will occur at some stage of the development. Plans must be drawn up before carrying out the activity. The chances of this impact occurring is defined as 75 %.	4
(D)EFINITE	The impact will take place regardless of any prevention plans, and only mitigation actions or contingency plans to contain the effect can be relied on. The chance of this impact occurring is defined as 100 %.	5
Weighting Factor		
Subjective score assigned by Impact Assessor to give the relative importance of a particular environmental component based on project knowledge and previous experience. Simply, such a weighting factor is indicative of the importance of the impact in terms of the potential effect that it could have on the surrounding environment. Therefore, the aspects considered to have a relatively high value will score a relatively higher weighting than that which is of lower importance		



(L)OW	1
LOW- MEDIUM	2
MEDIUM (M)	3
MEDIUM-HIGH	4
HIGH (H)	5

Mitigation Measures and Mitigation Efficiency

Determination of significance refers to the foreseeable significance of the impact after the successful implementation of the necessary mitigation measures

Mitigation measures were recommended to enhance benefits and minimise negative impacts and address the following:

Mitigation objectives: what level of mitigation must be aimed at: For each identified impact, the specialist must provide mitigation objectives (tolerance limits) which would result in measurable reduction in impact. Where limited knowledge or expertise exists on such tolerance limits, the specialist must make “educated guesses” based on professional experience;

Recommended mitigation measures: For each impact the specialist must recommend practicable mitigation actions that can measurably affect the significance rating. The specialist must also identify management actions, which could enhance the condition of the environment. Where no mitigation is considered feasible, this must be stated and reasons provided;

Effectiveness of mitigation measures: The specialist must provide quantifiable standards (performance criteria) for reviewing or tracking the effectiveness of the proposed mitigation actions, where possible; and

Recommended monitoring and evaluation programme: The specialist is required to recommend an appropriate monitoring and review programme, which can track the efficacy of the mitigation objectives. Each environmental impact is to be assessed before and after mitigation measures have been implemented.

The management objectives, design standards, etc., which, if achieved, can eliminate, minimise or enhance potential impacts or benefits. National standards or criteria are examples, which can be stated as mitigation objectives.

HIGH	The impact is of major importance. Mitigation of the impact is not possible on a cost-effective basis. The impact is regarded as high importance and taken within the overall context of the project, is regarded as a fatal flaw. An impact regarded as high significance, after mitigation could render the entire development option or entire project proposal unacceptable.	0.2
MEDIUM-HIGH	The impact is of major importance but through the implementation of the correct mitigation measures, the negative impacts will be reduced to acceptable levels	0.4
MEDIUM	Notwithstanding the successful implementation of the mitigation measures, to reduce the negative impacts to acceptable levels, the negative impact will remain of significance. However, taken within the overall context of the project, the persistent impact does not constitute a fatal flaw	0.6
LOW -MEDIUM	The impact is of importance, however, through the implementation of the correct mitigation measures such potential impacts can be reduced to acceptable levels	0.8
LOW	The impact will be mitigated to the point where it is of limited importance	1.0



Table 3.32: Description of bio-physical assessment parameters with its respective weighting

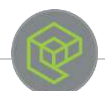
Extent	Duration	Intensity	Probability	Weighting Factor (WF)	Significance Rating (SR)	Mitigation Efficiency (ME)	Significance Following Mitigation (SFM)
Footprint 1	Short term 1	Low 1	Probable 1	Low 1	Low 0-19	High 0,2	Low 0-19
Site 2	Short to medium 2		Possible 2	Low to medium 2	Low to medium 20-39	Medium to high 0,4	Low to medium 20-39
Regional 3	Medium term 3	Medium 3	Likely 3	Medium 3	Medium 40-59	Medium 0,6	Medium 40-59
National 4	Long term 4		Highly Likely 4	Medium to high 4	Medium to high 60-79	Low to medium 0,8	Medium to high 60-79
International 5	Permanent 5	High 5	Definite 5	High 5	High 80-100	Low 1,0	High 80-100

Table 3.33: Significant Rating Scale Without Mitigation

Potential Impacts Without Mitigation Measures (WOM)		
Following the assignment of the necessary weights to the respective aspects, criteria are summed and multiplied by their assigned weightings, resulting in a value for each impact (prior to the implementation of mitigation measures).		
SIGNIFICANT RATING EQUATION		
Significant Rating (SR) = (Extent + Intensity + Duration) x Probability		
S=0	INSIGNIFICANT	The impact will be mitigated to the point where it is regarded as insubstantial
SR < 30	LOW (L)	The impact will be mitigated to the point where it is of limited importance.
20<SR<39	LOW- MEDIUM	The impact is of importance, however, through the implementation of the correct mitigation measures such potential impacts can be reduced to acceptable levels;
40> SR < 59	MEDIUM (M)	Notwithstanding the successful implementation of the mitigation measures, to reduce the negative impacts to acceptable levels, the negative impact will remain of significance. However, taken within the overall context of the project, the persistent impact does not constitute a fatal flaw.
60<SR>79	MEDIUM-HIGH	The impact is of major importance but through the implementation of the correct mitigation measures, the negative impacts will be reduced to acceptable levels.
80<SR > 100	HIGH (H)	The impact is of major importance. Mitigation of the impact is not possible on a cost-effective basis. The impact is regarded as high importance and taken within the overall context of the project, is regarded as a fatal flaw. An impact regarded as high significance, after mitigation could render the entire development option or entire project proposal unacceptable.

Table 3.34: Significant Rating Scale with Mitigation

Potential Impacts with Mitigation Measures (WM) –	
In order to gain a comprehensive understanding of the overall significance of the impact, after implementation of the mitigation measures, it will be necessary to re-evaluate the impact.	
SIGNIFICANT RATING WITH MITIGATION EQUATION	
Significance Rating (WM) = Significance Rating (WOM) x Mitigation Efficiency	



Or WM = WOM x ME		
S=0	INSIGNIFICANT	The impact will be mitigated to the point where it is regarded as insubstantial.
SR < 30	LOW (L)	The impact will be mitigated to the point where it is of limited importance.
20<SR<39	LOW- MEDIUM	The impact is of importance, however, through the implementation of the correct mitigation measures such potential impacts can be reduced to acceptable levels;
40> SR < 59	MEDIUM (M)	Notwithstanding the successful implementation of the mitigation measures, to reduce the negative impacts to acceptable levels, the negative impact will remain of significance. However, taken within the overall context of the project, the persistent impact does not constitute a fatal flaw.
60<SR>79	MEDIUM-HIGH	The impact is of major importance but through the implementation of the correct mitigation measures, the negative impacts will be reduced to acceptable levels.
80<SR > 100	HIGH (H)	The impact is of major importance. Mitigation of the impact is not possible on a cost-effective basis. The impact is regarded as high importance and taken within the overall context of the project, is regarded as a fatal flaw. An impact regarded as high significance, after mitigation could render the entire development option or entire project proposal unacceptable.

3.g.vii Advantages and Disadvantages of Proposed Activity (in terms of initial site layout) and Alternatives

Table 3.35: Advantages and Disadvantages regarding beneficiation alternatives

Description	Advantages	Disadvantages
Beneficiation Alternatives		
On site beneficiation plant	<ul style="list-style-type: none"> • Additional employment opportunities, higher staff requirements. • No subsidence risk post-closure. • Less capital output on hauling of ROM 	<ul style="list-style-type: none"> • Greater surface area disturbance. • Possible sterilisation of some of the coal resource as larger area is required for infrastructure • Change in land use required • More capital output on infrastructure • Increased noise from the use of construction and mining machinery on surface during operations. • Higher closure rehabilitation costs.
Offsite beneficiation (preferred method)	<ul style="list-style-type: none"> • Smaller footprint associated with surface disturbance. • Reduced impact on dust, noise and air quality. • Reduced closure rehabilitation costs. • The coal resource can be optimally mined as infrastructure will not sterilise the resource. • Less capital output on infrastructure 	<ul style="list-style-type: none"> • Limited employment opportunities • Risk of subsidence post-closure if mining area is not adequately rehabilitated. • More capital output on ROM hauling



Table 3.36: Advantages and Disadvantages regarding Mining Area Alternatives

Description	Advantages	Disadvantages
Mining Area Alternatives		
Open pit mining of areas not previously undermined	<ul style="list-style-type: none"> • Smaller footprint associated with surface disturbance. • Alternative/current land uses can continue on areas not directly impacted by surface activities. • Reduced impact on dust, noise and air quality. • Reduced rehabilitation costs. • Low risk of air inflow to old underground workings and subsequent spontaneous combustion. 	<ul style="list-style-type: none"> • Not economically viable as large pillars will remain. • Risk of subsidence during operation. • Continued AMD post mining and closure phase. • No rehabilitation of areas that are currently a subsidence and safety risk due to historic mining • Limited LOM and employment opportunities.
Open pit mining of areas previously undermined (preferred method)	<ul style="list-style-type: none"> • Additional employment opportunities. • Economically viable as more coal will be efficiently extracted. • Increased LOM – extended employment opportunities. • No subsidence risk during operation. • No subsidence risk post-closure. • Rehabilitation of areas that are currently a subsidence and safety risk due to historic mining 	<ul style="list-style-type: none"> • Greater surface area disturbance. • Change in land use required for all farm portions in the MRA. • Decrease in agricultural area/cultivated land. • Decrease in surface water runoff to catchment. • Increased dust generation. • Greater blast and vibration impacts. • Increased noise from the use of construction and mining machinery on surface during operations. • Higher rehabilitation costs. • Higher risk of air inflow to old underground workings and subsequent spontaneous combustion.

3.g.viii Possible Mitigation Measures for I&AP-Identified Impacts

The proposed mitigation measures or alterations that could be implemented specifically to address issues and concerns raised by I&APs are summarised below and discussed in terms of overall risks if these mitigation measures are implemented on site.

All mitigation measures included in the EMP have taken cognizance of any I&AP issues during the process.

3.g.ix Motivation Where No Alternative Sites Were Considered

As this is a Section 102 amendment the site location is limited to the Mining Right Area, which is constrained by the location of other mining houses and residential areas. The resource location and the presence of a watercourse on the site further restrict the infrastructure layout. Therefore, no alternative sites were considered.

3.g.x Statement Motivating the Alternative Development Location Within the Overall Site

As this is a Section 102 amendment the site location is limited to the Mining Right Area, which is constrained by the location of other mining houses and residential areas. The resource location on the site further restrict the infrastructure layout. Therefore, no alternative sites were considered.

The most suitable layout and mining area presented in the EIA is based on specialist investigations, Mine Health and Safety Act approved buffers, and ESKOM and Transnet servitudes and their respective buffers.



3.h FULL DESCRIPTION OF THE PROCESS UNDERTAKEN TO IDENTIFY, ASSESS AND RANK THE IMPACTS AND RISKS THE ACTIVITY WILL IMPOSE ON THE PREFERRED SITE (IN RESPECT OF THE FINAL SITE LAYOUT PLAN) THROUGH THE LIFE OF THE ACTIVITY

The assessment and evaluation of environmental impacts is often complicated by the subjective nature of these impacts. Ideally, the degree of severity or significance of a particular impact should be expressed in quantitative terms, against a quantitative assessment of the conditions that pertained before a particular activity started. There must also be some expression as to whether a particular impact is desirable or not, as the desirability of an impact will depend largely on the attitude and experience of the assessment team, subjectivity is unavoidable. In order to address these issues and to provide a basis for comparison of the different impacts associated with the activities, a number of standard definitions and approaches will be used.

For the purpose of assessing impacts of the proposed project has been divided into the following phases:

Table 3.37: Impact Phases

Construction Phase:	All the construction related activities on site related to Phase 2, until the contractor leaves the site
Operational Phase:	All activities, including the operation and maintenance of the proposed development. Life of Mine is planned for 3 years.
Decommissioning & Mine Closure	Mine closure is the period of time when the ore-extracting activities of a mine have ceased and final decommissioning and mine reclamation is being completed.

Mitigation measures were recommended to enhance benefits and minimise negative impacts and address the following:

Mitigation objectives: what level of mitigation must be aimed at: For each identified impact, the specialist must provide mitigation objectives (tolerance limits) which would result in measurable reduction in impact. Where limited knowledge or expertise exists on such tolerance limits, the specialist must make "educated guesses" based on professional experience;

Recommended mitigation measures: For each impact the specialist must recommend practicable mitigation actions that can measurably affect the significance rating. The specialist must also identify management actions, which could enhance the condition of the environment. Where no mitigation is considered feasible, this must be stated and reasons provided;

Effectiveness of mitigation measures: The specialist must provide quantifiable standards (performance criteria) for reviewing or tracking the effectiveness of the proposed mitigation actions, where possible; and

Recommended monitoring and evaluation programme: The specialist is required to recommend an appropriate monitoring and review programme, which can track the efficacy of the mitigation objectives. Each environmental impact is to be assessed before and after mitigation measures have been implemented.

The management objectives, design standards, etc., which, if achieved, can eliminate, minimise or enhance potential impacts or benefits. National standards or criteria are examples, which can be stated as mitigation objectives.



3.i ASSESSMENT OF EACH IDENTIFIED POTENTIALLY SIGNIFICANT IMPACT AND RISK

Activity	Aspect	Impact	Phase	+/-	Significance without mitigation	Mitigation efficiency	Significance with mitigation	Mitigation measures	Action Plan
Heritage									
Surface clearing and preparation	Clearing of surface	Destruction of structures at B-POI4	Construction and Operation	±	39 Low-Med	0,8	31,2 Low-Med	Prevent impact on sites	None - sufficient recording
Topsoil and overburden removal	Exposing sub-surface material	Destruction of possible sub-surface heritage material within the sensitive area	Construction and Operation	Negative	52 Med	0,8	41,6 Med	Monitor sub-surface material	Monitoring
Noise									
Construction and clearing activities	Offloading of construction materials; Excavations and backfilling where required; Concrete mixing and matching; Use and maintenance of roads; Machinery noise from construction related activities.	Increased Noise levels	Construction	Negative	10 Low	0,6	6 Low	Construct a Noise Barrier between the main noise source noise sensitive receivers Equipment Maintenance Implement Road rules.	<ul style="list-style-type: none"> • A noise barrier in the form of a berm, tree break or similar noise fence should be constructed on the mine boundary • Construction and mining-related machinery and vehicles must be serviced on a regular basis to ensure noise suppression mechanisms are effective e.g. installed exhaust mufflers. • Switching off equipment when not in use. • Fixed noise producing sources such as generators, pump stations and crushers to be to be either housed in enclosures or barriers put up around the noise source void the use of engine compression brakes when approaching the site entrance or driving through or in the vicinity of the adjacent town. • All access roads will be signposted and speed limited to minimise transport noise. • Equipment with lower sound power levels would be used in preference to noisier equipment. • The on-site road network will be well maintained to limit body noise from empty trucks travelling on internal roads



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Activity	Aspect	Impact	Phase	+/-	Significance without mitigation	Mitigation efficiency	Significance with mitigation	Mitigation measures	Action Plan
Operational Activities	Use and maintenance of haul roads (incl. transportation of material to site and offsite), Removal of material (mining process) and stockpiling, Machinery and excavation noise, Trucks clearing their load bins before loading, Vehicle travelling to and from site on a daily basis.	Increased Noise levels	Operation	Negative	80 High	0,6	48 Med	Construct a Noise Barrier between the main noise source noise sensitive receivers Equipment Maintenance Implement Road rules.	<ul style="list-style-type: none"> • A noise barrier in the form of a berm, tree break or similar noise fence should be constructed on the mine boundary • Construction and mining-related machinery and vehicles must be serviced on a regular basis to ensure noise suppression mechanisms are effective e.g. installed exhaust mufflers. • Switching off equipment when not in use. • Fixed noise producing sources such as generators, pump stations and crushers to be to be either housed in enclosures or barriers put up around the noise source • void the use of engine compression brakes when approaching the site entrance or driving through or in the vicinity of the adjacent town. • All access roads will be signposted and speed limited to minimise transport noise. • Equipment with lower sound power levels would be used in preference to noisier equipment. • The on-site road network will be well maintained to limit body noise from empty trucks travelling on internal roads
Decommissioning activities	Demolition & Removal of all infrastructure (incl. transportation off site), Reshaping of the area that was mined, Rehabilitation - spreading of soil, re-vegetation & profiling/contouring with heavy machinery, Aftercare and maintenance of rehabilitated areas.	Increased Noise levels	Closure and Decommissioning	Negative	20 Low-Med	0,6	12 Low	Equipment Maintenance Implement Road rules.	<ul style="list-style-type: none"> • mining-related machinery and vehicles must be serviced on a regular basis to ensure noise suppression mechanisms are effective e.g. installed exhaust mufflers. • Switching off equipment when not in use. • Avoid the use of engine compression brakes when approaching the site entrance or driving through or in the vicinity of the adjacent town. • All access roads will be signposted and speed limited to minimise transport noise. • Equipment with lower sound power levels would be used in preference to noisier equipment.
Ecological Impacts									



Activity	Aspect	Impact	Phase	+/-	Significance without mitigation	Mitigation efficiency	Significance with mitigation	Mitigation measures	Action Plan
Mining Activities	Clearance and removal of Habitat Increase in vehicle and machinery movement	Loss of species of conservation concern	Construction and Operation	Negative	18 Low	0,4	7,2 Low	<ul style="list-style-type: none"> Avoidance of wetland areas as far as possible, these areas are regarded as highly sensitive areas Create Environmental Awareness Any disturbed areas should be rehabilitated Protect as much indigenous vegetation as possible An alien invasive management programme must be incorporated into an Environmental Management Programme. 	<ul style="list-style-type: none"> Search and rescue for reptiles and other vulnerable species, before areas are cleared Environmental induction for all staff and contractors on-site Rehabilitate in line with the rehabilitation guidelines, this includes the clearing of alien vegetation, following the guidelines of a suitable alien invasive plant management plan. The site must be regularly monitored for re-growth of alien invasive species, and any new seedlings etc. eradicated using methods appropriate for the particular species, whether mechanical, chemical or biological. Ongoing alien plant control must be undertaken in the disturbed areas Herbicides must be carefully applied, in order to prevent any chemicals from entering the river. Spraying of herbicides within or near to the wetland areas is strictly forbidden. Re-instate indigenous vegetation (grasses and indigenous trees) in disturbed areas directly after mining ceases so as to stabilise against erosion and sedimentation.
Mining Activities	Vegetation clearance Opencast Mining	Loss of indigenous vegetation, floral and faunal habitat and ecological structure of water resources and soil	Construction and Operation	Negative	18 Low	0,4	7,2 Low	<ul style="list-style-type: none"> Avoidance of wetland areas as far as possible, these areas are regarded as highly sensitive areas Create Environmental Awareness Any disturbed areas should be rehabilitated Protect as much indigenous vegetation as possible An alien invasive management programme must be incorporated into an Environmental Management Programme. 	<ul style="list-style-type: none"> Search and rescue for reptiles and other vulnerable species, before areas are cleared Environmental induction for all staff and contractors on-site Rehabilitate in line with the rehabilitation guidelines, this includes the clearing of alien vegetation, following the guidelines of a suitable alien invasive plant management plan. The site must be regularly monitored for re-growth of alien invasive species, and any new seedlings etc. eradicated using methods appropriate for the particular species, whether mechanical, chemical or biological. Ongoing alien plant control must be undertaken in the disturbed areas Herbicides must be carefully applied, in order to prevent any chemicals from entering the river. Spraying of herbicides within or near to the wetland areas is strictly forbidden. Re-instate indigenous vegetation (grasses and indigenous trees) in disturbed areas directly after mining ceases so as to stabilise against erosion and sedimentation.



Updated- 22/7/2020

Activity	Aspect	Impact	Phase	+/-	Significance without mitigation	Mitigation efficiency	Significance with mitigation	Mitigation measures	Action Plan
Disturbance of the environment	Clearance of vegetation Inadequate Rehabilitation	increase in Alien Invasive species	Construction, Operation, Decommissioning and Closure	Negative	20 Low-Med	0,4	8 Low	<ul style="list-style-type: none"> Avoidance of wetland areas as far as possible, these areas are regarded as highly sensitive areas Create Environmental Awareness Any disturbed areas should be rehabilitated Protect as much indigenous vegetation as possible An alien invasive management programme must be incorporated into an Environmental Management Programme. 	<ul style="list-style-type: none"> Search and rescue for reptiles and other vulnerable species, before areas are cleared Environmental induction for all staff and contractors on-site Rehabilitate in line with the rehabilitation guidelines, this includes the clearing of alien vegetation, following the guidelines of a suitable alien invasive plant management plan. The site must be regularly monitored for re-growth of alien invasive species, and any new seedlings etc. eradicated using methods appropriate for the particular species, whether mechanical, chemical or biological. Ongoing alien plant control must be undertaken in the disturbed areas Herbicides must be carefully applied, in order to prevent any chemicals from entering the river. Spraying of herbicides within or near to the wetland areas is strictly forbidden. Re-instate indigenous vegetation (grasses and indigenous trees) in disturbed areas directly after mining ceases so as to stabilise against erosion and sedimentation.
Construction and operational activities	Increased traffic Use of heavy machinery Stormwater infrastructure Bank Erosion	Flow alterations due to erosion and sedimentation	Construction and Operation	Negative	54 Med	0,8	43,2 Med	<ul style="list-style-type: none"> Rehabilitation of the disturbed areas; Limiting instream sedimentation; Minimising pollutants entering the watercourse Erosion control measures must be employed where required. 	<ul style="list-style-type: none"> Design and implementation of a suitable stormwater system; Implement a programme for the clearing/eradication of alien species including long term control of such species; A 50 m buffer implemented for the wetland system; Water quality monitoring must take place every month during operational phases; and Wetland monitoring and biomonitoring must take place bi-annually.
Construction and operational activities	Increased traffic leading to potential accidental spills of hydrocarbon materials Hazardous materials entering the watercourses Acid Mine Drainage Increased road runoff during rainfall events	Pollution of watercourse	Construction, Operation	Negative	54 Med	0,8	43,2 Med	<ul style="list-style-type: none"> Erosion control measures must be employed where required. 	<ul style="list-style-type: none"> A topsoil stripping and stockpiling guideline must be completed to ensure rehabilitation success. Attenuation measures must include, but are not limited to - the use of sand bags, erosion control blankets, and silt fences. Long term attenuation measures, such as attenuation/infiltration trenches, swales must be established to control stormwater from hardened surfaces Vegetation clearing must be undertaken as and when necessary in phases. Install sediment barriers (silt catchers and Reno mattresses) along any drainage areas to prevent the migration of silt.



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Activity	Aspect	Impact	Phase	+/-	Significance without mitigation	Mitigation efficiency	Significance with mitigation	Mitigation measures	Action Plan
Operational, decommissioning and rehabilitation activities.	Increased runoff from hardened surfaces Further spread of plants and seedlings Increased traffic	Spread of alien vegetation	Operational, Closure and Decommissioning	Negative	64 Med-High	0,8	51,2 Med		<ul style="list-style-type: none"> Exposed soils must be rehabilitated as soon as practically possible to limit the risk of erosion. All roads need to be maintained and any erosion ditches forming along the road filled and compacted. Demarcate wetland areas to avoid unauthorised access. No washing of any equipment in close proximity to a watercourse is permitted. No releases of any substances that could be toxic to fauna or faunal habitats within the channels or any watercourses is permitted. Spillages of fuels, oils and other potentially harmful chemicals must be cleaned up immediately and contaminants properly drained and disposed of using proper solid/hazardous waste facilities Portable toilets must be placed on impervious level surfaces that are lipped to prevent spillage. The general consensus is that they should be within 30 m to 50 m of a work face Re-instate indigenous vegetation (grasses and indigenous trees) in disturbed areas.
Groundwater									
Construction activities	Oil and Diesel spills	Deterioration of groundwater quality	Construction phase	Negative	20 Low-Med	0,6	12 Low	Water management facilities should be designed to intercept and contain as much contaminated runoff and/or seepage as possible. Minimising the potential for water quality deterioration due to the oxidation of sulphide minerals Minimize the risk of spillages to the environment. Detect and prevent pollution at the earliest possible stage,	Implement SWMP and structures first, before further site establishment Apply passive water management measures within the operations by reducing the available contact time between water and exposed sulphide minerals. Proper storage, handling and monitoring of fuel and chemicals used on site. Institute detailed monitoring systems
Operational Activities	Groundwater dewatering	Impact on Groundwater Quantity	Operational phase	N	26 Low-Med	1	26 Low-Med	No mitigation available	N/A
Operational Activities	Open pit mining	Impact on groundwater quality	Operational phase	Negative	20 Low-Med	0,6	12 Low	Minimize the risk of spillages to the environment. Water management facilities should be designed to intercept and contain as much contaminated runoff and/or seepage as possible.	Proper storage, handling and monitoring of dirty water Proper storage, handling and monitoring of fuel and chemicals used on site. Implement SWMP
Closure of the mine	Groundwater rebound	Groundwater decant	Closure and Decommissioning	N	24 Low-Med	0,6	14,4 Low	Treat decant water before release to the environment	Establish a Passive treatment system in the form of a constructed wetland or similar.



Activity	Aspect	Impact	Phase	+/-	Significance without mitigation	Mitigation efficiency	Significance with mitigation	Mitigation measures	Action Plan
Closure of the mine	Groundwater rebound	Pollution Plume spread	Closure and Decommissioning	N	26 Low-Med	1	26 Low-Med	No mitigation available	N/A
Surface Water									
Construction activities	Vegetation clearance and site establishment	Sedimentation and pollution of the Blesbokspruit	Construction Phase	Nega	33 Low-Med	0,4	13,2 Low	Separate clean and Dirty Water System	Construct and implement SWMP
Open pit Mining	Pit dewatering and drawdown	Reduction in Baseflow	Operational Phase	N	28 Low-Med	1	28 Low-Med	No mitigation available	N/A
Pit dewatering	Reduction to Baseflow in the stream	Reduced Poor Quality Water input	Operational Phase	P	39 Low-Med	1	39 Low-Med	No mitigation required	N/A
Operational Activities	Hydrocarbon spills Dirty Water release Sediment runoff	Water quality deterioration	Operational Phase	Nega	60 Med-High	0,6	36 Low-Med	Separate clean and Dirty Water System	Construct and implement SWMP
Closure of the mine	Groundwater rebound	Decant of poor quality water	Closure and Decommissioning	N	32 Low-Med	0,4	12,8 Low	Treat decant water before release to the environment	Establish a Passive treatment system in the form of a constructed wetland or similar.
Air Quality									
Site establishment	Removal of topsoil and vegetation	Fugitive dust (containing TSP (total suspended particulate) will give rise to nuisance impacts as fallout dust, as well as PM10 and PM2.5 (dust with a size less than 10 microns, and dust with a size less than 2.5 microns) giving rise to health impacts	Construction and Operational Phase	Negative	40 Med	0,8	32 Low-Med	Area of disturbance to be kept to a minimum and no unnecessary clearing of vegetation to occur Reduce exposure areas Avoid Dust Creation	Demarcate areas of movement, and avoid areas where movement is not permitted. Topsoil should be re-vegetated. During the loading of topsoil onto trucks or stockpiles, the dropping heights should be minimised. Water or binding agents such as (petroleum emulsions, polymers and adhesives) can be used for dust suppression on earth roads. When using bulldozers and graders, minimise travel speed and distance and volume of traffic on the roads. All stockpiles to be damped down, especially during dry weather or re-vegetated (hydro seeding is a good option for slope revegetation)
Site establishment	Construction of surface infrastructure	Fugitive dust (containing TSP (total suspended particulate) will give rise to nuisance impacts as fallout dust, as well as PM10 and PM2.5 (dust with a size less than 10 microns, and dust with a size less than 2.5 microns) giving rise to health impacts	Construction and Operational Phase	Negative	40 Med	0,8	32 Low-Med	Area of disturbance to be kept to a minimum and no unnecessary clearing of vegetation to occur Reduce exposure areas Avoid Dust Creation	Demarcate areas of movement, and avoid areas where movement is not permitted. Dust emitted during bulldozing activity can be reduced by increasing soil dampness by watering the material being removed Time the blasting with wind to ensure the dust will not be blown to the sensitive receptors Material need to be removed to dedicated stockpiles to be used during rehabilitation Apply dust suppressant to roads. Cover Haul trucks with Tarpaulin



Activity	Aspect	Impact	Phase	+/-	Significance without mitigation	Mitigation efficiency	Significance with mitigation	Mitigation measures	Action Plan
General transportation	Hauling and vehicle movement on site	Fugitive dust (containing TSP (total suspended particulate) will give rise to nuisance impacts as fallout dust, as well as PM10 and PM2.5 (dust with a size less than 10 microns, and dust with a size less than 2.5 microns) giving rise to health impacts	Construction and Operational Phase	Negative	40 Med	0,8	32 Low-Med	Avoid Dust Creation Enforce a low Speed limit	Apply dust suppressant to roads. Cover Haul trucks with Tarpaulin Fit roads with Speed bumps
Site closure	Demolition & Removal of all infrastructure	Fugitive dust (containing TSP (total suspended particulate) will give rise to nuisance impacts as fallout dust, as well as PM10 and PM2.5 (dust with a size less than 10 microns, and dust with a size less than 2.5 microns) giving rise to health impacts	Decommissioning Phase	Negative	44 Med	0,8	35,2 Low-Med	The area of disturbance must be kept to a minimum Avoid Dust Creation	Demolition should not be performed during windy periods (August, September and October) Demarcate areas of movement Speed restrictions should be imposed and enforced Exhaust pipes of vehicles should be directed so that they do not raise dust. Hard surfaced haul roads or standing areas should be washed down and swept to remove accumulated dust. Dust suppression of roads being used during rehabilitation should be enforced.
Rehabilitation	Spreading of soil, revegetation & profiling/contouring	Fugitive dust (containing TSP (total suspended particulate) will give rise to nuisance impacts as fallout dust, as well as PM10 and PM2.5 (dust with a size less than 10 microns, and dust with a size less than 2.5 microns) giving rise to health impacts	Decommissioning Phase	Negative	56 Med	0,8	44,8 Med	Minimise exposed surface duration The area of disturbance must be kept to a minimum Avoid Dust Creation	Revegetation of exposed areas Demarcate areas of movement Spreading of soil must be performed on less windy days. Keep soil moist using sprays or water tanks, using wind breaks. Speed restrictions should be imposed and enforced Exhaust pipes of vehicles should be directed so that they do not raise dust.
Visual									
Construction related activities	Site Establishment	Potential visual impact on the viewpoints	Construction Phase	Nega	40 Med	0,6	24 Low-Med	The visual impact can be minimized creating a visual barrier.	Creating a Berm between the opencast pits and the town of Witbank and Planting Indigenous vegetation



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Activity	Aspect	Impact	Phase	+/-	Significance without mitigation	Mitigation efficiency	Significance with mitigation	Mitigation measures	Action Plan
Mining related activities	Open Pit Mining	Potential visual impact on Road and Land users	Operation, Decommissioning and Closure	Negativ	64 Med-High	0,8	51,2 Med	The visual impact can be minimized creating a visual barrier. Minimise areas of operation	Creating a Berm between the opencast pits and the town of Witbank and Planting Indigenous vegetation Perform concurrent rehabilitation as mining progresses
Soils, Land Use, Land Capability and Hydropedology									
Surface clearing and preparation	Removal of vegetation	Exposure of soil surface to erosion	Construction Phase	Negativ	64 Med-High	0,6	38,4 Low-Med	Keep vegetation removal limited to footprint and use geo-textiles and other erosion control structures to limit soil erosion	Implement Soil Management Plan (SMP) and monitor site for signs of erosion
Heavy machinery and vehicle movement	Vehicles and equipment traversing over soil surface, especially when soil is wet	Soil compaction and reduced water infiltration capacity	Construction Phase	Negative	42 Med	0,8	33,6 Low-Med	Restrict vehicle and equipment movement to surface footprint	Use deep ripping before vegetation establishment (rehabilitation) to alleviate compaction. Avoid vehicle and equipment moving outside of the demarcated footprint areas
Topsoil and overburden removal	Stripping of topsoil and overburden to access coal resources	Destruction of in situ soil profiles	Operational phase	Nega	42 Med	0,8	33,6 Low-Med	Only remove topsoil where necessary and don't mix topsoil layers with overburden	Follow SMP and keep footprint as small as possible
Topsoil and overburden stockpiling	Stockpiling of topsoil	Destruction of soil nutrient cycles and hydropedological functioning	Operational phase	Negativ	42 Med	0,8	33,6 Low-Med	Re-establish vegetation on topsoil stockpiles and maintain vegetation cover until soil is used for rehabilitation	Manage stockpiles according to SMP
Hydrocarbon spills	Movement of vehicles and equipment on site	Soil chemical pollution	Construction Phase	Nega	22 Low-Med	0,8	17,6 Low	Regularly check vehicles and equipment for possible oil and fuel leaks	Follow SMP and conduct regular soil quality audits
Infrastructure construction	Establishment of infrastructure required for mining	Destruction of arable and grazing land capability	Construction Phase	Nega	85 High	0,8	68 Med-High	No mitigation possible	Establish agricultural projects with in the larger mining right area
Heavy machinery and vehicle movement	Vehicles and equipment traversing over soil surface, especially when soil is wet	Soil compaction and reduced water infiltration capacity	Operational phase	Negative	42 Med	0,8	33,6 Low-Med	Restrict vehicle and equipment movement to surface footprint	Use deep ripping before vegetation establishment (rehabilitation) to alleviate compaction. Avoid vehicle and equipment moving outside of the demarcated footprint areas
Hydrocarbon spills	Movement of vehicles and equipment on site	Soil chemical pollution	Operational phase	Nega	22 Low-Med	0,8	17,6 Low	Regularly check vehicles and equipment for possible oil and fuel leaks	Follow SMP and conduct regular soil quality audits
Heavy machinery and vehicle movement	Movement of vehicles and equipment on site	Soil chemical pollution	Closure and Decommissioning	Nega	22 Low-Med	0,8	17,6 Low	Regularly check vehicles and equipment for possible oil and fuel leaks	Follow SMP and conduct regular soil quality audits
Area preparation, shaping and topsoil placement	Revegetation of mined areas	Soil compaction and reduced water infiltration capacity	Closure and Decommissioning	Nega	42 Med	0,8	33,6 Low-Med	Restrict vehicle and equipment movement to the areas that are revegetated	Use deep ripping before vegetation establishment (rehabilitation) to alleviate compaction. Avoid vehicle and equipment moving outside of the rehabilitation areas
Social Economic									



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Activity	Aspect	Impact	Phase	+/-	Significance without mitigation	Mitigation efficiency	Significance with mitigation	Mitigation measures	Action Plan
Mine establishment	Mining operations	Employment and income opportunity	Construction and Operation Phase	Positive	55 Med	1	55 Med	Maximise Employment Opportunities, Skills and Enterprise Development	<p>Prioritise local labour in the recruitment process as part of the company's own recruitment policy or as part of contractor management plan during operations</p> <p>Put a procurement strategy as well as a contractor management plan (if relevant) in place to ensure that 100% local employment target in terms of unskilled labour is met</p> <p>Up-skill the local labour force as per an updated SLP</p> <p>Develop a database of goods and services that could potentially be outsourced to the local community</p> <p>Establish a supplier development programme as part of the Local Economic Development component of the SLP</p> <p>Where local contractors are used, put a contractor management plan in place to ensure that the local employment and procurement targets of the operations are met</p>
Mining operations	Employee training	Upskilling of Labour force	Construction and Operation Phase	P	30 Low-Med	1	30 Low-Med	Promote Socio-Economic Development in the Local Area	<p>Develop an updated Local Economic Plan as part of an updated SLP for the project in consultation with the local community. Some strategic recommendations:</p> <p>Determine whether the current allocation as per Eyethu's MWP is in line with the targets of the Mining Charter of 2018</p> <p>Monitor and manage the social contribution of multinational suppliers (in-house as well as suppliers to contractor and direct service providers)</p>
Mining operations	Coal production and sales	Increased Public revenue	Construction and Operation Phase	P	36 Low-Med	1	36 Low-Med		
Mining operations	Social Development Plan	Increase in Local Economic Development Funds	Construction and Operation Phase	Positi	36 Low-Med	1	36 Low-Med		
Mining operations	Employment creation	Project Induced In-Migration	Construction and Operation Phase	Negative	32 Low-Med	0,8	25,6 Low-Med	Minimise Impacts of Project-Induced In-Migration	<p>The local labour procurement strategy as well as proof of residence required should be clearly communicated in the local community and broader regional media well in advance of the construction phase. The communication strategy should ensure that unrealistic employment expectations are not created.</p> <p>Ensure that foreign (outside) workers reside in suitable facilities and do not establish informal houses.</p> <p>Information distributed as part of the existing HIV/Aids awareness campaigns undertaken in the area should again be focused on and communicated to the local workforce.</p> <p>The general health of workers should be monitored on an on-going basis</p> <p>Establish a forum, with representatives of Eyethu Coal and local stakeholders for discussing potential issues of community conflict</p> <p>The area should be fenced off and security measures should ensure that no squatters are allowed on the mining right area</p> <p>The relevant actions related to this objective should form of the a contractor management plan</p>



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Activity	Aspect	Impact	Phase	+/-	Significance without mitigation	Mitigation efficiency	Significance with mitigation	Mitigation measures	Action Plan
Mining operations	Increased traffic Mining related hazards Increased dust Water quality deterioration Historical subsidence Blasting	Safety and Health Risks	Construction and Operation Phase	Negative	44 Med	0,6	26,4 Low-Med	Minimise Safety and Health Risks	<p>Permanent security personnel should be on site.</p> <p>The mining area must be fenced with electrical fencing and access to the area should be controlled to avoid animals or people entering the area without authorisation.</p> <p>Speed limits on the local roads surrounding the mining sites should be enforced</p> <p>The mining area should be equipped with surveillance around its perimeter.</p> <p>A Health and Safety Plan should be implemented and it must be ensured that all managers are qualified in First Aid and other relevant safety courses</p> <p>Ensure that a proper emergency plan that fits with the Municipal Disaster Management Plan is in place</p> <p>Implement a HIV/AIDS awareness programme as part of SLP with specific focus on communities in and nearby the mining areas, as well as on the mine employees</p> <p>Fire-fighting equipment should be on site and should be in a good working condition</p> <p>All mining vehicles should be in a good condition and adhere to the road worthy standards</p> <p>Access from haul roads and internal mine roads to local main roads should be in line with the road standard and requirements to accommodate the traffic load and traffic patterns.</p> <p>Eyethu to provide workers without transport with mine transport to and from work, with a safe off-loading site inside the mine premises</p> <p>Adhere to air pollution management plan to minimize health hazards related to coal dust particles and noxious gases</p> <p>Adhere to groundwater and surface water management measures to prevent any negative impacts on health due to ground or surface water pollution</p> <p>Suitable safety measures should be implemented to avoid subsidence</p>



Activity	Aspect	Impact	Phase	+/-	Significance without mitigation	Mitigation efficiency	Significance with mitigation	Mitigation measures	Action Plan
Mining operations	Open pit establishment	Change in sense of place	Construction and Operation Phase	Negative	36 Low-Med	1	36 Low-Med	Minimise Negative Impacts of Nuisance Factors (Noise and Dust) Minimise Negative Impacts from Blasting Activities	The mitigation measures of the Noise and Air Quality Impact Assessments are relevant Dust suppression measures should be applied if and when necessary Limit the number of haul roads to limit dust creation. Operational mining activities with potential noise impacts should be mitigated and should not be undertaken during night time. Noise generating activities should thus be kept to normal working hours (e.g. 7 am until 5 pm) where possible Heavy machinery and heavy vehicles should be kept in a good working order. Also, ensure that all vehicles and equipment comply with generally accepted noise levels and noise abatement regulations Personnel should be equipped with the necessary noise protection equipment I&AP forum needs to be established to discuss and address issues of concern. Quarterly meetings are advised Eyethu to maintain a complaints register for regular update as well as keep minutes of community forum meetings. Feedback should be provided on issues registered and resolved The mitigation measures of the Blasting Report are relevant. These include but is not limited to: <ul style="list-style-type: none"> • Use a qualified blasting expert • Close the provincial road during blasting in consultation with the relevant authority • Monitor noise levels from blasting to ensure it is not exceeded. • Establish a baseline of the structural condition of relevant structures (houses and public infrastructure) within a 1km radius of the operation. Inspect the structures on a 6 monthly basis or at public request. • Notify all I&APs an hour before blasting takes place • Conduct blasting in working hours (e.g. between 6:00 and 18:00)
Mining operations	Mine closure	Job losses	Decommissioning and Closure	N	75 Med-High	0,6	45 Med	Minimise the negative economic impacts related to mine closure	As per the requirements of the SLP develop mechanisms to assist employees, prior to retrenchment date in the transition phase after closure of the operations including portable skilled development programmes during the operational phase of the mine, providing assistance in accessing available and suitable jobs with other local mines or companies etc. Focus on non-core related local supply links during the operational phases of the mine to facilitate easier transitioning of local suppliers to other costumers
Mining operations	Mine Closure	Decrease/termination of community investment funds and support to local communities	Decommissioning and Closure	Negative	70 Med-High	0,6	42 Med		



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Activity	Aspect	Impact	Phase	+/-	Significance without mitigation	Mitigation efficiency	Significance with mitigation	Mitigation measures	Action Plan
Mine Closure	Water quality deterioration Historical subsidence	Safety and Health Risks	Decommissioning and Closure	Negative	48 Med	0,6	28,8 Low-Med		Plan community projects with an exit strategy of which beneficiaries are aware of The risk of ADM should be mitigated as per the ground water management plan Rehabilitate mining area as soon as possible to prevent to prevent high losses in agricultural potential Investigate the potential for a housing development as a high value post-closure land-use as well as a community priority as part of a final rehabilitation plan
Geology									
Open pit Mining of underground workings	Air inflow into old underground workings	Burning of historic underground mining areas and spontaneous combustion	Operational decommissioning and closure	Negative	68 Med-High	0,4	27,2 Low-Med	opencast pillar mining makes use of a 30.0 m wide blasted buffer to prevent spontaneous combustion and sinkhole formation	Cladding is provided by cast-blasting the overburden to cover the edge of the highwall, thus filling the boards and creating the buffer. The mining sequence is like the stripping sequence in conventional opencast: <ul style="list-style-type: none"> • Removal and stockpiling of topsoil material • Drilling, charging, and blasting of overburden • Push over and pre-stripping of overburden using truck and shovel operation • Stripping of blasted overburden • Extraction of No: 2 coal seam • Free digging of No: 2 seam coal and blasting of hard pillars



3.j SUMMARY SPECIFIC SPECIALIST RECOMMENDATIONS

List of Studies undertaken	Recommendations of Specialist Reports	Specialist recommendations that have been included in the EIA report	Reference to applicable section of report
Soils, Land Use and Land Capability Assessment	<ul style="list-style-type: none"> Once the Blesboklaagte Colliery Mining Right application has been granted and the area is fenced-off properly, the site be re-visited for a detailed soil classification survey when safe access to the site can be guaranteed. The area currently fenced-off by Anglo Coal, be properly investigated and that where possible, the surface areas where subsidence has occurred, be rehabilitated to a suitable land use. 	X	Section 3.i and within the EMP
Groundwater Assessment	<ul style="list-style-type: none"> During mine construction and operation high frequency (monthly) monitoring of groundwater levels in monitoring boreholes and collection of groundwater seepage data (ad hoc) is recommended to evaluate the influence of the excavation on the groundwater regime and mining operations. Routine water level and quality monitoring data can be used to update and validate the numerical model at different phases of mining. Update the numerical and geochemical model against monitored data during operations. Water quality data should be collected on a regular, ongoing basis during mine operations. These data will be used to recalibrate and update the mine water management model, to prepare monitoring and audit reports, to report to the regulatory authorities against the requirements of the IWMP and other authorisations and as feedback to stakeholders in the catchment, perhaps via the catchment management agency. The hydrocensus and risk assessment should at least be repeated once before closure to evaluate any impacts 	X	Section 3.i and within the EMP
Ecological Assessment	<ul style="list-style-type: none"> Design and implementation of a suitable stormwater system; Rehabilitation of the disturbed areas; Limiting instream sedimentation; Minimising pollutants entering the watercourse; Implement a programme for the clearing/eradication of alien species including long term control of such species; A 50 m buffer was implemented for the wetland systems; Ongoing water quality monitoring must take place every month during operational phases; and Wetland monitoring and biomonitoring where/if flow conditions allow for effective sampling analysis must take place bi-annually to determine any trends in ecology and hydrology. 	X	Section 3.i and within the EMP
Heritage Assessment	<ul style="list-style-type: none"> Sites B-POI1, B-POI2, B-POI3 and B-POI4 are located a significant distance from the proposed mining development and should therefore not be impacted by the proposed mining development. However, because the structures associated with these sites exceed 60 years of age, a destruction permit from the relevant heritage authority must be obtained prior to any impact. The area demarcated as 'sensitive' in the north-western corner of the proposed southern pit is considered potentially significant from a heritage perspective as this area is associated with structures dating to historical times. Even though no surface remains were 	X	Section 3.i and within the EMP



List of Studies undertaken	Recommendations of Specialist Reports	Specialist recommendations that have been included in the EIA report	Reference to applicable section of report
	<p>observed, subsurface cultural material might exist and care should therefore be exercised during construction and mining phases.</p> <ul style="list-style-type: none"> Because archaeological artefacts generally occur below surface, the possibility exists that culturally significant material may be exposed during the development and construction phases, in which case all activities must be suspended pending further archaeological investigations by a qualified archaeologist. Also, should skeletal remains be exposed during development and construction phases, all activities must be suspended and the relevant heritage resources authority contacted (See National Heritage Resources Act, 25 of 1999 section 36 (6)). Should the need arise to expand the proposed development beyond the surveyed area outlined in this study, the following applies: A qualified archaeologist must conduct a full Phase 1 Archaeological Impact Assessment (AIA) on the sections beyond the demarcated area that will be affected by the development, in order to determine the occurrence and extent of any archaeological sites and the impact development might have on these sites. From a heritage point of view, development may proceed on the surveyed portion, subject to the abovementioned conditions, recommendations and approval by the South African Heritage Resources Agency. 		
Noise Assessment	<ul style="list-style-type: none"> The proposed project could go forward without a detrimental impact on the environment given the sound implementation of the management, mitigation and monitoring measures as presented throughout this report. 	X	Section 3.i and within the EMP
Social-Economic Assessment	<ul style="list-style-type: none"> To further promote the socio-economic development in the local area, it is recommended that an updated Local Economic Plan, as part of an updated SLP for the project, in consultation with the local community, should be developed. To limit the negative impacts associated with blasting, the recommendations and management measures as included in the Blasting Report should be implemented. it would be beneficial to establish a baseline of the structural condition of relevant structures (houses and public infrastructure) within a 1km radius of the operation. Inspections of these structures on a 6 monthly basis or at public request are recommended. It is recommended that the socio-economic impacts be re-assessed at the time of decommissioning as the local dynamics could have changed. Since there is no evidence of critical negative socio-economic impacts that cannot be mitigated effectively, the recommendation is that environmental authorisation for the project is granted. 	X	Section 3.i and within the EMP
Air Quality Assessment	<ul style="list-style-type: none"> It is recommended that ambient air quality monitoring be established to get a baseline condition prior to the onset of the operations and in order to establish the level at which the proposed operations are noted to impact on the ambient air quality. Fallout monitoring should be continued for the life of mine to better assess the level of nuisance dust associated with both mining and process related operations. Sampling of fallout should be 	X	Section 3.i and within the EMP



List of Studies undertaken	Recommendations of Specialist Reports	Specialist recommendations that have been included in the EIA report	Reference to applicable section of report
	<p>undertaken within the neighbouring areas as well as on-site. Dust fallout monitoring is recommended</p> <ul style="list-style-type: none"> • PM10 and PM2.5 dust monitoring must also be undertaken at the same sites as mentioned under the previous bullet but also in and around potential fugitive emission sources to determine mitigation measures and focus management efforts. • Further mitigation measures that should be applied, if it is found that dust and PM10 levels are measured to be exceeding limits are: <ul style="list-style-type: none"> ○ Reducing the speed of the Haul Trucks on the Pit and Access Haul Roads. ○ Fully sealed Pit and Access Haul Road to achieve 100% mitigation on these roads. ○ The impacts from dust fallout and Particulate matter can be reduced by implementing dust control measures. The highest intensity of the construction work should be carried out during the summer months and not over the harsh winter months as can result in increased dispersion of fugitive dust. The mine should ensure that unpaved roads are continuously watered and treated with dust binding additive products to reduce the volume of fugitive dust emitted from unpaved roads. ○ Mitigation and management measures for mining operation as discussed in this report should be sufficient to ensure the mining operation can be conducted with minimal impact on the receiving environment and therefore not have a detrimental effect and can go ahead. 		
Visual Assessment	<ul style="list-style-type: none"> • Plant some indigenous trees to create a barrier between the neighbours and roads; • Dust from Stockpile areas, roads and other activities must be managed by means of dust suppression to prevent excessive dust; • A wind barrier system that encloses the stockpiles; • Rehabilitation of the area must be done once mining is completed. • Creating Berms around the opencast pits and planting indigenous vegetation on the berms. 	X	Section 3.i and within the EMP

3.k ENVIRONMENTAL IMPACT STATEMENT

3.k.i The Key Findings of the Environmental Impact Assessment and Positive and Negative Impacts Identified

The impacts that have been rated as medium or high risk after prioritisation must be carefully managed throughout the LOM in order to ensure the project is sustainable from an economic, social and environmental point of view. The project will stimulate the local economy and contribute to the national GDP, which in the current economic climate, is a positive impact. The negative impact on natural resources (groundwater, surface water, air quality and soils) can however not be avoided, but only managed and mitigated to a certain extent. It is therefore of utmost importance that monitoring is undertaken as stipulated within the EMP.



Table 3.38: Impacts of Medium to High Risk

Impact	Phase	+ -	SBM	SAM	Mitigation measures	Action Plan
Heritage						
Destruction of possible sub-surface heritage material within the sensitive area	Construction and Operation	Negative	Med	Med	Monitor sub-surface material	Monitoring
Noise						
Increased Noise levels	Operation	Negative	High	Med	Construct a Noise Barrier between the main noise source noise sensitive receivers Equipment Maintenance Implement Road rules.	<ul style="list-style-type: none"> A noise barrier in the form of a berm, tree break or similar noise fence should be constructed on the mine boundary Construction and mining-related machinery and vehicles must be serviced on a regular basis to ensure noise suppression mechanisms are effective e.g. installed exhaust mufflers. Switching off equipment when not in use. Fixed noise producing sources such as generators, pump stations and crushers to be either housed in enclosures or barriers put up around the noise source void the use of engine compression brakes when approaching the site entrance or driving through or in the vicinity of the adjacent town. All access roads will be signposted and speed limited to minimise transport noise. Equipment with lower sound power levels would be used in preference to noisier equipment. The on-site road network will be well maintained to limit body noise from empty trucks travelling on internal roads
Ecological Impacts						
Flow alterations due to erosion and sedimentation	Construction and Operation	Negative	Med	Med	<ul style="list-style-type: none"> Rehabilitation of the disturbed areas; Limiting instream sedimentation; Minimising pollutants entering the watercourse Erosion control measures must be employed where required.	<ul style="list-style-type: none"> Design and implementation of a suitable stormwater system; Implement a programme for the clearing/eradication of alien species including long term control of such species; A 50 m buffer implemented for the wetland system; Water quality monitoring must take place every month during operational phases; and Wetland monitoring and biomonitoring must take place bi-annually. A topsoil stripping and stockpiling guideline must be completed to ensure rehabilitation success. Attenuation measures must include, but are not limited to - the use of sand bags, erosion control blankets, and silt fences. Long term attenuation measures, such as attenuation/infiltration trenches, swales must be established to control stormwater from hardened surfaces Vegetation clearing must be undertaken as and when necessary in phases. Install sediment barriers (silt catchers and Reno mattresses) along any drainage areas to prevent the migration of silt. Exposed soils must be rehabilitated as soon as practically possible to limit the risk of erosion. All roads need to be maintained and any erosion ditches forming along the road filled and compacted. Demarcate wetland areas to avoid unauthorised access. No washing of any equipment in close proximity to a watercourse is permitted. No releases of any substances that could be toxic to fauna or faunal habitats within the channels or any watercourses is permitted. Spillages of fuels, oils and other potentially harmful chemicals must be cleaned up immediately and contaminants properly drained and disposed of using proper solid/hazardous waste facilities Portable toilets must be placed on impervious level surfaces that are lipped to prevent spillage. The general consensus is that they should be within 30 m to 50 m of a work face Re-instate indigenous vegetation (grasses and indigenous trees) in disturbed areas.
Pollution of watercourse	Construction, Operation	Negative	Med	Med		
Spread of alien vegetation	Operational, Closure and Decommissioning	Negative	Med-High	Med		
Air Quality						

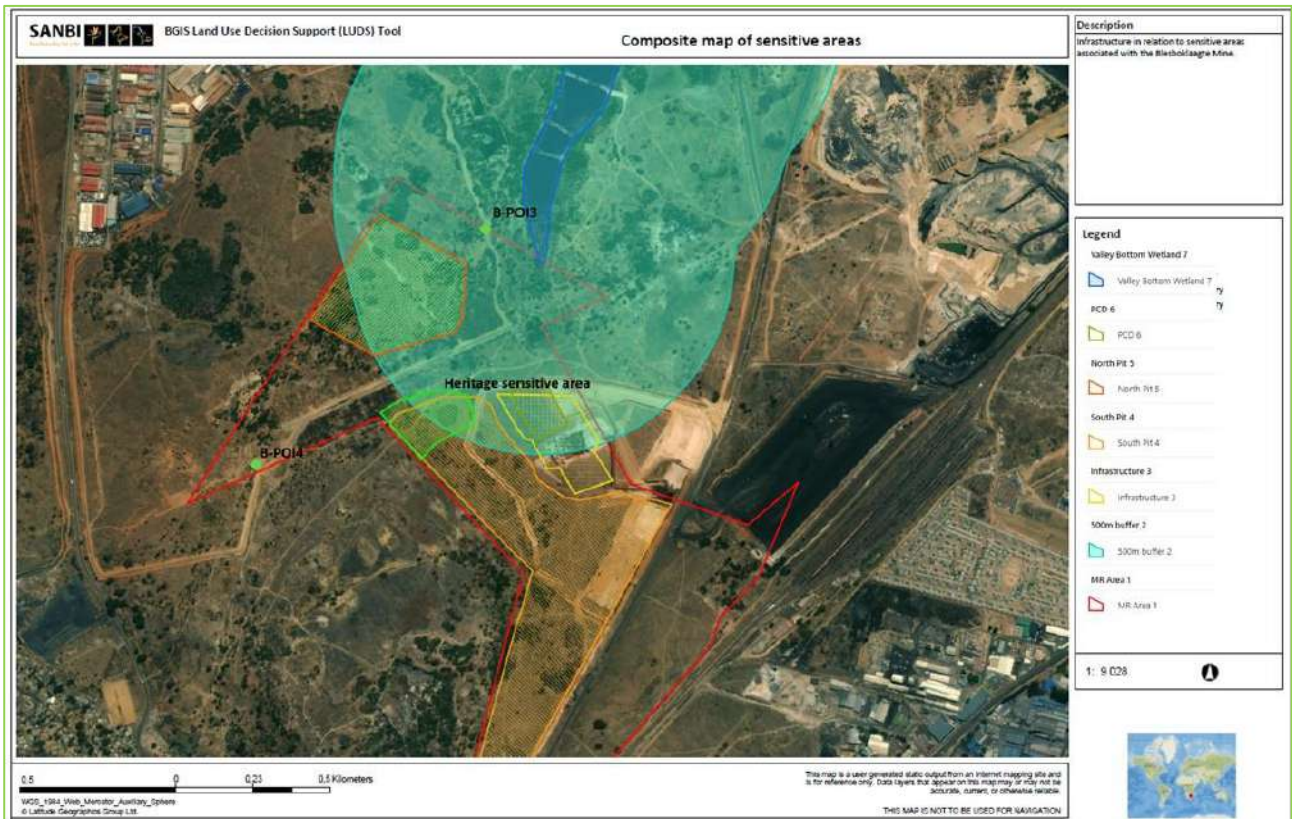


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Impact	Phase	+ -	SBM	SAM	Mitigation measures	Action Plan
Fugitive dust (containing TSP (total suspended particulate) will give rise to nuisance impacts as fallout dust, as well as PM10 and PM2.5 (dust with a size less than 10 microns, and dust with a size less than 2.5 microns) giving rise to health impacts	Decommissioning Phase	Negative	Med	Med	Minimise exposed surface duration The area of disturbance must be kept to a minimum Avoid Dust Creation	Revegetation of exposed areas Demarcate areas of movement Spreading of soil must be performed on less windy days. Keep soil moist using sprays or water tanks, using wind breaks. Speed restrictions should be imposed and enforced Exhaust pipes of vehicles should be directed so that they do not raise dust.
Visual						
Potential visual impact on Road and Land users	Operation, Decommissioning and Closure	Negative	Med-High	Med	The visual impact can be minimized creating a visual barrier. Minimise areas of operation	Creating a Berm between the opencast pits and the town of Witbank and Planting Indigenous vegetation Perform concurrent rehabilitation as mining progresses
Soils, Land Use, Land Capability and Hydrogeology						
Destruction of arable and grazing land capability	Construction Phase	Negative	High	Med-High	No mitigation possible	Establish agricultural projects with in the larger mining right area
Social Economic						
Employment and income opportunity	Construction and Operation Phase	Positive	Med	Med	Maximise Employment Opportunities, Skills and Enterprise Development	Prioritise local labour in the recruitment process as part of the company's own recruitment policy or as part of contractor management plan during operations Put a procurement strategy as well as a contractor management plan (if relevant) in place to ensure that 100% local employment target in terms of unskilled labour is met Up-skill the local labour force as per an updated SLP Develop a database of goods and services that could potentially be outsourced to the local community Establish a supplier development programme as part of the Local Economic Development component of the SLP Where local contractors are used, put a contractor management plan in place to ensure that the local employment and procurement targets of the operations are met
Job losses	Decommissioning and Closure	Negative	Med-High	Med	Minimise the negative economic impacts related to mine closure	As per the requirements of the SLP develop mechanisms to assist employees, prior to retrenchment date in the transition phase after closure of the operations including portable skilled development programmes during the operational phase of the mine, providing assistance in accessing available and suitable jobs with other local mines or companies etc.
Decrease/termination of community investment funds and support to local communities	Decommissioning and Closure	Negative	Med-High	Med		Focus on non-core related local supply links during the operational phases of the mine to facilitate easier transitioning of local suppliers to other costumers Plan community projects with an exit strategy of which beneficiaries are aware of The risk of ADM should be mitigated as per the ground water management plan Rehabilitate mining area as soon as possible to prevent to prevent high losses in agricultural potential Investigate the potential for a housing development as a high value post-closure land-use as well as a community priority as part of a final rehabilitation plan



3.k.ii Final Site Map



3.k.iii Summary of Positive and Negative Implications and Risks of the Proposed Activity and Identified Alternatives

Description	Advantages	Disadvantages
Mining Area Alternatives		
Open pit mining of areas not previously undermined	<ul style="list-style-type: none"> Smaller footprint associated with surface disturbance. Alternative/current land uses can continue on areas not directly impacted by surface activities. Reduced impact on dust, noise and air quality. Reduced rehabilitation costs. Low risk of air inflow to old underground workings and subsequent spontaneous combustion. 	<ul style="list-style-type: none"> Not economically viable as large pillars will remain. Risk of subsidence during operation. Continued AMD post mining and closure phase. No rehabilitation of areas that are currently a subsidence and safety risk due to historic mining Limited LOM and employment opportunities.
Open pit mining of areas previously undermined (preferred method)	<ul style="list-style-type: none"> Additional employment opportunities. Economically viable as more coal will be efficiently extracted. Increased LOM – extended employment opportunities. No subsidence risk during operation. No subsidence risk post-closure. 	<ul style="list-style-type: none"> Greater surface area disturbance. Change in land use required for all farm portions in the MRA. Decrease in agricultural area/cultivated land. Decrease in surface water runoff to catchment. Increased dust generation. Greater blast and vibration impacts.



Description	Advantages	Disadvantages
Mining Area Alternatives		
	<ul style="list-style-type: none"> Rehabilitation of areas that are currently a subsidence and safety risk due to historic mining 	<ul style="list-style-type: none"> Increased noise from the use of construction and mining machinery on surface during operations. Higher rehabilitation costs. Higher risk of air inflow to old underground workings and subsequent spontaneous combustion.

3.l IMPACT MANAGEMENT OBJECTIVES AND IMPACT MANAGEMENT OUTCOMES

The objectives of impact mitigation and management are to:

- Primarily pre-empt impacts, assess their significance and implement appropriate mitigation and management measures to either avoid, minimise and/or remediate the associated impacts where they cannot completely be avoided.
- Implement an adequate monitoring programme to:
 - Ensure that mitigation and management measure are effective.
 - Allow quick detection of potential impacts, which in turn will allow for quick response to issue/impacts.
 - Reduce duration of any potential negative impacts.

3.m FINAL PROPOSED ALTERNATIVES.

As this is a Section 102 amendment the site location is limited to the Mining Right Area, which is constrained by the location of other mining houses and residential areas. The resource location on the site further restrict the infrastructure layout. Therefore, no alternative sites were considered.

The most suitable layout and mining area presented in the EIA is based on specialist investigations, Mine Health and Safety Act approved buffers, and ESKOM and Transnet servitudes and their respective buffers.

3.n ASPECTS FOR INCLUSION AS CONDITIONS OF THE AUTHORISATION

- Adhere to all recommendation and management measures contained in the EMP.
- All relevant permits and authorisation must be obtained prior to construction commencing.
- Adhere to all monitoring requirements.
- A water use license must be obtained prior to any water uses undertaken on site.
- The area demarcated as 'sensitive' in the north-western corner of the proposed southern pit is considered potentially significant from a heritage perspective as this area is associated with structures dating to historical times. Even though no surface remains were observed, subsurface cultural material might exist and care should therefore be exercised during construction and mining phases.
- Because archaeological artefacts generally occur below surface, the possibility exists that culturally significant material may be exposed during the development and construction phases, in which case all activities must be suspended pending further archaeological investigations by a qualified archaeologist. Also, should skeletal remains be exposed during development and construction phases, all activities must be suspended and the relevant heritage resources authority contacted
- Improved methods of handling the potential decant should be investigated, approved and set in place prior to mine closure.
- All acoustic screening measures must be in place before commissioning the mining activities.
- Any development must occur outside of the recommended 50 m wetland buffer zone.
- No off-road driving, hunting, poaching, or fires should be permitted on the property.



- An Alien Invasive eradication plan should be compiled, approved and implemented.

3.0 DESCRIPTION OF ANY ASSUMPTIONS, UNCERTAINTIES AND GAPS IN KNOWLEDGE

List of Studies undertaken	Recommendations of Specialist Reports
Soils, Land Use and Land Capability Assessment	<ul style="list-style-type: none"> • There were significant personal safety risks involved with assessing the Blesboklaagte Mining Right Area. The soil survey team was informed of a person that was murdered by illegal inhabitants of the larger area while walking through the northern portion of the site a few months prior to the site visit. For the purpose of the site visit, this area was visited for site walk-over while being accompanied by a security team of Anglo Coal. • Apart from the possible danger of being shot or injured by illegal inhabitants, the site that has been fenced-off by Anglo Coal as it consists of areas where there is high risk of subsidence. Following personal communication with the Anglo Coal security team, very limited areas within the fenced-off area is considered safe to traverse through as there were previous incidents of severe injury and death where members of the local community walked through the area and fell into these areas. • Outside of the area that has been fenced off by Anglo Coal, there are informal housing in the field as well as informal traders and small shops in informal structures erected within the Blesboklaagte Mining Right Area. During the site visit, several people traversed the area and were also searching waste dump areas for electronic and other waste that could be re-used. • Another major limitation is the current operations at the Blesboklaagte South Pit and Infrastructure area (Figure 1) where mining activities are already taking place and major soil disturbance such as topsoil stripping and stockpiling, has already taken place. Other surface disturbance associated with existing mining activities, include the soil berm along the surfaced road that leads to Blesboklaagte Colliery's entrance. • Apart from the limitations posed by restrictions to site access, the following data gaps exist in the assessment: • No samples were collected to depict the baseline soil chemical conditions of the major modal soil profiles. To address this data gap, recommendations will be made for soil sample collection for analysis prior to commencement of mining and during the project cycle for monitoring purposes. • The study does not include a land contamination assessment to determine pre-mining soil pollution levels (should there be any present). • In order to address the study gaps, access limitations and uncertainties in available data, the study methodology is amended by detailed desktop assessment of baseline properties of the area, including analysis of aerial imagery. The data limitations are also addressed through the recommendations for thorough pre-construction assessment and soil quality monitoring once the entire Blesboklaagte Mining Right Area has been properly fenced-off with security fencing and when a detailed soil classification survey can be conducted with any risk to getting injured on site.
Groundwater Assessment	<ul style="list-style-type: none"> • The modelling was done within the limitations of the scope of work of this study and the amount of data available. Although all efforts have been made to base the model on sound assumptions and has been calibrated to observed data, the results obtained from this exercise should be considered in accordance with the assumptions made. Especially the assumption that a fractured aquifer will behave as a homogeneous porous medium can lead to error. However, on a large enough scale (bigger than the REV, Representative Elemental Volume) this assumption should hold reasonably well.
Ecological Assessment	<ul style="list-style-type: none"> • A hand-held Garmin eTrex 30 were used to delineate the watercourses had an accuracy of 3 m to 6 m • The findings, results, observations, conclusions and recommendations provided in this report are based on the author's best scientific and professional knowledge as well as available information regarding the perceived impacts on the watercourses and biodiversity; and • The assessment in determining the present ecological state (PES) of the identified system was based on a single site visit. Site visits should ideally be conducted over differing seasons in order to better understand the vegetation, hydrological and geomorphologic processes driving the characteristics of the watercourse. In order to obtain a comprehensive understanding of the dynamics of the aquatic ecosystem in an area, ecological assessments should always consider investigations at different time scales (across seasons/years) and through replication, as river systems are in constant change; and • The watercourse management and rehabilitation plan will need to be updated as more information about the dynamics of the system and its response to the implemented management measures are observed over time.
Heritage Assessment	<ul style="list-style-type: none"> • Certain areas were marked by dense vegetation during the time of surveying (December 2019 & February 2020) that hampered visibility and access. Site B-PO14, as well as the proposed northern pit, is located within



List of Studies undertaken	Recommendations of Specialist Reports
	<p>a fenced-off area and no access was gained during the initial survey. During the follow-up survey in February 2020, access was arranged to the fenced-off section that included an escort by Anglo American. According to Mr. Sekhukhune, the fenced-off section is considered to be extremely unsafe and hazardous as this section is associated with subsidence, sinkholes, burning sub-surface material and criminal activities that include illegal mining. Illegal access to the site is gained by breaching the ClearVu fence. It was also noted that one person was shot and killed within the fenced-off section during October 2019.</p> <ul style="list-style-type: none"> A section of the proposed southern pit has already been disturbed by current mining activities, while the general area is disturbed by contemporary building material and several trenches. What appears to be a shop or liquor store near the southern tip of the proposed mining right area attracted a relatively large number of people that hampered access to two of the pre-plotted sites: B-POI1 and B-POI2. The exact location and condition of these sites could therefore not be determined. However, a possibility exists that the shop/liquor store might be site B-POI1, while there is a reasonable chance that site B-POI2 no longer exists. These sites, however, are not located in close proximity of the planned mining layout.
Noise Assessment	<ul style="list-style-type: none"> The proposed project could go forward without a detrimental impact on the environment given the sound implementation of the management, mitigation and monitoring measures as presented throughout this report.
Social-Economic Assessment	<ul style="list-style-type: none"> The SEIA included consultations with selected stakeholders and potentially affected parties as part of the impact assessment phase. This does not form part of the Public Participation Process (PPP) required for the overall EIA process, except where it was specifically specified as such during the consultation sessions. A SEIA aims to identify possible social and economic impacts that could occur in future. These impacts are based on existing baseline information. There is thus always an uncertainty with regards to the anticipated impact actually occurring, as well as the intensity thereof. Impact predictions have been made as accurately as possible based on the information available at the time of the study. Sources consulted are not exhaustive and additional information can still come to the fore to influence the contents, findings, ratings and conclusions made. Socio-economic baseline information was mainly based on official statistics from StatsSA, as well as municipal documentation. Sub-municipal data was only available for 2011. Recent trends as well as information on a sub-municipal level were also based on quantitative and qualitative information received from local representatives with local knowledge. The lack of more recent official socio-economic data is therefore seen as a limiting factor, although it is not anticipated to influence the outcome of the report. Technical and other information provided by the client is assumed to be correct. The potential external costs associated with the project were based on information supplied by sub-specialists for the Environmental Impact Assessment of the project as accessed the Blesboklaagte Environmental Impact Assessment and Environmental Management Plan submitted in 2016 The economic impact model was based on information supplied by Eyethu Coal (Pty) Ltd (The Applicant). The employment and income impacts were based on information as contained in the Mining Works Programme (MWP) (2019) and the Social and Labour Plan (SLP) (2016) for the proposed project. Royalties, employment ratios of Historically disadvantaged South Africans (HDSAs) and non-core spending were based on ratios of other coal mines in Mpumalanga Economic multipliers, average salaries and wages and value added as a percentage of total income were based on provincial and national averages. An overall rating for the possible decommissioning and closure phase impacts was included although it is recommended that the socio-economic impacts be re-assessed at the time of decommissioning as the local dynamics could have changed.
Air Quality Assessment	<ul style="list-style-type: none"> None provided
Visual Assessment	<ul style="list-style-type: none"> It must be noted that no complete detail of the exact structures was available at the time of this report and general height and location assumptions were made where applicable. The core study area can be defined as an area with a radius of not more than 10 km from the structures and a total study area with a radius of 15 km from the structures. This is because the visual impact of structures beyond a distance of 10 km would be so reduced that it can be considered negligible even if there is direct line of sight.



List of Studies undertaken	Recommendations of Specialist Reports
	<ul style="list-style-type: none"> It is assumed that there are no alternative locations for the structures and that the visual assessment, therefore, assessed only the proposed site. Geographic location within the mining boundary of infrastructure. The assessment was undertaken during the planning stage of the project and is based on the information available at that time. Visual perception is by nature a subjective experience, as it is influenced largely by personal values. For instance, what one-viewer experiences as an intrusion in the landscape, another may regard as positive. Such differences in perception are greatly influenced by culture, education and socio-economic background. A degree of subjectivity is therefore bound to influence the rating of visual impacts. In order to limit such subjectivity, a combination of quantitative and qualitative assessment methods was used. A high degree of reliance has been placed on GIS-based analysis viewshed, visibility analysis, and on making transparent assumptions and value judgements, where such assumptions or judgements are necessary. The viewshed generated in GIS cannot be guaranteed as 100% accurate. Some viewpoints, which are indicated on the viewshed as being inside of the viewshed, can be outside of the viewshed. This is due to the change of the natural environment by surrounding activities as well as natural vegetation that play a significant role and can have a positive or negative influence on the viewshed.

3.p REASONED OPINION AS TO WHETHER THE PROPOSED ACTIVITY SHOULD OR SHOULD NOT BE AUTHORISED

3.p.i Reasons Why the Activity Should Be Authorized or Not

The project can be recommended for approval with conditions contained in this report due to the following reasons:

- As this is a Section 102 amendment this will be a continuation of an already approved mine, and therefore continuation of employment. The mining industry is identified as one of the key components toward Rapid Economic Growth in order to reduce poverty and minimise unemployment Growth (State of the Nation Address, 2019).
- The mining sector contributes significantly to the GDP (22% of the provincial economy).
- The area has been significantly degraded and the environmental impact will thus be Low. With the rehabilitation actions in place the site can attain a similar or higher ecological status than before the mining activities commenced.
- The Groundwater and water decant is of very poor quality as a baseline, and through the rehabilitation and closure objectives, the Groundwater quality can be improved from the current pre-mining state, which will in turn improve the surface water quality of the Blesbokspruit where decant is currently taking place.
- Historical underground mining has left the area unsafe, due to subsidence and burning of the old mining areas. Once opencast mining is rehabilitated the chance of subsidence will be eliminated in this area, and therefore increase safety of the area.

3.p.ii Conditions that must be included in the authorisation

3.p.ii.1 Specific conditions to be included into the compilation and approval of EMPr

- Adhere to all recommendation and management measures contained in the EMP.
- All relevant permits and authorisation must be obtained prior to construction commencing.
- Adhere to all monitoring requirements.
- A water use license must be obtained prior to any water uses undertaken on site.
- The area demarcated as 'sensitive' in the north-western corner of the proposed southern pit is considered potentially significant from a heritage perspective as this area is associated with structures dating to historical times. Even though no surface remains were observed, subsurface cultural material might exist and care should therefore be exercised during construction and mining phases.
- Because archaeological artefacts generally occur below surface, the possibility exists that culturally significant material may be exposed during the development and construction phases, in which case all activities must be suspended pending further archaeological investigations by a qualified archaeologist. Also, should skeletal remains be exposed during development and construction phases, all activities must be suspended and the relevant heritage resources authority contacted



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- Improved methods of handling the potential decant should be investigated, approved and set in place prior to mine closure.
- All acoustic screening measures must be in place before commissioning the mining activities.
- Any development must occur outside of the recommended 50 m wetland buffer zone.
- No off-road driving, hunting, poaching, or fires should be permitted on the property.
- An Alien Invasive eradication plan should be compiled, approved and implemented.

3.p.ii.2 *Rehabilitation requirements*

Rehabilitation of the project will aim to:

- Create a safe, physically stable rehabilitated landscape that limits long-term erosion potential and environmental degradation;
- Sustain the long term catchment water yield and ensure suitable water quality;
- Rehabilitation of the surface infrastructure where necessary to minimize infiltration into the underground water regime (the philosophy of concentration and containment);
- Rehabilitation to minimise contamination of surface water resources (the philosophy of dilution and dispersion);
- Focus on establishing a functional post-mining landscape that would ensure self-sustaining agricultural practices post mine closure where possible;
- Ensure interconnectivity between the rehabilitated landscapes with surrounding regionally biologically diverse areas;
- Encourage, if and where required, the re-instatement of terrestrial and aquatic wetland biodiversity over time; and
- Create opportunities for alternative post-mining livelihoods by aligning to the regional planning;
- Meet with prevailing environmental legal requirements outlined in this report; and
- Prevent / Minimise negative impacts and risks as identified in this report.

3.q PERIOD FOR WHICH THE ENVIRONMENTAL AUTHORISATION IS REQUIRED

The life of Mine is estimated at 4 years. The EA and Waste Management License (WML) are being sought for a period of 10 years.

3.r UNDERTAKING

The EAP herewith confirms

- | | | |
|----|---|-------------------------------------|
| a. | The correctness of the information provided in the reports | <input checked="" type="checkbox"/> |
| b. | The inclusion of comments and inputs from stakeholders and I&APs ; | <input checked="" type="checkbox"/> |
| c. | The inclusion of inputs and recommendations from the specialist reports where relevant; and | <input checked="" type="checkbox"/> |
| d. | The acceptability of the project in relation to the finding of the assessment and level of mitigation proposed; | <input checked="" type="checkbox"/> |

Signed: _____ 2019



3.s FINANCIAL PROVISION

Item description		Cost
1	Surface Infrastructure	R1 658 283.08
1	Dismantling of processing plant and associated structures (including associated conveyors & power lines)	R16 087.08
2(A)	Demolition of steel buildings and structures (including floor slabs)	R0.00
2(B)	Demolition of reinforced concrete buildings and structures	R0.00
3	Rehabilitation of access roads	R1 642 196.00
4(A)	Demolition of electrified railway lines	R0.00
4(B)	Demolition and rehabilitation of non-electrified railway lines	R0.00
5	Demolition of housing and facilities (including floor slabs)	R0.00
12	Fencing	R0.00
2	Mining Areas & Waste Sites	R3 950 748.00
6	Opencast rehabilitation (including final voids and ramps)	R3 950 748.00
7	Sealing of shafts, adits and inclines (including concrete cap)	R0.00
3	Mine Residue Sites	R7 418 612.51
8(A)	Rehabilitation of overburden and spoils	R643 199.88
8(B)	Rehabilitation of processing waste deposits and evaporation ponds (basic, salt-producing waste)	R0.00
8(C)	Rehabilitation of processing waste deposits and evaporation ponds (acidic, metal-rich waste)	R196 203.84
9	Rehabilitation of subsided areas	R0.00
13	Water management (Separating clean and dirty water, managing polluted water and managing the impact on groundwater, including treatment, when required)	R6 579 208.80
4	General Rehabilitation	R2 683 573.49
10	General surface rehabilitation, including of all denuded areas	R2 683 573.49
5	Aftercare & Maintenance	R2 527 280.11
13	Monitoring	R1 300 000.00
14	Maintenance	R1 227 280.11
15	Water Treatment Facility	R0.00
	Sub Total 1	R18 238 497.19
	Mobilisation and Project Management (10% of Subtotal 1)	R1 823 849.72
	Sub Total 2	R20 062 346.91
	Contingency (10% of subtotal 2)	R2 006 234.69
	Sub Total 3 (Closure Liability for Mine)	R22 068 581.60
	VAT (15% of subtotal 3)	R3 310 287.24
	Total	R25 378 868.84

3.s.i Explain how the aforesaid amount was derived.

The NEMA regulations require that the closure costs be calculated according to real rates. CIGroup was appointed to undertake the closure costing and therefore sourced these rates from a third-party contractor specialising in demolition and rehabilitation.

In order to calculate the closure cost using the third-party contractor rates, each of the closure actions from the report were broken down into specific units (i.e. roads, power lines, buildings, discard dump, Dirty Water Storage Facilities etc.) within specific categories (i.e. Decommissioning, Closure, Rehabilitation and Care and Maintenance).

A bill of quantity was determined for each of the units and applied to the third-party contractor rates to determine a closure cost per unit. The unit costs determined the category costs and the category costs resulted in a preliminary closure cost also called Sub-Total 1. Contractors costs include a mobilisation and project management fee which represents 12% of the Subtotal 1 and is calculated into a Subtotal 2. A contingency of 10% was included on Subtotal 2 to obtain a Financial Liability Cost in Subtotal 3. Finally, a 15% VAT was added to Subtotal 3 to obtain a subtotal 4. Subtotal 3 is regarded as the Final closure liability of the mine.

3.s.ii Confirm that this amount can be provided for from operating expenditure.

This amount can and will be provided for from operation expenditure.



3.t DEVIATIONS FROM THE APPROVED SCOPING REPORT

3.t.i Deviations from The Methodology for Impact and Risk Assessment

No deviation has been made.

3.t.ii Motivation for The Deviation

Not applicable as no deviation has been made.

3.u OTHER INFORMATION REQUIRED BY THE COMPETENT AUTHORITY

3.u.i Compliance with The Provisions of Sections 24(4) (A) And (B) Read with Section 24 (3) (A) And (7) Of NEMA, The EIA Report

3.u.i.1 Impact on the Socio-Economic Conditions of Any Directly Affected Person

Impact	Significance after mitigation
Employment and income opportunity	Med
Upskilling of Labour force	Low-Med
Increased Public revenue	Low-Med
Increase in Local Economic Development Funds	Low-Med
Project Induced In-Migration	Low-Med
Safety and Health Risks	Low-Med
Change in sense of place	Low-Med
Job losses	Med
Decrease/termination of community investment funds and support to local communities	Med
Safety and Health Risks	Low-Med

Also refer to the Social Impact Assessment attached as Appendix 3 and Section 3.g.iv.1.a

3.u.i.2 Impact on Any National Estate Referred to in Section 3(2) Of the National Heritage Resources Act

Impact	Significance after mitigation
Destruction of structures at B-POI4	Low-Med
Destruction of possible sub-surface heritage material within the sensitive area	Med

Refer to the Heritage Impact Assessment attached as Appendix 3 and Section 3.g.iv.1.a

3.v OTHER MATTERS REQUIRED IN TERMS OF SECTIONS 24(4) (A) & (B) OF THE ACT

Section 24(4) (b) (i) of the Act specifies “investigation of the potential consequences or impacts of the alternatives to the activity on the environment and assessment of the significance of those potential consequences or impacts, including the option of not implementing the activity”.

The alternatives assessed and the impacts associated with the alternatives assessed have been fully presented in Section 3.g.vii and Section 3.g.ix



List of Appendices

- **Appendix 1 – EMP**
- **Appendix 2 – Proof of Public Participation**
- **Appendix 3 – Specialist Reports**
- **Appendix 4 – Maps**
- **Appendix 5 – Site Layout and infrastructure**
- **Appendix 6 – EAP CV**

