

Seriti Coal (Pty) Ltd: Arnot Colliery

Mining Right Renewal Application at Arnot Colliery, Mpumalanga Province

Draft Scoping Report

Report date: 31 August 2023

SHANGONI
Management Services (Pty) Ltd



Stewards



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Executive summary

Arnot Colliery is the holder of the converted Mining Right (Reference No: MP 30/5/1/2/2/410 MR) located on farm Portion Braamspruit 465 JS, Portion of Arnot West 983 JS, A Portion of Portions RE 2, 3, 5 and 11 of Bosmanspruit, A Portion of Farm RE Bult en Dal 997 JS and a Portion of Portions RE 1, 2, 4 and 5 situated in the Mpumalanga Province. Arnot Colliery was constructed in the early 1970's to supply a total 6,18 million run of mine tons of coal per annum to the Arnot Power Station, comprising, 1,98 million tons from an underground mine and 4,20 million tons from an opencast mine. The Mine exploited bituminous coal from two pits, namely Pit 1 and Pit 2 (West and East). Mining of the open cast pits ceased in 1992, followed by backfilling and rehabilitation.

Arnot Colliery proposes to renew their existing Mining Right and mine seam 4 (S4L&S4UA), 2 seam and 1 seam situated on Braamspruit 465 JS, Arnot West 983 JS and Tweefontein Farms by means of open cast and underground mining methods. Opencast mining will include drilling and blasting of coal using hydraulic excavators and Articulated Dump Trucks ("ADT's") to transfer coal to a dedicated stockpile area. The underground plan includes the extraction of the deeper seams where the strip ratios increase to an uneconomical level applying bord and pillar mining methods.

Due to the extent and nature of the activities associated with the proposed mining project, the Environmental Assessment Practitioner ("EAP") has identified that a Scoping and Environmental Impact Assessment ("S&EIA") process is required in terms of the NEMA EIA Regulations, GN R.982 dated 2014, as amended. In addition, a Water Use Licence Application will be undertaken for water uses in terms of the National Water Act, 1998 (Act 36 of 1998) ("NWA") and a Waste Management License ("WML") in terms of the National Waste Management Act 2008 (Act 59 of 2008) from the Department of Mineral Resources and Energy ("DMRE").



The following listed activities are being applied for in this application:

Listed activity	Activity description
National Environmental Management Act (Act No. 107 of 1998)	
GN 983, 08 Dec 2014 as Amended Listing Notice 1 (327) of 7 April 2017	
Activity 9	<p>The development of infrastructure exceeding 1 000 metres in length for the bulk transportation of water or storm water—</p> <p>(i) with an internal diameter of 0,36 metres or more; or</p> <p>(ii) with a peak throughput of 120 litres per second or more;</p> <p><i>Arnot Colliery proposes to construct storm water infrastructure and pipelines to assist with the separation of clean water and dirty water to divert into PCD (dirty water) and clean water environment (berms, clean water & dirty channels, and culverts)</i></p>
Activity 10	<p>The development and related operation of infrastructure exceeding 1 000 metres in length for the bulk transportation of sewage, effluent, process water, wastewater, return water, industrial discharge or slimes –</p> <p>(i) with an internal diameter of 0,36 metres or more; or</p> <p>(ii) with a peak throughput of 120 litres per second or more;</p> <p>excluding where—</p> <p>(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;</p> <p><i>Arnot Colliery proposes to construct a dewatering pipeline for the removal of underground water from the open cast pits and underground workings for safe continuation of the mining activities and sewage water treatment pipeline.</i></p>
Activity 11	<p>The development of facilities or infrastructure for the transmission and distribution of electricity—</p> <p>(i) outside urban areas or industrial complexes with a capacity of more than 33 but less than 275 kilovolts; or</p> <p>(ii) inside urban areas or industrial complexes with a capacity of 275 kilovolts or more</p> <p><i>The Arnot Colliery proposes to reroute the existing powerlines and construct an electrical substation to supply electrical energy to the Proposed mining activities and associated infrastructure.</i></p>
Activity 12	<p>The development of—</p> <p>(ii) infrastructure or structures with a physical footprint of 100 square metres or more; where such development occurs—</p> <p>(a) within a watercourse.</p> <p>(c) if no development setback exists, within 32 metres of a watercourse, measured from the edge of a watercourse.</p> <p><i>Arnot Colliery proposes to mine coal and construct associated infrastructure within 32 metres of a watercourse</i></p>
Activity 19	<p>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.</p> <p><i>Arnot Colliery intends to renew it's existing Mining Right to commence with mining activities through open cast operations in close proximity to the water course resulting in the necessity to construct a water course diversion.</i></p>



Listed activity	Activity description
Activity 21 D	<p>Any activity including the operation of that activity which requires an amendment or variation to a right or permit in terms of section 102 of the Mineral and Petroleum Resources Development Act, as well as any other applicable activity contained in this Listing Notice or in Listing Notice 3 of 2014, required for such amendment.</p> <p><i>Arnot Colliery proposes to amend and renew it's existing Mining Right to commence with mining activities by means of open cast and underground mining methods.</i></p>
Activity 24	<p>The development of a road—</p> <p>(ii) [a road] with a reserve wider than 13,5 meters, or where no reserve exists where the road is wider than 8 metres:</p> <p><i>Arnot Colliery proposes to construct haul roads and access road within the Mining Right area</i></p>
Activity 25	<p>The development and related operation of facilities or infrastructure for the treatment of effluent, wastewater or sewage with a daily throughput capacity of more than 2 000 cubic metres but less than 15 000 cubic metres.</p> <p><i>Arnot Colliery proposes to construct a Sewage Treatment plant</i></p>
GNR.984, 08 Dec 2014 as Amended Listing Notice 2 (325) of 7 April 2017	
Activity 6	<p>The development of facilities or infrastructure for any process or activity which requires a permit or licence or an amended permit or licence in terms of national or provincial legislation governing the generation or release of emissions, pollution, or effluent.</p> <p><i>Arnot Colliery intends to construct a sewage treatment plant, workshop area, wash bay area, coal stockpile, crushing and screening plant, overburden dump and related infrastructure. In addition to the infrastructure backfilling of pit areas and stockpiling hard's and soft's will occur.</i></p>
Activity 15	<p>The clearance of an area of 20 hectares or more of indigenous vegetation, excluding where such clearance of indigenous vegetation is required for—</p> <p>(i) the undertaking of a linear activity; or</p> <p>(ii) maintenance purposes undertaken in accordance with a maintenance management plan.</p> <p><i>The proposed project includes the removal of vegetation to accommodate the open cast mining area, access roads, haul roads, workshops, surface offices and electricity substation.</i></p>
GNR.985, 08 Dec 2014 as Amended Listing Notice 3 (326) of 7 April 2017	
Activity 12	<p>The clearance of an area of 300 square metres or more of indigenous vegetation except where such clearance of indigenous vegetation is required for maintenance purposes undertaken in accordance with a maintenance management plan.</p> <p><i>Arnot Colliery intends to clear an area of 300 square metres or more of indigenous vegetation</i></p>
Activity 14	<p>The development of—</p> <p>(i) dams or weirs, where the dam or weir, including infrastructure and water surface area exceeds 10 square metres; or</p> <p>(ii) infrastructure or structures with a physical footprint of 10 square metres or more; where such development occurs—</p> <p>(a) within a watercourse.</p> <p>(b) in front of a development setback; or</p> <p>(c) if no development setback has been adopted, within 32 metres of a watercourse, measured from the edge of a watercourse;</p> <p>excluding the development of infrastructure or structures within existing ports or harbours that will not increase the development footprint of the port or harbour.</p>



Listed activity	Activity description
	<i>Arnot Colliery proposes to construct a Pollution control Dam ("PCD"), and storm water infrastructure to assist with the separation of clean water and dirty water to divert into PCD (dirty water) and clean water environment (berms, clean water & dirty channels, and culverts)</i>
Activity 18	<p>The widening of a road by more than 4 metres, or the lengthening of a road by more than 1 kilometre.</p> <p><i>Arnot Colliery intends to widen the R102 Provincial Road by a single lane towards / a short distance away from the main entrance gate of the mine to make provision for the trucks and cars that will be driving in and out of the mine</i></p>
Waste Management Activity (GN 921)	
Category B Activity 10	<p>The construction of a facility for a waste management activity listed in category B of this schedule (not in isolation to associated waste management activity)</p> <p><i>Arnot Colliery intends to store soft and hard overburden on site.</i></p>
Category B Activity 11	<p>The establishment or reclamation of a residue stockpile or residue deposit resulting from activities which require a mining right, exploration right or production right in terms of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002)</p> <p><i>Arnot Colliery intends to store overburden to be used for backfilling the mined-out pits</i></p>



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Appendix C1: Application Form

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References

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Abbreviations

ADT's	Articulated Dump Trucks
CA	Competent Authority
CBA	Critical Biodiversity Area
DFFE	Department of Forestry, Fisheries and the Environment
DMRE	Department of Mineral Resources and Energy
DSR	Draft Scoping Report
DWS	Department of Water and Sanitation
EA	Environmental Authorisation
EAP	Environmental Assessment Practitioner
EIA	Environmental Impact Assessment
EIAR	Environmental Impact Assessment Report
EMPr	Environmental Management Programme
ESA	Ecological Support Area
GPS	Geographical Positioning Systems
FSR	Final Scoping Report
IDP	Integrated Development Plan
MAR	Mean Annual Runoff
MAMSL	Metres above mean sea level
MSA	Middle Stone Age
NEMA	National Environmental Management Act (Act No. 107 of 1998)
NEM:AQA	National Environmental Management: Air Quality Act (Act No. 39 of 2004)
NEM:WA	National Environmental Management: Waste Act (Act No. 59 of 2008)
NEM:BA	National Environmental Management: Biodiversity Act (Act No. 10 of 2004)
NFEPA	National Freshwater Ecosystem Priority Areas
NWA	National Water Act (Act No. 36 of 1998)
ONA	Other natural area
PCD	Pollution Control Dam
RDT	Rigid Dump Trucks



SAHRA	South African Heritage Resources Association
S&EIR	Scoping and Environmental Impact Assessment
SCC	Species of conservation concern
SDF	Spatial Development Framework
STLM	Steve Tshwete Local Municipality
SWAS	Strategic Water Source Areas
WMA	Water Management Area
WML	Waste Management License
WUL	Water Use License
WULA	Water Use License Application



1. Details of project applicant and environmental assessment practitioner

1.1. Details of the project applicant

Table 1: Details of the applicant

Operation Name	Arnot Colliery
Applicant	Seriti Coal (Pty) Ltd: Arnot Colliery
Postal Address	PO Box 61820, Johannesburg, 2107
Responsible Person	Stephanus Van der Weshuizen
Telephone No.	013 689 4710
Fax No.	N/A
E-mail Address	etienne.vanderwesthuizen@seritiza.com
Company Registration No.	2016/416619/07

1.2. Details of the environmental assessment practitioner

Table 2: Details of the environmental assessment practitioner

Environment Consultancy	Shangoni Management Services (Pty) Ltd.
EAP	Seli Mahlangu
Tel No.	(012) 807 7036
Fax No.	(012) 807 1014
e-mail Address	seli@shangoni.co.za



1.3. Expertise of the environmental assessment practitioner

Table 3: Expertise of the environmental assessment practitioner

Name and Surname	Qualifications and summary of experience
Seli Mahlangu (EAPASA and SACNASP)	Seli Mahlangu is a registered Candidate Natural Scientist and Environmental Assessment Practitioner (EAP) with an Advanced Diploma in Environmental Sciences from the Tshwane University of Technology. She is a qualified Environmental Scientist with more than 4 years' experience in Environmental Consulting where she was exposed to different Environmental Impact Assessment (EIA) applications, processes, and documentation. Her experience includes implementation of environmental legislation on a wide range of environmental projects such as Environmental Auditing, Air Emission License, Prospecting Right, Mining Permit, Mining Right, Township and Cemetery site establishment Applications and mining risk assessment and feasibility studies. Seli has experience in drafting various reports required as part of Environmental Authorisation processes, including amongst other, Environmental Impact Assessments, Scoping Reports, Basic Assessments, Environmental Management Programmes and Integrated Water and Waste Management Plans (IWWMP).
Jan Nel	Jan is the Operations Director at Shangoni and holds a master's degree in environmental management. He has been actively involved in environmental management for the past 28 years focussing on the mining industry in providing assistance with EMP Compliance, Environmental Impact Assessments (EIA), Financial Provision Calculations, Closure Plans, Rehabilitation Plans, Environmental Management Programme Reports (EMP) and EMP compliance Assessments. He is furthermore experienced in environmental management through third party certification audits as well as Environmental Management System (EMS) implementation and has more than 9000 audit hours. Jan is also involved in TC 207 local in South Africa and the International ISO TC207 committee as well as the Strategic leadership Group of ISO TC207 focussing on international trends in environmental management. Jan represents Shangoni on the board of Shangoni Laboratory services.



2. Description of the property

Table 4: Affected properties

<p>Farm name</p>	<ul style="list-style-type: none"> • Farm Arnot West 983 JS • Portions Re, Re/2, 3, 5, and 11 of the Farm Boschmanspruit 459 JS • Farm Braamspruit 465 JS • Farm Bult en Dal 997 JS (Previously Rondervalley 482 JS) • Portions Re/1, 2, 4, and 5 of Farm Kwaggafontein 460 JS • Portion 10 of Farm Tweefontein 458 JS
<p>Application area (ha)</p>	<p>Approximately 2 056.2722 hectares</p>
<p>Local minimality</p>	<p>Steve Tshwete Local Municipality</p>
<p>Distance and direction from nearest town</p>	<p>Approximately 26 km from Hedrina</p>
<p>21-digit Surveyor General code for each farm portion</p>	<p>Farm Braamspruit 465 JS</p> <p>T0JS000000000465000</p> <p>T0JS000000000465001</p> <p>T0JS000000000465002</p> <p>Farm Arnot West 983 JS</p> <p>T0JS0000000009830000</p> <p>Portion 10 of Tweefontein 458JS</p> <p>Farm Boschmanspruit 459-JS</p> <p>T0JS0000000004590000</p> <p>T0JS0000000004590002</p> <p>T0JS0000000004590003</p> <p>T0JS0000000004590005</p> <p>T0JS00000000045900011</p>



	<p>Portions Re/1, 2, 4, and 5 of Farm Kwaggafontein 460 JS</p> <p>T0JS00000000046000000</p> <p>T0JS00000000046000001</p> <p>T0JS00000000046000002</p> <p>T0JS00000000046000004</p> <p>T0JS00000000046000005</p> <p>Farm Bult en Dal 997 JS</p> <p>T0JS0000000009970000</p>
Coordinates	25°55'8.26"S and 29°42'49.27"E

3. Locality of the project

Arnot Colliery is situated on Portion 1 and 2 of Braamspruit 465 JS, Portion 15 of Tweefontein 458 JS, remainder of Arnot West 983 JS, Portion 3 of Bosmanspruit 459 JS, Remainder of Portion 1 Kwaggafontein 460 JS and Remainder of Rondevalley/ Bult en Dal 997 JS. The Arnot Collier is approximately 43 km by road from Middleburg, 65 km from Carolina and 25 Km from Hendrina within Steve Tshwete Local Municipality, Nkangala District Municipality in the Mpumalanga Province.

Refer to Figure 1 for the locality map.

Table 5: Administrative boundaries

Province	Mpumalanga
Local Municipality	Steve Tshwete Local Municipality
District Municipality	Nkangala District Municipality
Competent Authority ("CA")	Mpumalanga Department Mineral Resources and Energy ("DMRE")
Department of Water and Sanitation ("DWS") Local Office	DWS (Nelspruit)
Catchment Zone	Olifants River catchment
Water Management Area ("WMA")	Upper Olifants sub-Water Management Area
Quaternary Catchment	B12 B



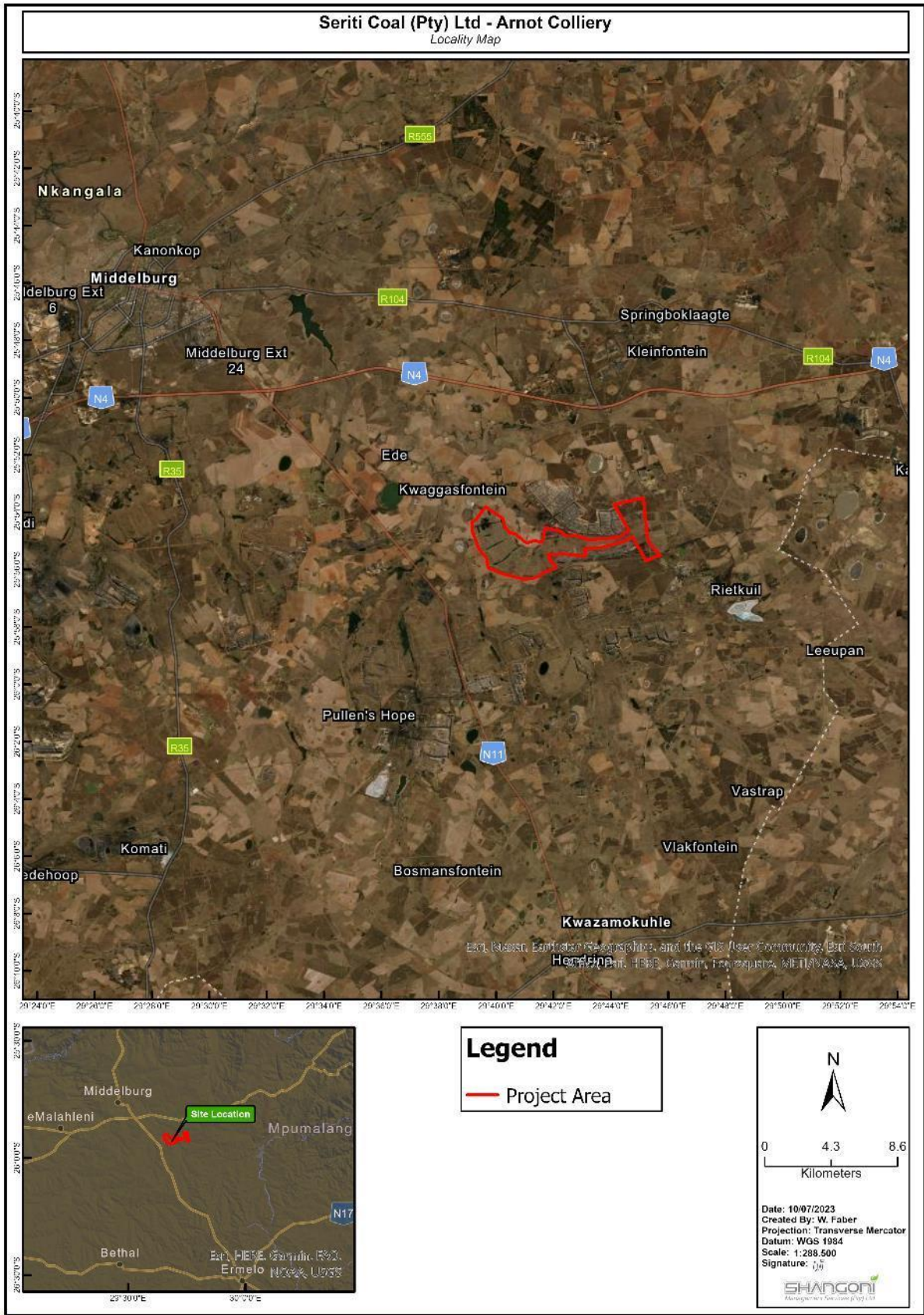


Figure 1: Locality Map



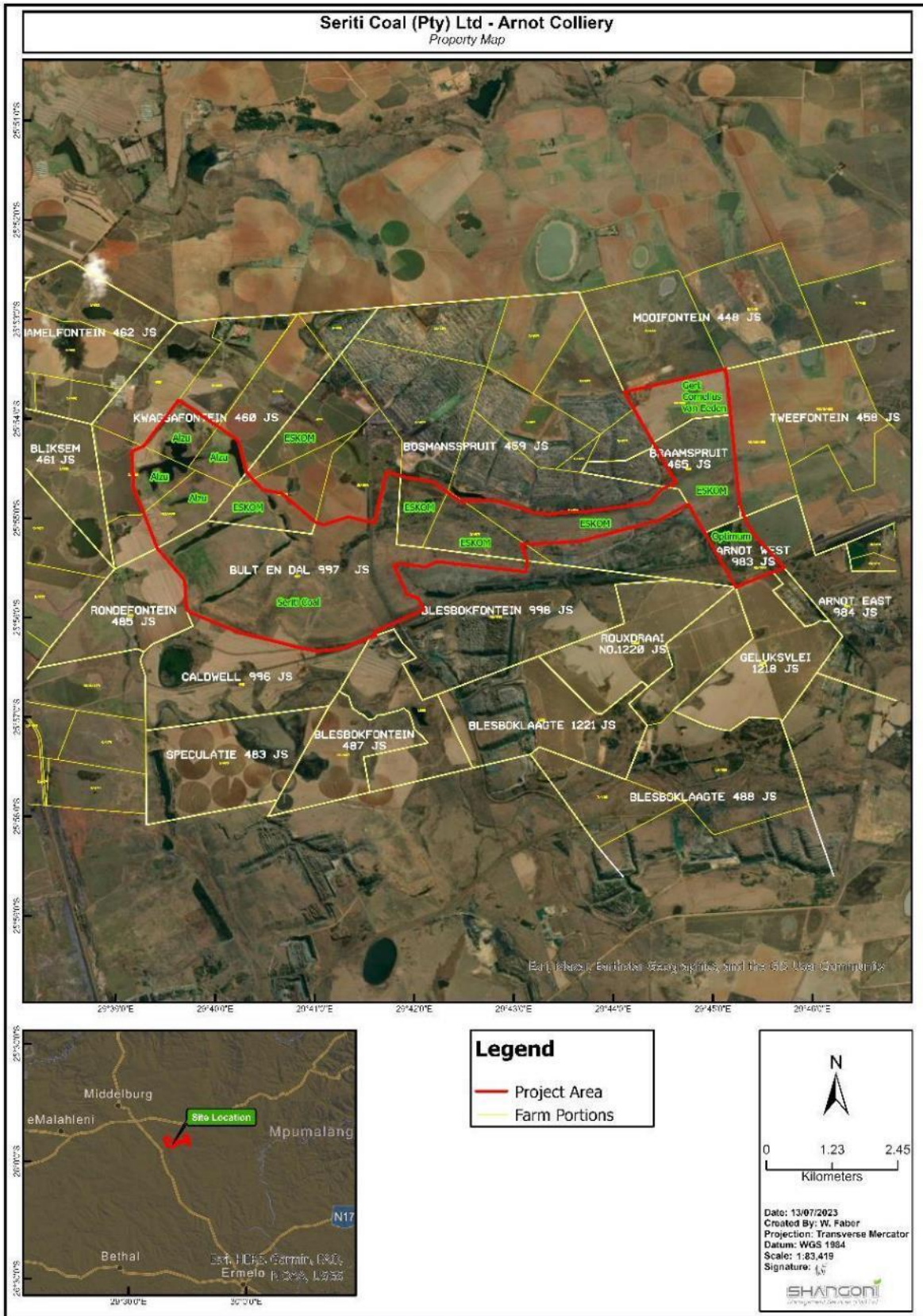


Figure 2: Affected Properties



4. Description of the scope of the proposed activities

As previously described, Arnot Colliery is the holder of the converted Mining Right (Reference No: MP 30/5/1/2/2/410 MR) located on farm Portion Braamspruit 465 JS, Portion of Arnot West 983 JS, A Portion of Portions RE 2, 3, 5 and 11 of Bosmanspruit, A Portion of Farm RE Bult en Dal 997 JS and a Portion of Portions RE 1, 2, 4 and 5 situated in the Mpumalanga Province. Arnot intends to renew this Mining Right and commence with open cast and underground mining activities to mine the 4 Seam (S4L&S4UA) and the 2A seams on Portion 1 and 2 of Farm Braamspruit 465 JS, Portion 10 of Farm Tweefontein and Remainder of Farm Arnot West 983 JS.

4.1. Description of the proposed activities to be undertaken

The following activities are proposed:

Open cast Coal mining

The mineable coal seams will be drilled and blasted where it is not dug freely. The blasted and the free dug coal will be extracted using hydraulic excavators and truck combination of (RDT's) and (ADT's) to a dedicated stockpile.

The stockpiled coal will be crushed and screened onsite and from there stockpiled at the stockpile area and to a designated beneficiation facility using road haulers. However, if a decision is made to beneficiate the coal on site, a provision to construct crushing, screening, and processing plants have been made. Rehabilitation will commence once the bottom seam has been fully excavated.

Underground Coal mining

Bord and pillar mining using Continuous Miners ("CM") was selected as the primary extraction method for underground reserves. In bord and pillar mining, parallel roadways are developed in the direction of advance. Perpendicular roads, called splits are developed at predetermined intervals to parallel roads. These roads interlink, creating pillars. The underground panel widths are determined by the size of the pillars required to support the overburden above the coal seam and the length of the production equipment's trailing cables. In between mining panels are barrier pillars which carries the abutment stress and therefore breaks the span of the panels which assist with the overall mine stability. The road width design is 7.2m wide with an average mining height of 2.5m. The pillar size determined by the safety factor formula results in the pillar strength divided by the pillar load. The underground panels consist of seven to eleven roadways. The following main mining activities form part of the bord and pillar mining method:

- Coal cutting and loading – the CM uses the rotating drum cutting head, equipped with cutting picks to cut the coal face. A loading mechanism collects the broken coal and delivers it onto the gathering arm which loads the coal on the CM's chain conveyor. The CM's conveyor conveys the broken coal



from the front to the rear of the CM. The CM's chain conveyor capable of vertical and horizontal movement enables coal loading into the shuttle car.

- Coal hauling and tipping – the loaded shuttle car is used to haul the coal to the section's feeder breaker that sizes the coal and feeds it into the conveyor belt system.
- Roof support – a roof bolt machine installs roof bolts once the CM has finished the development face and the roof support is installed on a systematic basis. Roof bolts enhance the stability of the overlying roof. The spacing between roof bolts and length of the bolts is determined through geotechnical studies.
- Coal transportation – a conveyor belt system transports the coal from the mining section to the coal stockpile on surface via the underground Adit.

Soil removal and storage

Topsoil will be excavated using a hydraulic excavator sand ADTs and then hauled to a topsoil stockpile area, until such time where concurrent rehabilitation and direct placement can commence. Stockpiles or berms will be positioned along the peripheral portions of the property, forming the barrier to the public, and dedicated topsoil dumps. The topsoil will be excavated to an average depth of 1.5m over the area that will be disturbed by approved mining activities.

Soft overburden material removal and storage

Soft overburden material will be excavated using a hydraulic excavators and ADTs. This material will not be blasted, but it will be fragmented by the excavator breakout force. The thickness of soft overburden layer will be determined using the limit of weathering, defined through exploration drilling. The soft overburden moved from the box cut will be stored in a dedicated overburden dump. When the opencast mining activities reach steady state, the soft overburden material will be placed back into the void for concurrent rehabilitation. The soft overburden material stored in the overburden dump will be moved back into the final void when the planned coal is completely extracted. This will be done as part of rehabilitation activities.

Hard overburden material removal and placement

The hard overburden material is the material below the limit of weathering. This material will be drilled and blasted prior to any excavation that can take place. The hard overburden material will be excavated to the roof of each coal seam that is planned to be mined. This material will be moved by the combination of hydraulic excavators, RDT's and ADT's.

The hard overburden material stripped from the initial box cut will be placed in a dedicated overburden dump, placed in an area where the water run-off from the dump can be contained and managed. When the mine production profile reaches steady-state, hard overburden material will be rolled back into the



voids by means of dozers and/or excavators and trucks. The voids will be filled up to the required rehabilitation level.

Associated infrastructure

The major surface infrastructure required to be developed include:

- Haul roads
- Access Road
- Electrical sub-stations with overhead powerlines
- Soft overburden dump
- Hard overburden dump
- Coal stock yard
- Surface workshops
- Equipment hard park areas
- Wash bay
- Bulk storage for fuel
- Sewage treatment plant
- Sewage treatment pipeline
- Storm water infrastructure (Culverts, channels and berms)
- Firefighting and dust suppression reticulation systems
- Underground dewatering and reticulation systems
- Potable and service water reticulation systems
- Ventilation shaft and associated ventilation infrastructure
- Perimeter and security fencing
- Pollution control dams and transfer dams (or sumps)
- Buildings (e.g. offices, change houses, etc.)
- Crushing and screening plant



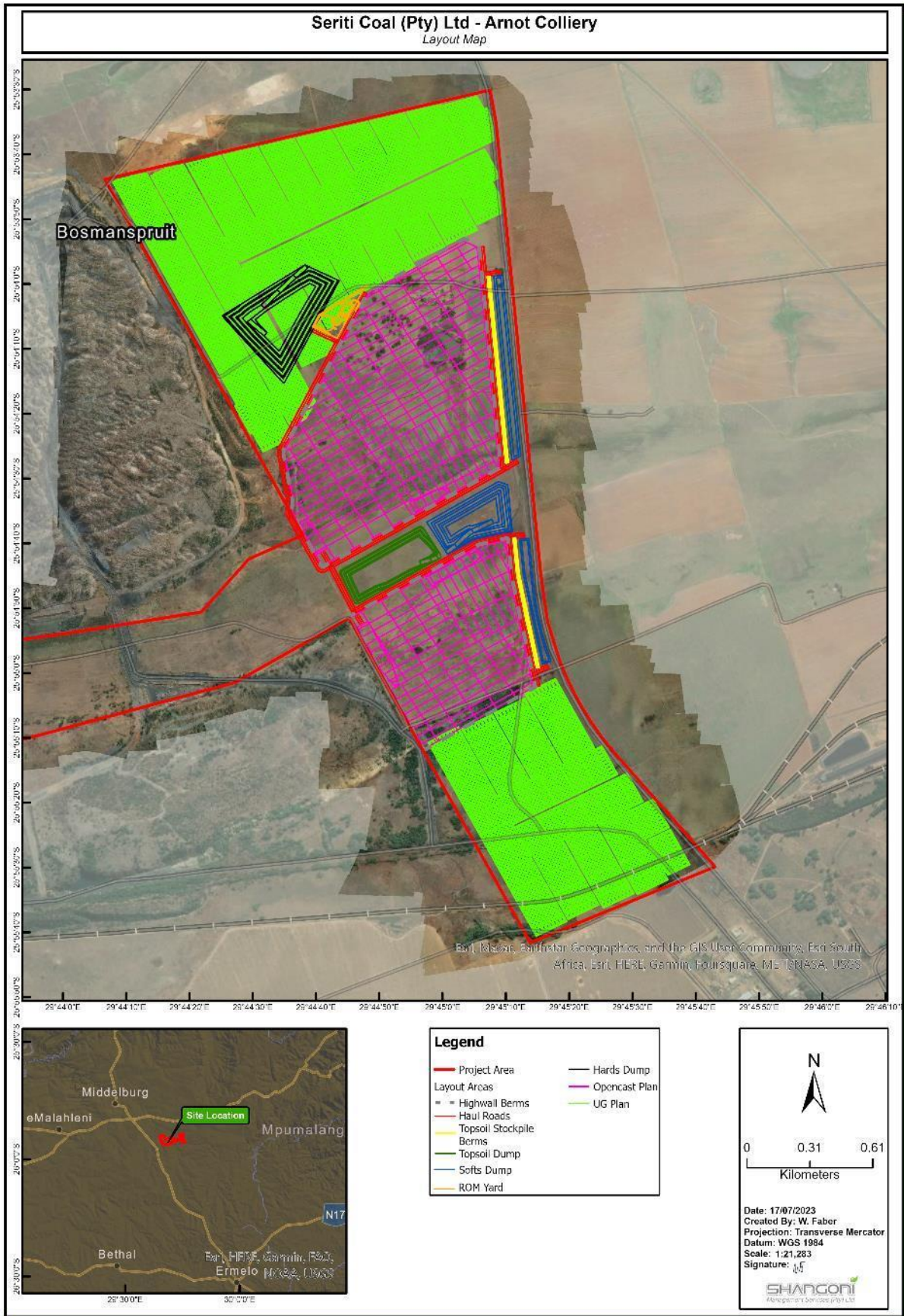


Figure 3: Proposed mining Right activities



4.2. Listed and specified activities applied for

The Arnot Colliery mining right renewal Project will trigger the following authorisations:

An Environmental Authorisation (“EA”) for listed activities contained in the Environmental Impact Assessment Regulations Listing Notices of 2014, as amended, and published in terms of sections 24(2), 24 (5), 24D, 44 and 47(A) (1) (b) of the National Environmental Management Act, 1998 (Act No. 107 of 1998) (“NEMA”).

For the EA applications, a Scoping and Environmental Impact Assessment (“S&EIR”) will be conducted in accordance with the NEMA and the Environmental Impact Assessment Regulations, 2014 (GN R982 of 4 December 2014) (“GN R982”), as amended. Listed activities have been identified and provided in Table 6.

Table 6: Listed Activities

Name of Activity	Area/Extent of Activity	Listed activity (Mark with X)	Applicable Listing Notice (GN R983, GN R984, GN R985) and applicable Waste Management Activity (GN 921)
Open cast and Underground Mining Activity	337 ha	X	<p><u>Activity 12 of listing Notice 1 (GNR R983 of GG 40772 of April 2017):</u> <i>The development of—</i> (ii) <i>infrastructure or structures with a physical footprint of 100 square metres or more; where such development occurs—</i> (a) <i>within a watercourse.</i> (c) <i>if no development setback exists, within 32 metres of a watercourse, measured from the edge of a watercourse.</i></p> <p><u>Activity 19 of listing Notice 1 (GNR R983 of GG 40772 of April 2017):</u> <i>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.</i></p> <p><u>Activity 21D of listing Notice 1 (GNR R983 of GG 40772 of April 2017):</u></p>



Name of Activity	Area/Extent of Activity	Listed activity (Mark with X)	Applicable Listing Notice (GN R983, GN R984, GN R985) and applicable Waste Management Activity (GN 921)
			<p><i>Any activity including the operation of that activity which requires an amendment or variation to a right or permit in terms of section 102 of the Mineral and Petroleum Resources Development Act, as well as any other applicable activity contained in this Listing Notice or in Listing Notice 3 of 2014, required for such amendment.</i></p> <p><u>Activity 15 of Listing Notice 2 (GNR 984 of GG 40772 of 7 April 2017):</u></p> <p><i>The clearance of an area of 20 hectares or more of indigenous vegetation, excluding where such clearance of indigenous vegetation is required for—</i></p> <p><i>(i) the undertaking of a linear activity; or</i></p> <p><i>(ii) maintenance purposes undertaken in accordance with a maintenance management plan.</i></p> <p><u>Activity 12 of Listing Notice 3 (GNR 985 of GG 40772 of April 2017):</u></p> <p><i>The clearance of an area of 300 square metres or more of indigenous vegetation except where such clearance of indigenous vegetation is required for maintenance purposes undertaken in accordance with a maintenance management plan.</i></p>
Proposed rerouting of powerline and electrical Substation	0.05 ha		<p><u>Activity 11 of listing Notice 1 (GNR R983 of GG 40772 of April 2017):</u></p> <p><i>The development of facilities or infrastructure for the transmission and distribution of electricity—</i></p> <p><i>(i) outside urban areas or industrial complexes with a capacity of more than 33 but less than 275 kilovolts; or</i></p> <p><i>(ii) inside urban areas or industrial complexes with a capacity of 275 kilovolts or more</i></p> <p><u>Activity 12 of Listing Notice 3 (GNR 985 of GG 40772 of April 2017):</u></p> <p><i>The clearance of an area of 300 square metres or more of indigenous vegetation except where such clearance of indigenous vegetation is required for maintenance purposes undertaken in accordance with a maintenance management plan.</i></p>
Bulk storage for fuel	0.1 ha		<p><u>Activity 14 of listing Notice 1 (GNR R983 of GG 40772 of April 2017):</u></p> <p><i>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.</i></p> <p><u>Activity 12 of Listing Notice 3 (GNR 985 of GG 40772 of April 2017):</u></p>



Name of Activity	Area/Extent of Activity	Listed activity (Mark with X)	Applicable Listing Notice (GN R983, GN R984, GN R985) and applicable Waste Management Activity (GN 921)
			<i>The clearance of an area of 300 square metres or more of indigenous vegetation except where such clearance of indigenous vegetation is required for maintenance purposes undertaken in accordance with a maintenance management plan.</i>
Sewage treatment plant	0.01 ha		<p><u>Activity 25 of Listing Notice 1 (GNR 983 of GG 40772 of 7 April 2017, as amended):</u> <i>The development and related operation of facilities or infrastructure for the treatment of effluent, wastewater or sewage with a daily throughput capacity of more than 2 000 cubic metres but less than 15 000 cubic metres</i></p> <p><u>Activity 6 of Listing Notice 2 (GNR 984 of GG 40772 of 7 April 2017):</u> <i>The development of facilities or infrastructure for any process or activity which requires a permit or licence or an amended permit or licence in terms of national or provincial legislation governing the generation or release of emissions, pollution, or effluent.</i></p>
Sewage Treatment pipeline	0.08 ha		<p><u>Activity 10 of Listing Notice 1 GNR R983 of GG 40772 of April 2017):</u> <i>The development and related operation of infrastructure exceeding 1 000 metres in length for the bulk transportation of sewage, effluent, process water, wastewater, return water, industrial discharge or slimes –</i></p> <p>(i) <i>with an internal diameter of 0,36 metres or more; or</i></p> <p>(ii) <i>with a peak throughput of 120 litres per second or more;</i></p> <p><u>Activity 12 of Listing Notice 3 (GNR 985 of GG 40772 of April 2017):</u> <i>The clearance of an area of 300 square metres or more of indigenous vegetation except where such clearance of indigenous vegetation is required for maintenance purposes undertaken in accordance with a maintenance management plan.</i></p>
Access Road	1 ha		<p><u>Activity 24 of listing Notice 1 (GNR R983 of GG 40772 of April 2017):</u> <i>The development of a road—</i></p>



Name of Activity	Area/Extent of Activity	Listed activity (Mark with X)	Applicable Listing Notice (GN R983, GN R984, GN R985) and applicable Waste Management Activity (GN 921)
Haul roads	11.5 ha		<p>(ii) [a road] with a reserve wider than 13,5 meters, or where no reserve exists where the road is wider than 8 metres;</p> <p><u>Activity 12 of Listing Notice 3 (GNR 985 of GG 40772 of April 2017):</u> <i>The clearance of an area of 300 square metres or more of indigenous vegetation except where such clearance of indigenous vegetation is required for maintenance purposes undertaken in accordance with a maintenance management plan.</i></p> <p><u>Activity 18 of Listing Notice 3 (GNR 985 of GG 40772 of April 2017):</u> <i>The widening of a road by more than 4 metres, or the lengthening of a road by more than 1 kilometre.</i></p>
Coal stock yards	2 ha		<p><u>Activity 12 of Listing Notice 3 (GNR 985 of GG 40772 of April 2017):</u> <i>The clearance of an area of 300 square metres or more of indigenous vegetation except where such clearance of indigenous vegetation is required for maintenance purposes undertaken in accordance with a maintenance management plan.</i></p> <p><u>Activity 10 Category B Waste Management Activity (GN 921):</u> <i>The construction of a facility for a waste management activity listed in category B of this schedule (not in is Category B</i></p> <p><u>Activity 11 Category B Waste Management Activity (GN 921):</u> <i>The establishment or reclamation of a residue stockpile or residue deposit resulting from activities which require a mining right, exploration right or production right in terms of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002).</i></p>
Surface workshops	0.5 ha		<p><u>Activity 12 of Listing Notice 3 (GNR 985 of GG 40772 of April 2017):</u> <i>The clearance of an area of 300 square metres or more of indigenous vegetation except where such clearance of indigenous vegetation is required for maintenance purposes undertaken in accordance with a maintenance management plan.</i></p>



Name of Activity	Area/Extent of Activity	Listed activity (Mark with X)	Applicable Listing Notice (GN R983, GN R984, GN R985) and applicable Waste Management Activity (GN 921)
Firefighting and dust suppression reticulation systems	0.01 ha		<p><u>Activity 11 of Listing Notice 2 (GNR 984 of GG 40772 of 7 April 2017):</u> <i>The development of facilities or infrastructure for the transfer of 50 000 cubic metres or more water per day, from and to or between any combination of the following —</i> <i>(i) water catchments.</i> <i>(ii) water treatment works; or</i> <i>excluding treatment works where water is to be treated for drinking purposes.</i></p> <p><u>Activity 12 of Listing Notice 3 (GNR 985 of GG 40772 of April 2017):</u> <i>The clearance of an area of 300 square metres or more of indigenous vegetation except where such clearance of indigenous vegetation is required for maintenance purposes undertaken in accordance with a maintenance management plan.</i></p>
Potable and service water reticulation systems	0.01 ha		<p><u>Activity 12 of Listing Notice 3 (GNR 985 of GG 40772 of April 2017):</u> <i>The clearance of an area of 300 square metres or more of indigenous vegetation except where such clearance of indigenous vegetation is required for maintenance purposes undertaken in accordance with a maintenance management plan.</i></p>
Pollution Control Dams and transfer dams (sumps)	5 ha		<p><u>Activity 9 of Listing Notice 1 (GNR R983 of GG 40772 of April 2017):</u> <i>The development of infrastructure exceeding 1 000 metres in length for the bulk transportation of water or storm water—</i> <i>(i) with an internal diameter of 0,36 metres or more; or</i> <i>(ii) with a peak throughput of 120 litres per second or more;</i></p> <p><u>Activity 6 of Listing Notice 2 (GNR 984 of GG 40772 of 7 April 2017, as amended):</u></p>



Name of Activity	Area/Extent of Activity	Listed activity (Mark with X)	Applicable Listing Notice (GN R983, GN R984, GN R985) and applicable Waste Management Activity (GN 921)
			<p><i>The development of facilities or infrastructure for any process or activity which requires a permit or licence or an amended permit or licence in terms of national or provincial legislation governing the generation or release of emissions, pollution or effluent.</i></p> <p><u>Activity 12 of Listing Notice 3 (GNR 985 of GG 40772 of April 2017):</u></p> <p><i>The clearance of an area of 300 square metres or more of indigenous vegetation except where such clearance of indigenous vegetation is required for maintenance purposes undertaken in accordance with a maintenance management plan.</i></p> <p><u>Activity 14 of Listing Notice 3 (GNR 985 of GG 40772 of April 2017):</u></p> <p><i>The development of—</i></p> <p><i>(i) dams or weirs, where the dam or weir, including infrastructure and water surface area exceeds 10 square metres; or</i></p> <p><i>(ii) infrastructure or structures with a physical footprint of 10 square metres or more;</i></p> <p><i>where such development occurs—</i></p> <p><i>(a) within a watercourse;</i></p> <p><i>(b) in front of a development setback; or</i></p> <p><i>(c) if no development setback has been adopted, within 32 metres of a watercourse, measured from the edge of a watercourse;</i></p> <p><i>excluding the development of infrastructure or structures within existing ports or harbours that will not increase the development footprint of the port or harbour.</i></p>
Hard overburden	13 ha		<p><u>Activity 12 of Listing Notice 3 (GNR 985 of GG 40772 of April 2017):</u></p> <p><i>The clearance of an area of 300 square metres or more of indigenous vegetation except where such clearance of indigenous vegetation is required for maintenance purposes undertaken in accordance with a maintenance management plan.</i></p> <p><u>Activity 10 Category B Waste Management Activity (GN 921)</u></p>



Name of Activity	Area/Extent of Activity	Listed activity (Mark with X)	Applicable Listing Notice (GN R983, GN R984, GN R985) and applicable Waste Management Activity (GN 921)
			<p><i>The construction of a facility for a waste management activity listed in category B of this schedule (not in isolation to associated waste management activity)</i></p> <p><u>Activity 11 Category B Waste Management Activity (GN 921)</u></p> <p><i>The establishment or reclamation of a residue stockpile or residue deposit resulting from activities which require a mining right, exploration right or production right in terms of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002)</i></p>
Soft Overburden	14 ha		<p><u>Activity 12 of Listing Notice 3 (GNR 985 of GG 40772 of April 2017):</u></p> <p><i>The clearance of an area of 300 square metres or more of indigenous vegetation except where such clearance of indigenous vegetation is required for maintenance purposes undertaken in accordance with a maintenance management plan.</i></p> <p><u>Activity 10 Category B Waste Management Activity (GN 921)</u></p> <p><i>The construction of a facility for a waste management activity listed in category B of this schedule (not in isolation to associated waste management activity)</i></p> <p><u>Activity 11 Category B Waste Management Activity (GN 921)</u></p> <p><i>The establishment or reclamation of a residue stockpile or residue deposit resulting from activities which require a mining right, exploration right or production right in terms of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002).</i></p>
Crushing and screening	0.02 ha		<p><u>Activity 12 of Listing Notice 3 (GNR 985 of GG 40772 of April 2017):</u></p> <p><i>The clearance of an area of 300 square metres or more of indigenous vegetation except where such clearance of indigenous vegetation is required for maintenance purposes undertaken in accordance with a maintenance management plan.</i></p>



Name of Activity	Area/Extent of Activity	Listed activity (Mark with X)	Applicable Listing Notice (GN R983, GN R984, GN R985) and applicable Waste Management Activity (GN 921)
Ventilation shaft and associated ventilation infrastructure	0.02 ha		<p><u>Activity 12 of Listing Notice 3 (GNR 985 of GG 40772 of April 2017):</u> <i>The clearance of an area of 300 square metres or more of indigenous vegetation except where such clearance of indigenous vegetation is required for maintenance purposes undertaken in accordance with a maintenance management plan.</i></p>
Wash bays	0.1 ha		<p><u>Activity 12 of Listing Notice 3 (GNR 985 of GG 40772 of April 2017):</u> <i>The clearance of an area of 300 square metres or more of indigenous vegetation except where such clearance of indigenous vegetation is required for maintenance purposes undertaken in accordance with a maintenance management plan.</i></p>
Equipment hard park areas	2 ha		<p><u>Activity 12 of Listing Notice 3 (GNR 985 of GG 40772 of April 2017):</u> <i>The clearance of an area of 300 square metres or more of indigenous vegetation except where such clearance of indigenous vegetation is required for maintenance purposes undertaken in accordance with a maintenance management plan.</i></p>
Surface workshops	0.05 ha		<p><u>Activity 12 of Listing Notice 3 (GNR 985 of GG 40772 of April 2017):</u> <i>The clearance of an area of 300 square metres or more of indigenous vegetation except where such clearance of indigenous vegetation is required for maintenance purposes undertaken in accordance with a maintenance management plan.</i></p>
Buildings (e.g. offices, change houses, etc.)	0.02 ha		<p><u>Activity 12 of Listing Notice 3 (GNR 985 of GG 40772 of April 2017):</u> <i>The clearance of an area of 300 square metres or more of indigenous vegetation except where such clearance of indigenous vegetation is required for maintenance purposes undertaken in accordance with a maintenance management plan.</i></p>
Storm water infrastructure (Clean and dirty water channels, Pipelines, culverts, sumps,)	3 ha		<p><u>Activity 9 of Listing Notice 1 (GNR R983 of GG 40772 of April 2017):</u> <i>The development of infrastructure exceeding 1 000 metres in length for the bulk transportation of water or storm water—</i> <i>(i) with an internal diameter of 0,36 metres or more; or</i> <i>(ii) with a peak throughput of 120 litres per second or more;</i></p>



Name of Activity	Area/Extent of Activity	Listed activity (Mark with X)	Applicable Listing Notice (GN R983, GN R984, GN R985) and applicable Waste Management Activity (GN 921)
			<p><u>Activity 12 of Listing Notice 3 (GNR 985 of GG 40772 of April 2017):</u> <i>The clearance of an area of 300 square metres or more of indigenous vegetation except where such clearance of indigenous vegetation is required for maintenance purposes undertaken in accordance with a maintenance management plan.</i></p> <p><u>Activity 14 of Listing Notice 3 (GNR 985 of GG 40772 of April 2017):</u> <i>The development of—</i></p> <p><i>(i) dams or weirs, where the dam or weir, including infrastructure and water surface area exceeds 10 square metres; or</i></p> <p><i>(ii) infrastructure or structures with a physical footprint of 10 square metres or more;</i> <i>where such development occurs—</i></p> <p><i>(a) within a watercourse;</i></p> <p><i>(b) in front of a development setback; or</i></p> <p><i>(c) if no development setback has been adopted, within 32 metres of a watercourse, measured from the edge of a watercourse;</i></p> <p><i>excluding the development of infrastructure or structures within existing ports or harbours that will not increase the development footprint of the port or harbour.</i></p>
Perimeter and security fencing	200 ha		<p><u>Activity 15 of Listing Notice 2 (GNR 984 of GG 40772 of 7 April 2017):</u> <i>The clearance of an area of 20 hectares or more of indigenous vegetation, excluding where such clearance of indigenous vegetation is required for—</i></p> <p><i>(i) <u>the undertaking of a linear activity;</u></i></p>



5. Policy and legislative context

5.1. Applicable Policy and Legislative Context

Several Acts, standards or guidelines inform the project and the scope of issues assessed in this report.

A listing of relevant legislation is provided in

Applicable Legislation and Guidelines used to compile the Report	Compliance and response of the Arnot Colliery Mining Right renewal Project.
The Constitution of the Republic of South Africa, 1996.	The Constitution states that everyone has the right – (a) to an environment that is not harmful to their health or well-being; and (b) To have the environment protected, for the benefit of present and future generations.
The Mineral and Petroleum Resources Development Act (Act No. 28 of 2002, as amended).	The Scoping Report has been compiled to comply to the requirements of the Mineral and Petroleum Resources Development Regulations (GN R527 dated 2004).
The National Environmental Management Act (Act No. 107 of 1998 as amended).	The Scoping Report has been compiled in terms of GN R982, as amended and promulgated in terms of sections 24(5), 24M and 44 of the National Environmental Management Act, Act No. 107 of 1998 (“NEMA”).
The Environmental Impact Assessment Regulations (GN R982 dated 2014, as amended).	The Scoping Report was compiled in terms of the requirements of Appendix 2 of the Environmental Impact Assessment (“EIA”) Regulations (GN R.982 dated 2014, as amended).
Mine Health and Safety Act (Act No.29 of 1996).	The Arnot Colliery will be undertaken to meet the requirements of the Mine Health and Safety Act
The Environmental Impact Assessment Regulation. Listing Notice 1. (GN R983 dated 2014, as amended).	Activity 9, 10, 11, 12, 14, 19, 21 D, 24 and 25 of Listing Notice 1 are applied for as part of the Arnot Colliery Mining Right Renewal Application.
The Environmental Impact Assessment Regulation. Listing Notice 2. (GN R984 dated 2014, as amended).	Activity 6, 11 and 15 of Listing Notice 2 are applied for as part of the Arnot Colliery Mining Right Renewal Application
The Environmental Impact Assessment Regulation. Listing Notice 3. (GN R985 dated 2014, as amended).	Activity 12, 14 and 18 of Listing Notice 3 are applied for as part of the Arnot Colliery Mining Right Renewal Application.
Integrated Environmental Management Guideline: Guideline on Need and Desirability (2017).	The need and desirability were assessed for the Arnot Colliery Mining Right Renewal Application.
Integrated Environmental Management Guideline: Guideline on Need and Desirability (2017).	The need and desirability were assessed for the Arnot Colliery Mining Right Renewal project.
Regulations on use of water for mining and related activities aimed at the protection of water resources published in terms of the National Water Act under Government Notice 704 of 4 June 1999 (GN R704).	Storm water management measures, in compliance to GN R704, will be implemented at Arnot Colliery Mining Right Renewal project.



Applicable Legislation and Guidelines used to compile the Report	Compliance and response of the Arnot Colliery Mining Right renewal Project.
The National Environmental Management: Biodiversity (Act 10 of 2004, as amended).	DAFF permits in terms of National Environmental Management: Biodiversity (Act 10 of 2004, as amended) will be required for the Arnot Mining Right renewal Project for the removal of nationally protected trees
Alien and Invasive Species Regulations (GN R598 dated 2014).	The occurrence of alien and invasive species will be assessed and mitigated (in accordance with these regulations) during the operational phase of the Arnot Mining Right renewal Project
Conservation of Agricultural Resources (Act 43 of 1983).	Erosion potential will be assessed and mitigated (in accordance with this act) during the operational phase of the project
The National Environmental Management: Air Quality (Act 39 of 2004, as amended).	No Atmospheric Emissions Licence is required for the Arnot Colliery Mining Right renewal project.
SABS Code of Practice 0103 of 2008: The measurement and rating of environmental noise with respect to land use, health, annoyance and to speech communication. SABS Code of Practice 0328 of 2008: Environmental Noise Impact Assessments.	The SABS Code of Practice 0103 will be taken into account when the mitigation measures for the Arnot Colliery Mining Right renewal project.
National Environmental Management: Waste Act (Act No. 59 of 2008, as amended).	A Waste Management License is required for the Arnot Colliery Mining Right renewal project. The coal stockpile and the hards and softs stockpile which will be later on used for Backfilling will trigger Activity 10 and 11 of Category B in the NEMWA.
National Heritage Resources Act (Act No. 25 of 1999, as amended).	Graves have been identified as part of the heritage study. A Heritage Impact Assessment was undertaken, and mitigation measures provided in the EIAR and EMP Reports was considered in the risk matrix.
The National Water Act (Act No. 36 of 1998, as amended).	A Water Use Licence Application (“WULA”) Will be submitted to the DWS
DMRE Guideline for Consultation with communities and Interested and Affected Parties. As required in terms of sections 16(4)(b) or 27(5)(b) of the MPRDA, and in accordance with the standard directive for the compilation thereof as published on the official website of the Department of Mineral Resources.	The public participation process is done in accordance with the DMRE guideline for consultation with communities and interested and affected parties
Integrated Environmental Management Information Series. Criteria for determining alternatives in EIA.	Alternatives, Location, conveyance and no-go alternatives were assessed for the Arnot Colliery Mining Right renewal Project.

, where the level of applicability of the legislation or policy to the project is described.



Applicable Legislation and Guidelines used to compile the Report	Compliance and response of the Arnot Colliery Mining Right renewal Project.
The Constitution of the Republic of South Africa, 1996.	The Constitution states that everyone has the right – (a) to an environment that is not harmful to their health or well-being; and (b) To have the environment protected, for the benefit of present and future generations.
The Mineral and Petroleum Resources Development Act (Act No. 28 of 2002, as amended).	The Scoping Report has been compiled to comply to the requirements of the Mineral and Petroleum Resources Development Regulations (GN R527 dated 2004).
The National Environmental Management Act (Act No. 107 of 1998 as amended).	The Scoping Report has been compiled in terms of GN R982, as amended and promulgated in terms of sections 24(5), 24M and 44 of the National Environmental Management Act, Act No. 107 of 1998 (“NEMA”).
The Environmental Impact Assessment Regulations (GN R982 dated 2014, as amended).	The Scoping Report was compiled in terms of the requirements of Appendix 2 of the Environmental Impact Assessment (“EIA”) Regulations (GN R.982 dated 2014, as amended).
Mine Health and Safety Act (Act No.29 of 1996).	The Arnot Colliery will be undertaken to meet the requirements of the Mine Health and Safety Act
The Environmental Impact Assessment Regulation. Listing Notice 1. (GN R983 dated 2014, as amended).	Activity 9, 10, 11, 12, 14, 19, 21 D, 24 and 25 of Listing Notice 1 are applied for as part of the Arnot Colliery Mining Right Renewal Application.
The Environmental Impact Assessment Regulation. Listing Notice 2. (GN R984 dated 2014, as amended).	Activity 6, 11 and 15 of Listing Notice 2 are applied for as part of the Arnot Colliery Mining Right Renewal Application
The Environmental Impact Assessment Regulation. Listing Notice 3. (GN R985 dated 2014, as amended).	Activity 12, 14 and 18 of Listing Notice 3 are applied for as part of the Arnot Colliery Mining Right Renewal Application.
Integrated Environmental Management Guideline: Guideline on Need and Desirability (2017).	The need and desirability were assessed for the Arnot Colliery Mining Right Renewal Application.
Integrated Environmental Management Guideline: Guideline on Need and Desirability (2017).	The need and desirability were assessed for the Arnot Colliery Mining Right Renewal project.
Regulations on use of water for mining and related activities aimed at the protection of water resources published in terms of the National Water Act under Government Notice 704 of 4 June 1999 (GN R704).	Storm water management measures, in compliance to GN R704, will be implemented at Arnot Colliery Mining Right Renewal project.
The National Environmental Management: Biodiversity (Act 10 of 2004, as amended).	DAFF permits in terms of National Environmental Management: Biodiversity (Act 10 of 2004, as amended) will be required for the Arnot Mining Right renewal Project for the removal of nationally protected trees
Alien and Invasive Species Regulations (GN R598 dated 2014).	The occurrence of alien and invasive species will be assessed and mitigated (in accordance with these regulations) during the operational phase of the Arnot Mining Right renewal Project
Conservation of Agricultural Resources (Act 43 of 1983).	Erosion potential will be assessed and mitigated (in accordance with this act) during the operational phase of the project



Applicable Legislation and Guidelines used to compile the Report	Compliance and response of the Arnot Colliery Mining Right renewal Project.
The National Environmental Management: Air Quality (Act 39 of 2004, as amended).	No Atmospheric Emissions Licence is required for the Arnot Colliery Mining Right renewal project.
<p>SABS Code of Practice 0103 of 2008: The measurement and rating of environmental noise with respect to land use, health, annoyance and to speech communication.</p> <p>SABS Code of Practice 0328 of 2008: Environmental Noise Impact Assessments.</p>	The SABS Code of Practice 0103 will be taken into account when the mitigation measures for the Arnot Colliery Mining Right renewal project.
National Environmental Management: Waste Act (Act No. 59 of 2008, as amended).	<p>A Waste Management License is required for the Arnot Colliery Mining Right renewal project.</p> <p>The coal stockpile and the hards and softs stockpile which will be later on used for Backfilling will trigger Activity 10 and 11 of Category B in the NEMWA.</p>
National Heritage Resources Act (Act No. 25 of 1999, as amended).	Graves have been identified as part of the heritage study. A Heritage Impact Assessment was undertaken, and mitigation measures provided in the EIAR and EMP Reports was considered in the risk matrix.
The National Water Act (Act No. 36 of 1998, as amended).	A Water Use Licence Application (“WULA”) Will be submitted to the DWS
DMRE Guideline for Consultation with communities and Interested and Affected Parties. As required in terms of sections 16(4)(b) or 27(5)(b) of the MPRDA, and in accordance with the standard directive for the compilation thereof as published on the official website of the Department of Mineral Resources.	The public participation process is done in accordance with the DMRE guideline for consultation with communities and interested and affected parties
Integrated Environmental Management Information Series. Criteria for determining alternatives in EIA.	Alternatives, Location, conveyance and no-go alternatives were assessed for the Arnot Colliery Mining Right renewal Project.



6. Need and desirability of the proposed activities

6.1. Need and desirability in terms of the guideline on need and desirability, 2017

In 2017, the Department of Environmental Affairs published an Integrated Environmental Management Guideline, the Guideline on Need and Desirability. The following provides information on how the guideline requirements were considered in this EIAR/EMPr.

How will this development (and its separate elements/aspects) impact on the ecological integrity of the area?

- The area consists of a large portion that has been mined in the past and therefore the ecology has already been altered to a large extent as can be seen from the specialist studies.
- The ecological integrity of the area was assessed as part of the specialist assessments (animal, aquatic, terrestrial biodiversity assessments and terrestrial plant species compliance statement) with the baseline environmental description provided in Section 6.5.1 below. Impacts that have been identified resulting from Arnot Colliery Mining Renewal Project have been discussed in Section 6.6.1 of this document.
- Alternatives have been identified to limit the impact to natural resources. Refer to section 6.2. for the alternatives identified and section 6.8 for the advantages and disadvantages of the alternatives identified.
- The impacts on non-renewable resources that have been identified resulting from Arnot Colliery mining Project have been discussed in Section 6.6.1 of this document. Further thereto, a separate WUL application will be submitted for the Arnot Colliery Mining Right Renewal Project.
- Construction of storm water management measures on site to ensure that clean and dirty water separation meet the requirements of the best practice guidelines (DWAF, 2006) and Section 19 of the National Water Act and Regulation GN 704 (No. 704 of 4 June 1999)
- All negative and positive impacts associated with Arnot Colliery Project have been identified by the specialists and discussed in Section 6.8 below.

Promoting justifiable economic and social development

- A Social and Labour Plan 2022 (“SLP”) has been developed and implemented for Arnot Colliery. It is expected that Arnot Colliery Mining project will create 183 job opportunities over the life of mine. However, a lot more short-term jobs will be created during the construction phase.
- The needs of the community will be determined through the public participation process of this EIAR/EMPr with the results of the public participation process presented in the Public Participation Report. The public participation process aims to ensure that all I&APs are provided with an opportunity of access to information regarding the Arnot Colliery Mining Right Renewal Project.



- The local economy is largely dependent on the mining sector. The proposed Arnot Colliery Mining Right renewal Project will continue to contribute to the socio economy in the area as mining of coal can continue.

7. Period for which environmental authorisation is required

The intended Life of Mne is approximately 7 years. Therefore, the period for which the environmental authorisation should be valid is at least 7-10 years from the date of approval provided by the Department of Mineral Resources and Energy (“DMRE”).

8. Details of alternatives considered.

The following alternatives have been identified as part of the Arnot Colliery mining renewal project and will be further be assessed in the EIA/EMPr.

8.1.1 Details of the development footprint alternatives considered

- Location alternatives.
- Site alternatives;
- Design and layout alternatives;
- Technology alternatives; and
- No-go alternative.

Location Alternatives

The proposed Arnot Colliery mining development is located within farms that are already included in the existing Mining Right Area /boundary of Arnot Colliery. Therefore, no other alternatives were considered with regards to the consideration of location.

Site alternative

The sites for the opencast and underground mining operations were selected based on the availability of coal seams reserves to be mined. The upper 2 Seam will be mined by means of open cast method and the deeper seams (Seam 4 and 4A) can be extracted by means of underground. As a result, no site alternative has been considered.

Designs and layout Alternatives

The locations of the supporting infrastructure have been determined by considering practical, economic, logistical and environmental aspects.



Affected water storage

Two alternatives for the separation and storage of affected water from the workshops, wash bays, mining pits and screening and crushing plant will be assessed in the EIA phase. The two options are the PCD (two possible locations) or in pit storage of affected water.

Alternative 1: Construction of Pollution control Dam (PCD) at the Northern Section to capture all the dirty water from the workshops, wash bays, screening and crushing plant, ROM stockpile and the Northern and Southern Pits.

Alternative 2: Storing water in the Northern and Southern pits.

Alternative 3: Construction of Pollution control Dam (PCD) at the Northern Section to capture all the dirty water from the workshops, wash bays, screening and crushing plant, ROM stockpile and constructing a separate PCD at the Southern Pit.

Managing affected water at closure

Alternative 1: Construction of affected water pipeline (approximately 7 Km) to transport the affected water from the Northern pit, Southern Pit to the existing voids on the Far Western section of the site to be treated in the new Combined Water treatment plant.

Alternative 2: No decant will take place thus no need to treat affected water.

Clean Water for domestic use at the Mine

Two Alternatives will be assessed in the EIA phase for the clean water which will be needed at the Mine for domestic use.

Alternative 1: Abstracting of clean water from the boreholes.

Alternative 2: Construction of clean water pipelines (about 7 Km) from the Water Treatment Plant to supply clean water at the new mining area for domestic use.

Access Roads

Two alternatives for the access roads from the site to the Provincial Road (R102) will be assessed in the EIA Phase. The two options considered are the Access Road (Access Road 1) on the Northern section and Access Road on the Southern Section (Access Road 2).

Access Road 1: Entrance to and from the site to the Provincial Road will be gained through an access road on the Northern Section of the Mine.

Access Road 2: Entrance to the site will be gained on the access road on the Southern Section of the Mine.

Technology alternatives

The technology used in a mining project is determined by the shape, position and orientation of the mineral resource. Bord and pillar mining using Continuous Miners ("CM") was selected as the primary extraction method for underground reserves and this method entails the use of the rotating drum cutting



head, equipped with cutting picks to cut the coal face. The open cast reserves will be blasted, drilled and extracted using hydraulic excavators and truck combination of RDT's and ADT's to a dedicated stockpile.

8.1.1.2 No-go option

The no-go option would mean the status quo environmental conditions of the site will mostly remain as is and there would be no additional impacts to the site. The no-go option assumes the site remains in its current state. The no go alternative would result in no impacts on the social and biophysical environment.

The option of not implementing the activity has been considered, it also assumes that the high possibility of this activity to lead to socio-economic gains will not be realised.

8.1. Details of the Public Participation Process followed

The PPP will be conducted in terms of Regulations 19 and 39 to 44 of the EIA Regulations, 2014. This will include the following:

- Identification of stakeholders, including occupiers of the property, owners and occupiers of land adjacent to the site, municipal officials and relevant State Departments as part of the Public Participation Process. All respondents will then be placed on the project database. The database will be used throughout the process to inform the stakeholders of the project.
- Site notices, size A2 advertising the proposed development and displaying the contact details of the EAP will be prepared and displayed on-site. The site notices serve the purpose of informing potential I&APs of the project and therefore afford them the opportunity to comment.
- Distribution of the notification letters with a registration and comment sheet and the locality map to state departments and other potential stakeholders through emails.
- An advert will be placed in a local newspaper to notify the public about the Scoping and Environmental Impact Assessment process and invite members of the public to register as I&APs on the project's database.
- Communication with local authorities and stakeholders.
- A copy of the Draft Scoping Report will be made available for public review for a 30-day review period.
- Any comments received during the review period of the Draft Scoping Report as well as responses provided will be captured and recorded within the Comments and Response Report in the Final Scoping Report that will be submitted to DMRE.
- A copy of the Draft Environmental Impact Assessment Report ("EIAR") will be made available for public review for a 30-day review period.
- Any comments received during the review period of the Draft EIAR as well as responses provided will be captured and recorded within the Comments and Response Report in the Final EIAR that will be submitted to DMRE.
- Focus Group/ Public Meetings during review periods.



- DMRE decision on Environmental Authorisation: The registered I&APs, stakeholders and organs of state will be notified of the department’s decision.

Table 7 below will be completed when the Final Scoping Report is compiled and will provide a summary of the comments and issues raised and responses thereto.

Table 7: Summary of the issues raised by the I&APs

Interested and Affected Parties	Date Received	Comments	Issues Raised	EAPs Response to Issues as Mandated by the Applicant	Section and Paragraph Reference in this Report Where the Issues and Responses Were Incorporated.
To be completed upon completion of the public participation process.					

All proof of public participation will be included in the Final Scoping Report.

8.2. Description of Baseline Environment

8.3.1 Type of environment affected by the proposed activity

A baseline description or “*status quo*” of the present environmental situation is provided in this part of the document. The following attributes / aspects have been described in detail, in the following respective chapters:

- Chapter A: Geology
- Chapter B: Climate
- Chapter C: Topography
- Chapter D: Soil and Land Use
- Chapter E: Vegetation
- Chapter F: Fauna
- Chapter G: Hydrology
- Chapter H: Terrestrial Biodiversity
- Chapter I: Air Quality
- Chapter J: Noise
- Chapter K: Archaeology and Cultural History
- Chapter L: Visual Aspects
- Chapter M: Regional socio-economic structures



Chapter A: Geology

The study area is underlain by arenite. The site is dominated by red to yellow sandy soils of the Ba land types, found on shales and sandstones of the Madzaringwe Formation (Karoo Supergroup) (Mucina and Rutherford, 2006). The site falls on the BA19 land type. Ba land types indicate land in which red and / or yellow brown apedal soils (Hutton, Bainsvlei, Avalon, Glencoe and Pinedene soil forms) that are dystrophic and mesotrophic, dominate over red and yellow brown eutrophic soils. Land type Ba19 is characterised by plinthic catena: dystrophic and/or mesotrophic; red soils widespread, upland duplex and margalitic soils rare.

Arenite is a type of sedimentary rock, namely sandstone. It is a clastic rock composed predominantly of sand-sized mineral grains or rock fragments. The grains are usually composed of quartz, feldspar, and other minerals, and they are often held together by a cementing material like silica, calcium carbonate, or iron oxide. Arenite formations typically occur in environments where sand is deposited, such as beaches, riverbeds, or sand dunes.



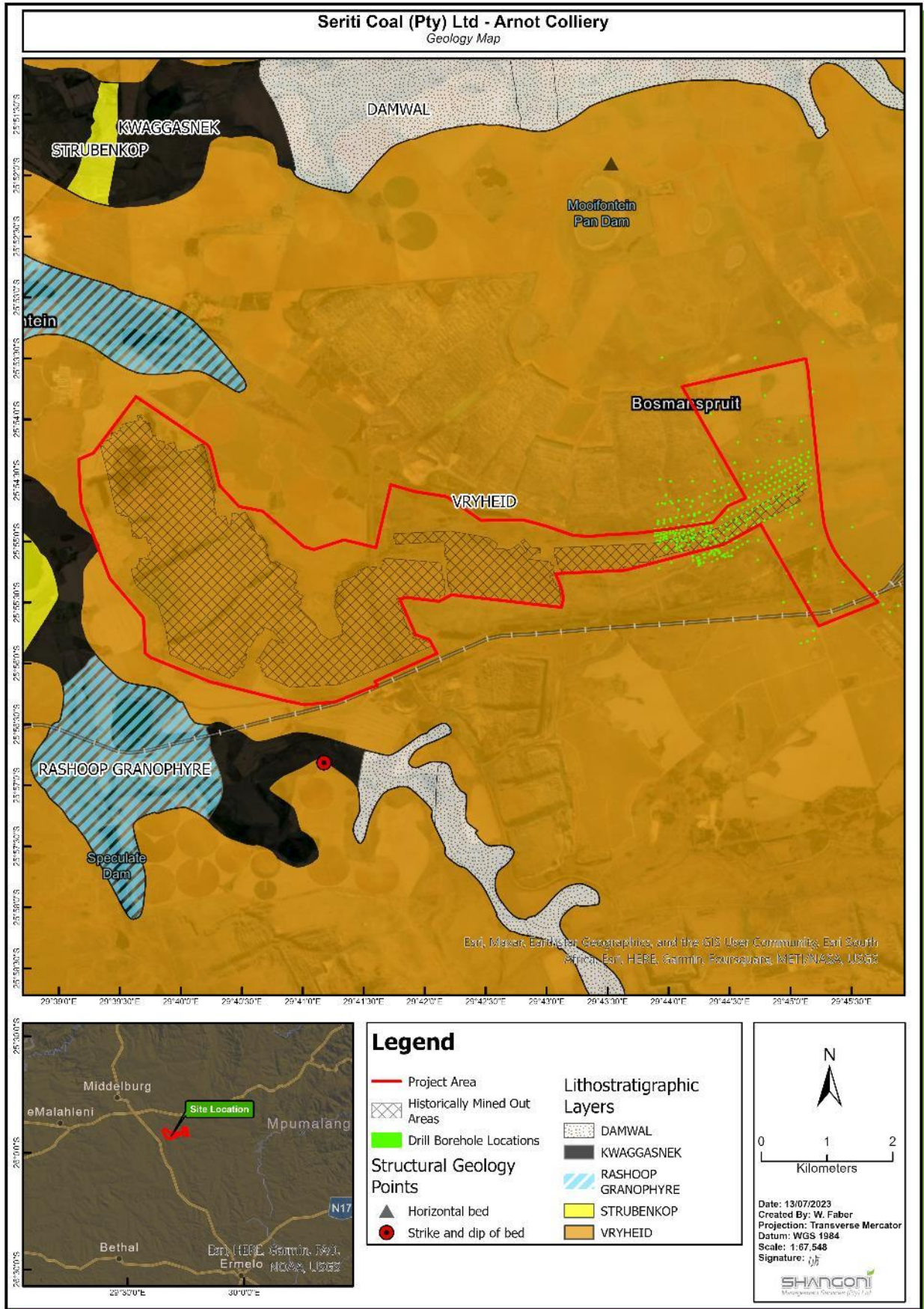


Figure 4: Geology



Chapter B: Climate

The following information was extracted from the report, *Proposed Mining Right Renewal: Arnot Colliery Mpumalanga Desktop / scoping report terrestrial vegetation assessment and plant species habitat assessment*, Prepared by Dimela Eco Consulting, dated July 2023.

The proposed mining right renewal area is situated on the Highveld in the central part of the Mpumalanga Province. The area is characterised by strongly seasonal summer rainfall, with very dry winters. The region has a Mean Annual Precipitation (“MAP”) of 726mm and a Mean Annual Temperature (“MAT”) of 14.7°C. It also has 32 Mean Frost Days (“MFD”), Mean Annual Potential Evaporation (“MAPE”) of 1926mm and Mean Annual Soil Moisture Stress (“MASMS”) of 73%. The rainfall in this area is approximately 714 mm per year, as depicted in Figure 5. Most of the rainfall occurs in December to February, with winter months being dry. With an average of 20.1°C, January is the warmest month and July has the lowest average temperature of the year with an average of 10.4°C.

Table 8: Average Temperature

	January	February	March	April	May	June	July	August	September	October	November	December
Avg. Temperature °C (°F)	20.1 °C (68.1) °F	20 °C (68.1) °F	18.8 °C (65.9) °F	16.3 °C (61.4) °F	13.5 °C (56.2) °F	10.7 °C (51.3) °F	10.4 °C (50.8) °F	13.6 °C (56.5) °F	17.1 °C (62.7) °F	18.7 °C (65.6) °F	19 °C (66.2) °F	19.9 °C (67.8) °F
Min. Temperature °C (°F)	15.2 °C (59.4) °F	15.1 °C (59.2) °F	13.8 °C (56.8) °F	11 °C (51.8) °F	7.2 °C (45) °F	4.1 °C (39.4) °F	3.4 °C (38.2) °F	6.4 °C (43.6) °F	9.6 °C (49.4) °F	12 °C (53.6) °F	13.4 °C (56.1) °F	14.9 °C (58.7) °F
Max. Temperature °C (°F)	25.3 °C (77.6) °F	25.5 °C (77.9) °F	24.4 °C (76) °F	21.9 °C (71.5) °F	20 °C (68) °F	17.8 °C (64) °F	17.8 °C (64) °F	21.1 °C (70) °F	24.6 °C (76.3) °F	25.6 °C (78.1) °F	24.8 °C (76.7) °F	25.2 °C (77.4) °F
Precipitation / Rainfall mm (in)	128 (4)	98 (3)	92 (3)	43 (1)	16 (0)	6 (0)	6 (0)	9 (0)	20 (0)	72 (2)	108 (4)	122 (4)
Humidity(%)	68%	65%	64%	62%	53%	51%	46%	40%	39%	50%	61%	66%
Rainy days (d)	12	10	9	5	2	1	1	1	3	8	11	12
avg. Sun hours (hours)	8.8	8.9	8.4	8.1	8.8	8.6	8.9	9.4	9.7	9.6	9.2	9.3



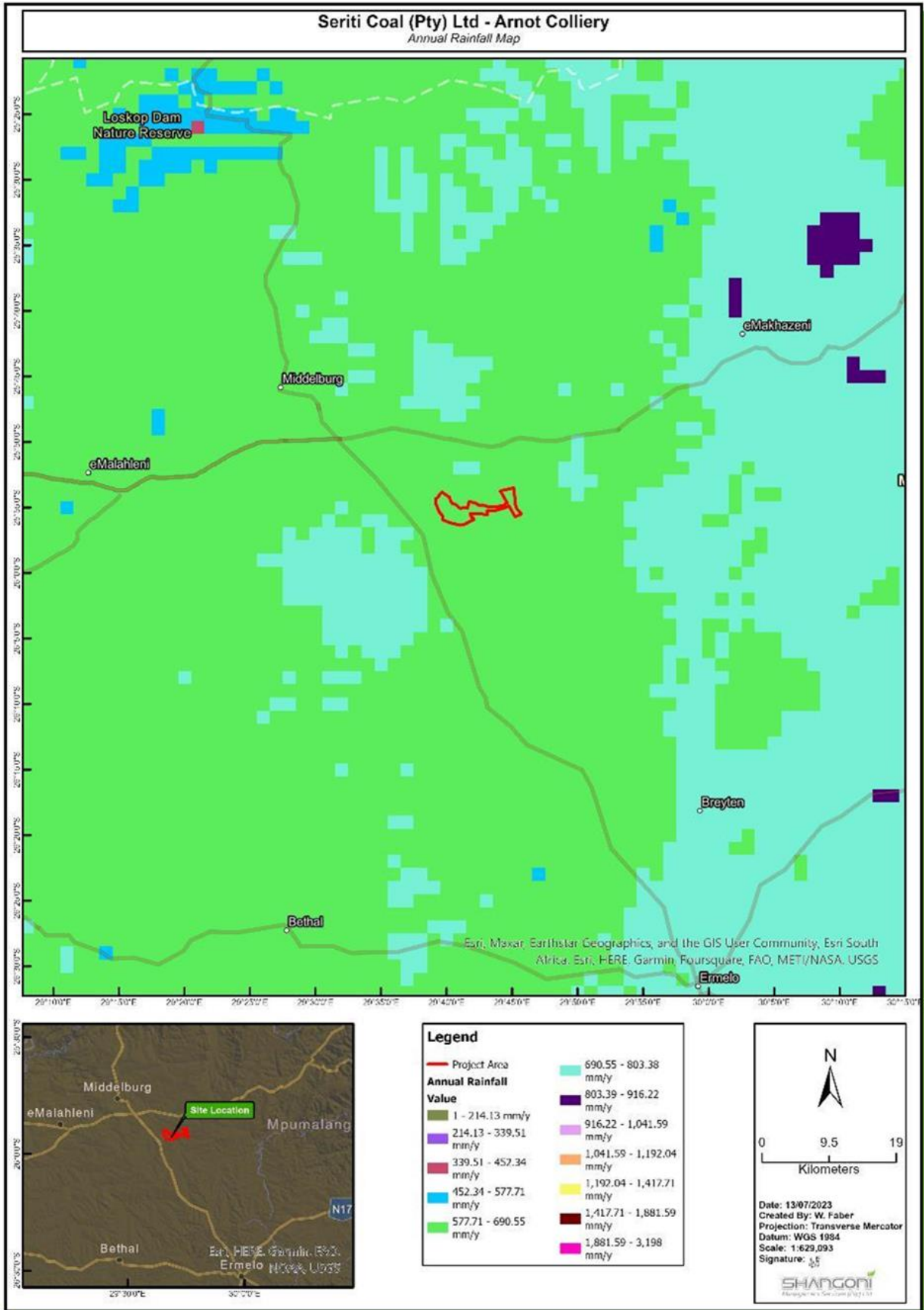


Figure 5: Annual Rainfall



Chapter C: Topography

The following information was extracted from the report, *Proposed Mining Right Renewal: Arnot Colliery Mpumalanga Desktop / scoping report terrestrial vegetation assessment and plant species habitat assessment*, Prepared by Dimela Eco Consulting, dated July 2023.

The proposed mining right renewal area is characterised by gently undulating topography with numerous pans in the greater area. The highest point in the immediate vicinity of the site is approximately 1 730 meters above sea level (“masl”) with the topography generally sloping towards the north and west following the drainage of the Rietkuilspruit, Boesmansspruit and Mooifonteinspruit which are all tributaries of the Klein Olifants River. The site slopes gently towards the Bosmanspruit, which drains into the Klein Olifants River about 3km north-west of the site.



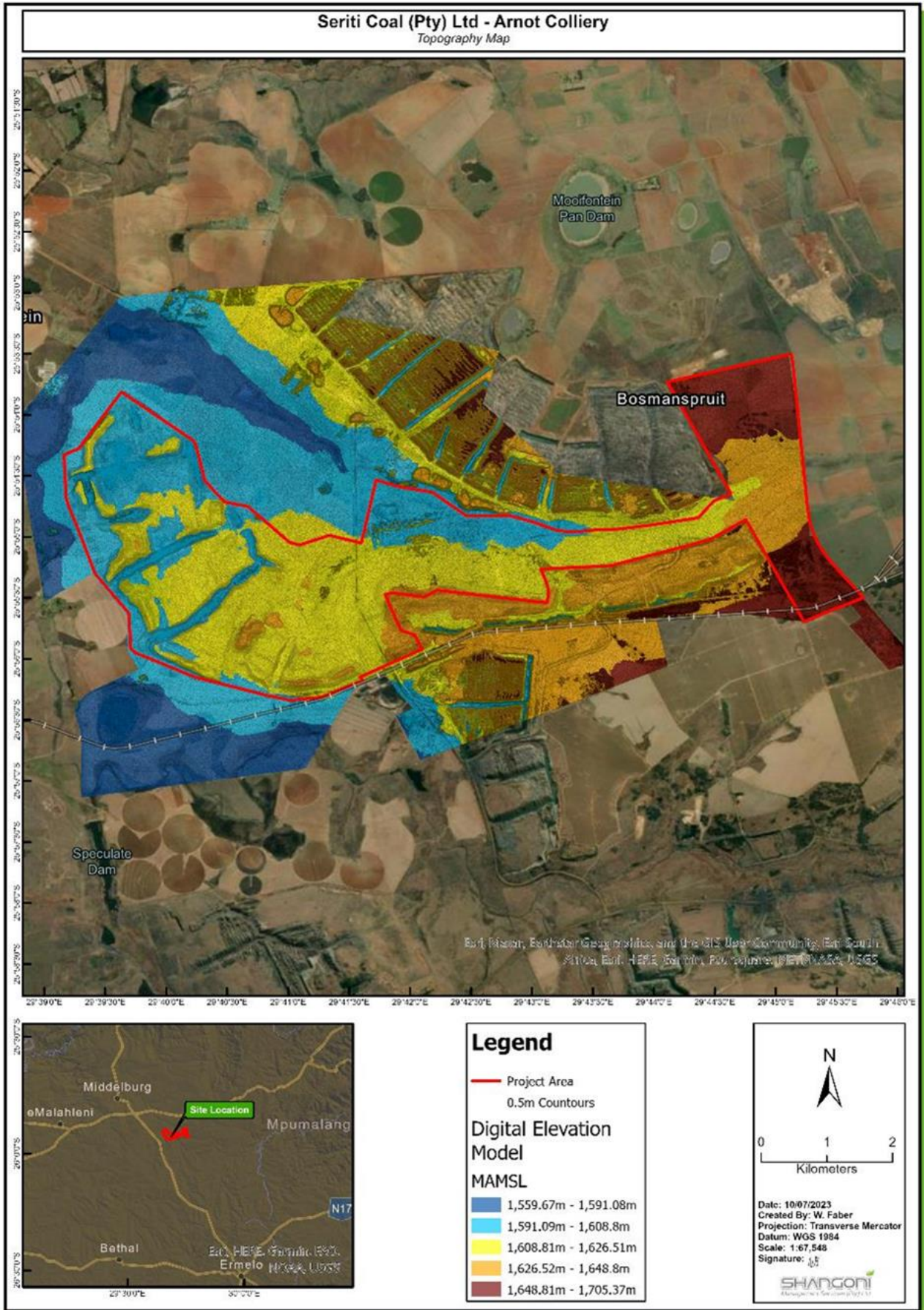


Figure 6: Topography associated with the Arnot Colliery MR area



Chapter D: Soil and Land Use

Soils

The study area is underlain by arenite. The site is dominated by red to yellow sandy soils of the Ba land types, found on shales and sandstones of the Madzaringwe Formation (Karoo Supergroup) (Mucina and Rutherford, 2006). The site falls on the BA19 land type. Ba land types indicate land in which red and / or yellow brown apedal soils (Hutton, Bainsvlei, Avalon, Glencoe and Pinedene soil forms) that are dystrophic and or mesotrophic, dominate over red and l or yellow brown eutrophic soils. Land type Ba19 is characterised by plinthic catena: dystrophic and/or mesotrophic; red soils widespread, upland duplex and margalitic soils rare.

Land use and surface infrastructure

According to the DFFE Screening Tool Report, the agricultural sensitivity is very high as majority of the site falls within Land capability;09. Moderate-High/10. Moderate-High; Annual Crop Cultivation / Planted Pastures Rotation; Land capability;09. Moderate-High/10. Moderate-High; Annual Crop Cultivation / Planted Pastures Rotation; Land capability;06. Low-Moderate/07. Low-Moderate/08. Moderate; Land capability;01. Very low/02. Very low/03. Low-Very low/04. Low-Very low/05. Low; Land capability;06. Low-Moderate/07. Low-Moderate/08. Moderate; Pivot Irrigation; Land capability;09. Moderate-High/10. Moderate-High.

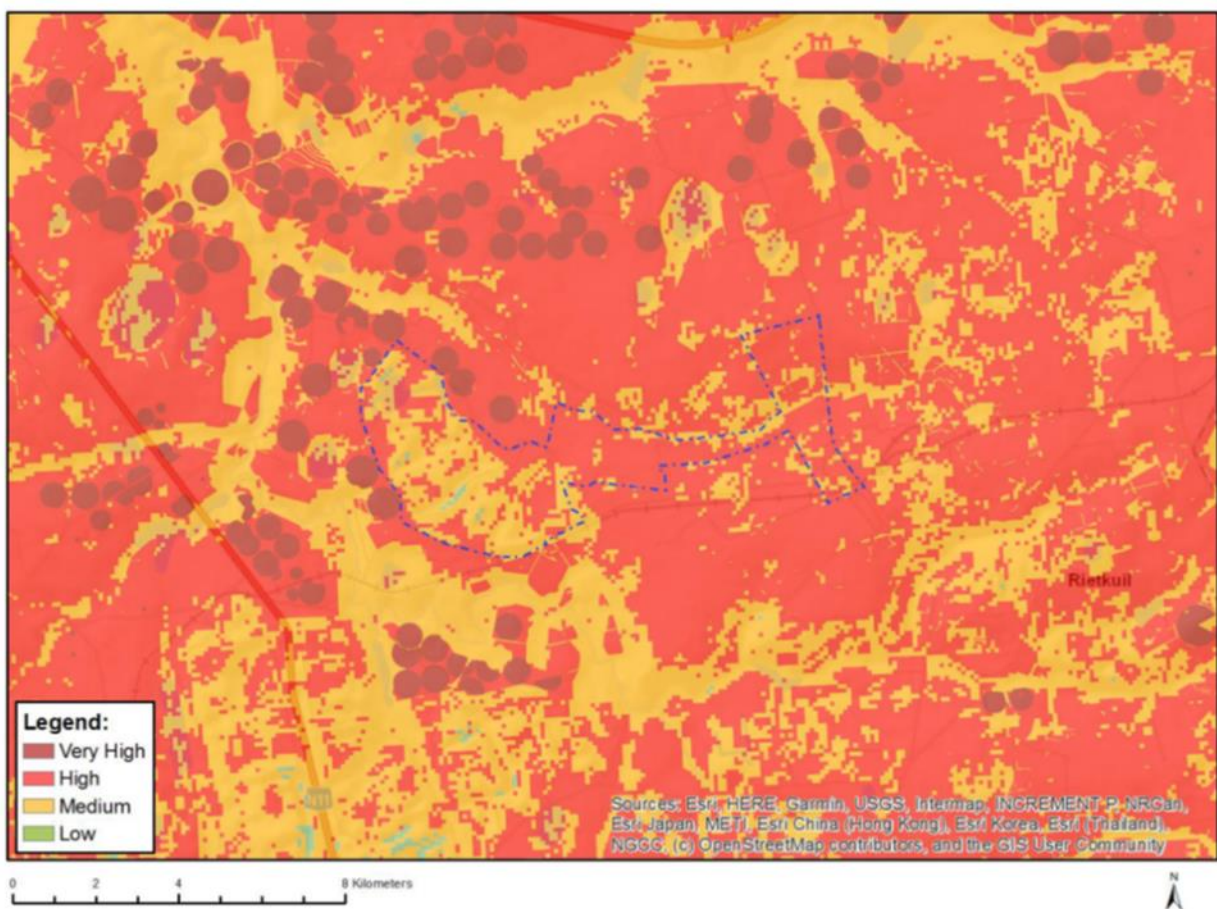


Figure 7: Agricultural sensitivity



The current land use for the properties associated with the proposed project area is zoned for agriculture and as such, agricultural land-use dryland field crops (maize and soya beans) and grazing (mainly for cattle farming) were observed to be the dominant land-uses on the study area. Additionally, there is a cemetery site and Eskom Powerline within the study area. The study area is located at 3 km Northwest of Arnot Power Station and directly opposite the Optimum Coal Mining area (Northern Section) and the Tao Mine (Southern section), the optimum Conveyor belt and the haul road from the Tao Mine transverses through the proposed site from the Northern direction to the Southern direction. There is also a railway line (including the Rietkuil siding) directly south of the project area and the R104 Provincial Road which is within the study area boundary and will be mainly used for access to and from side during the life cycle of the proposed Mining project.

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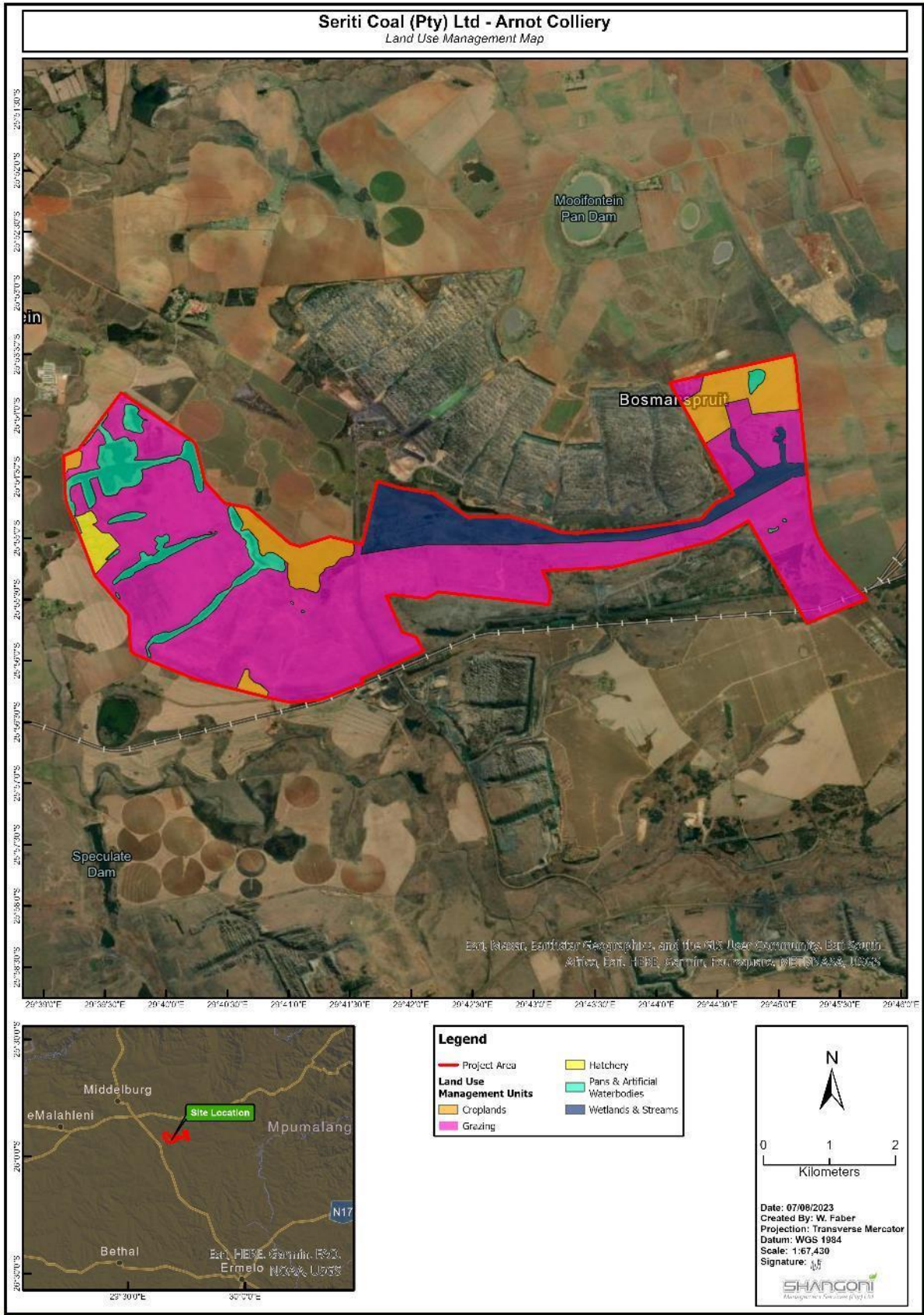


Figure 8: Land Use Management Map



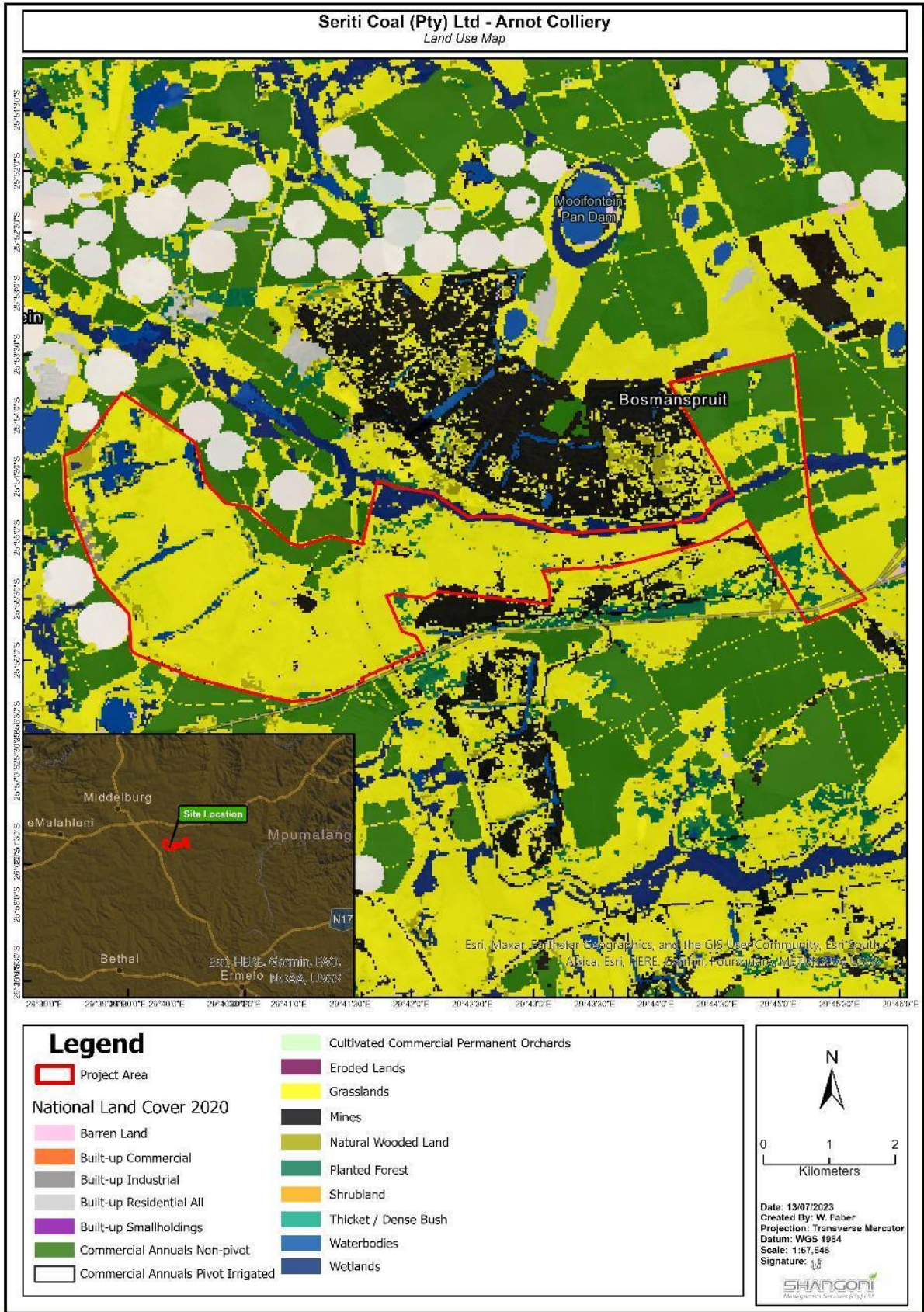


Figure 9: Land Use Map



Chapter E: Vegetation

The Following information was extracted from *Proposed Mining Right Renewal: Arnot Colliery Mpumalanga Desktop / scoping report terrestrial vegetation assessment and plant species habitat assessment*, Prepared by Dimela Eco Consulting, dated July 2023.

The site falls within the Eastern Highveld Grassland vegetation unit of the Grassland Biome. Most of the site has been significantly disturbed and constitutes modified habitats. Only remnant undisturbed grassland units may occur in the eastern extent and these appear to be fragmented, with only the grasslands around the Bosmanspruit showing some limited connectivity.

Eastern Highveld Grassland is a poorly conserved vegetation unit with much of its area transformed by cultivation, plantations, urbanisation, and mining. Where disturbances occur, the invasive exotic tree *Acacia mearnsii* (black wattle) can become dominant and displace the natural vegetation. The remaining portions of the Eastern Highveld Grassland are therefore of high conservation value and sensitivity and are thus classified as an endangered vegetation type (Mucina & Rutherford, 2006).

The vegetation is short dense grassland dominated by the usual highveld grass composition (*Aristida*, *Digitaria*, *Eragrostis*, *Themeda*, *Tristachya* etc.) with small, scattered rocky outcrops with wiry, sour grasses and some woody species (*Senegalia caffra*, *Celtis africana*, *Diospyros lycioides subsp lycioides*, *Parinari capensis*, *Protea caffra*, *P. welwitschii* and *Searsia magalismsontanum*).



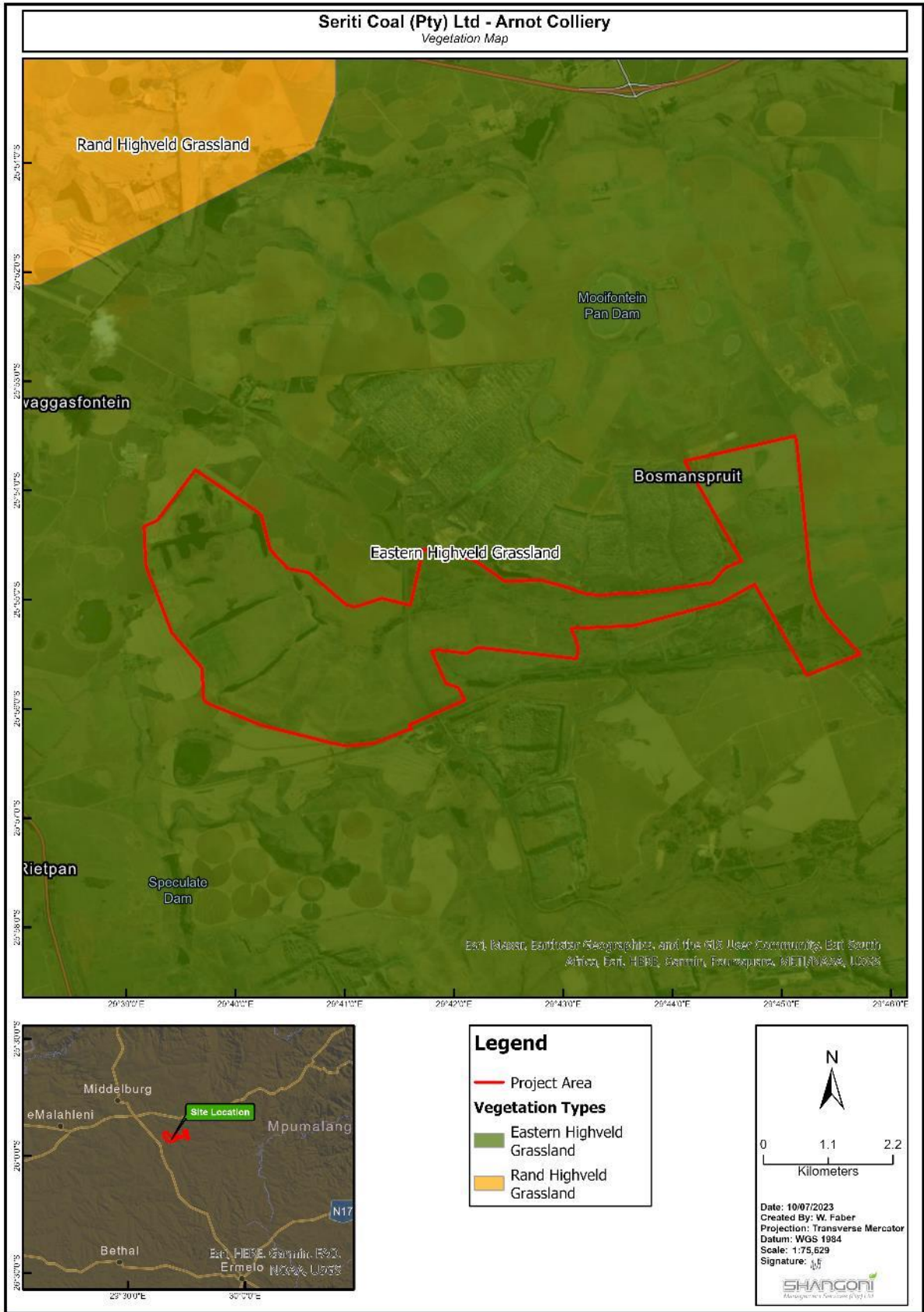


Figure 10: Plant Sensitivity Map



The area in question may be described as natural grassland and is classified as the central variation of the Transvaal Bankenveld. Any trees present within the immediate regions vary from farm to farm, with little diverse vegetation being present due to clearing of the land surface for agricultural purposes.

Naturally occurring grasses are sour and wiry with the dominant species being Narrow Heart Love Grass (*Eragrostis racemosa*), Purple Finger Grass (*Gigitaria tricholaenoides*), Creeping Brittle Grass (*Setaria flabelleta*) and Wire Grass (*Heterspogan contortus*).

The site has in the past been extensively utilised for cattle grazing. The conservation plan for Kungwini/Metsweding does not identify any conservation areas on the proposed site. The nearest conservation area is the Bronkhorstspuit Dam Nature Reserve, a popular recreational area, which lies approximately 7 km to the Northeast of the proposed development.

Chapter F: Fauna

The following information was sourced from the *Seriti Coal's Arnot Colliery: Braamspruit Mine: Mpumalanga Province Terrestrial Fauna Specialist Desktop Report*, prepared by Limosella Consulting Pty Ltd, dated July 2023.

Species specifically linked to natural habitat units are most likely to occur in the proposed development footprint; most likely grassland and grassland-wetland ecotone species. Additionally, the proposed mining site is not expected to support extensive rocky habitats due to the historic and current mining and agricultural activity in the area. If present, rocky habitats may be associated with the remnant grasslands, specifically along the Bosmanspruit, and possibly with tree stands. Species strictly associated with such habitats are considered as unlikely on-site. No special or critical ecological services provided by fauna were identified for the area, the area is highly likely to support AI species that have been historically recorded for in the area.

According to the DFFE Screening Tool, the Animal Species sensitivity is considered high. This is a result of the following species: *Aves-Geronticus calvus*, *Aves-Hydroprogne caspia*, *Aves-Eupodotis senegalensis*, *Mammalia-Chrysospalax villosus*, *Mammalia-Crocidura maquassiensis*, *Mammalia-Hydrictis maculicollis*, *Mammalia-Ourebia ourebi ourebi*.



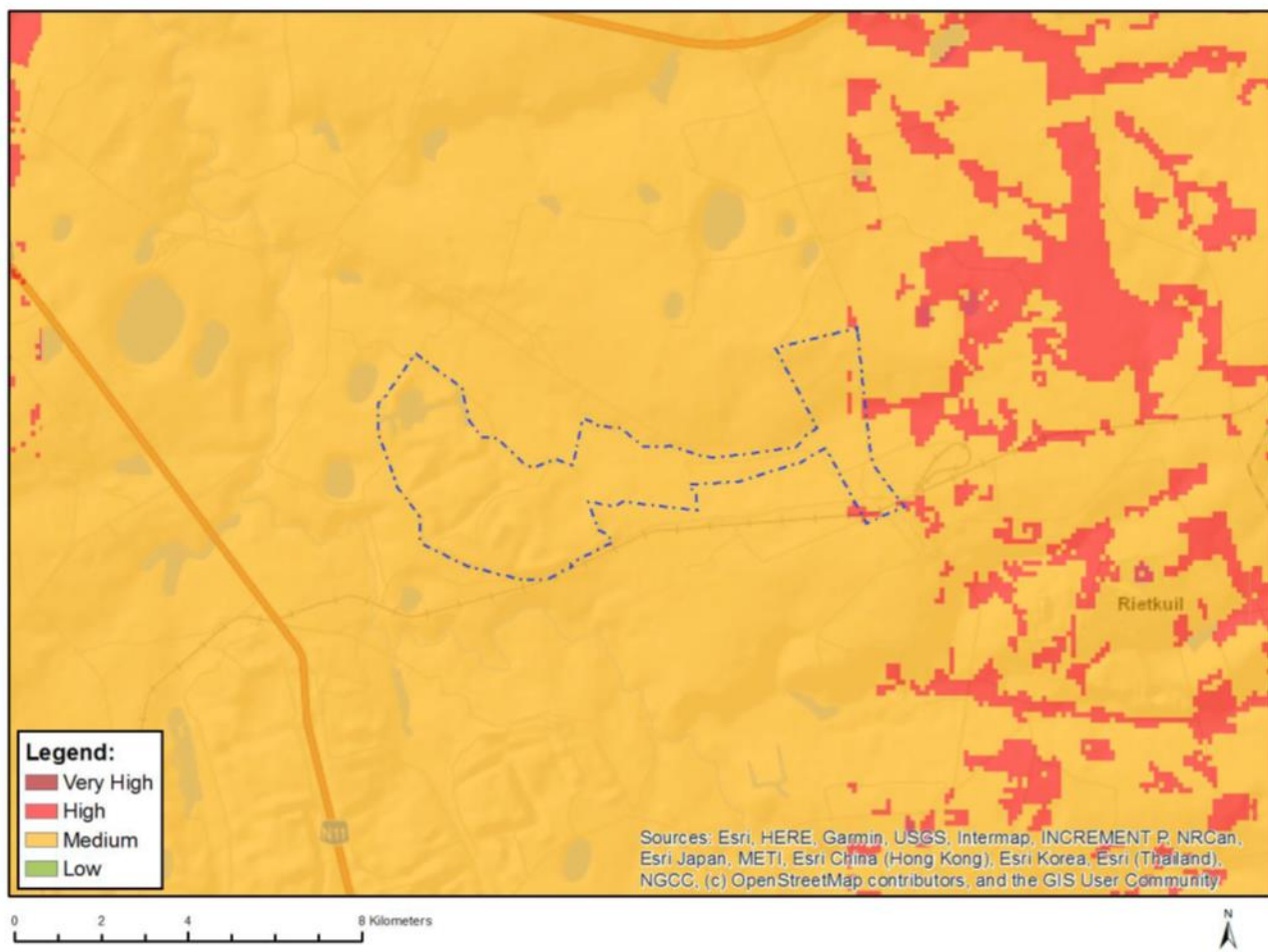


Figure 11: Animal species sensitivity



Chapter G: Hydrology

Surface Water

According to the DFFE Screening Tool Report, Aquatic Biodiversity holds a very high sensitivity slightly on the boundary of the site and small section within the site as it falls within a Wetlands and Estuaries area, with the sensitivity of the remainder of the area being low.

The study area is located within Quaternary Catchment B12B and B12C in the Upper Olifants sub-Water Management Area (“sub-WMA”) of the Olifants Water Management Area (“WMA”). The B12B quaternary catchment has been classified as a Moderately Sensitive system which, in its present state, can be considered a Class D (largely modified) stream.

The Olifants River catchment (including the Letaba and Shingwedzi catchments) is a sub-catchment of the Limpopo Basin and is the largest tributary of the Limpopo River. The Olifants Catchment covers an area of about 54 570 km² and is subdivided into 9 secondary catchments. The total Mean Annual Runoff (“MAR”) is approximately 2400 million cubic metres per year. The Olifants River and some of its tributaries, notably the Klein Olifants River, Elands River, Wilge River and Bronkhorstspuit, rise in the Highveld grasslands.

The Olifants River meanders past the foot of the Strydpoort Mountains and through the Drakensberg, descending over the escarpment. The Steelpoort and Blyde tributaries, and others, join the Olifants River before it enters the Kruger National Park and neighbouring private game reserves. Crossing the Mozambique border, the Olifants River flows into the Massingire Dam.



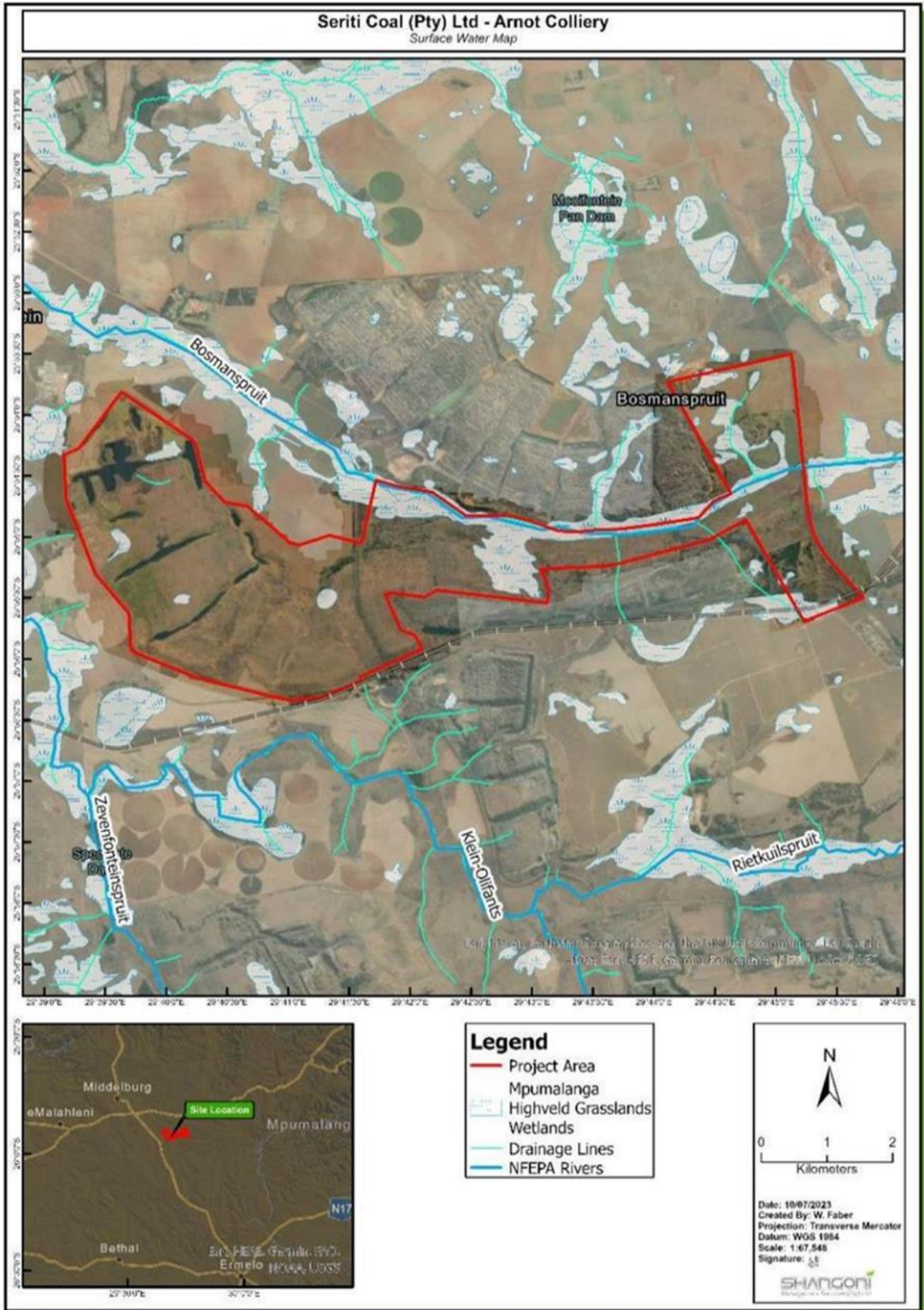


Figure 12: Aquatic Sensitivity



The Following information was extracted from the Report, *The Proposed Mining Right Renewal of Arnot Colliery (Pty) Ltd, Mpumalanga Province. DESKTOP Aquatic Biodiversity Assessment*, dated July 2023, and Prepared by Limosella Consulting Pty Ltd.

Multiple wetland types were identified, including endorheic and exorheic depressional pans, an unchannelled valley bottom, and seepage wetlands. In the northern section of the site, a small endorheic depressional wetland retains water within its basin without a channelled inflow, relying on precipitation, local runoff, and groundwater seepage. Another depressional pan, classified as exorheic, also exists in the north. It has an outlet that connects to the adjacent seepage wetland and further to the external unchannelled valley bottom wetland. This outlet prevents the accumulation of permanent standing water by allowing overflow and discharge when water levels are high. It is also important to note that an area classified as a relic wetland was identified on historical aerial images, it however appears to have been mostly loss, with some small fragments still visible.

Unchannelled Valley Bottom (Bosmanspruit)

The unchanneled valley bottom wetland has experienced substantial adverse effects due to the proximal mining activities, manifesting across multiple aspects of its ecological and hydrological integrity. In terms of hydrology, the mining activities have disrupted natural water flow patterns, leading to altered surface and groundwater dynamics, reduced water infiltration rates, and changes in the wetland's hydroperiod. Consequently, the wetland's capacity to retain and regulate water is compromised, resulting in fluctuations in water levels and potential periods of water scarcity. In terms of geomorphology, the mining activities have caused physical disturbances to the wetland's landscape, including land subsidence, soil compaction, and altered drainage patterns. The natural shape and depth of the wetland are modified, with potential consequences for sediment transport and deposition, and the overall habitat availability for aquatic and terrestrial species. Regarding vegetation, the adjacent mining operations have led to habitat destruction and fragmentation, reducing the wetland's biodiversity. Additionally, increased soil disturbance and exposure to pollutants may foster the proliferation of invasive plant species, further displacing indigenous vegetation and disrupting ecological balance. Lastly, water quality has been severely impacted by mining activities, as runoff and leachate from mining sites introduce contaminants into the wetland. These pollutants may include heavy metals, sediments, and chemicals used in mining processes, resulting in deteriorated water quality and potential harm to aquatic organisms and wildlife reliant on the wetland's resources.

Seepage Wetlands

The seepage wetlands alterations in its hydrology and water flow patterns as a consequence of agricultural activities. These activities can disturb the natural water infiltration and groundwater recharge processes, leading to fluctuations in the wetland's water table and reduced seepage rates. The introduction of pollutants, such as sediment runoff and agrochemicals, further degrades water quality and poses a threat to the delicate balance of aquatic ecosystems within the wetland. The presence of alien invasive species like Eucalyptus and Acacia mearnsii exacerbates the ecological impact, as they can outcompete indigenous vegetation, alter soil composition, and limit habitat availability for indigenous flora and fauna.



Depressional Pans

Both pans share similarities and are situated within the same catchment area and are thus assessed together in the Desktop Study, additionally only a very small section of the northern pan is located on the study site – approximately 0.46 ha. As they exist in close proximity to each other, they likely experience similar environmental influences, such as weather patterns, soil composition, and vegetation. Moreover, both have been impacted by the same anthropogenic activities such as agriculture and mining. This integrated approach to assessment allows for a more holistic understanding these aquatic bodies and the surrounding environment, enabling effective conservation and management strategies to be devised.

National Freshwater Ecosystem Priority Areas (“NFEPA”) and National Biodiversity Assessment (“NBA”) areas identified includes the Bosmanspruit River, which flows into the Klein-Olifants before flowing into the Olifants River. Wetlands identified are associated with artificial impoundments. Furthermore, several small NFEPA and NBA wetlands are indicated in the study site.

According to Le Maitre et al. (2018), the project is not located within a Strategic Water Source Areas (SWSA). SWSAs are landscapes where a relatively large volume of runoff produces water for the majority of South Africa. Strategic water source areas can be regarded as natural ‘water factories’, supporting growth and development needs that are often a far distance away. Deterioration of water quality and quantity in these areas can have a disproportionately large negative effect on the functioning of downstream ecosystems and the overall sustainability of growth and development in the regions they support (Nel et al., 2013).

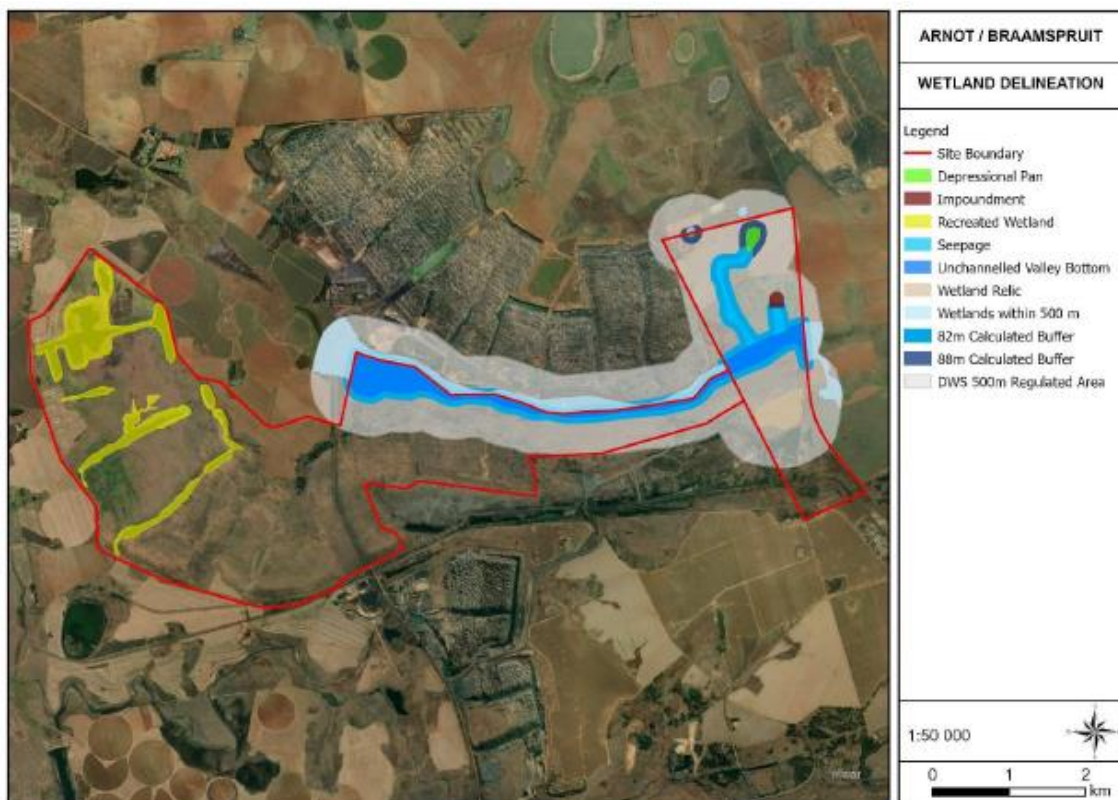


Figure 13: Delineated Watercourse and calculated Buffer zone



Hydrogeology

The groundwater system for the study is composed of three distinct superimposed aquifers, namely:

- the upper weathered Ecca aquifer.
- the fractured Karoo aquifers comprising of unweathered Ecca sediments.
- the aquifer below the Ecca sediments (the fractured pre-Karoo aquifer); and
- Artificial backfilled aquifer.

These aquifers are common to the groundwater regime in the Karoo environment and do not necessarily occur in isolation but often form a composite groundwater regime that is comprised of one, some, or all of the systems. Based on the exploration drilling at the site the upper weathered and fractured Karoo aquifers are present for the project area. The Karoo rocks are not known for large scale development of aquifers, but occasional high yielding boreholes can be present. The aquifers that occur in the area are therefore classified as minor aquifers (low yielding), but of high importance and are understood to have a low to medium development potential, mostly being used for small scale domestic purposes or occasionally for large scale irrigation.

The Weathered Aquifer

The Ecca sediments are weathered to depths between 5 and 20 m (average of 12 m) below the surface throughout the area. The upper aquifer is associated with this weathered zone and water is often found a few metres below the surface. The weathered layer comprises of residual soils and weathered shales and sandstones. The hydraulic conductivity values are in the order of 10⁻¹ m/d to 10⁻² m/d. This aquifer is recharged by rainfall. The percentage recharge to this aquifer is estimated to be in the order of 1% to 3% of the annual rainfall based on work by Kirchner et al. (1991) and Bredenkamp (1995). It should, however, be emphasised that in a weathered system, such as the Ecca sediments, highly variable recharge values can be found from one area to the next. This is attributed to the composition of the weathered sediments, which range from coarse grained sand to fine clay. In terms of susceptibility to pollution, the shallow primary aquifer is understood to be highly susceptible to pollution due to coal mining in the area as the pollutants travel shorter distance to reach the aquifer system (Hodgson and Krantz, 1998). Low-lying wetlands, where groundwater levels are close to the surface, can indicate interaction between groundwater and surface water and can also serve as conduits for potential contamination.

Fractured Ecca Aquifer

The fractured aquifer occurs beneath the weathered aquifer, within fresh sediments. The Ecca sediments are generally well-cemented which limits the permeability of the sediments. Groundwater movement, therefore, occurs predominately along secondary structures, such as fractures and faults. However not all secondary structures will be water bearing and fracture density in this aquifer generally decreases with depth. The yields for this aquifer are low, typically in the range of 10⁻³ m/d to 10⁻⁴ m/d.

Pre-Karoo basement aquifer



The pre-Karoo rocks, consisting mainly of felsites of the Bushveld Igneous Complex, are present below the Dwyka group tillites. Groundwater is mostly present in very small and low yielding fractures. The pre-Karoo is considered not to be a reliable source of groundwater given its great depth, compactness of the host rock and inability to fracture, inferior quality associated with felsites and granites (mostly fluoride), and low recharge because of the overlying impermeable Dwyka tillite. However, reliable sources of groundwater may be encountered on bedding plane fractures or lithological contact zones.

Artificial aquifer

Recharge to the groundwater system varies profoundly with surface conditions. If expressed as a percentage of MAP, recharge quotients over natural surfaces are estimated to range from 1 to 3%. Un-rehabilitated backfill in the pits may, in contrast, induce recharge efficiencies of 40% of MAP.

Backfilling is part of the rehabilitation process for the closure of opencasts at Kromdraai. Backfill material is highly heterogeneous in composition and is subject to variable compaction, resulting in significant local scale differences of hydraulic properties. The saturated hydraulic conductivity of the backfill is inherently greater than that of the host rock.

At closure, backfill is therefore of significance for the storage of groundwater, and also as a conduit through which groundwater levels may rise more rapidly than under conditions of partial confinement, as commonly evident within the in-situ Ecca Group sequence.

Backfilling and compacting of opencast pits have completely different characteristics compared to the virgin ground. It will not be possible to compact the spoil to the same density as before the mining process started. There will still be an increase in volume even after compaction was completed. It contains for instance substantially greater hydraulic conductivities and also recharge of orders of magnitudes greater compared to virgin ground. The consequence of this is that decant typically occurs from these artificial systems.

The flow rate and residence time of groundwater in a rehabilitated opencast mine control the dissolution of minerals as well as the range of release of contamination from the pit. The release of contaminants largely depends on the reactivity of the minerals, the oxygen saturation, the residency and the pH of the pore water.

An important consideration is the change in the hydrological status of the pit as it evolves from a groundwater 'sink' (void) to groundwater 'source' (backfill). Because groundwater follows the path of least resistance, it will try to fill the open connected spaces (termed effective porosity) completely. Therefore, the water in the pit will continue to rise until equilibrium is reached between the water level in the pit and the water level in the surrounding rock, usually within the weathered zone. However, if a large amount of water is quickly added after an intense rainfall event, the system cannot absorb the water fast enough and decant at the lowest elevation will occur. Despite rainfall recharge, such an artificial aquifer will also receive groundwater from all sides due to the hydraulic gradient created. If runoff is added to the balance, a rapid rise of water results and decant is often the unavoidable consequence of this.



Chapter H: Terrestrial Biodiversity

As per the Screening Report, the Terrestrial Biodiversity sensitivity on the site is very high, as the site falls within Critical Biodiversity Area 2, Protected Areas Expansion Strategy, and a Vulnerable Ecosystem.

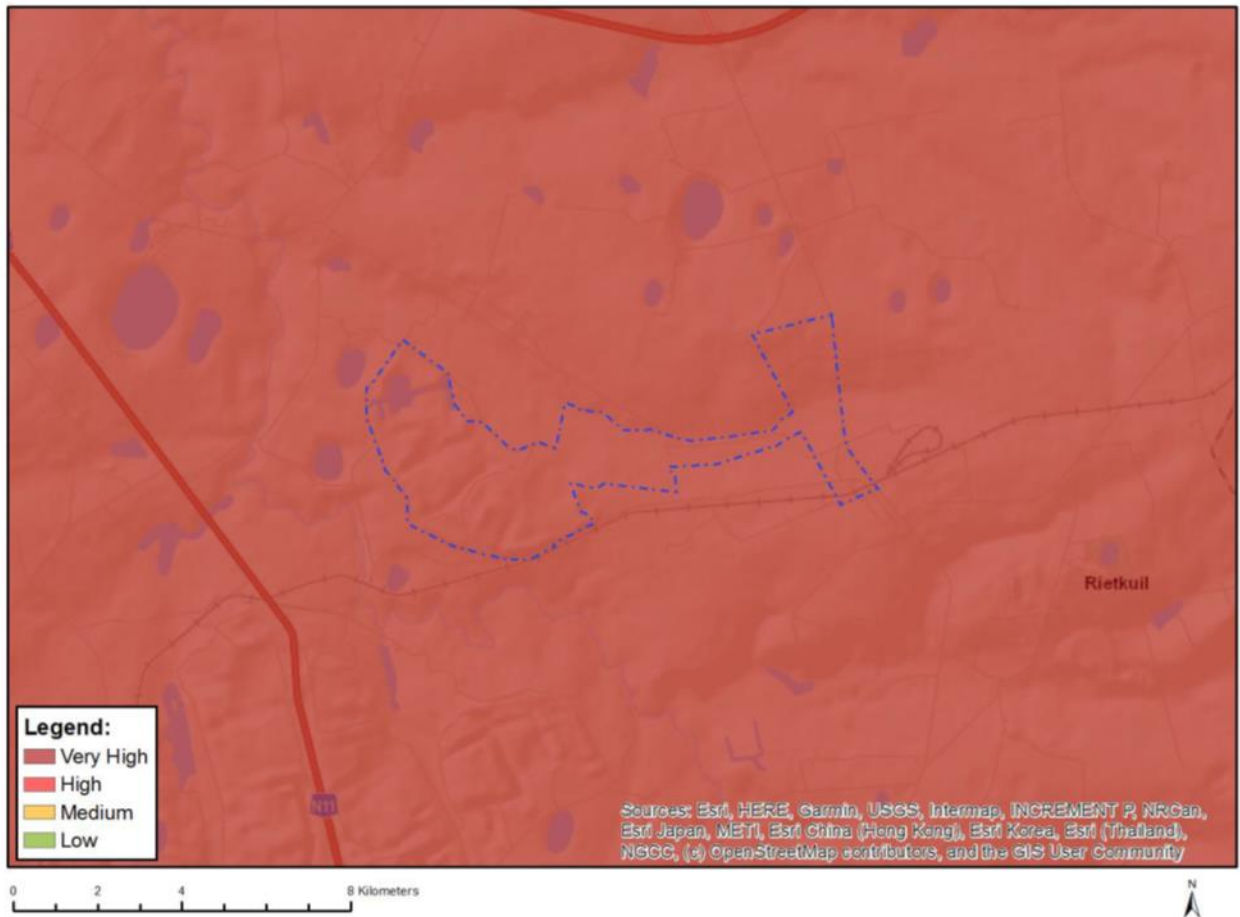


Figure 14: Terrestrial Sensitivity

Chapter I: Air Quality

The Following Information was extracted from the Report, *Steve Tshwete Local Municipality 2022/23 Integrated Development plan dated 2022* and prepared by Steve Tshwete Local Municipality.

The Mpumalanga Highveld is home to twelve of Eskom's coal-fired power stations, Sasol's operations, Highveld Steel and Vanadium, Columbus Stainless Steel, Samancor, Rand Carbide, Vanchem, Exxaro Zincor, and many other mines and industries. This makes the Mpumalanga Highveld highly susceptible to various types of pollution, especially air pollution that may contribute to the degradation of the natural surrounding environment. An Air Quality Management Plan (AQMP) has been developed for the area and polluting industries are required to develop emission reduction plans to limit air pollution.

The Steve Tshwete first Greenhouse Gas (GHG) Inventory was conducted in 2012 and again in 2019. The GHG inventory is compliant to the international accounting protocols, techniques and



methodologies of both International Local Government Greenhouse Gas Emissions Analysis Protocol (IEAP) version 1.0 and the Global Protocol for Community-Scale Greenhouse Gas Emissions (GPC).

Chapter J: Noise

The following information was extracted from the Report, *Environmental Noise Impact Assessment Proposed Braamspruit Project north-west of Rietkuil in Mpumalanga Province*, dated July 2023 and prepared by Enviro-Acoustic Research.

The site is characterised by areas with elevated ambient sound levels, with the soundscape influenced by mining and road traffic noises. These areas typically would have a rating level typical of a sub-urban to urban noise district. Areas further than 2,000m from existing mining activities as well as 1,000m from the D1398 road. Ambient sound levels are typical of a rural noise district, with the soundscape dominated by natural noises (faunal communication and wind-induced noises). Road traffic noises might be audible at times in these rural areas.

Chapter K: Archaeology and Cultural History

As per the Screening Report, the Archaeological and Cultural Heritage Sensitivity has a high sensitivity since the area is located Within 150m of a Grade IIIa Heritage site with small sections of the site regarded as low. There is a large cemetery containing between 40 to 60 graves present on the eastern border of the property. Owing to vegetation covering the whole burial ground, and the condition of the graves, it was difficult to establish the exact number.



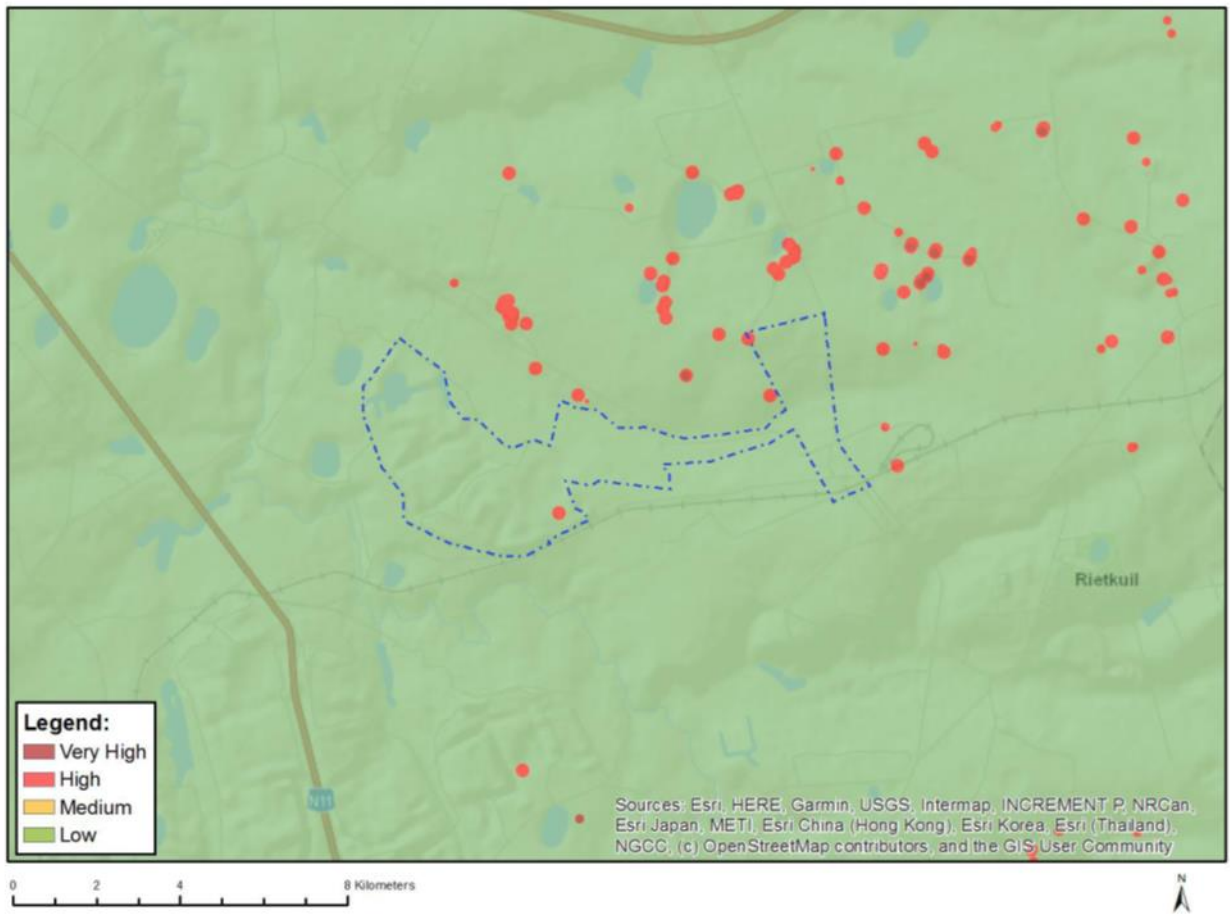


Figure 15: Archaeological and Cultural Heritage sensitivity Map

Palaeontology

The DFFE Screening Report indicates that the palaeontology sensitivity of the area is very high. Fossils likely to be found are mostly plants such as '*Glossopteris flora*' of the Vryheid Formation. The aquatic reptile Mesosaurus and fossil fish may also occur with marine invertebrates, arthropods and insects. Trace fossils can also be present. During storms a great variety of leaves, fructifications and twigs accumulated and because they were sandwiched between thin films of mud, they were preserved to bear record of the wealth and the density of the vegetation around the pools. They make it possible to reconstruct the plant life in these areas and wherever they are found, they constitute most valuable palaeobotanical records (Plumstead 1963) and can be used in palaeoenvironmental reconstructions. The *Glossopteris flora* is thought to have been the major contributor to the coal beds of the Ecca. These are found in Karoo-age rocks across Africa, South America, Antarctica, Australia and India. This was one of the early clues to the theory of a former unified Gondwana landmass (Norman and Whitfield 2006).



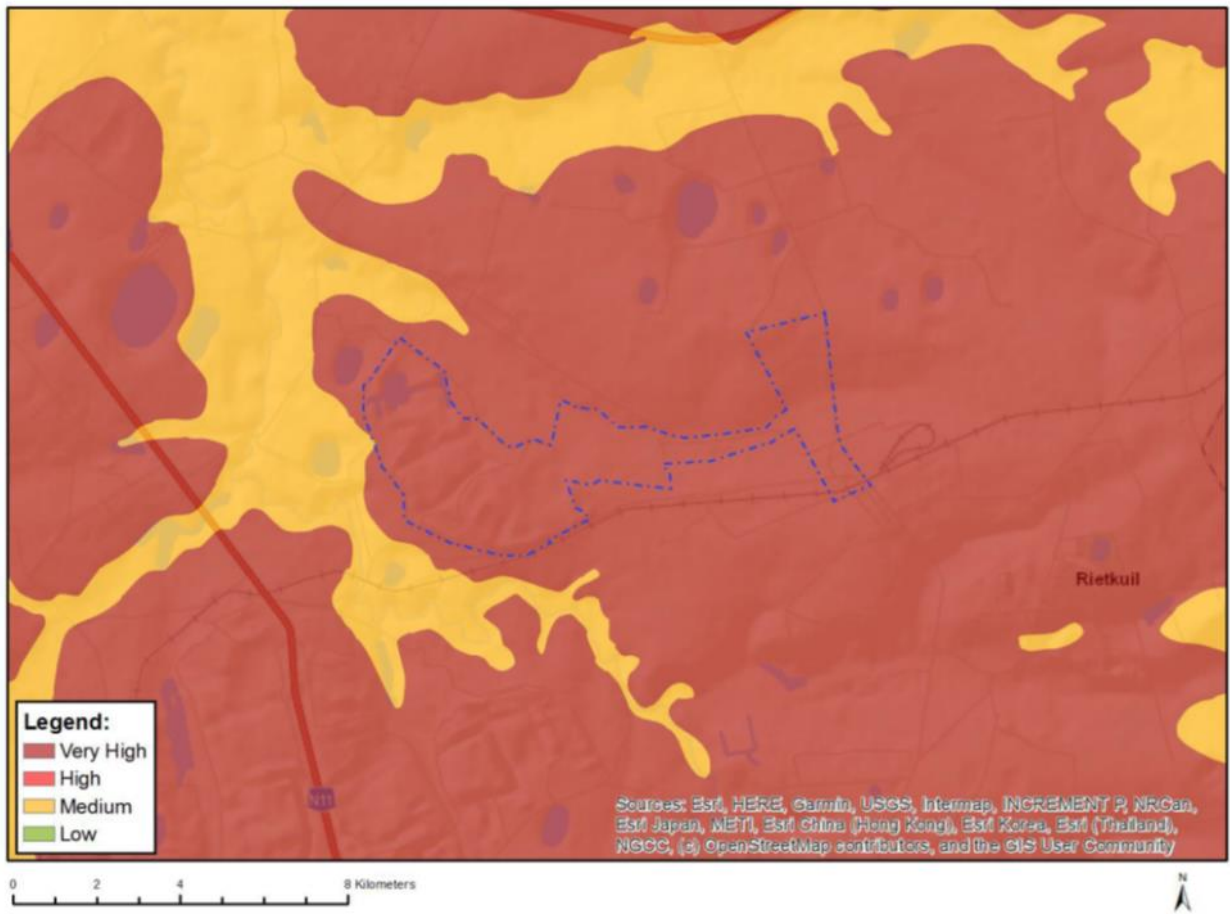


Figure 16: Paleontological sensitivity

Chapter L: Visual aspects

The following information was extracted from *Visual impact assessment report for the Seriti Coal (Pty) Ltd Colliery Environmental Permit and License application for the Renewal of the existing Mining Right, Southeast of the town Middelburg, Mpumalanga Province*. Prepared by Skets and dated June 2023

The landscape character sensitivity in the study area is considered low and is attributed to the transformed landscape that presents land uses of sporadic and extensive mining, large surface areas of modern agriculture that converted the natural grassland vegetation to cultivated fields, and widespread powerline infrastructure that traverses the study area, the incoherent relationship of contrasting land uses associated with mining, agriculture and electrical infrastructure and the low number of remaining natural features in the study area.

Chapter M: Regional socio-economic structure

The Following Information was extracted from the following Reports:

- *Steve Tshwete Local Municipality 2022/23 Integrated Development plan* dated 2022 and prepared by Steve Tshwete Local Municipality.
- *Socio-Economic Scoping Report for Arnot Colliery, Mpumalanga*, dated August 2023 and prepared by Southern Economic Development.



Arnot Colliery is situated in south-eastern sections of Steve Tshwete Local Municipality (“STLM”) in the Nkangala District Municipality (NDM) of Mpumalanga Province. The colliery is furthermore situated in the rural ward 7 of STLM close to Arnot Colliery and Rietkuil village.

Table 9: Demographics of the study area

AREA	Population	Population growth p.a.	Households	Household growth p.a	Average household size	% Females
	2016	2011-2016	2016	2011-2016	2016	2016
STLM	278,749	3,9%	86,713	5,9%	3,2	47,8%
Rietkuil ¹⁾	4,400	n/a	1,375	n/a	3,2	44,9%
STLM Ward 7 ¹⁾	7,061	n/a	1,922	n/a	3,6	48,0%
Mpumalanga	4,039,939	1,6%	1,238,861	2,9%	3,3	51,1%
South Africa	55,653,654	1.5%	16,923,309	2.4%	3,3	51.0%

According to Census 2011, STLM has a total population of 217 073 people, of whom 73,6% are black African, and 21,8% are white. The other population groups make up the remaining 4,6%. Middelburg has the largest concentration of the STLM’s population within one settlement (38%). Rietkuil village is situated in a rural ward 7 of STLM and only represents 1,6% of the STLM’s population, and more than 62% of the population that resides in the larger ward 7 area. It is estimated that the population number for 2030 will be at more or less 509 000 people given the historic population growth per annum which will put pressure on the infrastructure and basic service delivery and eventually also sustainable job creation in the long run.

In 2011, SiSwati (28%) and Isizulu (24%) were the dominant languages in Mpumalanga province. In STLM the majority language was Isizulu (28%) and Afrikaans (23%). In Rietkuil village Afrikaans is the majority language (27%) followed by Isizulu (19%) while IsiZulu is the main language in the larger ward (28%) followed by Afrikaans (22%) (Stats SA, 2011).

Of those aged 20 years and older, 3,4% have completed primary school, 30,8% have some secondary education, 35% have completed matric, and 14,4% have some form of higher education, while 7,4% of have no form of schooling.

Municipal service delivery

Due to relatively high rates of in-migration into the municipal area, there are more informal houses in STLM than in the province, on par with levels nationally. Due to the high demands on municipal services, the backlogs in terms of many municipal services like piped water, improved sanitation and access to electricity is slightly higher in the STLM than nationally.



Table 10: Access to households

Category	STLM	STLM Ward 7	Mpumalanga	National
Informal houses (shacks), 2016	13%	1%	11%	13%
Piped water inside the house 2016	85%	n/a	88%	90%
With access to improved sanitation, 2016	63%	88%	49%	74%
Access to electricity, 2016	90%	n/a	91%	93%
Access to weekly refuse removal, 2016	76%	59%	40%	57%

Educational Profile

STLM's grade 12 pass rate deteriorated slightly from 85.6% in 2014 to 84.7% in 2020, but was still the 2nd best/highest in the province. Steve Tshwete's pass rate also declined/deteriorated between 2019 and 2020 by 4.3 percentage points – very much Covid-19 related factors. The area achieved an admission rate to university/degree studies of 42.0% in 2020, which was the highest of the 17 municipal areas in the province. The challenge is to accommodate the educated young people in the area - inadequate economic opportunities. Provision of adequate educational, recreational infrastructure, and skills development activities to meet the needs of the community. Steve Tshwete's functional literacy is improving and it is the 2nd highest in the province.

Economic Profile

STLM can be regarded as one of the commercial hubs in Mpumalanga with a 14.3% contribution to the Mpumalanga economy – 3rd largest ranked economy in the province for 2019. In the District the municipality contributes 36.0% to the economy making it the 2nd largest economy in the Nkangala District Municipality. The dominating economic sectors are Mining, Manufacturing, Trade and Agriculture.

Contribution to the Mpumalanga economy in 2020 was 13.3% – 3rd largest economy in the province. Contribution to the district economy was 34.4% – 2nd largest economy in the district.

Dominant contribution to Nkangala's agriculture and manufacturing industries and contributes significantly in all of the other seven industries.

Average annual economic growth for Steve Tshwete was 2.1% over the period 1996 to 2020. For the period 2015 to 2020, the economy in Steve Tshwete contracted by 1.0% p.a., in line with the weak economic climate in the country.

Estimated contraction in 2020 of between 8% and 9% due to the COVID-19 lockdown. Construction, transport, manufacturing, mining and trade (including tourism) most negatively affected. Expected growth of approximately 5% in 2021 from a low base. The estimated average annual GDP growth for Steve Tshwete between 2020 and 2025 2.9%. In 2020, the size of the economy was estimated at R52.8 billion in current prices.



In 2020, the largest industries were mining, manufacturing, community services and finance. Together these four contributed 72.9% to the Steve Tshwete economy. Steve Tshwete holds comparative advantages in agriculture, mining, manufacturing and utilities. In 2015, tourism spend totalled R1.7 billion or equal to 4.1% of the local GDP. In 2020, due to COVID-19 related factors, it decreased to only R513.4 million, which was equal to only 1.0% of the local GDP.

Employment

Steve Tshwete economy is one of the biggest economic areas and it is therefore expected that a significant number of employment opportunities are being provided in the area. Mining, trade and manufacturing are the major leading employment drivers in Steve Tshwete LM.

The unemployment rate of Steve Tshwete was 23.1% in 2020, which was one of the lower rates in the province, but still relatively high in comparison with the target of 6% by 2030. Steve Tshwete's unemployment rate was however, the lowest among all the municipal areas of Mpumalanga. In 2020, the unemployment rate for females was 30.1% and that of males 18.3%. Youth unemployment rate according to the Census figures 34.4%.- challenge with especially very high youth unemployment rate of females.

The largest employing industries in Steve Tshwete trade (including tourism), community services, finance and mining. Concern about the high-unemployed youth & especially females relatively low level of education and inadequate skills impact negatively on their employability.

- Importance of quality and relevant education and training in line with the economic needs of the province.

Increase in employment level between 2016 & 2020, but at a modest rate of 1.0% p.a. Average annual employment growth deteriorated when compared with the growth of 4.7% p.a. between 2011 and 2015.

STLM is contributing 10.3% to the total employment in the province. Looking at this as well as its economic contribution, STLM is supposed to create at least 10 000 new and sustainable jobs per annum. In fact, even closer to 14 000 jobs. For now, it should have an annual job creation target of at least 5 000 new jobs per annum.

Water Services

Water services are provided in 95.6% households in the STLM with a backlog of 4.31% mostly in rural areas and the municipality's Blue drop status was at 97.1% in 2013/14 financial year

In the holiday towns of Kranspoort and Presidentsrus (Proclaimed town ship) the communities also have a full level of service. Villages and CPA lands are in general served with systems fed from boreholes, using communal taps, with the systems meeting the criteria for a basic level of service in line with RDP standards.

In the rural areas the municipality has initiated a program to provide basic water (25 L per person per day) to households. Supply consists of elevated 5 kl plastic storage tanks supplied mainly by mobile tankers, and in some instances from existing borehole installations or, in isolated cases by municipal



borehole pumps. More than 165 of these tanks have been erected and water is provided to 550 HH in Rural Area, illustrating the commitment of the municipality to meet the needs of its community. Insufficient water infrastructure and high population growth in rural areas such as Doornkop, Somaphepha and Sikhululiwe. The communities are served on an RDP standard which relies on borehole water. High vandalism rate and theft is impeding progress in the provision of services.



8.3. Impacts and Risks Identified

The following information was obtained from impacts and risks identified by the specialists.

Table 10 below contains preliminary potential impacts that have been identified for the Arnot Colliery Mining Right Renewal Application project. A detailed risk assessment will be undertaken as part of the EIA/EMPr, in which the duration, probability, magnitude and reversibility of the impacts will be determined, and the significance of the impact calculated. Potential cumulative impacts have also been determined and are presented in Table 11.

Table 11: Preliminary determination of potential Impacts associated with the Arnot Colliery Mining Right Renewal Application

Environmental component	Activity	Potential Impact description
Geology	Altering the geology with the open cast and underground mining activities	Loss of minerals resources and unavoidable impact/destruction to geological reserves and rock structures...
Topography	Alteration of the natural drainage patterns	The proposed open cast and underground mining activities will change the existing topography by altering the slope and stability of the existing topography
		Temporary stockpiling of Overburden, ROM coal stockpile, topsoil, construction and operation of the surface infrastructure will cause a temporary minor change in topography until the closure of the mine when the infrastructure will be demolished
Soil, land use and land capability	Clearing of soil	The removal of topsoil may result in the mixing of the horizons of the soil that will have an impact on the fertility and production potential of the soil.
		The temporary stockpiling of topsoil may result in a decrease in the fertility of the soil and the leaching of minerals due to exposure of the soil to elements.
		A loss of microbes and viable seed may occur as a result of the temporary stockpiling of topsoil.
		Soil compaction and topsoil loss through erosion may occur as a result of the mining and mining related activities (including the temporary stockpiling). This will further lead to a loss of soil fertility.



Environmental component	Activity	Potential Impact description
		<p>The construction of the waste rock dumps may impact on soil in terms of compaction and possible spillages from machinery.</p> <p>Ineffective erosion control along haul roads may lead to siltation of downstream water resources and scouring of soil.</p>
Surface water	<p>Surface water contamination</p> <p>alteration of natural drainage patterns and catchment yield</p>	<p>In the event of chemical or hydrocarbon spillages on soil, surface water runoff that comes into contact with the soil may become contaminated and enter the receiving environment and / or water resources. This will have an impact on surface water quality.</p> <p>Surface water contamination may occur should the separation of clean and dirty water management areas not be effectively implemented.</p> <p>Possible failure of the proposed pollution control dam at Arnot Colliery, which will lead to surface water contamination.</p>
Groundwater	Groundwater contamination	<p>Potential seepage of water to the groundwater regime may contaminate groundwater resources.</p> <p>Groundwater quality may be impacted in the event of a spillage of chemicals or hydrocarbon materials (e.g. oil spill from vehicles and machinery).</p> <p>Numerous pollution sources exist which have the potential to contaminate groundwater. The contamination of groundwater will occur during all phases of development and may continue long after closure.</p>
Biodiversity	<p>Clearing of indigenous vegetation</p> <p>Mining activities</p>	<p>The mining activities will disturb vegetation and may impact on threatened or protected species</p> <p>The mining activities will disturb vegetation and may lead to disturbances of fauna species.</p> <p>The mining activities will disturb vegetation and may lead to disturbances of avifauna species.</p>



Environmental component	Activity	Potential Impact description
		The mining activities will disturb and impact on freshwater ecology features
	Rehabilitation and closure activities	The rehabilitation and closure activities will disturb vegetation and may lead to the spread and growth of alien plants.
		The rehabilitation and closure activities will disturb vegetation and may lead to disturbances of fauna species.
		The rehabilitation and closure activities will disturb vegetation and may lead to disturbances of avifauna species.
Sites of archaeological and cultural importance	Open cast mining activities	There is a large cemetery containing between 40 to 60 graves present on the eastern border of the property. The potential impact of the development on the graves due to earth moving equipment/machinery (for example haul trucks, front end loaders, excavators, graders, dozers) during construction activities.
Sensitive landscapes	Establishment of open cast pit within an existing drainage line, river stream	Change in topography - increase in surface water quantities Seepage and runoff – Change in surface water and groundwater quality. Stream diversion
	Construction of haul roads and placement of softs and hard and berms on within 500 m of river/ natural drainage line	Change in surface hydrological patterns and processes within drainage line.
Air quality	Construction and use of infrastructure associated with Arnot	During the transport of the mined material, and rehabilitation activities, dust (particulate matter, PM10 and PM 2.5) may be generated that may have an impact on the ambient air quality of the area.



Environmental component	Activity	Potential Impact description
	Colliery Mining activities.	All vehicles and mining machinery may have an impact on the air quality of the surrounding area as a result of the emissions released by the vehicles and machinery. Generation of dust from stripping activities, blasting and mining.
Noise	Increase in noise levels and disturbance	Noise pollution can be measured as noise disturbance and/or cause noise nuisance, both of which will have different impacts on the receiving environment and receptors.
Visual	Construction and use of infrastructure associated with the Arnot Colliery Mining activities.	Visual intrusion caused by surface disturbances, excavations and stockpiling of material on oversized dumps for extended periods. The occurrence of windblown dust may aggravate unsightly conditions.
Socio-economic	Construction and use of infrastructure associated with the Arnot Colliery Mining activities.	Job security of the mine's current employees will continue, along with other benefits arising from the Social and Labour Plan.

8.4. Methodology used in determining and ranking potential environmental impacts and risks

8.5.1 Methodology to be applied during the EIA and EMPr phase

The environmental risk of any aspect is determined by a combination of parameters associated with the impact. Each parameter connects the physical characteristics of an impact to a quantifiable value to rate the environmental risk.

Impact assessments should be conducted based on a methodology that includes the following:

- Clear processes for impact identification, predication and evaluation.
- Specification of the impact identification techniques.
- Criteria to evaluate the significance of impacts.
- Design of mitigation measures to lessen impacts.
- Definition of the different types of impacts (indirect, direct or cumulative).



- Specification of uncertainties.

After all impacts have been identified, the nature and scale of each impact can be predicted. The impact prediction will take into account physical, biological, socio-economic as well as cultural heritage information and will then estimate the likely parameters and characteristics of the impacts. The impact prediction will aim to provide a basis from which the significance of each impact can be determined, and appropriate mitigation measures can be developed. The risk assessment methodology is based on defining and understanding the three basic components of the risk, i.e., the source of the risk, the pathway and the target that experiences the risk (receptor).

Table 12 and Table 14 below indicates the methodology to be used in order to assess the Probability and Magnitude of the impact, respectively, and provides the Risk Matrix that will be used to plot the Probability against the Magnitude in order to determine the Severity of the impact.

Table 12: Determination of Probability of impact

Score	Frequency of Aspect / Unwanted Event	Availability of Pathway from the source to the receptor	Availability of Receptor
1	Never known to have happened, but may happen	A pathway to allow for the impact to occur is never available	The receptor is never available
2	Known to happen in industry	A pathway to allow for the impact to occur is almost never available	The receptor is almost never available
3	< once a year	A pathway to allow for the impact to occur is sometimes available	The receptor is sometimes available
4	Once per year to up to once per month	A pathway to allow for the impact to occur is almost always available	The receptor is almost always available
5	Once a month - Continuous	A pathway to allow for the impact to occur is always available	The receptor is always available

Step 1: Determine the PROBABILITY of the impact by calculating the average between the Frequency of the Aspect, the Availability of a pathway to the receptor and the availability of the receptor.



Table 13: Determination of Severity of impact

Environmental Impact Rating / Priority					
	MAGNITUDE				
Probability	1 Minor	2 Low	3 Medium	4 High	5 Major
5 Almost Certain	Low	Medium	High	High	High
4 Likely	Low	Medium	High	High	High
3 Possible	Low	Medium	Medium	High	High
2 Unlikely	Low	Low	Medium	Medium	High
1 Rare	Low	Low	Low	Medium	Medium

Step 3: Determine the SEVERITY of the impact by plotting the averages that were obtained above for Probability and Magnitude.



Table 14: Determination of Magnitude of impact

Score	Source				Receptor	
	Duration of impact	Extent	Volume / Quantity / Intensity	Toxicity / Destruction Effect	Reversibility	Sensitivity of environmental component
1	Lasting days to a month	Effect limited to the site. (metres);	Very small quantities / volumes / intensity (e.g., < 50 l or < 1 ha)	Non-toxic (e.g., water) / Very low potential to create damage or destruction to the environment	Bio-physical and/or social functions and/or processes will remain unaltered.	Current environmental component(s) are largely disturbed from the natural state.
2	Lasting 1 month to 1 year	Effect limited to the activity and its immediate surroundings. (tens of metres)	Small quantities / volumes / intensity (e.g. 50 l to 210 l or 1 ha to 5 ha)	Slightly toxic / Harmful (e.g. diluted brine) / Low potential to create damage or destruction to the environment	Bio-physical and/or social functions and/or processes might be negligibly altered or enhanced / Still reversible	Receptor of low significance / sensitivity
3	Lasting 1 – 5 years	Impacts on extended area beyond site boundary (hundreds of metres)	Moderate quantities / volumes / intensity (e.g. > 210 l < 5000 l or 5 – 8 ha)	Moderately toxic (e.g. slimes) Potential to create damage or destruction to the environment	Bio-physical and/or social functions and/or processes might be notably altered or enhanced / Partially reversible	Current environmental component(s) are moderately disturbed from the natural state.
4	Lasting 5 years to Life of Organisation	Impact on local scale / adjacent sites (km)	Very large quantities / volumes / intensity (e.g. 5000 l – 10 000 l or 8 ha– 12 ha)	Toxic (e.g. diesel & Sodium Hydroxide)	Bio-physical and/or social functions and/or processes might be considerably altered or enhanced / potentially irreversible	No environmentally sensitive components.
5	Beyond life of Organisation / Permanent impacts	Extends widely (nationally or globally)	Very large quantities / volumes / intensity (e.g. > 10 000 l or > 12 ha)	Highly toxic (e.g. arsenic or TCE)	Bio-physical and/or social functions and/or processes might be severely/substantially altered or enhanced / Irreversible	Current environmental component(s) are a mix of disturbed and undisturbed areas.

Step 2: Determine the MAGNITUDE of the impact by calculating the average of the factors above.



8.5. Knowledge gaps, assumptions, and limitations

In terms of the EIA Regulations GN R982 Appendix 1(3)(o), the EAP must provide a description of any assumptions, uncertainties and gaps in knowledge upon which the impact assessment has been based.

The following assumptions, uncertainties and gaps in knowledge were identified:

Aquatic Biodiversity Assessment

- The report is based entirely on desktop methods and although guided by experience, the findings should be verified in field during the summer season.
- The information provided by the client forms the basis of the planning and layouts discussed.
- No alternatives were available for assessment at the time of writing this report. This requirement of GNR982 (as amended by GN326) could therefore not be addressed.
- Formal vegetation sampling was not done by the specialist. All vegetation information recorded was based on the onsite visual observations of the author. Furthermore, only dominant, and noteworthy plant species were recorded. Thus, the vegetation information provided has limitations for true botanical applications.
- The recreation grade GPS used for wetland and riparian delineations is accurate to within five meters.
- Watercourse delineation plotted digitally may be offset by at least five meters to either side. Furthermore, it is important to note that, during the course of converting spatial data to final drawings, several steps in the process may affect the accuracy of areas delineated in the current report. It is therefore suggested that the no-go areas identified in the current report be pegged in the field in collaboration with the surveyor for precise boundaries. The scale at which maps and drawings are presented in the current report may become distorted should they be reproduced by for example photocopying and printing.

Terrestrial Fauna

- The animal species guidelines (SANBI, 2020) require assessment of potential areas of influence. The current report does explore areas of influence beyond site borders where relevant (for example downstream and catchment level impacts to potential fauna habitats and ecological corridors, or the migration / dispersion pathways of animals from conservation areas). Working with various fauna means the area of influence varies, but the discussion within this report is deemed to be more than adequate to address the areas of potential influence, although they are not all necessarily mapped.
- The animal species protocols require academic-level information on species population demographics which is not possible with mobile animals that are startled by and run away from, observers. Where such information is readily available, or can be collected during field surveys, this will be done in accordance with the protocols.



- A few species are data deficient species, such as the Maquassie Musk Shrew relevant to the study site. Information on species is limited and extrapolation is often required. A cautionary approach has been taken with such species.

Terrestrial Vegetation Assessment

- The results of this report rely on the accuracy of available literature, data from provincial and national data bases and spatial data.
- The information in this report relied entirely on existing data and no site visit was undertaken at this stage.

Palaeontological Impact Assessment

- Most development areas have never been surveyed by a palaeontologist or geophysicist.
- Variable accuracy of geological maps and associated information.
- Poor locality information on sheet explanations for geological maps.
- Lack of published data.
- Lack of rocky outcrops.

Visual Assessment

- A Visual Impact Assessment is not a purely objective science and often integrates qualitative evaluations based on human perceptions. It is the visual specialist's aim to utilise as much quantitative data and scientific research as possible, to substantiate professional judgement and to motivate subjective opinions.
- The project is still in a planning phase and the project description and layout reflected in this report are considered conceptual and will be assessed as a draft layout until such time that the final layouts are provided.
- It is uncertain whether a beneficiation facility will be constructed on site, but at the moment, the plan is to transport coal to a nearby beneficiation facility. For this study no beneficiation facility is assessed.
- No comments or complaints have been received from the public prior to the writing of this report and could therefore not be incorporated. If, at any point, public responses highlights concern with regards to visual impacts, this report should best be revised.
- The visual specialist did a single site inspection on 21 June 2023 and the photographs shown in this report represents the landscape character during winter. Time and budget constraints prevented the specialist to conduct site inspections during other seasons. However, the information gathered during the site inspection is considered sufficient in order to conduct an accurate landscape characterisation.
- Many of the surrounding properties have strict access restrictions due to mining activity or private properties and could therefore not be visited to record views from those locations. This is however not seen as a limitation as the study area feature few sensitive visual and landscape receptors and



the areas that were accessible, provided the necessary information to fulfil the requirements of the assessment.

- The viewshed analyses reflected in this report indicates the extent of the potential Zone of Visual Influence (ZVI) based on the topography alone, thereby not considering the screening effect of vegetation or other anthropogenic elements. It can therefore be considered a worst-case scenario assessment. This provides a first order impression of the ZVI and additional interpretations is required for a more accurate assessment; and
- An accurate topographical survey of the study area is not available. As a substitute, a 30mx30m SRTM grid is used, but due to its coarse resolution, it does not reflect minor topographical variations. Therefore, a degree of inaccuracy may be encountered when processing data based on the SRTM grid. However, in terms of the scale of the assessment, these inaccuracies are considered minor, and the first order data is sufficient to make the required assessments.

Noise Impact Assessment

- Ambient sound levels are the cumulative effects of innumerable sounds generated at various instances both far and near. A high measurement may not necessarily mean that the area is always noisy. Similarly, a low sound level measurement will not necessarily mean that the area is always quiet, as sound levels will vary over seasons, time of day, dependant on faunal characteristics (mating season, dawn chorus (20) early hours of the morning, temperature etc.), vegetation in the area and meteorological conditions (especially wind).
- Seasonal changes in the surrounding environment can influence typical ambient sound levels, as many faunal species are more active during warmer periods than the colder periods. As an example, cicada is usually only active during warmer periods. Certain cicada species can generate noise levels up to 120 dB for mating or distress purposes, sometimes singing in synchronisation magnifying noise levels they produce from their tymbals ⁽²¹⁾
- Some equipment that could influence measurements may be missed when deploying instruments, or the equipment may not be audible. This could include equipment such as hidden water pumps and associated pipelines and outflows, ESKOM stepdown transformers, hidden compressors, inverters, condensers or other electrical equipment, etc. While not audible during deployment, such equipment may significantly influence ambient sound levels during quiet periods.
- Measurements over wind speeds of 3 m/s could provide data influenced by wind-induced noises. However, when determining the ambient sound levels associated with increased wind speeds, it is desired to measure ambient sound levels at higher wind speeds.



8.6. Positive and negatives that the Arnot Colliery Mining Project and alternatives will have on the environment and community affected

The positive and negative implication of the Arnot Colliery Mining Project and the alternative identified have been provided below and assessed in terms of the following four categories:

- Environmental.
- Technical/Engineering.
- Economical.
- Social.

The positive and negative impacts of both the proposed activities and the preliminary identified alternatives will be further assessed as part of the EIAR/EMPr. Refer to Table 15.

Table 15: Advantages and disadvantages of the Technology Alternative versus the No-Go option

Alternative	Advantages	Disadvantages
Location alternative for proposed Mining Right Renewal (Braamspruit, Tweefontein, Arnot West)		
Location (preferred)	<p>Environmental: Impacts will be limited to proposed mining footprint area. The area has not been mined yet. Mining will take place in a previously disturbed area.</p> <p>Technical/Engineer: Coal reserves are easier to be accessed.</p> <p>Economical: Mining of coal contributes massively to the economy of the Country.</p> <p>Social: Job opportunities will be retained, providing income for the local communities.</p>	<p>Environmental: None identified</p> <p>Technical/Engineer: None identified.</p> <p>Economical: the economy of the country will be affected.</p> <p>Social: No jobs will be created for the local community.</p>
Site layout / Infrastructure layout plan alternative		
Affected water separation and capturing		
Construction of PCD	<p>Environmental: The affected water runoff from the Workshops, Screening and crushing Plant, ROM stockpile and Northern pit will be captured in the PCD</p> <p>Technical/Engineer: Less storm water management measures required.</p>	<p>Environmental: Location of the PCD is closer to the infrastructure on the Northern Section, too far from the Southern Section</p> <p>Technical/Engineer: A pipeline from the Southern section will be needed to Direct water to the PCD.</p>



Alternative	Advantages	Disadvantages
	<p>Economical: The preferred location of the PCD is smaller, reducing the construction and management costs</p> <p>Social: None identified</p>	<p>Economical: More costs will be incurred from additional trenches/storm water channels directing water from the Southern section to the PCD</p> <p>Social: None identified</p>
<p>Construction of water sumps, pipeline to the Combined Water Treatment Plant</p>	<p>Environmental: Affected water will be directed/ transmitted in pipelines to the treatment plant.</p> <p>Technical/Engineer: Less storm water management measures required.</p> <p>Economical: The treatment plant costs have been provided for.</p> <p>Social: None identified</p>	<p>Environmental: Risk of affected water leaking from the pipeline into clean water environment</p> <p>Technical/Engineer: The pipeline will be 7 km long or longer.</p> <p>Economical: The construction of a 7km Long Pipeline may result in high costs.</p> <p>Social: None identified</p>
Clean Water Supply		
<p>Abstraction of clean water from boreholes</p>	<p>Environmental: Clean water will be extracted from the underground.</p> <p>Technical/Engineer: Pumping equipment required.</p> <p>Economical: The pumping equipment may be cheaper than the pipeline option.</p> <p>Social: None identified</p>	<p>Environmental: Reduction of water volumes</p> <p>Technical/Engineer: The pumping equipment will regularly need maintenance.</p> <p>Economical: The pumping equipment may result in higher costs.</p> <p>Social: Less jobs created</p>
<p>Construction of pipeline from the Water Treatment plant to supply water at the Mining Area</p>	<p>Environmental: clean water will be directed in pipelines from the treatment plant and supplied to new mining area.</p> <p>Technical/Engineer: Less storm water management measures required.</p> <p>Economical: The treatment plant costs have been already provided for.</p> <p>Social: None identified</p>	<p>Environmental: Leaks in the pipelines which result in water loss/ waste</p> <p>Technical/Engineer: None identified</p> <p>Economical: the construction of the pipeline may be expensive since the distance from the treatment plant to the mining area is large which means a longer pipeline and will be needed</p> <p>Social: None identified</p>

Location alternative for the access road



Alternative	Advantages	Disadvantages
<p>Access Road 1 on the Northern section</p>	<p>Environmental: There will less removal of vegetation and destruction habitats since the road will be shorter</p> <p>Technical/Engineer: Easy Access to the Provincial Road, closer to the screening plant and ROM stockpile area.</p> <p>Economical: Shorter distance between the Provincial Road and the ROM stockpile area, screening plant, Mine Offices which may result in less traffic in the Mine area.</p> <p>Social: Less traffic within the Mine</p>	<p>Environmental: None identified</p> <p>Technical/Engineer: None identified.</p> <p>Economical: None identified</p> <p>Social: None identified</p>
<p>Access Road 2 on the Southern section</p>	<p>Environmental: the access will be located further away from the Bosmanspruit</p> <p>Technical/Engineer: Easy Access to the Provincial Road and to the ROM stockpile area.</p> <p>Economical: Transportation of coal product from the site to the wash plant.</p> <p>Social: More job opportunities will be created since more drivers will be needed to transport the coal from the site to the Wash plant.</p>	<p>Environmental: None identified.</p> <p>Technical/Engineer: This access road is further away from the ROM stockpile area</p> <p>Economical: Longer distance to the ROM stockpile area, mine offices, workshops which could cause traffic in the Mine area and affect other activities.</p> <p>Social: Traffic congestion within the Mine from the Southern to the Northern Section</p>
<p>Technological (alternative)</p>	<p>Environmental: Underground mining (Bord and Pillar Method) will result in no impacts to the vegetation and fauna.</p> <p>Technical/Engineer: None identified.</p> <p>Economical: More coal will be extracted by means of this method.</p> <p>Social: Job opportunities will be created providing income for the local communities.</p>	<p>Environmental: None identified</p> <p>Technical/Engineer: None identified</p> <p>Economical: None identified</p> <p>Social: None identified.</p>
<p>No-go option</p>	<p>Environmental: Status quo of the site will remain as is. No environmental impacts will occur as a result of the mining and related activities.</p>	<p>Environmental: No opportunity to improve the environment in the area</p> <p>Technical/Engineer: None identified.</p>



Alternative	Advantages	Disadvantages
	<p>Technical/Engineer: No infrastructure and resources required.</p> <p>Economical: None identified.</p> <p>Social: None identified.</p>	<p>Economical: Loss of income from not mining the mineral reserve</p> <p>Social: Opportunity lost in creating job opportunities.</p>

9. Plan of study for the Environmental Impact Assessment Process

9.1. Description of alternatives

Refer to sections 8.1 and 8.7 above for a description of the alternatives that have been identified.

9.2. Description of the aspects to be assessed as part of the environmental impact assessment process

As part of the proposed Arnot Colliery Mining Project, the following aspects of the environment will be considered and include:

- Geology
- Climate
- Topography
- Soil and Land Use
- Vegetation
- Fauna
- Hydrology
- Terrestrial Biodiversity
- Air Quality
- Noise
- Archaeology and Cultural History
- Visual Aspects
- Regional socio-economic structures
- Traffic



9.3. Description of aspects to be assessed by specialists

The following specialist studies were identified:

- Geotechnical Assessment
- Wetland Delineation and Functional Assessment
- Terrestrial Biodiversity Assessment (Flora and Fauna)
- Phase 1 Heritage Impact Assessment
- Palaeontology Impact Assessment
- Flood line determination Assessment
- Visual Impact Assessment
- Noise Impact Assessment
- Blasting and Vibration
- Soil and Land Use Capability Study
- Social Impact Assessment
- Traffic Impact Assessment

Proposed method of assessing the environmental aspects including the proposed method of assessing alternatives

9.4.1 Proposed method of assessing environmental aspects

The method for assessing the environmental aspects have been described in Section 8.6.2 above.

9.4.2 Proposed method of assessing alternatives

Refer to Sections 8.1 and 8.6 above for the description of alternatives identified and for the advantages and disadvantages of the identified alternatives.

9.4. The proposed method of assessing duration and significance

Refer to Section 8.6 above for the methodology used in determining and ranking potential environmental impacts and risks.

9.5. The stages at which the Competent Authority will be consulted

The Competent Authority, in this case the Department of Mineral Resources and Energy (“DMRE”) will be consulted throughout the application process.

This Scoping Report is compiled and will be made available for public and stakeholder review for a period of thirty (30) days. This Scoping Report will be submitted to the DMRE, where after DMRE will have 44 days to either refuse or accept the Scoping Report and inform the applicant to proceed with the tasks contemplated in the plan of study for the EIA.



The Competent Authority (DMRE) will further be involved during the EIA phase of the Arnot Colliery Mining Project. The EIA/EMPr will also be made available for a public and stakeholder review period of thirty (30) days. Upon completion of the review period, the EIA/EMPr will be finalised and submitted to DMRE, where after the DMRE will have a period of 107 days to consider the application and, in writing, notify the applicant of the decision to grant or refuse environmental authorisation.

9.6. Particulars of the public participation process with regard to the Impact Assessment process that will be conducted

9.7.1 Steps to be taken to notify interested and affected parties

Refer to section 8.2 that details the public participation to be undertaken as part of the Arnot Colliery Mining right Project.

9.7. Description of the tasks that will be undertaken as part of the environmental impact assessment process

The EIAR and EMPr will be submitted, once the Scoping Report has been accepted by the Competent Authority. The EIAR will be compiled in accordance with Appendix 3 of the EIA Regulations 2014, as amended and the EMPr will be compiled in accordance with Appendix 4 of the EIA Regulations 2014, as amended.

9.8. Measures to avoid, reverse, mitigate, or manage identified impacts

Table 16 below is the risk assessment table in which preliminarily identified impacts have been identified. Mitigations measures (to avoid, reverse, mitigate, or manage identified impacts) as well as the extent to which these impacts are anticipated to result in residual risks are also provided.



Table 16: Risk assessment table for the proposed Arnot Colliery Mining Project including alternatives.

Environmental component	Activity	Potential Impact description	Mitigation type Modify/ Remedy/ Control/Stop	Potential for residual risk
Geology	Extraction of coal reserves	Loss of minerals resources and unavoidable impact/destruction to geological reserves and rock structures.	there will be limited mitigation measures as the reserves will be permanently destroyed and cannot be recovered. The impact will be limited to the mining footprint only	High A residual impact will occur on the geology as the mining activities will occur.
Topography	Open cast and underground mining activities as well as placing of supporting infrastructure on the topography.	The establishment of a coal stockpile, topsoil stockpile and overburden dump will change the topography of the study area. Changes to the topography of the site will increase the amount of run-off which can subsequently lead to erosion. .	Control and modify: Backfilling the voids with softs and hard overburden, Revegetation with indigenous vegetation. Topsoil stockpiles and overburden must be persevered for backfilling purposes for rehabilitation.	Medium A residual impact on topography may occur due to open cast mining activities and stockpiling of Topsoil, overburden and ROM stockpiles
		The proposed open cast and underground mining activities will change the existing topography by altering the slope and stability of the existing topography.	Storm water management plan will accommodate for berms/channels around the mining footprint in order to contain runoff.	
Soil, land use and land capability	Clearing of soil	The removal of topsoil may result in the mixing of the horizons of the soil which will have an impact on the fertility and production potential of the soil.	Control: Limiting site clearance to areas where no alternative options exist.	Low. If mitigated / managed appropriately. If rehabilitation is not implemented adequately, a residual impact on land use and land capability may occur.
		The temporary stockpiling of topsoil may result in a decrease in the fertility of the soil and the leaching of minerals due to exposure of the soil to elements.	Strip topsoil in a manner to prevent the mixing of soil horizons. Soil will be stockpiled in accordance to soil horizons.	



Environmental component	Activity	Potential Impact description	Mitigation type Modify/ Remedy/ Control/Stop	Potential for residual risk
		<p>Soil compaction and topsoil loss through erosion may occur as a result of the mining and mining related activities (including the temporary stockpiling). This will further lead to a loss of soil fertility.</p>		
Surface water	<p>Mining and construction of the) will result in surface water contamination and alteration of natural drainage patterns</p> <p>Open cast Mining activities will intercept the Bosmanspruit which will result in Surface water contamination and alteration of natural drainage patterns</p>	<p>Open cast Mining activities will divert the natural drainage patterns.</p> <p>Mining activities and potential chemical or hydrocarbon spillages on soil, surface water runoff which comes into contact with the soil may become contaminated and enter the receiving environment and / or water resources. This will have an impact on surface water quality.</p>	<p>Control:</p> <p>Implementation of appropriate stormwater management around the excavation to prevent the ingress of run-off into the excavation and to prevent contaminated runoff into the watercourse. All vehicle and equipment usage should be limited to designated areas only.</p> <p>Store fuel and oil in designated bunded areas.</p> <p>Refuelling of vehicles to take place on an impermeable surface fitted with a sump to contain any spillages.</p> <p>Emergency spill kits should be available and emergency spills to be cleaned up quickly and effectively with approved absorbent material.</p>	<p>Low.</p> <p>If mitigated / managed appropriately.</p>
		<p>Surface water contamination may occur should the separation of clean- and dirty</p>	<p>Control:</p> <p>All mining related infrastructure must have runoff containment infrastructure (catchment channels).</p>	<p>Low.</p> <p>If mitigated / managed appropriately through</p>



Environmental component	Activity	Potential Impact description	Mitigation type Modify/ Remedy/ Control/Stop	Potential for residual risk
		water management areas not be effectively implemented.		implementation of effective storm water control.
	Construction associated infrastructure within 32 m of a watercourse (Bosmansspruit)		Control: Implementation of appropriate stormwater management around the excavation to prevent the ingress of run-off into the excavation and to prevent contaminated runoff into the watercourse. Provision of adequate sanitation facilities located outside the watercourse area or its associated buffer zone.	Low. If mitigated / managed appropriately through implementation of effective storm water control.
Groundwater	Open cast and underground mining activities	Potential seepage of water to the groundwater regime may contaminate groundwater resources.	Control: Monitoring boreholes should be identified on a gradient from site to ensure the extent of deterioration of groundwater is monitored post closure. Stop: Infrastructure design should be altered to minimise seepage where possible utilizing impermeable catchments to minimise infiltration and related seepage.	Low. If mitigated / managed appropriately, and to prevent/minimise groundwater pollution.
		Groundwater quality may be impacted in the event of a spillage of chemicals or hydrocarbon materials (e.g. oil spill from vehicles and machinery).	Modify and control: Maintenance of operating machines and vehicles only to take place in designated areas regularly. Approved environmentally friendly chemicals should be used as far as possible. All hydrocarbons must be stored in bunded areas. Spillages should be cleaned up and discarded correctly immediately after such an event occurs.	Low. If mitigated / managed appropriately.



Environmental component	Activity	Potential Impact description	Mitigation type Modify/ Remedy/ Control/Stop	Potential for residual risk
			Contractor induction should include environmental awareness and the correct action to take in the event of a hydrocarbon spill.	
		During the decommissioning phase, the underground voids will start filling with groundwater seepage to reinstate the equilibrium with surrounding aquifers.	<p>Modify and control:</p> <p>Minimizing infiltration to the underground voids is critical since elevated infiltration will cause higher decant rates of contaminated water that will need to be managed. The final surface needs to be free-draining to minimize recharge. A monitoring point be positioned in the mine void near the theoretical decant area to determine the actual recharge rate and use it for post-closure planning</p>	Low. If mitigated / managed appropriately.
Biodiversity	The removal of indigenous vegetation for the purpose of construction, access roads, and related infrastructure	The mining activities will disturb vegetation and may impact on threatened or protected species.	<p>Control and / or stop:</p> <p>Mitigation measures include:</p> <p>Limiting the footprint area, restricting the footprint area to areas of lower sensitivity as far as practical, and adherence to DAFF permit guidelines.</p> <p>Compile and implement a vegetation management plan that includes the management and relocation of sensitive plant species within the mining footprint.</p> <p>Apply for permits for the removal of provincial protected plant species prior to clearing of the land.</p> <p>Prevent disturbance to the adjoining natural vegetation cover.</p> <p>Revegetation should take place successively to re-establish vegetation as soon as possible after mining / activities in a specific area.</p>	<p>Medium to high.</p> <p>The removal of natural vegetation is regarded as a significant impact. However, should rehabilitation to as close as pre-mining conditions be undertaken appropriately and adequately, as well as the control of alien invasive species, a residual impact on vegetation may be prevented.</p>



Environmental component	Activity	Potential Impact description	Mitigation type Modify/ Remedy/ Control/Stop	Potential for residual risk
	Mining activities	Pollution and sedimentation of Bosmanspruit and vegetation	<p>Control and / or stop:</p> <p>Mitigation measures include:</p> <p>Impact area kept to the minimum.</p> <p>Implement an ecological / vegetation management plan that includes the management and relocation of sensitive plant species within the mining footprint or where it could be impacted on by edge effects.</p> <p>An independent Ecological Control Officer (“ECO”) should be appointed to oversee construction.</p> <p>A rehabilitation plan must be implemented. Use only species naturally occurring within the Eastern Highveld Grassland.</p> <p>Prevent vehicular access into natural areas beyond the demarcated area to be cleared. No off-road driving beyond designated areas may be permitted, especially not in natural vegetation</p>	Medium. Appropriate mitigation measures will be implemented which will result in reduction of the significance of the impact.
	Opencast mining activities within Bosmanspruit	<p>Loss of aquatic biota</p> <p>Loss of instream habitat, deposition of wind-blown sand, loss of fringing vegetation and erosion, alteration in base flow, natural fire regimes and subsequent loss of non-marginal and marginal vegetation</p>	<p>Preventative, Rehabilitation and Offset:</p> <p>Ensure that no unnecessary vegetation is removed during the construction phase.</p> <p>Avoid unnecessary aquatic ecosystem crossing - limit work within the stream, river or wetland. The use of single access points for crossings.</p> <p>Other than approved and authorized structure, no other development or maintenance infrastructure is allowed within the delineated watercourse or its associated buffer zones.</p> <p>Mark all areas which do not form part of the proposed development within the watercourse as no-go areas.</p>	High. Cutting through a Bosmanspruit will result in the disturbance of aquatic habitats.



Environmental component	Activity	Potential Impact description	Mitigation type Modify/ Remedy/ Control/Stop	Potential for residual risk
			<p>Implement weed control in aquatic ecosystem and buffer zones.</p> <p>Monitor the establishment of alien invasive species within the areas affected by the construction and maintenance of the proposed infrastructure and take immediate corrective action where invasive species are observed to establish.</p> <p>Incorporation of phytoremediation into the storm water attenuation systems to facilitate nutrient reduction, sediment regime control and manage toxicants releases.</p>	



Environmental component	Activity	Potential Impact description	Mitigation type Modify/ Remedy/ Control/Stop	Potential for residual risk
	Rehabilitation of all the disturbed areas	The rehabilitation and closure activities will disturb vegetation and may lead to disturbances of avifauna species.	<p>Modify and control:</p> <p>Mitigation measures include:</p> <p>Impact area kept to the minimum.</p> <p>All impact areas must be demarcated.</p> <p>Any fauna directly threatened by the activities should be removed to a safe location by the Environmental Officer (EO) or other suitably qualified person.</p> <p>The collection, hunting or harvesting of any plants or animals at the site should be strictly forbidden.</p> <p>All staff and contractors should undergo an environmental induction course by the EO.</p> <p>Fires should only be allowed within fire-safe demarcated areas.</p> <p>No fuelwood collection should be allowed on-site.</p> <p>All hazardous materials should be stored in the appropriate manner to prevent contamination of the site. Any accidental chemical, fuel and oil spills that occur at the site should be cleaned up in the appropriate manner as related to the nature of the spill.</p>	<p>Medium to high.</p> <p>Sensitive habitats will be disturbed and will be difficult to recover.</p>
Sites of archaeological and cultural importance	Construction of roads and mining associated infrastructure	Potential destruction of the cemetery and a fountain associated with it.	<p>Demarcate the cemetery and the fountain and mark as a "No go Area"</p> <p>Maintain 50 m buffer distance from the cemetery and fountain, no activities/ infrastructure will be allowed to be within 50 m from the cemetery and the fountain</p>	<p>High to medium permanent destruction of graves and the fountain which will be impossible to replace. however, should the graves be demarcated and protected from the activities , there will be no destruction/ impact.</p>



Environmental component	Activity	Potential Impact description	Mitigation type Modify/ Remedy/ Control/Stop	Potential for residual risk
Sensitive landscapes	Construction of haul roads, clean water and dirty water channels, open cast pits within Bosmanspruit,	Change in topography - increase in surface water quantities. Seepage and runoff – Change in surface water and groundwater quality.	Control: Wetlands should be demarcated to prevent unnecessary impact and loss of this habitat.	Medium. Sensitive wetland habitats will be lost, and the quality of ground and surface water will be affected.
		compaction of soil, the removal of vegetation, surface water redirection, changes to watercourse morphology or input of high energy surface water which could occur during construction and operation of the mining development	Stop: this is unavoidable a Watercourse offset plan and/or a Water use licence should be considered. In situations where wetland loss is unavoidable, creating or restoring wetlands elsewhere can help to replace lost hydrological functions. However, this is generally seen as a last resort, as created or restored wetlands may not fully replicate the functions of the original wetlands. Excavated materials (from any trenching) should not be contaminated, and it should be ensured that the minimum surface area is taken up. Implement Best Practice with regards to concrete mixing on site and control of waste and pollution	High. Sensitive aquatic habitats will be lost.
Air quality	Construction and use of infrastructure associated with the Arnot Colliery	During the transport of the mined material, and rehabilitation activities, dust (particulate matter, PM10 and PM2.5) may be generated which may have an impact on the ambient air quality of the area.	Control: Dust management to be done on all cleared areas and unpaved roads. Additional dust suppression to be implemented if deemed necessary. Equipment to be selected in such a manner as to minimise emissions and equipment to be serviced at regular intervals.	Low. Mining and related activities will have ceased after Closure, and therefore dust will no longer be generated.
		All vehicles and mining machinery may have an impact on the air quality of the surrounding area as a result of the emissions released by the vehicles and machinery.		
		Generation of dust from stripping activities, blasting and mining.		



Environmental component	Activity	Potential Impact description	Mitigation type Modify/ Remedy/ Control/Stop	Potential for residual risk
Noise	Mining activities and movement of vehicles will result in increased noise levels and disturbance.	Noise pollution can be measured as noise disturbance and/or cause noise nuisance, both of which will have different impacts on the receiving environment and receptors.	Control; Noise pollution is to be monitored regularly and night-time activities are to be kept to a minimum to lower noise pollution outside of daylight hours.	Low. Mining and related activities will have ceased after Closure, and therefore noise will no longer be generated.
Visual	Construction and use of infrastructure associated with the Arnot Colliery	Arnot Colliery Mining activities may be intrusive, in terms of visual aspects that may result in a change of sense of place to the local community. It is, however, important to note that the surrounding area is currently characterised by mining activities. Therefore, it is likely that regular passers-by and the local residents are desensitised to the mining activities.	Control and modify: All areas are to be rehabilitated concurrently and if the site must be lit at night, this will be done with low-UV type lights (such as most LEDs), which do not attract insects. Lights must also be placed in such a manner as to face inwards towards the mine as far as possible.	Medium. If rehabilitation is not implemented adequately, a residual visual impact may occur.
Socio-economic	Construction and use of infrastructure associated with the Arnot Colliery Mining activities.	Job security of the mine's current employees will continue, along with other benefits arising from the Social and Labour Plan.	Control: If possible, goods and services should be procured from local small businesses; this will stimulate indirect job creation. Knowledge sharing and on-the-job training should be viewed as a prerequisite, where feasible, for all contractor's/service providers working on the project and employing local labour. Continued inclusion of skills development programmes in the mine's Social and Labour Plan ("SLP").	Low. Job security will not continue after the mine has closed.



10. Other information required by the Competent Authority

10.1. Compliance with the provisions of section 24(4)(a) and (b): - read with section 24(3)(a) and (7) of the National Environmental Management Act 107 of 1998. The EIAR must include the:

10.1.1 Impact on the socio-economic conditions of any directly affected person

Table 17: Impact on the socio-economic conditions of any directly affected person

Results of investigation, assessment and evaluation of impact on any directly affected person	Reference to where mitigation is reflected
Arnot Colliery indicates that it strives to maintain a positive impact on the socio-economic environment during the life of mine. The mine indicates that it is actively involved in the community whereby funds are made available for the development of local infrastructure and social upliftment as indicated in the Social and Labour Plan.	Section 8.5

10.1.2 Impact on any national estate referred to in section 3(2) of the National Heritage Resources Act 25 of 1999.

Table 18: Impact on any national estate referred to in section 3(2) of the National Heritage Resources Act 25 of 1999

Results of investigation, assessment and evaluation of impact on any national estate	Reference to where mitigation is reflected
There is a large cemetery containing between 40 to 60 graves present on the eastern border of the property. Owing to vegetation covering the whole burial ground, and the condition of the graves, it was difficult to establish the exact number	Refer to Table 16 under Section 9.8 above.

11. Other matters required in terms of section 24(4)(a) and (b) of the Act

No additional matters in terms of section 24(4)(a) and (b) have been identified.



Undertaking

The EAP herewith confirms

- the correctness of the information provided in the reports;
- the inclusion of comments and inputs from stakeholders and I&APs ;
- the inclusion of inputs and recommendations from the specialist reports where relevant; and
- the acceptability of the project in relation to the finding of the assessment and level of mitigation proposed



Signature of EAP

Date: 31 August 2023

12. Declaration of independence

Shangoni hereby declares that it is an independent EAP has no business, financial, personal, or other interest in this project in respect of which Shangoni is appointed. Furthermore, no circumstances exist that may compromise the objectivity of Shangoni, excluding fair remuneration for work performed in connection with this project.

**Report compiled
by:**

Seli Mahlangu

Report reviewed by:

Jan Nel

