CABANGA environmental

Telephone: +27 11 794 7534
Fax: +27 11 794 6946
E-mail: info@cabangaenvironmental.co.za

Pan African Resources PLC

Barberton Mines (Pty) Ltd

Fairview Mine

Barberton, Mpumalanga

Proposed Fairview TSF and reclamation of historic dumps

Scoping Report

LICENCE NUMBER: MP/30/5/1/2/2/191 MR

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Unit 5 & 6 Beyers Office Park, Bosbok Road, Randpark Ridge
Postnet Suite 470, Private Bag X3, Northriding, 2162 • www.cabangaenvironmental.co.za
Members: K.C. van Rooyen • J. Barrett • O.M. Senosi

Telephone: +27 11 794 7534
Fax: +27 11 794 6946
E-mail: info@cabangaenvironmental.co.za

Prepared for:	
Company	Barberton Mines (Pty) Ltd
Site	Fairview Mine
Contact Person	Mandla Ndlozi
Telephone	+27(0) 11 243 2900
E-Mail	mandlan@bmines.co.za

Completed by independent EAP	
Company	Cabanga Environmental
Author	Lelani Claassen
Reviewer	Jane Barrett, Ken van Rooyen
Telephone	+27 (0)11 794 7534
E-Mail	lelani@cabangaenvironmental.co.za

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Author:	Lelani Claassen	Signature:		Date:	08/10/2019 07/11/2019 06/01/2020
Reviewed:	Jane Barrett	Signature:		Date:	15/10/2019
Internal Approval:	Ken van Rooyen	Signature:		Date:	21/10/2019
Applicant Review:	Mandla Ndlozi	Signature:	Electronic approval	Date:	07/11/2019
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CABANGA environmental

Telephone: +27 11 794 7534
Fax: +27 11 794 6946
E-mail: info@cabangaenvironmental.co.za

Executive Summary

Barberton Mines (Pty) Ltd, which forms part of Pan African Resources PLC, owns and operates the existing Fairview Mine near the town of Barberton, Mpumalanga. Mining in the area commenced in the late 1880's.

At Fairview (Reference Number MP/30/5/1/2/2/191 MR) the Mining operation comprises underground gold mining, as well as surface reclamation of Tailings material. Ore is transported to the processing facilities at the Main Infrastructure Area where it is crushed and milled, before undergoing flotation to produce gold concentrate. Concentrate is further processed at the Biox Plant and the Carbon In Leach (CIL) Plant. Final concentrate is smelted on site to produce gold bullion.

Tailings waste produced by these processes, are currently being deposited on the existing Tailings Storage Facility (TSF) known as the BTRP TSF, or the New Bramber TSF. The BTRP/New Bramber TSF does not have sufficient capacity to facilitate ongoing production. Barberton Mines therefore proposes to construct a new facility at the site of the original Bramber TSF which has since been reclaimed. The proposed TSF will be referred to as the Fairview TSF.

Historical gold mining in the area has resulted in several waste dumps throughout the area. Many of these dumps still contain high percentages of gold. In addition to the proposed construction of the new Fairview TSF, Barberton Mines wishes to obtain the necessary authorizations to recover material from these historic dumps via mechanical methods and re-process the material in the existing Fairview Plant. This reprocessing has two main objectives, namely gold recovery from the deposits and environmental clean-up.

Prior to implementing the proposed projects, the Mine is required to apply for and obtain authorisation in terms of the following mining and environmental legislation:

- Amendment of the existing Environmental Management Plan (EMP) in terms of Section 102 of the Mineral and Petroleum Resources Development Act (No. 28 of 2002) (MPRDA);
- Environmental Authorisation for Listed Activities in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA);
- A Waste Management License (WML) in terms of the National Environmental Management Waste Act, 2008 (Act No 59 of 2008) (NEMWA);
- Potential Destruction permits for heritage resources in terms of the National Heritage Resources Act, 1999 (Act No. 25 of 1999) (NHRA);
- Potential Relocation Permits for Protected Plant Species in terms of the National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004) (NEMBA); and
- An Integrated Water Use License (IWUL) in terms of the National Water Act, 1998 (Act No. 36 of 1998) (NWA).

This report pertains specifically to the applications in terms of the MPRDA, NEMA, and NEMWA. Barberton Mines have submitted an application in terms of the MPRDA, the NEMA and NEMWA to the Department of Mineral Resources (DMR), who is the competent authority in respect of these applications. Potential Impacts to Air Quality, Biodiversity, Heritage Resources and Water Resources are also assessed as part of the Scoping and EIA Process.

This report constitutes the Scoping Report in terms of the abovementioned applications. The report was available for review by Interested and Affected Parties (I&APs) for a comment period of 30 days from 13 November to 13 December 2019. This report is now submitted to the DMR for consideration and decision-making, before the project can progress to the EIA phase.

Project Scope

This Application relates to three interrelated aspects:

- Application for Amendment of the existing Mining Right MP/30/5/1/2/2/191 MR, to
    - incorporate the Fairview Surface rights areas where existing Mine Infrastructure is located and ensure the activities occurring at the Fairview Mine are all integrated under one Right, and managed under one EMP;
    - accommodate the construction of the new Fairview TSF, at the site of the reclaimed Bramber TSF; and
    - accommodate the recovery of material from historic dumps and re-processing of this material at the existing Fairview processing plants.
- Application for Environmental Authorisation for new Listed Activities associated with the new Fairview TSF, and the proposed reclamation of the historic dumps.
- Application for a WML for the new TSF and reclamation of the historic dumps.

A Scoping and Environmental Impact Assessment (EIA) Process is relevant to the application.

Summary of the Project Description

The Fairview Mining Right Area (MRA) falls within the Mbombela Local Municipality of the Ehlanzeni District Municipality in the Mpumalanga Province.

Road access to the Fairview mine is via the existing Provincial Road D2195. The access road is tarred.

Internal vehicle movement at Fairview Mine is via a series of paved and unpaved roads. The roads at the main infrastructure areas are mostly tarred, only minor roads are gravel.

Access to the historic dumps in the eastern portion of the MRA is via various routes and tracks, mostly dirt tracks. Some of these have recently been upgraded by the Mine to facilitate access to these portions of the MRA. The majority of these tracks are considered pre-existing, but will need to be upgraded to facilitate the proposed reclamation.

The proposed project comprises the following components, discussed separately below:

- Proposed new TSF (the Fairview TSF); and
- Proposed reclamation of historic dumps.

Proposed Fairview TSF:

The design of the proposed new TSF is underway but not yet concluded.

The proposed new TSF footprint will not exceed 30 Ha. Deposition rate onto the TSF will be 100,000 tons per month. The final height of the facility will not exceed 35 metres from the lowest ground level. The design life of the facility is approximately 5 years. The proposed new TSF is at the footprint of the original Bramber TSF and will abut against the existing BTRP/New Bramber TSF.

Due to a reduced starter wall embankment size and in order to maintain an acceptable rate of rise, it may be required to continue deposition on the BTRP/New Bramber TSF at low tonnages over a three-year period. Material for the construction of the embankment will be sourced from the TSF footprint.

Proposed Reclamation:

Ten (10) historic waste dumps have been identified to date within the Fairview MRA, that the Holder wishes to recover. These dumps include waste rock and tailings material that resulted from past mining and processing activities (over the past 100 years). At the time these dumps were established, no legislation requiring the licensing of these dumps existed. These dumps were established in areas now included in the Fairview MRA. Accurate information about the exact dates these dumps were established is not available.

These dumps are located within the proclaimed boundaries of the Barberton Nature Reserve that overlaps with the Fairview MRA, in extremely mountainous terrain. The dumps are generally difficult to access and the current impact of these dumps relate primarily to surface water impacts as many of these dumps are located within or immediately adjacent to drainage lines.

The Mine proposes to recover this material via mechanical means (i.e. with Front-end-loaders or similar equipment), and transport the material via existing tracks (which will be upgraded) to the Fairview Mine Processing Plants. The areas will then be shaped and re-vegetated.

Environmental Context of the Project

The entire Fairview MRA falls within the current boundaries of the Barberton Nature Reserve (BNR) as identified in the South Africa Protected Areas Database (SAPAD). Barberton Mines holds the surface rights to those farms where the TSFs are located, west of the MRA and will also apply to have these surface right areas included in their MRA. The surface rights fall just outside of the BNR boundary.

The area on and around the site has been extensively affected by historic mining activities over the past 100 years. There are remnants of old waste rock dumps and TSFs scattered throughout the MRA.

Areas not directly affected by past mining contain relatively pristine vegetation. Various frogs and birds are known to occur in the area and bats frequent old mine adits throughout the site and surroundings. Anthropogenic influence has likely caused most larger mammals to migrate.

The site and surrounding areas contain numerous heritage resources including graves and structures older than 60 years, primarily associated with historic mining activity.

Legal Context of the Project

The Fairview Mine has consistently aligned with changing mineral regulation throughout its operational life, gaining approval in terms of Section 39 of the Minerals Act (No. 50 0f 1991) in 2003, and subsequently aligning with the requirements of the Mineral and Petroleum Resources Development Act (No. 28 of 2002) (MPRDA) in 2010.

The MPRDA holds that a mining right granted in terms of the MPRDA is a limited real right in respect of the mineral and the land to which such right relates. The Act further states that the

Holder of a Mining Right may access the land to which their Mining Right relates, and prospect, mine and produce on that land for the Mineral to which the Right pertains.

The MPRDA further states that nobody may mine without environmental authorisation (Section 5A). On the 2nd September 2014, the One Environmental System for mining came into effect making the NEMA the overarching National environmental legislation. In terms of Section 12(4) of the NEMA Amendment Act, 2008 (Act No. 62 of 2008) an EMP approved in terms of the MPRDA, prior to the One Environmental System coming into effect, is regarded as having been approved in terms of NEMA.

Changes to the approved activities (e.g. establishment of access roads and mechanical recovery of material from historic dumps, the establishment of a new TSF) will be subject to Environmental Authorisation being granted in terms of NEMA and the EIA Regulations, 2014 (as amended), and consent of the Minister of Mineral Resources in terms of Section 102 of the MPRDA.

The National Environmental Management Waste Act, 2008 (Act No. 59 of 2008) (NEMWA) requires that a Waste Management License (WML) be obtained for (among others) the establishment of Residue Stockpiles (like the proposed Fairview TSF). An application for a WML is also made and is an integrated process.

Fairview Mine also holds an approved Water Use License in terms of the National Water Act, 1998 (Act No 36 of 1998) (NWA). New water uses associated with the proposed activities will be applied for from the Department of Human Settlements, Water and Sanitation (DHSWS, formerly the Department of Water and Sanitation, DWS) through the Inkomati-Usuthu Water Management Agency (IUCMA) as the competent authority in respect of water use licensing in this area. This process is being managed by Escon Consulting.

Preliminary Impact Assessment

The purpose of the impact assessment is to determine the significance of potential impacts associated with the proposed project activities, so that those activities that are expected to result in substantial impacts can be altered, or management measures imposed to lessen the impact significance.

A detailed impact assessment will be undertaken as part of the EIA Phase. This scoping report only aims to identify preliminary anticipated impacts and their anticipated significance.

If appropriate management and mitigation measures are not implemented, the project is expected to impact on the receiving environmental aspects as follows:

- Destruction and degradation of floral communities and possible loss of species of conservation concern, due to direct destruction, pollution, poaching by mine employees or general disturbance and proliferation of alien and invasive species;
- Fauna mortalities or reduced faunal diversity due to increased human activities, vehicle and machinery operation and/or loss of suitable habitat;
- Loss of soil resources due to pollution, erosion or compaction;
- Deterioration of air quality due to dust and emissions;
- Increase in environmental noise;
- Reduced surface water quality due to pollution including sedimentation;

- Reduced groundwater quality due to pollution (spills) or mineral waste facilities leaching contaminants to the groundwater resource;
- Alteration of the visual character of the site;
- Negative social impacts, such as an influx of job seekers to the area, threats to employee safety, littering, fires, increased poaching due to an increased number of people on site and in the surroundings;
- Direct destruction of heritage resources or damage to heritage resources by ancillary activities (unauthorised driving outside of designated roads, employees accessing areas outside of the footprint etc.), or by direct means (reclaiming of historic dumps; and
- Positive social impacts associated with job creation (albeit temporary in nature) and job-retention due to the continued operation of Fairview Mine.

It is important to understand, in this context, that operations at Fairview Mine cannot continue if the Mine does not have sufficient tailings storage capacity. Thus, if the proposed Fairview TSF is not established, alternative disposal of tailings will have to be identified (which is limited to constructing another TSF or disposing of the tailings into underground workings), or the Fairview Mine will have to cease operations.

Plan of study for EIA

In summary, the tasks that will be undertaken as part of the EIA Process include:

1. Refine the project description so the detail is sufficient to identify each project-related activity that could impact on the surrounding environment;
2. Describe the likely nature of the impacts;
3. Define the significance of each impact, in the absence of management and mitigation measures;
4. Rank the impacts in order of significance and identify avoidance, management and/or mitigation measures for each;
5. Re-assess the impact significance taking the proposed management measures into account;
6. Compile the management measures into a comprehensive EMP that must be implemented during the different project phases and against which compliance can be audited (update the existing Fairview EMP to incorporate these new specific measures);
7. Formulate a monitoring and auditing plan for the proposed projects to ensure the EIA/EMP is regularly updated and will remain valid and relevant throughout the LoM, and that potential non-compliances can be addressed immediately;
8. Based on the impact significance, after mitigation measures have been applied, formulate a professional opinion on the benefits and risks of the project to assist the decision-making authorities in assessing the merit of the Project and reaching a decision on the Project.

All the preceding steps go hand-in-hand with public and authority consultation as well as specialist input. The following specialist studies have been commissioned as part of the EIA Process:

- Groundwater Impact Assessment;
- Terrestrial Biodiversity Assessment (Flora and Fauna);
- Freshwater Ecological Assessment (Aquatic Assessment and wetland identification);
- Soils and hydro-pedology Assessment;
- Heritage and Palaeontological Assessments; and
- Air quality Impact Assessment.

In addition to the specialist studies commissioned as part of the EIA Process, a Rehabilitation plan will be compiled and financial provision for closure of the Project elements will be calculated.

Public Participation

The public participation process (PPP) aims to involve the authorities and interested and affected parties (I&APs) in the project process; and determine their needs, expectations and perceptions. An open and transparent process was and will be followed at all times and is based on the reciprocal dissemination of information.

The PPP comprises the following phases / steps:

1. Identify all relevant stakeholders, including (but not limited to) affected and adjacent land owners and occupants, relevant government institutions and NGO's, the relevant municipalities and ward councillor and any other person who may have an interest in the Project;
2. Compile a register of all I&APs as identified above and update the I&AP register throughout the process;
3. Undertake pre-application consultative meetings with the Department of Mineral Resources (DMR) as the competent authority in this application (this meeting was held on 17 October 2019). Other targeted consultation meetings may also be arranged with key role-players, such as the community meeting held on 5 November 2019;
4. Notify I&APs of the proposed project and application process via the following means:
    a. Publication of a newspaper advertisement in a popular local newspaper in English and Siswati (published in the News Horn on 13 November 2019);
    b. Display of posters (site notices) in English and Siswati at the project site and in prominent locations easily accessible to the public (displayed since 6 November 2019 at the site fence, mine village and Municipal Offices); and
    c. Distribute notification letters / background information documents (BIDs) to I&APs via e-mail, fax, post and hand delivery on site (done between 5-8 November 2019).
5. Make the Scoping Report available in digital and hard copy to I&APs for review and comment (The comment period was from 13 November 2019 to 13 December 2019). During the comment period, a scoping-phase public meeting was hosted (28 November 2019) in the form of an open day, to present the proposed project to I&APs, and gather their comments, thoughts and/or concerns. I&AP comments have been incorporated into the final scoping report for submission to the DMR (This Report).
6. Once the DMR approves the Scoping Report (including the Plan of Study for EIA), compile the EIA Report and similarly make the Report available to I&APs for review and comment. During the comment period, host an EIA-phase public meeting to present

the findings of the specialist assessments and EIA to I&APs, and gather their comments. Incorporate I&AP comments into the final EIA report and EMP, for submission to the DMR.

7. Once the DMR reaches a decision on the EIA and EMP, and communicates their decision to the Applicant, notify I&APs of the decision, reasons for the decision, and the appeal process that I&APs may follow if they do not agree with the decision or a part thereof.

Conclusion

This report constitutes the Scoping Report for the proposed Fairview TSF, and proposed reclamation of historic dumps at Fairview Mine.

The Report was made available to I&APs for a comment period of 30 days from 13 November 2019 to 13 December 2019, as follows:

- In hard copy at the Barberton Public Library; and
- On the Cabanga Environmental Website (Cabanga Environmental) (under "public documents" tab).

Hard copies of the report was also made available to I&APs who requested hard copies.

Details of the public meeting (open day) was communicated to I&APs on 12 November 2019 via e-mail and sms.

Following conclusion of the comment period, this report was updated with comments and additional information received from I&APs, and is submitted to the DMR for consideration. The EIA phase will commence after conclusion of the scoping phase, and registered I&APs will be kept informed of the Project progress.

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ACRONYMS AND ABBREVIATIONS

ACRONYM	DESCRIPTION:
AQIA	Air Quality Impact Assessment
ARD /AMD	Acid Rock Drainage / Acid Mine Drainage
BEE	Black Economic Empowerment
BML	Barberton Mines (Pty) Ltd
BNR	Barberton Nature Reserve
BTRP	Barberton Tailings Retreatment Plant
CARA	Conservation of Agricultural Resources Act, 1983 (Act No 43 of 1983)
CBA	Critical Biodiversity Area
CIL	Carbon In Leach
CRR	Comment and Response Report
DEA	Department of Environmental Affairs
DHSWS/ DWS	Department of Human Settlements, Water and Sanitation
DMR	Department of Mineral Resources
EAP	Environmental Assessment Practitioner
EAPASA	Environmental Assessment Practitioner's Association of South Africa
EIA	Environmental Impact Assessment
EIS	Ecological Importance and Sensitivity
EMP	Environmental Management Plan
ESA	Ecological Support Area
GIS	Geographic Information System
I&APs	Interested and Affected Parties
ICOMOS	International Council on Monuments and Sites
IDP	Integrated Development Plan
IEM	Integrated Environmental Management
IUCMA	Inkomati-Usuthu Water Management Agency
IUCN	International Union for the Conservation of Nature
IWUL(A)	Integrated Water Use License (Application)
IWWMP	Integrated Water and Waste Management Plan

ACRONYM	DESCRIPTION:
LoM	Life of Mine
MHSA	Mine Health and Safety Act, 1996 (No 29 of 1996)
MLM	Mbombela Local Municipality
MPRDA	Mineral and Petroleum Resources Development Act, 2002 (No. 28 of 2002)
MRA	Mining Right Area
MTPA	Mpumalanga Tourism & Parks Agency
MWP	Mine Work Programme
NAAQS	National Ambient Air Quality Standards
NAEIS	National Atmospheric Emissions Information System
NEMA	National Environmental Management Act, 1998 (Act No. 107 of 1998)
NEMAQA	National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004)
NEMBA	National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004)
NEMPAA	National Environmental Management: Protected Areas Act, 2003 (Act No 57 of 2003)
NEMWA	National Environmental Management Waste Act, 2008 (Act No 59 of 2008)
(N)FEPA	(National) Freshwater Ecosystems Priority Areas
NHRA	National Heritage Resources Act, 1999 (Act No. 25 of 1999)
NWA	National Water Act, 1998 (Act No. 36 of 1998)
PES	Present Ecological State
PPP	Public Participation Process
SABAP	South African Bird Atlas Project
SAPAD	South Africa Protected Areas Database
SCC	Species of Conservation Concern
SDF	Spatial Development Framework
SHEQ	Safety, Health, Environment & Quality
SLP	Social and Labour Plan
SPLUMA	Spatial Planning, Land Use and Management Act, 2013 (Act No. 16 of 2013)
SWMP	Stormwater Management Plan
TSF	Tailings Storage Facility
ULM	Umjindi Local Municipality
UNESCO	United Nations Educational, Scientific and Cultural Organization

ACRONYM	DESCRIPTION:
WHS	World Heritage Site
WMA	Water Management Area
WML	Waste Management License
WRC	Water Research Commission
WRD	Waste Rock Dump

1 Introduction

Barberton Mines (Pty) Ltd (BML), which forms part of Pan African Resources PLC, owns and operates the Fairview Mine, New Consort Mine, Sheba Mine and Barberton Tailings Retreatment Plant (BTRP) near the town of Barberton, Mpumalanga (Figure 1).

Mining in the Fairview area commenced in the 1880's. Today, Fairview Mine has an approved Mining Right (Reference Number MP/30/5/1/2/2/191 MR) and Environmental Management Plan (EMP) in terms of the Mineral and Petroleum Resources Development Act (No. 28 of 2002) (MPRDA) (Van Der Merwe, August 2010).

The Mining operation comprises underground gold mining through the No 11 Adit, as well as surface reclamation of Tailings material. Ore is transported from the No. 11 Adit via aerial ropeway to the processing facilities, while material is hydraulically reclaimed from Tailings facilities and piped to the processing facilities. Processing involves crushing, milling and flotation to produce gold concentrate, which is further processed at the Biox Plant and the Carbon In Leach (CIL) Plant. Final concentrate is smelted on site to produce gold bullion. Flotation Tailings and CIL Tailings are produced by these processes, Tailings is currently being deposited on a Tailings Storage Facility (TSF) known as the BTRP/New Bramber TSF.

Ongoing production will soon necessitate additional capacity for storage of Tailings material. BML therefore proposes to construct a new TSF at the site of the original Bramber TSF which has since been reclaimed. The new TSF will be referred to in this report as the Fairview TSF.

Due to the long history of gold mining in the area, several waste dumps resulting from historic mineral extraction and processing exist throughout the Area. Many of these dumps still contain high percentages of gold.

In addition to the proposed construction of the new Fairview TSF, BML wishes to obtain the necessary authorizations to recover material from these historic dumps via mechanical methods and re-process the material in the existing Fairview Plant. This reprocessing has two main objectives, namely gold recovery from the deposits and environmental clean-up.

BML is therefore required to apply for authorisation in terms of the following mining and environmental legislation:

- Amendment of the existing EMP in terms of Section 102 of the MPRDA;
- Environmental Authorisation for Listed Activities in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA), and the Environmental Impact Assessment (EIA) Regulations, 2014 (as amended);
- A Waste Management License (WML) in terms of the National Environmental Management Waste Act, 2008 (Act No 59 of 2008) (NEMWA) and the Regulations Listing Waste Management Activities that have, or are likely to have, a detrimental effect on the environment (as amended);
- Potential Destruction permits for heritage resources in terms of the National Heritage Resources Act, 1999 (Act No. 25 of 1999) (NHRA);
- Potential Relocation Permits for Protected Plant Species in terms of the National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004) (NEMBA); and

- An Integrated Water Use License (IWUL) in terms of the National Water Act, 1998 (Act No. 36 of 1998) (NWA) and the Water Use License Application (WULA) and Appeals Regulations, 2017[1].

BML has submitted an application in terms of the MPRDA, the NEMA and NEMWA to the Department of Mineral Resources (DMR), who is the competent authority in respect of these applications. The EIA process which is being undertaken also pertains to the applications required in terms of the NEMBA and NHRA. Potential Impacts to Air Quality, Ecology, Heritage Resources and Water Resources are also assessed as part of the Scoping and EIA Process.

This report constitutes the Scoping Report compiled in terms of the abovementioned applications, and is submitted to the DMR for consideration.

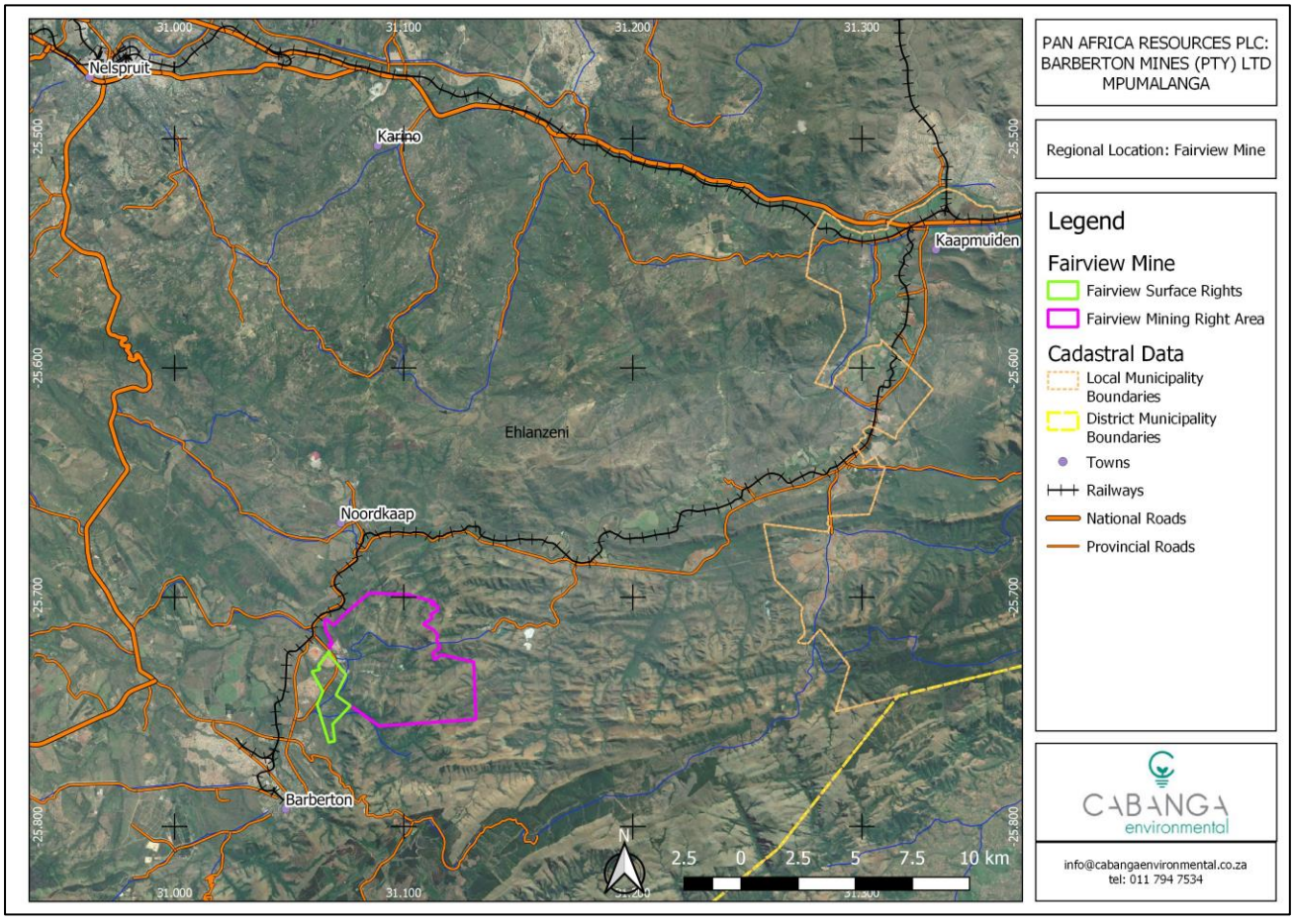


Figure 1: Regional Location of the Fairview Mine

[1] Please note the IWULA in terms of the NWA is being addresses directly with the Inkomati-Usuthu Catchment Management Agency (IUCMA) as part of a separate application process, managed by Escon Consulting.

1.1 Structure of the Report

The required content of a Scoping Report is prescribed in Appendix 2 of the EIA Regulations, 2014 (as amended). Table 1 presents these requirements and provides cross-references to the various sections of this report where the requirements are addressed.

Table 1: Structure of the Scoping Report

No	Requirement	Section of this report
1	A scoping report must contain the information that is necessary for a proper understanding of the process, informing all preferred alternatives, including location alternatives, the scope of the assessment, and the consultation process to be undertaken through the environmental impact assessment process, and must include:	
(a)	details of— (i) the Environmental Assessment Practitioner (EAP) who prepared the report; and (ii) the expertise of the EAP, including a curriculum vitae;	Section 1.2 Section 1.3
(b)	the location of the activity, including— (i) the 21-digit Surveyor General code of each cadastral land parcel; (ii) where available, the physical address and farm name; (iii) where the required information in items (i) and (ii) is not available, the coordinates of the boundary of the property or properties;	Section 2.2
(c)	a plan which locates the proposed activity or activities applied for at an appropriate scale, or, if it is— (i) a linear activity, a description and coordinates of the corridor in which the proposed activity or activities is to be undertaken; or (ii) on land where the property has not been defined, the coordinates within which the activity is to be undertaken;	See Appendix A for A3 Plans. Also See Figure 4 and Figure 5
(d)	a description of the scope of the proposed activity, including— (i) all listed and specified activities triggered; (ii) a description of the activities to be undertaken, including associated structures and infrastructure;	Section 2.3
(e)	a description of the policy and legislative context within which the development is proposed including an identification of all legislation, policies, plans, guidelines, spatial tools, municipal development planning frameworks and instruments that are applicable to this activity and are to be considered in the assessment process;	Section 3

No	Requirement	Section of this report
(f)	motivation for the need and desirability for the proposed development including the need and desirability of the activity in the context of the preferred location;	Section 4
(g)	a full description of the process followed to reach the proposed preferred activity, site and location of the development footprint within the site, including— (i) details of all the alternatives considered;	Section 5
(g)	(ii) details of the public participation process undertaken in terms of regulation 41 of the Regulations, including copies of the supporting documents and inputs; (iii) a summary of the issues raised by interested and affected parties, and an indication of the manner in which the issues were incorporated, or the reasons for not including them;	Section 6
(g)	(iv) the environmental attributes associated with the alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects;	Section 7
(g)	(v) the impacts and risks which have informed the identification of each alternative, including the nature, significance, consequence, extent, duration and probability of such identified impacts, including the degree to which these impacts— (aa) can be reversed; (bb) may cause irreplaceable loss of resources; and (cc) can be avoided, managed or mitigated;	Section 5
(g)	(vi) the methodology used in identifying and ranking the nature, significance, consequences, extent, duration and probability of potential environmental impacts and risks associated with the alternatives;	Section 8.1
(g)	(vii) positive and negative impacts that the proposed activity and alternatives will have on the environment and on the community that may be affected focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects;	Section 8
(g)	(viii) the possible mitigation measures that could be applied and level of residual risk;	Section 8
(g)	(ix) the outcome of the site selection matrix;	Section 5

No	Requirement	Section of this report
(g)	(x) if no alternatives, including alternative locations for the activity were investigated, the motivation for not considering such; and	Section 5
(g)	(xi) a concluding statement indicating the preferred alternatives, including preferred location of the activity;	Section 10
(h)	A plan of study for undertaking the environmental impact assessment process to be undertaken,	Section 9
(i)	An undertaking under oath or affirmation by the EAP in relation to— (i) the correctness of the information provided in the report; (ii) the inclusion of comments and inputs from stakeholders and interested and affected parties; and (iii) any information provided by the EAP to interested and affected parties and any responses by the EAP to comments or inputs made by interested or affected parties;	Section 1.2
(j)	an undertaking under oath or affirmation by the EAP in relation to the level of agreement between the EAP and interested and affected parties on the plan of study for undertaking the environmental impact assessment;	Section 1.2
(k)	where applicable, any specific information required by the competent authority	Section 11.1
(l)	any other matter required in terms of section 24(4)(a) and (b) of the Act.	Section 11.1

1.2 Details of the Report Author

The details of the persons who prepared this report are provided in Table 2

Table 2: Details of the Author

Author	**Lelani Claassen**
Highest qualification	BSc Hons Environmental Management
Years' experience	10+ years
Professional registration	Registered Environmental Assessment Practitioner (EAP) with the Environmental Assessment Practitioner's Association of South Africa (EAPASA). Registration Number 2018/153.
Review	**Ken van Rooyen**
Highest qualification	MSc Geography
Years' experience	30 years
Professional registration	Pr.Sci.Nat (Reg. 121/93)
Review	**Jane Barrett**
Highest qualification	BSc Environmental Management & Botany
Years' experience	10+ years

1.3 Expertise of the EAP

Lelani Claassen started her career as an environmental consultant in 2008. She holds an Honours degree in Environmental Management from UNISA, which she completed whilst working as an environmental consultant following the successful completion of a BSc Degree in Landscape Architecture from the University of Pretoria. She has also successfully completed the SABS Short-course: Environmental Legal Requirements for ISO 14001 compliance. Her project experience is extensive in scope and covers various aspects of development including residential developments, filling stations and depots, infrastructure and mining projects.

Lelani's experience includes environmental authorization processes: Basic Assessments, Environmental Impact Assessments, Environmental Management Plans and Programmes, Mining Right Applications, Water Use Licensing, Concept (Fatal Flaw), Pre-Feasibility and Feasibility Studies. She also has experience as an Environmental Control Officer on construction projects. Lelani has also completed numerous environmental compliance audits and environmental-legal compliance assessments.

Lelani is a Registered EAP (Registration Number 2018/153) with the Environmental Assessment Practitioner's Association of South Africa (EAPASA), the Registration Authority for EAPs in South Africa in terms of Section 24H of the National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA). From 08 February 2020, it will be compulsory to be registered in order to undertake and review Environmental Impact Assessments.

1.4 Undertaking by the EAP

I, Lelani Claassen, herewith confirm:

- That the information provided in this report are to the best of my knowledge true and correct;
- That comments and inputs from stakeholders and interested and affected parties that have been communicated to Cabanga Environmental, have been included in this report;

This report is being made available for a public comment period of 30 days. After receipt of comments from the Public, I will be in a position to comment on the level of agreement between the EAP and interested and affected parties on the plan of study for undertaking the environmental impact assessment.

I further declare that –

- I act as the independent environmental practitioner in this application;
- I will perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the applicant. I have no, and will not engage in, conflicting interests in the undertaking of the activity. I do not have and will not have any vested interest (either business, financial, personal or other) in the proposed activity proceeding other than remuneration for work performed in terms of the Regulations;
- there are no circumstances that may compromise my objectivity in performing such work;
- I have expertise in conducting EIAs, including knowledge of the relevant Acts, Regulations and any guidelines that have relevance to the proposed activity;
- I undertake to disclose to the applicant and the competent authority all material information in my possession that reasonably has or may have the potential of influencing any decision to be taken with respect to the application by the competent authority;
- I will ensure that participation by I&APs is facilitated so that all I&APs will be provided with a reasonable opportunity to participate and to provide comments on documents that are produced for the application .I will keep a register of I&APs and ensure that the comments of all I&APs are recorded in reports that are submitted to the competent authority in respect of the application, provided that comments that are made by I&APs in respect of a final report may be attached to the report without further amendment to the report; and
- I realise that a false declaration is an offence and is punishable by law.

_____ 08 January 2020

Signature of the EAP: Date:

Name of company: Cabanga Concepts CC (t/a Cabanga Environmental)

2 Details of the proposed Project

The purpose of this section of the report is to provide details of the Location and Nature of the proposed Project. Details of the Project Applicant are provided in Table 3.

Table 3: Details of the Project Applicant

Project applicant:	Barberton Mines (Pty) Ltd Fairview Mine		
Registration No:	1938/011761/07		
Primary contact person	General Manager: Jan Thirion		
Alternative Contact person:	Group SHEQ Manager: Mandla Ndlozi		
Head-Office Address:	The Firs, Corner Cradock and Biermann Avenues, Rosebank, Johannesburg, South Africa		
Mine Address:	Fairview mine, off the R38 on Provincial Road D2195, Barberton		
Central Coordinate of the Mine	25°43'45.44"S; 31° 3'58.58"E		
Postal Address:	P.O. Box 121 Barberton, 1300		
Telephone:	+27 13 712 8500 +27 11-243-2900	**Cell:**	+27 66 476 3292 +27 71 403 9219
E-mail:	jant@bmines.co.za mandlan@bmines.co.za	**Fax:**	+27 13 712 9060 +27 11 880 1240

2.1 Historical Context

The town of Barberton was established in 1884 by the Gold Commissioner, after Henry and Fred Barber discovered gold in the area. It is reported that Tom McLachlan found the first traces of alluvial gold in the area as long ago as 1874. Gold Mines in the area have flourished ever since and four operational Gold Mines remain in the Barberton area today, that have been operational for over 100 years (including Sheba, the oldest mine discovered by Edward Bray, New Consort, Fairview and Agnes Gold Mines).

Mining at the Fairview Mine area started in 1886 as a number of small operations. These continued intermittently until 1955 when they were consolidated under Federale Mynbou. ETC acquired Fairview Mine in 1998. The ETC operations consisting of Fairview, New Consort and Sheba was bought by Metorex (Pty) Ltd and Millennium Consolidated Investments in June 2003. Subsequently the Mine was owned and operated by Pan African Resources and Shanduka since 2009 (https://lowvelder.co.za/feat/barberton-mines/).

Currently Barberton Mines is Pan African Resources flagship gold project, producing between 95,000 to 100,000 oz per year at an average all-in sustaining cost of approximately US$1,100/oz (https://www.panafricanresources.com /operations-overview/barberton/).

Over the past 100 years of these Mines' operations, the remaining life of each of the mines has often been forecast as being only six to ten years. The mines have consistently defied these estimates in the past and have continued to operate with new ore bodies and extensions adding to resources and reserves (https://lowvelder.co.za/feat/barberton-mines/).

The entire Mining Right Area (MRA) of the Fairview Mine falls within the Barberton Nature Reserve (BNR), with infrastructure areas including the Original and current Bramber TSFs situated on land owned by BML, immediately west of the BNR. This portion of the BML was originally known as the Mountainlands Nature Reserve and was first reserved for conservation in 1985 (https://www.mountainlands.co.za/mountainlands-reserve-introduction/). Mountainlands was identified as Phase 3 of the BNR and incorporated in the BNR Integrated Management Plan (MTPA, 2012).

It is concluded that mining and conservation in the immediate area have been in conflict to some degree since 1985, despite the pre-existence of active mining activities since the late 1880's. The conflicting land uses are however both duly authorised:

- Fairview Mine is authorized in terms of the NEMA and MPRDA as further discussed in Section 3, and
- The BNR is proclaimed and authorized in terms of the National Environmental Management: Protected Areas Act, 2003 (Act No 57 of 2003) (NEMPAA).

Mining by nature is associated with a limited life-span as the reserves being exploited are considered non-renewable and will eventually be mined out. The majority of surface activities at Fairview Mine are located outside of, or right on the edge of the proclaimed boundaries of the BNR, which presents an opportunity for these land uses to co-exist without affecting one another negatively. Several remnants of historical mining activities which exist within the Fairview MRA (and therefore also within the BNR) may present opportunities for tourism-related activities within the BNR, while others present a threat to the conservation land use intended by the regulators responsible for conservation (Mpumalanga Tourism and Parks Agency, MTPA). As the MTPA is now the custodian of the land, BML cannot lay claim to the historic dumps in terms of common-law or surface rights. However, the removal of surface dumps of historic mine waste material from the boundaries of the BNR as proposed by BML will likely improve the conservation potential of the land in question.

Immediately south and east of the Fairview MRA, lies the Barberton-Makhonjwa Mountains World Heritage Site (WHS), which was inscribed on the World Heritage List in 2018. The Barberton Makhonjwa Mountains contain the best-preserved, oldest and most diverse sequence of volcanic and sedimentary rocks on Earth (DEA, January 2017).

Conventional perimeter buffer zones are not mandatory for WHSs and may be omitted with reasons. The Nomination Dossier for this WHS states that "geosites are only threatened by direct *in situ* impacts, so buffer zones protecting against external threats are redundant". It is acknowledged that this is not true in all cases, however, given the extremely mountainous terrain and distance between the proposed reclamation activities and the nearest geosite (over 5km), the Fairview Mine should not have any direct impacts on the WHS inscription.

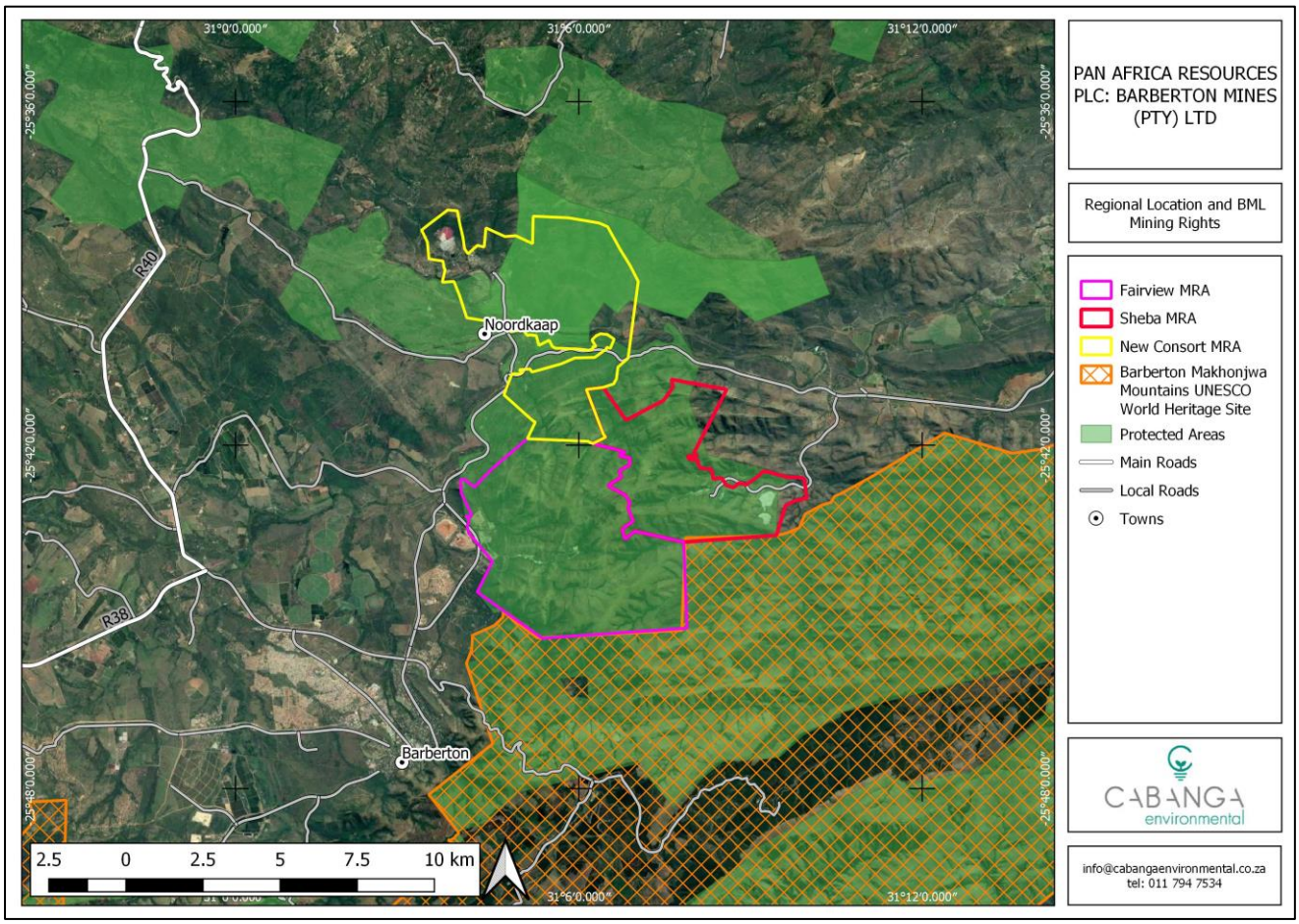


Figure 2: Barberton Mines: Mining Right Areas and Conservation Areas

2.2 Project Location

Fairview Mine is located in the Mbombela Local Municipality of the Ehlanzeni District Municipality in the Mpumalanga Province of South Africa (Figure 1). The area formed part of the Umjindi Local Municipality before Umjindi Municipality was disestablished and merged with Mbombela Local Municipality to establish the City of Mbombela Local Municipality on 3 August 2016.

The Fairview MRA comprises the following properties (according to the converted Mining Right MP30/5/1/2/2/191MR) subject to Regulation 17 of the Mine Health and Safety Act, and thus excluding any area within 100m of any public road, railway, cemetery, residential area or public area.

- Lots 119, 120, 123, 124, 126, 136, 137, 138, 140, 141, 142, 143 and 144 of Section A Kaap Block
- The Farm Worral 352 JU,
- The Farm Bickenhall 346 JU,
- The Farm Bramber Est 314 JU, and
- The Farm Hayward 310 JU,

The abovementioned Farms have subsequently been consolidated / subdivided and re-named and some inconsistency exists between different property / farm portion databases. The above list of farms as it appears in the Fairview Mining Right remains valid, with the addition of the Farm Sheba 940JU.

BML, the Holder of the Mining Right at Fairview, is also the surface rights owner of the Farm Fairview 542 JU, and the Farm Bramber South 348 JU, adjoining the MRA (Van Der Merwe, August 2010). Fairview Mine infrastructure is also located on the Farms Bramber East 314 JU, over which the Mine had extensive rights to use the surface in terms of section 51(1) of the Minerals Act (Act No 50 of 1991). BML is engaged in discussions with the relevant land owners (local government) to continue to use these farms under a similar agreement.

The proposed project relates to the proposed construction of the Fairview TSF, on the footprint of the reclaimed Bramber TSF, which is located on the Farm Fairview 542 JU.

Furthermore, it is proposed to include the Farms Fairview 542 JU, Bramber South 348 JU and Bramber East 314 JU into the Fairview MRA, as these properties contain infrastructure associated with the Fairview Mine (including the TSFs).

Additionally, historic TSFs and waste rock dumps that may be economically recoverable are located throughout the MRA, on the Farm Sheba 940 JU (also known as "Staats grond" with SG code: T0JU00000000056300000).

The Location of the different project elements are provided in Figure 3.

The direction and distance from the Fairview TSF site (at the site of the reclaimed Bramber TSF) to the nearest towns are provided in Table 4.

Table 4: Direction and distance to surrounding towns

Town Name	Direction from site	Linear Distance from site
Barberton	South-South-West	6.5 km
Sheba	East	10 km
Bulembu (border post)	South	25 km
Mbombela (Nelspruit)	North-North West	30 km
Piggs Peak (Swaziland)	South-East	30 km

The proposed Fairview TSF is proposed on the footprint of the original Bramber TSF, which is located outside of the proclaimed nature reserve boundary. The historic TSFs that are targeted for reclamation are located within the current boundary of the BNR and the approved Fairview MRA.

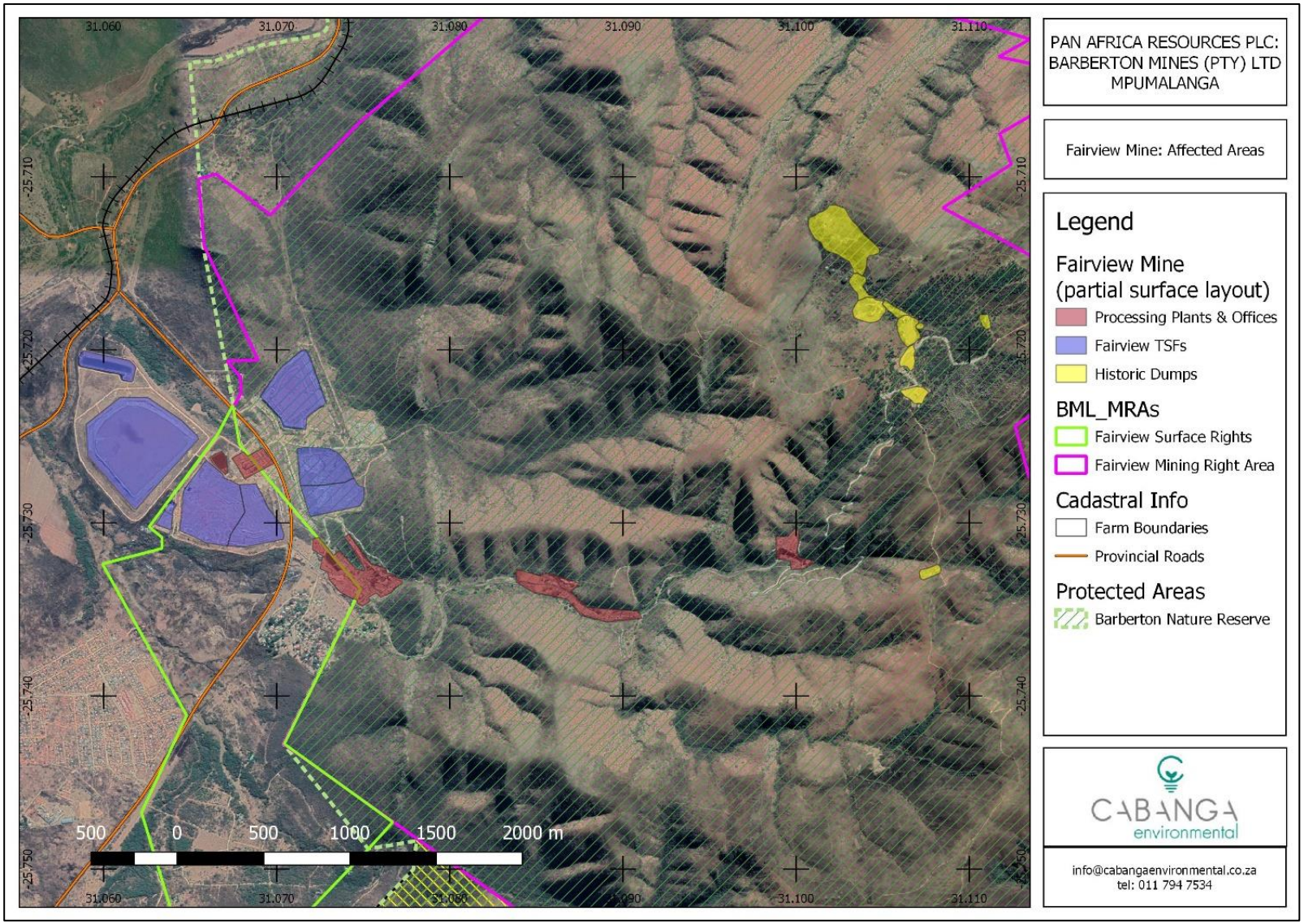


Figure 3: Affected Area

2.3 Project Scope

This Application relates to three interrelated aspects:

- Application for Amendment of the existing Mining Right MP30/5/1/2/2/191MR, to
  - incorporate the Fairview Surface rights areas where the existing TSFs are located and ensure the activities occurring at the Fairview Mine are all integrated under one Right, and managed under one EMP;
  - accommodate the construction of the new Fairview TSF, at the site of the reclaimed Bramber TSF; and
  - accommodate the recovery of material from historic dumps and re-processing of this material at the existing Fairview processing plants.
- Application for Environmental Authorisation for new Listed Activities associated with the new Fairview TSF, and the proposed reclamation of the historic dumps.
- Application for a Waste Management License (WML) for the new TSF and reclamation of the historic dumps.

There are new Listed Activities associated with the proposed Project. These Activities are identified in terms of Listing Notice 1, 2 and 3 of the EIA Regulations 2014 (as amended) and Category A, B and C of the List of Waste Management Activities that have, or are likely to have, a detrimental effect on the environment (as amended)

A Scoping and Environmental Impact Assessment (EIA) Process is therefore relevant to the application.

The EIA Process will focus on the proposed activities associated with the Project. While the existing impacts from current and past mining activities on the site will be informative of the baseline conditions of the site and the cumulative nature of some of the potential impacts, the existing impacts of the Fairview Mine will not be the focus of the study. The EMP will be amended as part of this process to ensure that Fairview Mine can operate under one, consolidated EMP.

2.4 Project Description

The purpose of this section is to provide the public with sufficiently detailed information regarding the project to facilitate meaningful public participation; and to provide the relevant decision-making authorities with sufficiently detailed information about the proposed project to enable informed consideration of the application, and decision-making.

2.4.1 Proposed new TSF

Continued gold production at Fairview Mine means that the BTRP/New Bramber TSF will soon reach capacity. BML intends to construct a new TSF on the footprint of the Old Bramber TSF (which is currently being reclaimed as part of the BTRP), to accommodate future tailings deposition. It is further proposed to earmark the footprints of the Moon TSF and Harper North and South TSFs (being reclaimed or planned to be reclaimed) for future TSF development, though no design of such new TSFs are available currently.

The abovementioned TSFs are shown in Figure 5.

The design of the proposed new TSF is underway but not yet concluded.

The proposed new TSF footprint will not exceed 30 Ha. Deposition rate onto the TSF will be 100,000 tons per month. The final height of the facility will not exceed 35 metres from the lowest ground level. The design life of the facility is approximately 5 years.

The proposed new TSF embankment is being designed not to encroach on the 100m regulated zone from the non-perennial stream south of the TSF site (that joins the Hyslops Creek just west of the TSF). However, due to the footprint of the previous Bramber TSF, catchment paddocks and solution collection infrastructure will be located within 100m of the watercourse and exemption in terms of GN704 (see Section 3.2.3.1) must be applied for as part of the Water Use License Application.

Due to a reduced starter wall embankment size and in order to maintain an acceptable rate of rise, it may be required to continue deposition on the BTRP/New Bramber TSF at low tonnages over a three-year period. Material for the construction of the embankment will be sourced from the TSF footprint area as part of the base preparation.

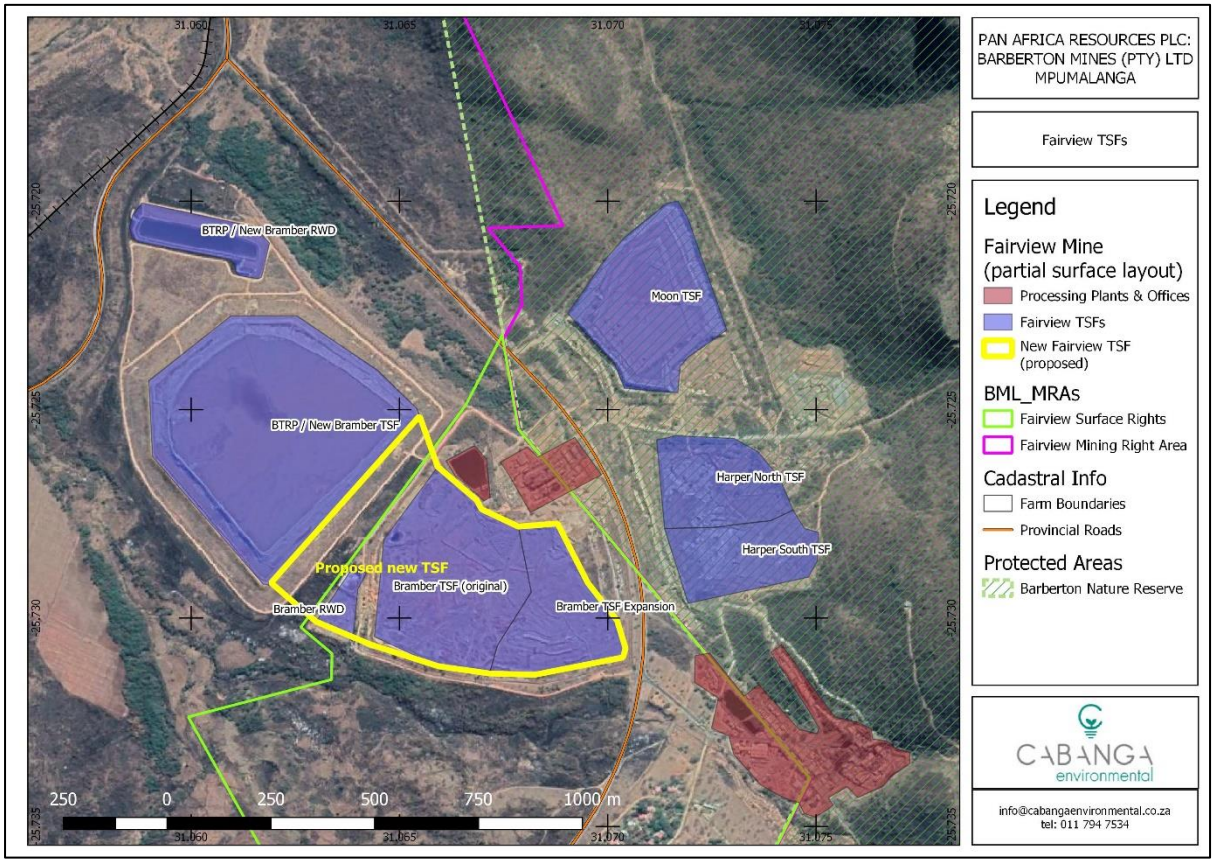


Figure 4: Location of the Fairview Mine TSFs

2.4.2 Proposed reclamation activities

Ten (10) historic waste dumps have been identified to date within the Fairview MRA, that the Holder wishes to recover. These dumps include waste rock and tailings material that resulted from past mining and processing activities (over the past 100 years). At the time these dumps were established, no legislation requiring the licensing of these dumps existed. They are

however located within the approved Fairview MRA. Accurate information about the exact dates these dumps were established, and the persons responsible for establishing them, is not available. The location of the dumps is shown in Figure 5.

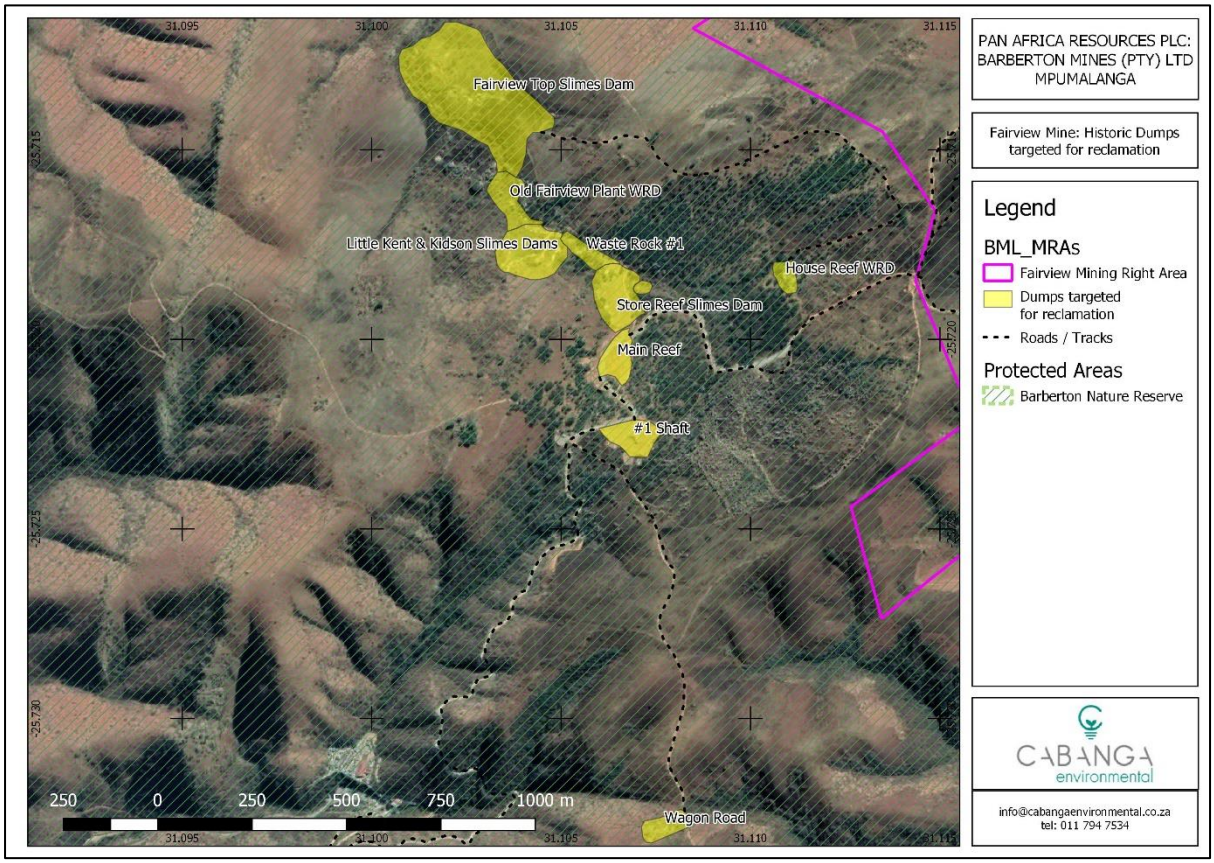


Figure 5: Dumps targeted for reclamation

#1 Shaft is located immediately adjacent to an existing mine road, which was upgraded to enable access to the dump. A road (approximately 100m in length) was established from #1 Shaft Waste Rock Dump (WRD) to Main Reef WRD. Upgrades / construction involved widening where necessary for safety of vehicles, surfacing with gravel where necessary to prevent erosion and removal of vegetation (mostly roadside weeds).

The remnants of the historic #1 Shaft remains on site (Figure 6). The area should be shaped, top-soiled and re-vegetated (by hydroseeding or similar). The remains of #1Shaft Infrastructure should be removed from the site and the shaft sealed to prevent access by illegal miners. The same applies to the Main Reef WRD, once reclamation has been completed (Figure 7).

Figure 6: #1 Shaft (left) and reclaimed area (right)

Figure 7: Reclamation area at Main Reef WRD

There is an existing, historic road from where access to Store Reef WRD and Store Reef Slimes Dam can be obtained. More likely BML will access both areas directly from the Main Reef WRD once that area has been reclaimed. Overview of Store Reef WRD and Store Reef Slimes Dam is shown in Figure 8. Store Reef Slimes Dam and WRD are partially within 100m of a non-perennial stream / drainage line.

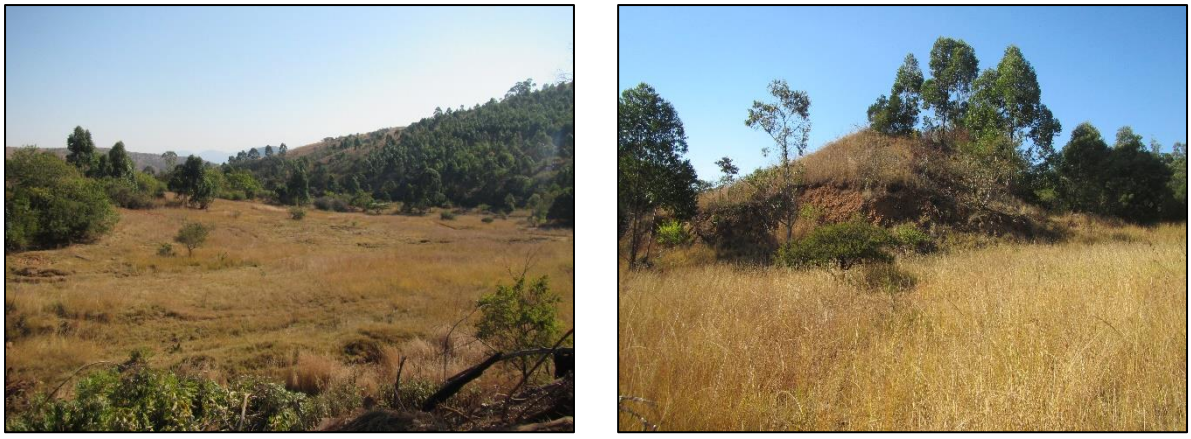


Figure 8: Store Reef Slimes Dam Footprint (Left) and WRD (right)

Contiguous with the aforementioned areas lies the Waste Rock #1, Little Kent & Kidson Slimes Dams (Figure 9), Old Fairview Plant and Fairview Top Slimes Dam (Figure 10 to Figure 12). All of these are within 100m of the aforementioned drainage line.

Two silos are the only visible remains of the Old Fairview Plant. As part of the EIA Process, an archaeologist will investigate the area in more detail before any inadvertent damage is done to this structure, as it is older than 60 years and therefore automatically protected in terms of the National Heritage Resources Act, 1999 (Act No. 25 of 1999) (NHRA).

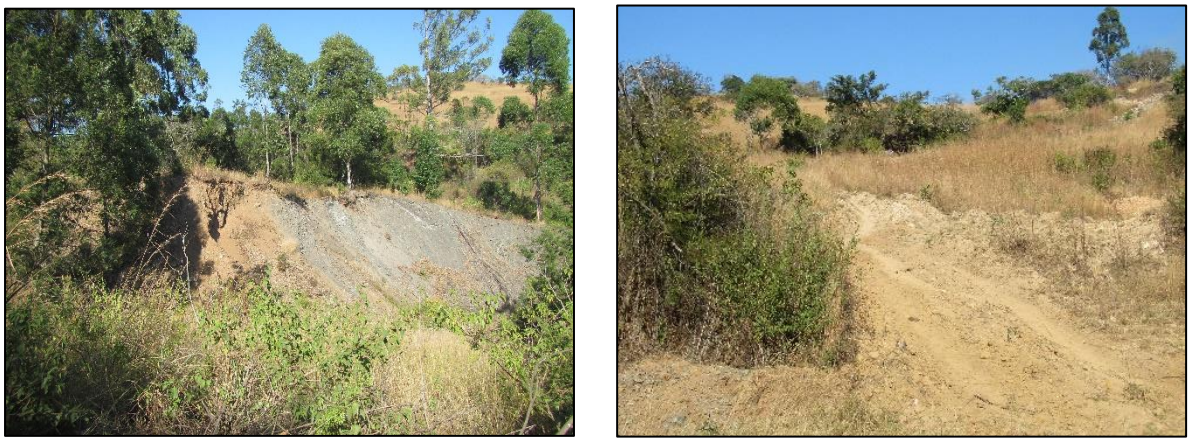


Figure 9: Waste Rock #1 (Left) and Little Kent & Kidson Slimes Dams (right)

Figure 10: Remains of the Fairview Plant (Left) and the affected drainage line (right)

Note from Figure 10 that Tailings material is visible in the drainage line in the photograph on the right.

Figure 11: Waste Rock and Tailings material in and adjacent to the drainage line at and downstream of the Old Fairview Plant

Figure 12: Fairview Top Slimes Dam

House Reef WRD (Figure 13) is isolated from the previously mentioned dumps. There is an existing road that travels within 300m from the Dump location, but this road is in poor condition and at times impassable. The road will have to be upgraded. Wagon Road WRD is located approximately 750 metres directly east (linear distance) of the existing Crusher Plant and #11 Adit at Fairview Mine. The extremely steep terrain necessitates travelling a distance over 3km to reach the Dump. There is an existing road to the Wagon Road WRD which will be used, however the road will require to be upgraded in places.

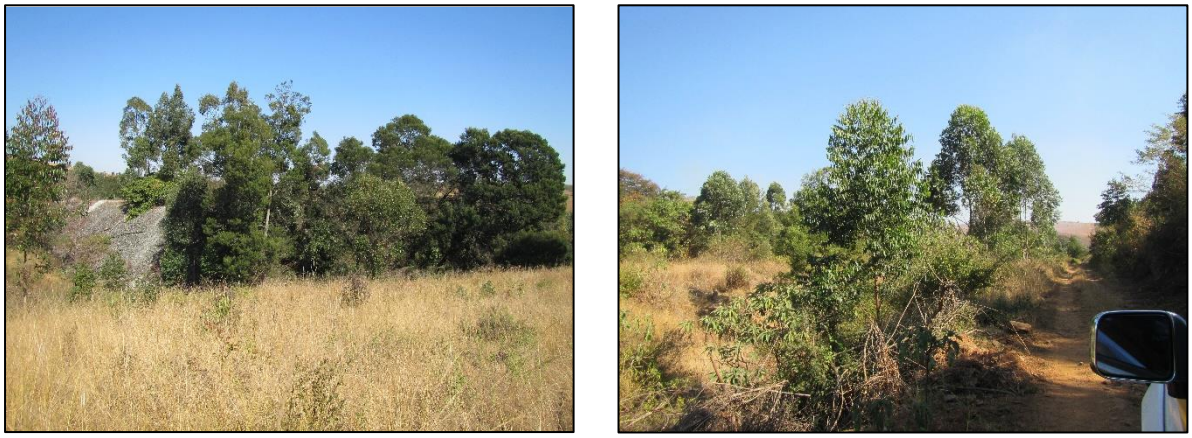


Figure 13: House Reef WRD (Left) and typical access roads within the MRA (Right)

2.4.3 Site access

Road access to the Fairview mine is via the existing Provincial Road D2195. The access road is tarred.

Internal vehicle movement at Fairview Mine is via a series of paved and unpaved roads. The roads at the main infrastructure areas are mostly tarred, only minor roads are gravel.

Access to the historic dumps in the eastern portion of the MRA is via various routes and tracks, mostly dirt tracks. Some of these have recently been upgraded by the Mine to facilitate access

to these portions of the MRA. The majority of these tracks are considered pre-existing, but will need to be upgraded to facilitate the proposed reclamation.

There is an aerial ropeway to transport mined and crushed material from the crushing and milling plants at No. 11 Adit to the Mineral Processing Plant. The aerial ropeway extends approximately 4 kilometres (Van Der Merwe, August 2010).

2.4.4 Services

The proposed Project will require a number of services in addition to those that can be shared with the existing Fairview Mine. These relate to the provision of potable and process water, power, sewage and waste management services.

2.4.4.1 Power supply

Eskom supplies power to the Fairview Mine, the Barberton Sub-station is currently being used for electricity supply. From the sub-station, electricity is supplied to the mine by means of 11 kV overhead powerlines. Generator sets are available on surface to provide electricity to essential systems during electricity outages (Van Der Merwe, August 2010).

The proposed project will require power to pump slurry from the processing plant to the proposed new TSF – it is anticipated that the existing electricity supply at Fairview Mine will be sufficient to accommodate the Project. No electricity supply is needed to reclaim the historic dumps as reclamation will be mechanical using diesel-driven equipment.

2.4.4.2 Potable water

Potable Water is currently abstracted from two on-site boreholes, the Hyslops Creek and the Suidkaap River. Water from the boreholes is stored at the Mine Village potable supply tanks, from where overflow reports to the administration potable water supply tank, and the processing plant. Water pumped from the rivers is first treated at the Mine's purification plant prior to supplying the plant and administration potable water supply tank (Van Der Merwe, August 2010).

The proposed project will not result in a significant increase in the number of employees at Fairview Mine and it is anticipated that potable water demand will be met by these existing sources of potable water.

2.4.4.3 Process Water

Water found in underground workings is pumped to surface at the No. 11 Adit and piped to the process water tank at the Mineral Processing Plant. Water from the processing plant is re-used, and water reporting to the RWD at the existing TSFs is also pumped back to the plant as needed.

The plant does not have the capacity to use all water encountered in the underground workings, and the excess water pumped to surface at the No. 11 Adit is at times pumped into the Olifantskloof Creek. The workshop dams also overflow into the Olifantskloof Creek at times when not all the water can be used in the process (Van Der Merwe, August 2010).

The water balance will be updated as part of the EIA Process and associated specialist studies.

2.4.4.4 Sewage

All sewage produced at the village, hostel and plant is piped to and managed at the municipal sewage treatment works in Barberton. There are no sewage treatment facilities at Fairview mine (Van Der Merwe, August 2010).

Sewage generated at the historic dump reclamation sites will be managed by portable chemical toilets to be serviced by a subcontractor.

The proposed new TSF is located close enough to existing infrastructure areas that sewage generated here can tie in with the existing sewage management at Fairview Mine.

2.4.5 Waste Management

Waste streams that will be generated at the Project include sewage waste (discussed above), general domestic waste, hazardous waste and mineral waste.

2.4.5.1 General Waste

General waste generated during the operation of the mine is currently disposed at a waste disposal facility located south of the Bramber tailings facility and the Olifantskloof Creek. General waste is separated at the waste site and recycled where possible. General waste originates from the Fairview Village, Fairview Hostel, offices and mining operations (Van Der Merwe, August 2010).

The proposed project will not generate significant additional quantities of general waste (mostly domestic waste generated by employees), and general waste that is generated will be able to feed into the existing general waste stream.

It is recommended that Fairview Mine upgrade their waste storage and management facility to appropriate design standards.

2.4.5.2 Hazardous Waste

Hazardous waste generated at the mine is temporarily stored on site before being collected by a waste management contractor for disposal off-site at a licenced hazardous waste disposal facility.

The hazardous waste storage facilities are concrete bunded and roofed areas.

Hazardous waste generated at the mine is minimal, empty containers for chemicals used by the plants are kept at the chemical storage and returned to the suppliers.

Medical waste is disposed at the local hospital and incinerated.

The waste stored on site includes workshop waste (such as used oil and lubricants, hydrocarbon contaminated rags, used oil filters etc), fluorescent tubes, tins that have contained hazardous material (returned to suppliers), certain paints, solvents (empty tins are removed by a contractor) and batteries (returned to suppliers). Used oils are collected and removed from site by a waste oil recycling contractor (Van Der Merwe, August 2010).

The proposed project will contribute to the generation of hazardous waste, but in negligible quantities. This should feed into the Mine's existing waste management systems.

The Mine must keep records of hazardous waste generated and legally disposed of, and register as a Hazardous Waste Generator in terms of NEMWA.

In addition, it is expected that the tailings generated by the Processing Plant will also be regarded as hazardous waste and the Cyanide Tailings Code will have to be followed. This will apply to the proposed new Fairview TSF as well.

2.4.6 Stormwater Management

A stormwater management plan (SWMP) will be designed for the site as part of the EIA in accordance with the requirements of GN704 (Regulations on Use of Water for Mining and Related Activities Aimed at the Protection of Water Resources).

It must however be noted that the Bramber TSF (now reclaimed and the site of the proposed new Fairview TSF) is within 100 metres of the creek to the South, and a number of the historic dumps were established within, or very close, to watercourses. Exemption from certain provisions of GN704 will therefore have to be obtained for the project to continue.

2.4.7 Emissions

Other than the existing processing plant, increased emissions may be expected in the form of emissions and dust from vehicle movement on unpaved roads, construction activities, reclamation activities and the new TSF.

Gaseous emissions from vehicle and machinery operation during the construction and operational phases of the project can be expected but are not expected to be significant in the context of the existing and proposed mining and processing operations.

An air quality impact assessment (AQIA), which will include a comprehensive emissions inventory, has been commissioned as part of the EIA Process.

2.4.8 Security, fencing and access control

Fencing is provided along the Kaapmuiden road. Internal security fencing is also in place at the Mineral Processing Plant.

The mine has also installed advanced surveillance and Closed-Circuit Television systems at the Mineral Processing Plants. Guard dogs are also provided to patrol the perimeter of this area.

The Fairview Mine is not fenced on the mining right perimeter, as the area is too large and inaccessible, and affected by the BNR. Illegal mining from old adits throughout the MRA is a challenge. Fences that have previously been installed have been repeatedly stolen.

Security personnel are employed in an attempt to prevent people from accessing historic workings.

The proposed new TSF will be fenced and access controlled. The sites of the proposed reclamation activities will most likely not be fenced, however, it is anticipated that the proposed reclamation of these dumps will at least also prevent illegal miners from attempting to reclaim gold from these facilities.

2.4.9 Administration, workshops and other buildings

Existing administration buildings associated with the Fairview Mine are located in the Main infrastructure area east of the Kaapmuiden Road. There are also administration buildings at the No. 11 Adit area.

Several workshops (engineering and mechanical) and warehouses (equipment and maintenance parts) are also located at the Main infrastructure area and at No. 11 Adit.

There are two housing facilities at Fairview Mine – the Fairview Village and Fairview Hostel, consisting of 66 married quarters and approximately 155 Hostel rooms respectively. Residents of these facilities are employed by the Mine.

Fuel storage facilities are located at the Plant and at No. 11 Adit. Tanks are underground storage tanks with a cumulative capacity of 45,500 litres (45.5m^3). There are also mobile diesel storage facilities at the Underground Mining Areas.

The proposed project will not directly affect any of the existing administration, workshops or accommodation facilities but will use the existing facilities.

2.4.10 Employment

According to the approved EMP (Van Der Merwe, August 2010), approximately 1,871 direct, indirect and induced job opportunities will arise from the entire Barberton Mine's company activities at Fairview, Sheba and New Consort. Of this amount, almost 77% is a direct result of the mining activities at the Mine. The remaining 23% is related to the indirect and induced impacts associated with the mining activities.

The proposed Project will not contribute significantly to job creation but rather focus on the retention of jobs by prolonging the Life of Mine (LoM) through the reclamation activities and enabling continued production by ensuring sufficient tailings disposal capacity exists.

Construction phase employment opportunities associated with the construction of the new TSF may be associated with the generation of new employment opportunities.

2.4.11 Operating hours

Fairview Mine operates two shifts per day on a five-day production work week. The plant is operational for three shifts per day, 7 days a week (24 hours a day).

The proposed reclamation activities will be operational as the Mining shifts are. No reclamation activities can be undertaken at night-time.

Construction will also be limited to daylight hours. Once operational, the proposed new TSF will be able to receive tailings 24 hours per day, seven days per week.

2.5 Listed Activities being applied for

The Listed Activities in terms of the NEMA EIA Regulations 2014 (as amended) pertaining to the proposed Project are summarised in the Tables in Sections 2.5.1 to 2.5.3.

Waste Management Activities are detailed in section 2.5.4

2.5.1 Listed Activities identified in Listing Notice 1 GN R 983 (as amended)

Listing Notice	Activity Number	Activity Description	Relevance to the Project
GN R 983 (as amended) Listing Notice 1	9	The development of infrastructure exceeding 1 000 metres in length for the bulk transportation of water or storm water— (i) with an internal diameter of 0,36 metres or more; or (ii) with a peak throughput of 120 litres per second or more; excluding where— (a) such infrastructure is for bulk transportation of water or storm water or storm water drainage inside a road reserve or railway line reserve; or (b) where such development will occur within an urban area.	It is possible that stormwater management infrastructure at the site of the new TSF will meet these thresholds and thus the activity is included in the Application.
GN R 983 (as amended) Listing Notice 1	10	The development and related operation of infrastructure exceeding 1 000 metres in length for the bulk transportation of sewage, effluent, process water, waste water, return water, industrial discharge or slimes – (i) with an internal diameter of 0,36 metres or more; or (ii) with a peak throughput of 120 litres per second or more; excluding where— (a) such infrastructure is for the bulk transportation of sewage, effluent, process water, waste water, return water, industrial	It is possible that tailings reticulation infrastructure associated with the new TSF will meet these thresholds and thus the activity is included in the Application.

Listing Notice	Activity Number	Activity Description	Relevance to the Project
		discharge or slimes inside a road reserve or railway line reserve; or (b) where such development will occur within an urban area.	
GN R 983 (as amended) Listing Notice 1	19	The infilling or depositing of any material of more than 10 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 10 cubic metres from a watercourse; but excluding where such infilling, depositing, dredging, excavation, removal or moving— (i) will occur behind a development setback; (ii) is for maintenance purposes undertaken in accordance with a maintenance management plan; (iii) falls within the ambit of activity 21 in this Notice, in which case that activity applies; (iv) occurs within existing ports or harbours that will not increase the development footprint of the port or harbour; or (v) where such development is related to the development of a port or harbour, in which case activity 26 in Listing Notice 2 of 2014 applies.	This activity is relevant to the proposed reclamation of historic dumps, and potentially to the establishment of access roads to and from these dumps. As the dumps were established prior to the MPRDA being in effect, there is legal precedent that the reclamation does not require MPRDA authorisation and therefore Activity 21 does not apply, even though the dumps fall within the existing Fairview MRA.
GN R 983 (as amended)Listing Notice 1	21	Any activity including the operation of that activity which requires a mining permit in terms of section 27 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002),	Fairview Mine has an existing Mining Right and does not require a new Mining Permit.

Listing Notice	Activity Number	Activity Description	Relevance to the Project
		including —(a) associated infrastructure, structures and earthworks, directly related to the extraction of a mineral resource; or (b) the primary processing of a mineral resource including winning, extraction, classifying, concentrating, crushing, screening or washing;but excluding the secondary processing of a mineral resource, including the smelting, beneficiation, reduction, refining, calcining or gasification of the mineral resource in which case activity 6 in Listing Notice 2 applies.	
GN R 983 (as amended) Listing Notice 1	24	The development of a road— (i) for which an environmental authorisation was obtained for the route determination in terms of activity 5 in Government Notice 387 of 2006 or activity 18 in Government Notice 545 of 2010; or (ii) with a reserve wider than 13,5 metres, or where no reserve exists where the road is wider than 8 metres; but excluding a road— (a) which is identified and included in activity 27 in Listing Notice 2 of 2014; (b) where the entire road falls within an urban area; or (c) which is 1 kilometre or shorter.	Collectively, road upgrades required to access the historic dumps will exceed 1km in length and these roads may have to be wider than 8m in places. The road developments follow paths of previously used roads and may be seen as upgrades to existing roads in most locations, however since these roads have been in disuse for an extended period of time, it may be argued that, even though previously established routes are followed, the roads will have to be newly constructed in places.
GN R 983 (as amended) Listing Notice 1	27	The clearance of an area of 1 hectare or more, but less than 20 hectares of indigenous vegetation, except where such clearance of indigenous vegetation is required for—	There is practically no indigenous vegetation remaining at the site of the TSF, except for the area between the reclaimed Bramber footprint and the existing New Bramber / BTRP TSF. Collectively, the

Listing Notice	Activity Number	Activity Description	Relevance to the Project
		(i) the undertaking of a linear activity; or (ii) maintenance purposes undertaken in accordance with a maintenance management plan.	dumps targeted for reclamation comprise a footprint of 20.22 Hectares. Coupled with road development and vegetation clearance for the Fairview TSF, it is anticipated that vegetation removal will exceed 20 Hectares. Indigenous vegetation is defined as "vegetation consisting of indigenous plant species occurring naturally in an area, regardless of the level of alien infestation and where the topsoil has not been lawfully disturbed during the preceding ten years". Vegetation that has established on the historic dumps is not regarded as indigenous vegetation, as the presence of topsoil is questioned. This will however be confirmed by the specialist soil study during the EIA phase.
GN R 983 (as amended) Listing Notice 1	34	The expansion of existing facilities or infrastructure for any process or activity where such expansion will result in the need for a permit or licence or an amended permit or licence in terms of national or provincial legislation governing the release of emissions, effluent or pollution, excluding— (i) where the facility, infrastructure, process or activity is included in the list of waste management activities published in terms of section 19 of the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008) in which case the National	The proposed project is not regarded as an expansion of the Fairview Mine, but rather relates to re-use of previous TSF sites that have been reclaimed, for the establishment of a new TSF, to facilitate continuation of processing activities. The development of the proposed new TSF will require a WML and the stipulated exclusion therefore applies.

Listing Notice	Activity Number	Activity Description	Relevance to the Project
		Environmental Management: Waste Act, 2008 applies; (ii) the expansion of existing facilities or infrastructure for the treatment of effluent, wastewater, polluted water or sewage where the capacity will be increased by less than 15 000 cubic metres per day; or (iii) the expansion is directly related to aquaculture facilities or infrastructure where the wastewater discharge capacity will be increased by 50 cubic metres or less per day.	
GN R 983 (as amended) Listing Notice 1	45	The expansion of infrastructure for the bulk transportation of water or storm water where the existing infrastructure— (i) has an internal diameter of 0,36 metres or more; or (ii) has a peak throughput of 120 litres per second or more; and (a) where the facility or infrastructure is expanded by more than 1 000 metres in length; or (b) where the throughput capacity of the facility or infrastructure will be increased by 10% or more; excluding where such expansion— (aa) relates to transportation of water or storm water within a road reserve or railway line reserve; or (bb) will occur within an urban area.	Existing infrastructure at Fairview Mine meets these thresholds and the proposed new infrastructure at the proposed new TSF will likely also meet these thresholds (though detail design is still underway). It may be argued that the establishment of infrastructure related to the Project is an expansion of the current infrastructure of the Fairview Mine, as the Project falls within the existing Fairview MRA.

Listing Notice	Activity Number	Activity Description	Relevance to the Project
GN R 983 (as amended)Listing Notice 1	46	The expansion and related operation of infrastructure for the bulk transportation of sewage, effluent, process water, waste water, return water, industrial discharge or slimes where the existing infrastructure— (i) has an internal diameter of 0,36 metres or more; or (ii) has a peak throughput of 120 litres per second or more; and (a) where the facility or infrastructure is expanded by more than 1 000 metres in length; or (b) where the throughput capacity of the facility or infrastructure will be increased by 10% or more; excluding where such expansion— (aa) relates to the bulk transportation of sewage, effluent, process water, waste water, return water, industrial discharge or slimes within a road reserve or railway line reserve; or (bb) will occur within an urban area.	Existing infrastructure at Fairview Mine meets these thresholds and the proposed new infrastructure at the proposed new TSF will likely also meet these thresholds (though detail design is still underway). It may be argued that the establishment of infrastructure related to the Project is an expansion of the current infrastructure of the Fairview Mine, as the Project falls within the existing Fairview MRA.
GN R 983 (as amended) Listing Notice 1	56	The widening of a road by more than 6 metres, or the lengthening of a road by more than 1 kilometre— (i) where the existing reserve is wider than 13,5 metres; or (ii) where no reserve exists, where the existing road is wider than 8 metres; excluding where widening or lengthening occur inside urban areas	None of the existing tracks used to access the historic dumps within the MRA are wider than 8 metres and the exclusion therefore applies.

2.5.2 Listed Activities identified in Listing Notice 2 GN R 984 (as amended)

Listing Notice	Activity Number	Activity Description	Relevance to the Project
GN R 984 (as amended) Listing Notice 2	6	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, excluding— (i) activities which are identified and included in Listing Notice 1 of 2014; (ii) activities which are included in the list of waste management activities published in terms of section 19 of the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008) in which case the National Environmental Management: Waste Act, 2008 applies; (iii) the development of facilities or infrastructure for the treatment of effluent, polluted water, wastewater or sewage where such facilities have a daily throughput capacity of 2 000 cubic metres or less; or (iv) where the development is directly related to aquaculture facilities or infrastructure where the wastewater discharge capacity will not exceed 50 cubic metres per day.	The proposed new TSF will require a license in terms of the NEMWA, but will also require licensing in terms of Section 21(g) of the NWA, which governs the generation and release of polluted water and effluent. This activity is therefore regarded as relevant.

Listing Notice	Activity Number	Activity Description	Relevance to the Project
GN R 984 (as amended) Listing Notice 2	7	The development and related operation of facilities or infrastructure for the bulk transportation of dangerous goods— (i) in gas form, outside an industrial complex, using pipelines, exceeding 1 000 metres in length, with a throughput capacity of more than 700 tons per day; (ii) in liquid form, outside an industrial complex, using pipelines, exceeding 1 000 metres in length, with a throughput capacity of more than 50 cubic metres per day; or (iii) in solid form, outside an industrial complex, using funiculars or conveyors with a throughput capacity of more than 50 tons per day.	The transport of dangerous goods within the Fairview Plant will not trigger this activity, as it is regarded as an industrial complex. Pumping of tailings to the proposed new TSF may trigger this activity, though detail of the pipes to transport slurry to the TSF is still underway. It is unlikely that pipelines between the Processing plant at Fairview and the proposed new TSF will exceed 1000 metres in length.
GN R 984 (as amended) Listing Notice 2	15	The clearance of an area of 20 hectares or more of indigenous vegetation, excluding where such clearance of indigenous vegetation is required for— (i) the undertaking of a linear activity; or (ii) maintenance purposes undertaken in accordance with a maintenance management plan.	Vegetation clearance in preparation for the reclamation of dumps and establishment of the Fairview TSF where it adjoins the New Bramber / BTRP TSF will exceed 20 hectares. Specialist studies will have to be undertaken before it can be confirmed whether the vegetation meets the definition of "indigenous vegetation".
GN R 984 (as amended) Listing Notice 2	17	Any activity including the operation of that activity which requires a mining right as contemplated in section 22 of the Mineral and Petroleum Resources	The proposed Project is within the existing Fairview Mining Right Area, and therefore requires amendment of the existing right in terms of Section

Listing Notice	Activity Number	Activity Description	Relevance to the Project
		Development Act, 2002 (Act No. 28 of 2002), including— (a) associated infrastructure, structures and earthworks, directly related to the extraction of a mineral resource; or (b) the primary processing of a mineral resource including winning, extraction, classifying, concentrating, crushing, screening or washing; but excluding the secondary processing of a mineral resource, including the smelting, beneficiation, reduction, refining, calcining or gasification of the mineral resource in which case activity 6 in this Notice applies.	102 of the MPRDA, and not a new Mining Right in terms of Section 22 of the MPRDA. The existing and authorized mineral processing facilities at Fairview Mine will be used to process reclaimed material. Tailings from the existing plant will be deposited on the proposed new TSF.
GN R 984 (as amended)Listing Notice 2	19	The removal and disposal of minerals contemplated in terms of section 20 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002), including— (a) associated infrastructure, structures and earthworks, directly related to prospecting of a mineral resource; or (b) the primary processing of a mineral resource including winning, extraction, classifying, concentrating, crushing, screening or washing; but excluding the secondary processing of a mineral resource, including the smelting, beneficiation, reduction, refining, calcining or gasification of the	This activity may be relevant to future prospecting and bulk sampling activities at Fairview Mine and is included in the List of Activities being applied for as part of this Project, as the proponent may wish to further investigate other historical waste dumps and potentially extract bulk samples from these dumps to confirm whether these can be economically reclaimed.

Listing Notice	Activity Number	Activity Description	Relevance to the Project
		mineral resource in which case activity 6 in this Notice applies.	
GN R 984 (as amended) Listing Notice 2	24	The extraction or removal of peat or peat soils, including the disturbance of vegetation or soils in anticipation of the extraction or removal of peat or peat soils, but excluding where such extraction or removal is for the rehabilitation of wetlands in accordance with a maintenance management plan.	A specialist soil study has been commissioned as part of the EIA, and the presence of peat soils associated with the non-perennial drainage lines affected by the historic dumps will have to be confirmed. If the drainages are associated with Peat soils, this activity will apply, but this is considered unlikely.

2.5.3 Listed Activities identified in Listing Notice 3 GN R 985 (as amended)

Listing Notice	Activity Number	Activity Description	Mpumalanga	Relevance to the Project
GN R 985 (as amended) Listing Notice 3	4	The development of a road wider than 4 metres with a reserve less than 13,5 metres	**i. Outside urban areas: (aa) A protected area identified in terms of NEMPAA, excluding disturbed areas**; (bb) National Protected Area Expansion Strategy Focus areas; (cc) Sensitive areas as identified in an environmental management framework as contemplated in chapter 5 of the Act and as adopted by the competent authority; (dd) Sites or areas identified in terms of an international convention; (**ee) Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans;** (ff) Core areas in biosphere reserves; or **(gg) Areas within 10 kilometres from national parks or world heritage sites or 5 kilometres from any other protected area identified in terms of NEMPAA or from the core areas of a biosphere reserve, excluding disturbed areas, where such areas comprise**	Roads required to access the historic dumps and reclaim this material will likely exceed 4 metres in width at places. Due to the long-term disuse of the previous tracks, it may be argued that the proponent will have to construct new roads on the footprints of the old tracks, rather than simply upgrading existing roads. The dumps targeted for reclamation are located within the proclaimed boundaries of the Barberton Nature Reserve. It is important to note that the Fairview Mine obtained approval prior to the establishment of the BNR along these current boundaries. The Fairview MRA is also adjacent to a United Nations Educational, Scientific and Cultural Organization (UNESCO) World Heritage Site.

Listing Notice	Activity Number	Activity Description	Mpumalanga	Relevance to the Project
			indigenous vegetation; or ii. Inside urban areas: (aa) Areas zoned for use as public open space; or (bb) Areas designated for conservation use in Spatial Development Frameworks adopted by the competent authority or zoned for a conservation purpose.	
GN R 985 (as amended)Listing Notice 3	12	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 purposesundertaken in accordance with a maintenance management plan.	i. Within any critically endangered or endangered ecosystem listed in terms of section 52 of the NEMBA or prior to the publication of such a list, within an area that has been identified as critically endangered in the National Spatial Biodiversity Assessment 2004; ii. **Within critical biodiversity areas identified in bioregional plans**; or iii. On land, where, at the time of the coming into effect of this Notice or thereafter such land was zoned open space, **conservation** or had an equivalent zoning **or proclamation in terms of NEMPAA.**	The implementation of the project will definitely require the clearance of more than 300m^2 of vegetation, which includes areas identified as CBAs. Specialist studies during the EIA Phase will confirm whether this constitutes "indigenous vegetation". Furthermore, the site of the proposed reclamation falls within the BNR proclaimed boundary, even though the Mining Right was approved and valid prior to the promulgation of the BNR along these boundaries.

Listing Notice	Activity Number	Activity Description	Mpumalanga	Relevance to the Project
GN R 985 (as amended) Listing Notice 3	18	The widening of a road by more than 4 metres, or the lengthening of a road by more than 1 kilometre.	**i. Outside urban areas:** **(aa) A protected area identified in terms of NEMPAA, excluding conservancies;** (bb) National Protected Area Expansion Strategy Focus areas; (cc) Sensitive areas as identified in an environmental management framework as contemplated in chapter 5 of the Act and as adopted by the competent authority; (dd) Sites or areas identified in terms of an international convention; (**ee) Critical biodiversity areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans**; (ff) Core areas in biosphere reserves; or **(gg) Areas within 10 kilometres from national parks or world heritage sites or 5 kilometres from any other protected area identified in terms of NEMPAA or from the core area of a biosphere reserve, where such areas comprise indigenous vegetation**; or	The roads that will be required to access the dumps that are targeted for reclamation generally align with old tracks. The re-establishment / upgrade of these roads could therefore be regarded as alterations to existing roads. It is likely that the proposed access roads will need to be over 4m wide in places. As the dumps are located within the BNR proclaimed boundary, this activity may apply.

Listing Notice	Activity Number	Activity Description	Mpumalanga	Relevance to the Project
			ii. Inside urban areas: (aa) Areas zoned for use as public open space; or (bb) Areas designated for conservation use in Spatial Development Frameworks adopted by the competent authority or zoned for a conservation purpose.	

2.5.4 Listed Waste Management Activities in terms of NEMWA (GN 921)

NEMWA Category	Activity Number	Activity Description	Relevance to the Project
Category B	11	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).	The original Bramber TSF (where the new Fairview TSF is proposed) is approved in terms of the Fairview EMP. However, the TSF has been reclaimed to ground-level and it is considered that the Project does not merely involve the re-establishment of the old TSF, but rather the design, construction and operation of a new facility, albeit on the previous TSF footprint. The proposed Fairview TSF will therefore require authorization in terms of the NEMWA. It is posited that reclamation of processed material that was deposited onto BML dumps prior to the commencement of the MPRDA (i.e. 1 May 2004), does not constitute a waste management activity, as these dumps did not result from activities which required any rights in terms of the MPRDA. It can therefore be argued that the reclamation of the historic dumps does not constitute a Listed Activity in terms of NEMWA.

NEMWA Category	Activity Number	Activity Description	Relevance to the Project
Category B	7	The disposal of any quantity of hazardous waste to land	The Tailings generated at Fairview, that will be disposed of at the proposed Fairview TSF, is categorized as Hazardous Waste in terms of the NEMWA.
Category B	10	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).	Construction of the Fairview TSF will trigger this Activity

3 Policy and Legislative Context

Section 24 of the Constitution of the Republic of South Africa states that:

> *Everyone has the right to (a) an environment that is not harmful to their health or well-being; and (b) to have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures that –*
>
> - *Prevent pollution and ecological degradation;*
> - *Promote conservation; and*
> - *Secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development.*

To give effect to Section 24 of the Constitution, several laws have been promulgated towards realisation of these rights, which broadly speaking relates to:

- Development and Use of Resources (in this case, mining);
- Environmental Management; and
- Conservation and Protected Areas.

This section describes the key legislation, policies, plans, guidelines and development planning frameworks and tools and their relevance to the Fairview Mine and proposed projects.

3.1 Legislation specific to mining

By 1980, mining's contribution to the country's total economic production peaked at 21%, meaning that for every R100 that the South African economy produced, R21 was due to mining. In 1987, employment in the industry peaked at just over 760,000 people (Stats SA, 2015). Mining production decreased by 5,2% year-on-year in July 2018, with gold being the largest negative contributor (http://www.statssa.gov.za/? Page_id=1856&PPN=P2041&SCH=7255).

The rights to search for and exploit Minerals in South Africa have been guided by changing laws and principles throughout the country's history. Originally it was accepted that the owner of land would be allowed to exploit the minerals on his land, however the government saw the benefits in reserving rights to mine, or control mining through the issuing of permits, especially for precious stones and gold. The intention of many of the past mining laws, was to ensure that the development of mineral deposits (especially oil, precious stones and precious metals) could not be prevented by private land owners (who were previously the holders of the mineral rights). Many of the previous mining laws were consolidated between 1964 to 1967, resulting in a reservation of certain mineral rights (generally precious metals and natural oil) on certain types of land occurring in favour of the State, primarily through the Mining Rights Act, 20 of 1967. The Minerals Act, 1991 (Act No. 50 of 1991) simplified the law on mineral exploitation by doing away with the differentiation between different classes of land and minerals, and recognising the common law rights of landowners in relation to mining (van der Schyff, 2012).

Then, after South Africa became a democracy in 1994, the Minerals and Petroleum Resources Development Act, 2002 (MPRDA) (Act No. 28 of 2002) moved away from the preceding provisions in an attempt to advance the mining industry in an equitable manner.

The laws and regulations that are relevant to mining of gold in South Africa at present are briefly discussed below.

3.1.1 Minerals and Petroleum Resources Development Act, 2002 (MPRDA)

The Minerals and Petroleum Resources Development Act, 2002 (MPRDA) (Act No. 28 of 2002) and its Regulations (GNR527, 23 April 2004 as amended by: GNR R1288 dated 29 October 2004; GNR1203 dated 30 November 2006; and GNR349 dated 18 April 2011) is the predominant legislation dealing with the acquisition of rights to search for, extract and process mineral resources in South Africa. The MPRDA came into effect on 1 May 2004. The MPRDA holds that mineral resources in South Africa belong to the nation and that the State is the custodian thereof.

3.1.1.1 Applications for Mining Rights

Any person may apply for a mining right by following the application procedure set out in the MPRDA and administrated by the Department of Mineral Resources (DMR). Applications for rights must be accepted if the application requirements are met, and if no other person holds a prospecting right, mining right, mining permit or retention permit for the same mineral on the same land. Once the DMR accepts an application, the DMR will notify the applicant to conduct an Environmental Impact Assessment (EIA), and submit an Environmental Management Programme (EMP, also called an Environmental Management Plan) to the DMR for consideration. The DMR will further instruct the applicant to consult with Interested and Affected Parties (I&APs).

In general terms, the Minister must grant a mining right if—

a. the mineral can be mined optimally in accordance with the mining work programme;
b. the applicant has access to financial resources and has the technical ability to conduct the proposed mining operation optimally;
c. the financing plan is compatible with the intended mining operation and the duration thereof;
d. the mining will not result in unacceptable pollution, ecological degradation or damage to the environment;
e. the applicant has provided financially and otherwise for the prescribed social and labour plan;
f. the applicant has the ability to comply with the relevant provisions of the Mine Health and Safety Act, 1996 (Act No. 29 of 1996);
g. the applicant is not in contravention of any provision of this Act; and
h. the granting of such right will further the objects referred to in section 2(d) and (f)[2] and in accordance with the charter contemplated in section 100 and the prescribed social and labour plan.

The application to which this report relates includes an application to include the surface rights currently held by BML, and on which mining-related infrastructure has already been approved and established, into the existing and approved Fairview Mining Right (MP/30/5/1/2/2/191 MR).

[2] Section 2(d)"and (f): The objects of this Act are to— (d) substantially and meaningfully expand opportunities for historically disadvantaged persons, including women, to enter the mineral and petroleum industries and to benefit from the exploitation of the nation's mineral and petroleum resources; (f) promote employment and advance the social and economic welfare of all South Africans.

As part of this application, BML is applying for Listed Activities in terms of the NEMA, to recover historically dumped material from the historic dumps on the surface of their MRA.

3.1.1.2 Application of the MPRDA to historic dumps

Section 1 of the MPRDA contains the following definitions that are relevant when considering the proposed reclamation projects at Fairview:

1) "***mine***" *means, when—*

   (a) used as a noun—

      (i) any excavation in the earth, including any portion under the sea or under other water ***or in any residue deposit****, as well as any borehole, whether being worked or not, made for the purpose of searching for or winning a mineral;*

      (ii) any other place where a mineral resource is being extracted, including the mining area and all buildings, structures, machinery, ***residue stockpiles****,* ***access roads*** *or objects situated on such area and which are used or intended to be used in connection with such searching, winning or extraction or processing of such mineral resource; and*

   (b) used as a verb, in the mining of any mineral, in or under the earth, water or any ***residue deposit****, whether by underground or open working or otherwise and includes any operation or activity incidental thereto, in, on or under the relevant mining area;*

2) "***mineral***" *means any substance, whether in solid, liquid or gaseous form, occurring naturally in or on the earth or in or under water and* ***which was formed by or subjected to a geological process****, and includes sand, stone, rock, gravel, clay, soil and* ***any mineral occurring in residue stockpiles or in residue deposits;***

3) "**residue deposit**" means any residue stockpile remaining at the termination, cancellation or expiry of a prospecting right, mining right, mining permit, exploration right, production right or an old order right;

4) "**residue stockpile**" means any debris, discard, tailings, slimes, screening, slurry, waste rock, foundry sand, beneficiation plant waste, ash or any other product derived from or incidental to a mining operation and which is stockpiled, stored or accumulated for potential re-use, or which is disposed of, by the holder of a mining right, mining permit, production right or an old order right;

The MPRDA regulates residue stockpiles and deposits as defined in Section 1 of the Act and provided above. The essential difference between a residue stockpile and a residue deposit as provided in the MPRDA, is that a residue stockpile exists during the validity period and up until the cancellation or expiry of rights issued in terms of the MPRDA, while a residue stockpile becomes a residue deposit upon expiry or cancellation of such rights.

The notion of "old order rights" was only introduced into law by the commencement of the MPRDA on 1 May 2004. Therefore, it is concluded that only residues produced in terms of rights granted under the MPRDA can be defined as residue stockpiles or residue deposits.

As the dumps being considered for reclamation at Fairview were established long before 2004 (in the time period spanning approximately 1890 to 2000), these do not constitute residue

stockpiles as defined in the MPRDA, and the gold that may still be recovered from these dumps do not constitute "minerals" as defined in the MPRDA. The historic dumps are therefore not subject to the provisions of the MPRDA and permits or rights in terms of the MPRDA are not required to reclaim these dumps, though they are located within the approved MRA.

The case law precedent for this conclusion was affirmed by the High Court of South Africa in the following matters:

- De Beers Consolidated Mines Limited v Ataqua Mining (Pty) Ltd and others (Case No 3215/06); and
- Realeboga Bosaletse NO and others v the Minister of Mineral Resources and others (Case No 1891/13).

Following the abovementioned cases and others, it has become well accepted in South African law that once a mineral is extracted, it becomes the movable property of the person who extracted it (Geldenhuys, 2014). The person(s) who extracted the material that constitute the historical dumps targeted for reclamation are not known in every case and have abandoned the site. Presently BML holds Mineral Rights over their MRA while the MTPA is the custodian of the surface rights.

3.1.1.3 Rights and obligations of the Holder of a Mining Right

Section 25 of the MPRDA pertains to the rights and obligations of the Holder of a Mining Right (such as Barberton Mines Pty Ltd). Section 5 of the MPRDA states that:

> *(1) A prospecting right, mining right, exploration right or production right granted in terms of this Act and registered in terms of the Mining Titles Registration Act, 1967 (Act No. 16 of 1967), is a limited real right in respect of the mineral or petroleum and the land to which such right relates.*
> *(2) The holder of a prospecting right, mining right, exploration right or production right is entitled to the rights referred to in this section and such other rights as may be granted to, acquired by or conferred upon such holder under this Act or any other law.*
> *(3) Subject to this Act, any holder of a prospecting right, a mining right, exploration right or production right may:*
>> *a. enter the land to which such right relates together with his or her employees, and bring onto that land any plant, machinery or equipment and build, construct or lay down any surface, underground or under sea infrastructure which may be required for the purpose of prospecting, mining, exploration or production, as the case may be;*
>> *b. prospect, mine, explore or produce, as the case may be, for his or her own account on or under that land for the mineral or petroleum for which such right has been granted;*
>> *c. remove and dispose of any such mineral found during the course of prospecting, mining, exploration or production, as the case may be;*

Section 25 therefore seems to imply that Barberton Mines has the right to prospect for and mine gold within their MRA (including the Fairview, Sheba and New Consort MRAs).

The MPRDA further states that nobody may mine without environmental authorisation (Section 5A) and (Section 48(1)), that a mining right may not be granted "*on any land being used for public or government purposes or reserved in terms of any other law*". In this context it is important to note that the Applicant is the Holder of an Existing Mining Right, which was granted prior to the Proclamation of the Barberton Nature Reserve as a protected area. The land is therefore not regarded as being "reserved in terms of any other law" particularly the NEMPAA, as the land was lawfully reserved for mining prior to the Promulgation of the NEMPAA and prior to the promulgation of the BNR along its current boundaries, though it is acknowledged that the BNR does enjoy the status of a Nature Reserve as defined in the NEMPAA, and therefore that the prohibition on *new* mining activities in a nature reserve as provided for in Section 48 of NEMPAA applies. The proposed reclamation activities are however not strictly regarded as a new mining activity, as per the definitions of "mining" provided in the MPRDA.

3.1.1.4 Amendment of Mining Rights

The existing and approved EMP relevant to the Fairview Mining Right (Van Der Merwe, August 2010) pertains to underground mining and hydraulic reclamation of surface tailings facilities, in addition to the associated processing and waste handling activities.

Section 102 of the MPRDA states that

> *A reconnaissance permission, prospecting right, **mining right**, mining permit, retention permit, technical corporation permit, reconnaissance permit, exploration right and production right work programme; mining work programme, **environmental management programme, and environmental management plan** may not be amended or varied (including by extension of the area covered by it or by the addition of minerals or a share or shares or seams, mineralised bodies, or strata, which are not at the time the subject thereof) without the written consent of the Minister.*

Barberton Mines therefore have to apply to the Minister of Mineral Resources for consent to:

- incorporate the Fairview Surface rights areas where the existing TSFs are located and ensure the activities occurring at the Fairview Mine are all integrated under one Right, and managed under one EMP;
- accommodate the construction of the new Fairview TSF, at the site of the reclaimed Bramber TSF; and
- accommodate the mechanical recovery of material from historic dumps and re-processing of this material at the existing Fairview processing plants.

3.1.1.5 Use of land surface rights contrary to objects of Act

Section 53 of the MPRDA provides that persons who intend to use the surface rights of any land in any way which may result in sterilisation of a mineral resource or impede any objects of the MPRDA, has to obtain consent from the Minister of Mineral Resources prior to undertaking such activity or land use.

Section 53 of the MPRDA would therefore have been relevant to the Proclamation of the land as a Nature Reserve, considering the provisions of the NEMPAA (See Section 3.3.1) prohibiting mining in Nature Reserves. It is not known whether the MTPA obtained consent from the Minister

of Mineral Resources in terms of Section 53, prior to proclaiming the BNR over the Mining Right Areas held by BML.

3.1.2 The Mining Charter, 2018

One of the objectives of the MPRDA is to ensure the attainment of Government's objectives to redress historical socio-economic inequalities, to ensure broad-based economic empowerment and the meaningful participation of Historically Disadvantaged Persons in the mining and minerals industry.

Section 100(2)(a) of the MPRDA empowers the Minister to develop a Broad-Based Black Economic Empowerment Charter for the South African Mining and Minerals Industry ("Mining Charter") as a regulatory instrument.

The first Mining Charter was published in 2004. The Mining Charter was amended in 2010 to streamline and expedite the attainment of its objectives. Further shortcomings of the previous Charter were identified and Government initiated another review process in 2015, culminating in the publication of the latest Mining Charter, 2018.

According to the Mining Charter, 2018, Existing mining right holders (such as Barberton Mines) must implement the Mining Charter, 2018 from the 01 March 2019 (Item 8.9). An existing mining right holder who has achieved a minimum of 26% Black Economic Empowerment (BEE) shareholding shall be recognised as compliant for the duration of the mining right. Renewal of the Right will require the Holder of the Mining Right to increase their shareholding to a minimum of 30%. The Mining Charter also prescribes allocation of benefits to host communities in accordance with an approved host community development programme, in addition to the Social and Labour Plan (SLP) requirements as per Section 23 of the MPRDA.

Further to the direct benefits accruing to historically disadvantaged South Africans by the implementation of elements of the Mining Charter (including ownership, employment equity and Human Resources Development), Mines are also now obligated to meet certain BEE targets in terms of procurement, supplier and enterprise development.

3.1.3 Precious Metals Act, 2005

The Precious Metals Act, 2005 (Act No. 37 of 2005) provides for the acquisition, possession, smelting, refining, beneficiation, use and disposal of precious metals and related matters.

According to this Act, "precious metal" means – (a) the metal **gold**, any metal of the platinum group and the ores of such metals; and (b) any other metal that the Minister has declared by notice in the Gazette to be a precious metal for the purposes of this Act, and the ores of any such metal.

"producer" means any person who holds a permit or right to prospect for or mine precious metals in terms of the MPRDA. According to this definition, Barberton Mines will be considered a Producer.

According to the Precious Metals Act, Section 4, no person may possess any unwrought precious metal (precious metal of a purity less than 99.9%), unless they hold a refining license, is an authorised dealer or producer, or has obtained a certificate or license from the Regulator (South African Diamond and Precious Metals Regulator) authorising such possession. Only a person who is authorised may make up, smelt or change the form of any unwrought precious

metal (Section 4(5)). Similar restrictions are imposed in terms of "semi-fabricated precious metal" (i.e. refined precious metal that is in the form of sheet, tube, wire, granule, plate, strip, rod, or sponge (including carat gold alloys as prescribed). By virtue of their Mining Right, Barberton Mines is an authorised producer.

Section 8 deals with the issue and renewal of precious metal beneficiation licenses. Section 13 specifically prohibits the transport of semi-fabricated or unwrought precious metals outside the boundaries of a mine without the prescribed documentation.

The Precious Metals Regulations were made in terms of Section 23 of the Act in July 2007 (amended in 2008 and again in 2014). The Regulations prescribe the manner in which to apply for various types of licenses and permits defined in the Precious Metals Act.

3.1.4 Other Mining Legislation

Regulation 17(8) of the Mine Health and Safety Act, 1996, (MHSA) Regulations state that "no person may erect, establish or construct any buildings, roads, railways, dams, waste dumps, reserve land, excavations or any other structures whatsoever within a horizontal distance of 100 (one hundred) metres from workings, unless a lesser distance has been determined safe by a professional geotechnical specialist and all restrictions and conditions determined by him or her or by the Chief Inspector of Mines are complied with."

There are several other pieces of legislation which deal with such issues such as royalties (the Mineral and Petroleum Resources Royalty Act, 2008), title registration (the Mining Titles Registration Act, 1967), and health and safety (MHSA). These issues constitute specialist fields on their own and will not be discussed in further detail.

Sections of the MPRDA have been amended to make the Minister of Mineral Resources the responsible authority for implementing environmental matters in terms of the NEMA as it relates to mining and prospecting operations and incidental activities, and to align the MPRDA with NEMA.

The EIA Process that is being followed meets the requirements of the MPRDA and the relevant applications and reports will be submitted to the DMR in terms of Barberton Mines' application for amendment of their Fairview Mine EMP (Section 102 of the MPRDA).

3.2 National Environmental Management Legislation

South Africa first enacted legislation which provides for the determination of environmental policy to guide decision-making in 1989 (The Environmental Conservation Act, No. 73 of 1989), though evidence of the value placed on South Africa's environment is known from our earliest histories (Sowman, Fuggle, & Preston, 1995).

It is important to distinguish between the concept of conservation (i.e. the preservation of natural resources) and environmental management (i.e. the sustainable development of natural resources) at this point. Legislation and policy related to conservation specifically, is discussed further in Section 3.3.

During the 1970s the debate on the necessity for and appropriateness of EIA as a tool in decision-making was raised in several forums in South Africa. In 1974, an inter-disciplinary committee representing various environmental planning professions was established to

prepare a set of guidelines to assist planning professionals in effectively taking environmental aspects into account. The Guidelines were published in 1980, but never adopted officially (Sowman, Fuggle, & Preston, 1995).

Further evidence of the government's recognition of the value of EIA as an aid to decision-making was given in the 1980 "White Paper on a National Policy Regarding Environmental Conservation." It is noted that a white paper is a declaration of intention and is not legally binding. Following the White Paper, a Commission of Inquiry into environmental legislation was appointed (in1981), who proposed a draft bill on environmental conservation.

The White Paper and Draft Bill formed the basis of the Environmental Conservation Act, 1982 (Act No 100 of 1982). The act contained limited provision to regulate activities and decisions that could impact on the environment.

During the 1980s the voluntary undertaking of EIAs as an input to decision-making increased. The publication of the Integrated Environmental Management (IEM) procedural document in 1989 coincided with the promulgation of the new Environmental Conservation Act 73 of 1989, which provided for protection, sustained utilization, maintenance and improvement of the environment, and incorporation of IEM in decision-making as a regulatory tool (Sowman, Fuggle, & Preston, 1995).

The most prominent legislation dealing with environmental management and impact assessment are discussed below.

3.2.1 The NEMA and EIA Regulations

The National Environmental Management Act, 1998 (Act No 107 of 1998) (NEMA), as amended was set in place in accordance with Section 24 of the Constitution of the Republic of South Africa. Certain environmental principles under NEMA have to be adhered to, to inform decision making for issues affecting the environment. Section 24 (1)(a) and (b) of NEMA state that the potential impact on the environment and socio-economic conditions of activities that require authorisation or permission by law and which may significantly affect the environment, must be considered, investigated and assessed prior to their implementation and reported to the organ of state charged by law with authorizing, permitting, or otherwise allowing the implementation of an activity.

The EIA Regulations, Government Notice (GN) Regulation 982 were published on 04 December 2014 and promulgated on 08 December 2014. Together with the EIA Regulations, the Minister also published GN R 983 (Listing Notice No. 1), GN 984 (Listing Notice No. 2) and GN R 985 (Listing Notice No. 3). The NEMA EIA Regulations, 2014 and Listing Notices have recently been amended by GN R326, (EIA Regulations) GN R 327 (Listing Notice 1); GN R325 (Listing Notice 2) and GN R324 (Listing Notice 3) of 7 April 2017. The undertaking of Listed Activities in terms of the EIA Regulations requires Environmental Authorisation to be obtained prior to commencement.

On the 2nd September 2014, the One Environmental System for mining came into effect making the NEMA the overarching National environmental legislation. In terms of Section 12(4) of the NEMA Amendment Act, 2008 (Act No. 62 of 2008) an EMP approved in terms of the MPRDA, prior to the One Environmental System coming into effect, is regarded as having been approved in terms of NEMA.

The existing operations at Fairview Mine are therefore deemed to have been approved in terms of NEMA, by virtue of alignment with the activities described in the approved EMP.

Changes to the approved activities (e.g. establishment of access roads and mechanical recovery of material from historic dumps, the establishment of a new TSF) will be subject to Environmental Authorisation being granted in terms of NEMA and the EIA Regulations, 2014 (as amended).

There are new Listed Activities associated with the proposed Project, as summarized in Section 2.5. These Activities are identified in terms of Listing Notice 1, 2 and 3 of the EIA Regulations 2014 (as amended) and Category A, B and C of the List of Waste Management Activities that have, or are likely to have, a detrimental effect on the environment (as amended).

A comprehensive Scoping and EIA Process is therefore relevant to the application. The application process is discussed in Section 2.3 of this report, and is in accordance with the EIA Regulations, 2014 (as amended). The EIA Regulations further set out the requirements for Reporting, Timeframes, Public Participation and Specialist Reports.

The Scoping and EIA Process that is being undertaken in terms of the proposed Project is undertaken in accordance with the Regulations.

3.2.2 National Environmental Management: Waste Act

The National Environmental Management Waste Act, 2008 (Act No. 59 of 2008) (NEMWA) provides for national norms and standards for regulating the management of waste, and the licensing and control of waste management activities.

Regulations to the NEMWA identifies a number of activities which require a Waste Management License (WML) prior to being undertaken.

The establishment and reclamation of residue deposits and residue stockpiles is included in the List of Activities as follows:

> *Category B, Activity 11: 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).*

The original Bramber TSF (where the new Fairview TSF is proposed) is approved in terms of the Fairview EMP. However, the TSF has been reclaimed to ground-level and it is considered that the Project does not merely involve the re-establishment of the old TSF, but rather the design, construction and operation of a new facility, albeit on the previous TSF footprint.

In addition to the above, Category B Activity 7 identifies the disposal of any quantity of hazardous waste to land as an activity requiring a WML, and Activity 10 relates to "the construction of a facility for a waste management activity listed in Category B of this Schedule".

The proposed Fairview TSF will therefore require authorization in terms of the NEMWA.

It is posited that reclamation of processed material that was deposited onto BML dumps prior to the commencement of the MPRDA (i.e. 1 May 2004), does not constitute a waste management activity, as these dumps did not result from activities which required any rights

in terms of the MPRDA (no deposition has occurred on these dumps since the MPRDA commenced).

It can therefore be argued that the reclamation of the historic dumps does not constitute a Listed Activity in terms of NEMWA.

The definition of "residue stockpile" provided for in the NEMWA differs from that provided in the MPRDA. According to NEMWA, a residue stockpile is defined as "any debris, discard, tailings, slimes, screening, slurry, waste rock, foundry sand, mineral processing plant waste, ash or any other product derived from or incidental to a mining operation and which is stockpiled, stored or accumulated within the mining area for potential re-use, or which is disposed of by the holder of a mining right, mining permit or production right or an old order right, **including historic mines and dumps created before the implementation of this Act**".

Therefore, the target dumps at Fairview are regarded as residue stockpiles in terms of the NEMWA, but reclamation of these dumps is still excluded from the Listed Waste Management Activity, which refers specifically to reclamation of a "*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),*** and not to reclamation of stockpiles which resulted from activities which were not governed by the MPRDA,

The process to apply for a WML is in this case an integrated process to the application for Environmental Authorisation.

3.2.2.1 NEMWA: Regulations regarding the planning and management of Residue Stockpiles and Residue Deposits

The Residue Deposits Regulations, 2015, aims to regulate the planning and management of residue stockpiles and residue deposits from prospecting, mining, exploration or production operations.

The NEMWA prescribes a Waste Classification and Management System comprising of three Regulations that:

- establish a methodology for the classification of all wastes (GN R 634);
- provides methods for the assessment of wastes to be disposed of to landfill (GN R 635) and to determine the type of landfill site on which such waste can be disposed of (GN R 636); and
- Regulations specifically pertaining to residue stockpiles and residue deposits (GN R 632).

While the term "Landfill" is not specifically defined in the Act or its Regulations, it is accepted that there is a clear distinction between a landfill site and a residue stockpile/deposit and GN R 635 and 636 cannot be made applicable to a residue stockpile/deposit (including the proposed Fairview TSF). GN R 632 was published in July 2015 and supersedes the waste classification and management system Regulations promulgated in August 2013.

Therefore, the recommendations on a barrier system to be implemented at the Fairview TSF will be based on a risk-based approach guided by the waste classification, and will be undertaken by the Engineering Team who are designing the Fairview TSF.

3.2.3 National Water Act, 1998 (Act No. 36 of 1998) (NWA)

The NWA provides for the sustainable and equitable use and protection of water resources. It is founded on the principle that the National Government has overall responsibility for and authority over water resource management, including the equitable allocation and beneficial use of water in the public interest, and that a person is only entitled to use water, without a license, if the use is permissible in terms of Section 22 of the NWA.

The competent authority in respect of water use licenses is the Department of Human Settlements, Water and Sanitation (DHSWS, previously the Department of Water and Sanitation, DWS, and the Department of Water Affairs and Forestry, DWAF). In the project area, this responsibility has been assigned to the Inkomati-Usuthu Catchment Management Agency (IUCMA).

Fairview Mine was issued with an Integrated Water Use License (IWUL) in August 2016 (License No. 04/X23F/ABEFGJ/4725). The License is valid for a period of ten years. The authorised water uses are summarised in Table 5 and shown on Figure 14.

The proposed project will be associated with additional water uses that are not currently included in the Fairview IWUL. The integrated water use license application (IWULA) process and compilation of the Integrated water and waste management plan (IWWMP) is being undertaken by Escon consulting, and will not be discussed in detail in this report.

Table 5: Water Uses Authorised at Fairview Mine

Water Use as defined in the NWA		Description	Coordinates	Volume
A1	Taking water from a water resource.	Abstraction from boreholes to supply mine village, plant, offices, clinic, workshop, stores, hostels, change houses and Barberton Gold (Pty) Ltd with domestic water.	25°43'35.6"S 31°03'56.3"E	142,350 m^3/a
A2		Abstraction from Suid Kaap River to supply Mine village, plant, offices, clinic, workshops, stores, hostels, change houses and Verulam community with domestic water.	25°42'01.0"S 31°04'26.2"E	521,500 m^3/a
A3		Abstraction from Hyslops Creek to supply mine village, plant, offices, clinic, workshops, stores, hostels, change houses with domestic water.	25°44'55.8"S 31°04'66.5"E	175,000 m^3/a
A4.1		Abstraction of groundwater for remediation purposes, interception of	25°44'07.3"S 31°04'52.4"E	19,345 m^3/a

Water Use as defined in the NWA		Description	Coordinates	Volume
A4.2		plume from the old rousting plant footprint (interception boreholes)	25°43'58.86"S 31°09'22.2"E[3]	19,345 m³/a
A4.3			25°44'01.6"S 31°04'49.1"E	19,345 m³/a
A5.1		Abstraction of groundwater for remediation from the Loubschers Creek (Scavenger Boreholes to intercept pollution plume). Water is used in the BTRP. It is noted that Scavenger Boreholes 3 & 4 in license have exact same coordinates.	25°43'06.0"S 31°03'35.5"E	10,164 m³/a
A5.2			25°43'16.1"S 31°03'47.3"E	3,390 m³/a
A5.3			25°43'08.8"S 31°03'34.5"E	44,664 m³/a
A5.4			25°43'08.8"S 31°03'34.5"E	72,792 m³/a
A5.5			25°43'11.8"S 31°03'41.3"E	14,000 m³/a
A5.6			25°43'08.9"S 31°03'37.2"E	3000 m³/a
A6		Abstraction from borehole to irrigate 2 ha of the local community vegetable garden	25°44'23.9"S 31°03'55.8"E	2,047 m³/a
A7		Abstraction of water from underground mine workings at Fairview, to use for reworking of TSFs.	25°43'55.8"S 31°06'01.7"E	779,202 m³/a
A8		Abstraction of water from underground mine workings at New Consort, to use for reworking of TSFs.	25°39'13.0"S 31°04'01.3"E	657,000 m³/a
B	Storing of Water	Storage of potable water into underground reservoir	25°43'57.0"S 31°06'03.1"E	624,150 m³/a
E	Engaging in a controlled activity	Irrigation with wastewater: Irrigation rehabilitation: Irrigation of land to leach out the Arsenic Roasting Plant Footprint.	25°43'57.0"S 31°06'03.1"E	31,390 m³/a

[3] It is noted that this coordinate is incorrectly captured in the IWUL and should be 25°43'58.86"S; 31° **B**'22.20"E.

Water Use as defined in the NWA		Description	Coordinates	Volume
F1	Discharging waste or water containing waste into a water resource through a pipe, canal, sewer, sea outfall or other conduit.	Discharge of excess underground water for continuation of mining into Olifants Creek	25°43'55.8"S 31°06'01.7"E	262.435 m³/a
F2		Discharge of excess underground water from process water tank and overflow from treatment plant backwash into Olifants Creek.	25°43'56.8"S 31°04'23.6"E	115,304 m³/a
G1	Disposing of waste in a manner which may detrimentally impact on a water resource.	Disposal of rainfall runoff water, overflow from potable treatment backwash into workshop dam	25°43'55.30"S 31° 3'21.80"E	153,300 m³/a
G2		Disposal of tailings to Bramber TSF	25°43'35.60"S 31° 3'56.30"E	21,900 tons/a
G3		Disposal of tailings to Bramber TSF extension	25°43'40.20"S 31° 4'2.50"E	156,950 tons/a
G4		Disposal of supernatant water from Bramber TSF to the Bramber RWD	25°43'34.10"S 31° 3'58.10"E	18,250 m³/a
G5		Disposal of supernatant water BTRP RWD into Bramber extension RWD	25°43'34.10"S 31° 3'58.10"E	87,235 m³/a
G6		Emergency Dam to dispose supernatant water from re-mining of Bramber TSF	25°43'48.80"S 31° 3'45.60"E	17,800 m³/a
G7		Disposal of tailings into BTRP/New Bramber TSF	25°43'30.80"S 31° 3'42.90"E	1,241,000 tons/a
G8		Disposal of supernatant water from BTRP/New Bramber TSF to new Bramber RWD	25°43'55.80"S 31° 6'1.70"E[4]	1,204,500 m³/a
G9		Disposal of underground water from New Consort, into workshop dams to be re-used in BTRP and Biox plants.	25°43'34.10"S 31° 3'58.10"E	657,000 m³/a

[4] It is noted that this coordinate is incorrectly captured in the IWUL

Water Use as defined in the NWA		Description	Coordinates	Volume
G10		Disposal of underground water from Fairview to the workshop dams (surplus water after the mill tanks).	25°43'55.30"S 31° 3'21.80"E	300,000 m^3/a
G11		Disposal of treated sewage waste water.	25°43'32.40"S 31° 4'8.30"E	70,304 m^3/a
j	Removing, discharging or disposing of water found underground if it is necessary for the efficient continuation of an activity or for the safety of people.	Dewatering of water found underground for mine continuation.	25°43'55.8"S 31° 6'01.7"E	779,202 m^3/a

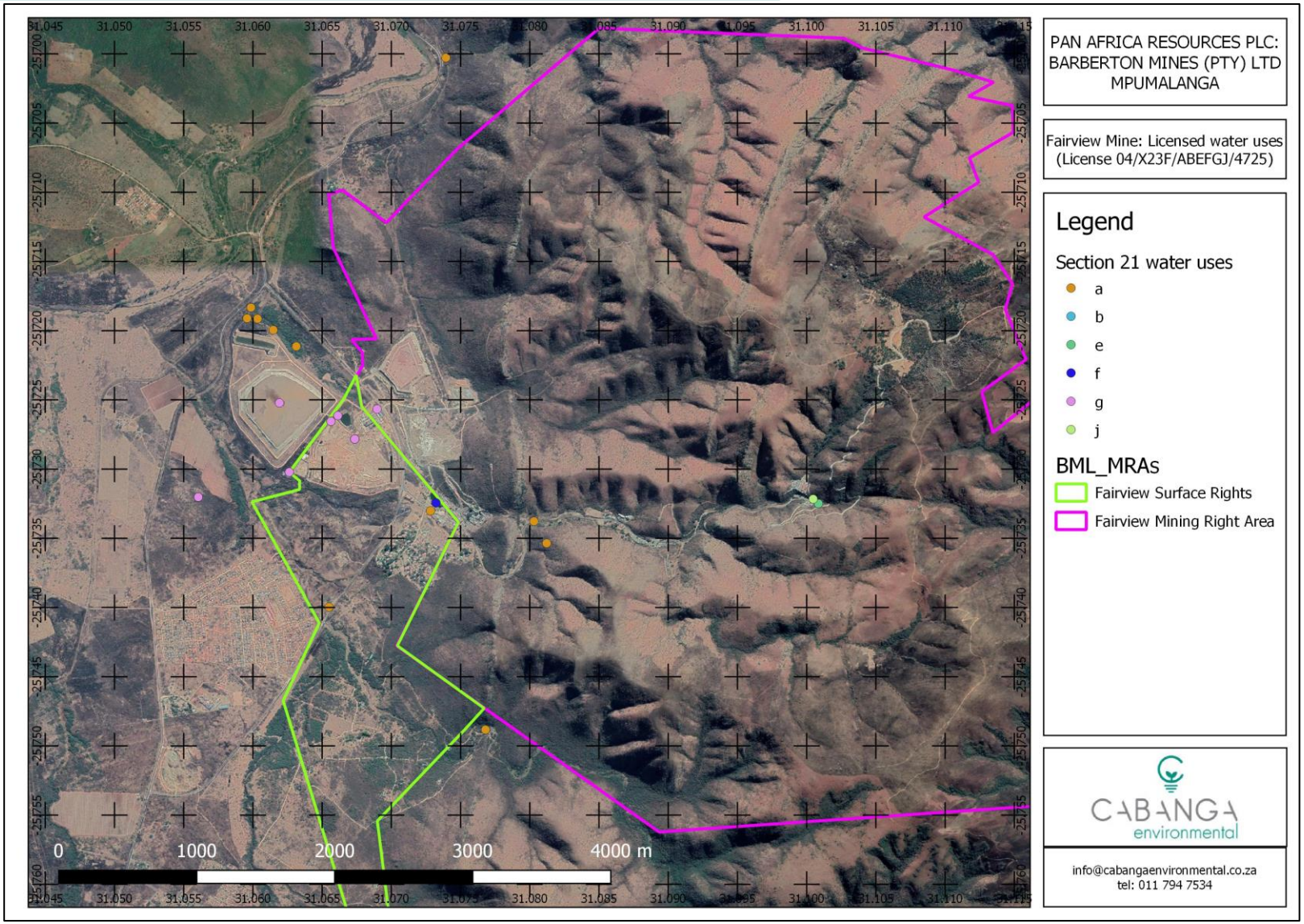


Figure 14: Authorised water uses according to the Fairview Mine IWUL

3.2.3.1 NWA: Regulations for the use of water for mining and related activities in GNR 704 of 4 June 1999 (GNR 704).

Specific regulations made in terms of Section 26(1) of the NWA pertain to the use of water for mining and related activities. The provisions of GN704 will be incorporated into the design of the proposed Project, where possible. Where the implementation of provisions of GN704 is not possible, the IWULA must include application for exemption from the relevant provisions, as per Regulation 3 of GN704.

Regulation 2 of GN704 stipulates this Mine's obligations in terms of notifications to the DWS, if changes take place at the Mine, or if incidents occur. These provisions will be incorporated into the Mine's updated EMP and associated emergency response plan and communication protocols.

There are also existing activities at Fairview Mine that require exemption from GN704, which are not currently included in the approved WUL. These relate mainly to the placement of infrastructure within drainage lines and in close proximity to drainage lines, discharge from dirty water facilities into clean water systems, waste disposal and security.

The WUL Application for the Project should include application for exemption of the relevant provisions of GN704 for the proposed as well as the existing operations.

3.2.4 National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004) (NEMAQA)

According to the National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004) (NEMAQA) the Department of Environmental Affairs (DEA), the provincial environmental departments and local authorities (district and local municipalities) are separately and jointly responsible for the implementation and enforcement of various aspects of NEMAQA. A fundamental aspect of the new approach to the air quality regulation, as reflected in the NEMAQA is the establishment of National Ambient Air Quality Standards (NAAQS) (GN R 1210 of 2009). These standards provide the goals for air quality management plans and also provide the benchmark by which the effectiveness of these management plans is measured.

An Air Quality Impact Assessment (AQIA) has been commissioned as part of the EIA process.

Activities that are identified in GN 983 require an Atmospheric Emissions License AEL to be issued in terms of NEMAQA. The proposed TSF establishment and proposed recovery of waste material from historic dumps do not constitute Listed Activities in terms of the NEMAQA.

GN701 declared Greenhouse gasses as priority air pollutants. The greenhouse gas reporting regulations (GenN275) identifies Mining and Quarrying as one of the industries who must report their Greenhouse Gas Emissions to the competent authority.

The National Atmospheric Emission Reporting Regulations, 2015 identifies all mines as a Group C Emission Source, and requires the Mine to report to the National Atmospheric Emissions Information System (NAEIS) on their dust, PM_{10} and $PM_{2.5}$ emissions on an annual basis. These requirements will be incorporated into the updated Fairview EMP.

3.3 National Legislation related to Protected Areas and Conservation

Prior to European colonialization of South Africa, the use of natural resources was controlled by local traditional leaders, healers and religious beliefs. Colonialization brought increased pressure on natural resources, to the point where authorities were forced to regulate activities such as hunting in the Cape (1656) and preserving the Southern Cape Forests (1811). The first game reserves in South Africa were established in the Knysna and Tsitsikamma forests in 1886. Fencing of reserves have led to forced relocation of South African communities, and the associated loss of land and access to resources, and conservation became an increasingly elitist industry. This period created distinct divisions of the land: European settlement areas, African communal areas and the beginning of the demarcation of conservation areas. The African population was forced into smaller areas of land. The notorious Land Acts of 1913 and 1936 legislated this divide, and left indigenous people with only 13% of the total land area in South Africa. The apartheid era further enforced the division between communal-managed areas and formally managed protected areas. (https://www.environment.gov.za/projectsprogrammes/peopleparks/southafrican_conservationhistory).

After democracy in 1994, the land issue was addressed in many cases by the successful lodgement of land claims, which saw previously displaced people accessing conservation areas for their own use again.

The government is now faced with the challenge of seeing that previously disadvantaged people are supported and advised to ensure they get the benefits they deserve, whilst upholding their conservation mandates under the NEMPAA (https://www.environment.gov.za/projectsprogrammes/peopleparks/southafrican_conservationhistory).

The following sections provide an overview of the most pertinent legislation relating to conservation in South Africa at present.

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

The National Environmental Management: Protected Areas Act, 2003 (Act No 57 of 2003) (NEMPAA) (as amended) provides for the protection and conservation of ecologically viable areas of South Africa's biological diversity, natural landscapes and seascapes. It further provides for the establishment of a register of protected areas (SAPAD), the management of those areas and for intergovernmental co-operation and public consultation in matters concerning protected areas.

The Fairview MRA overlaps with the proclaimed boundaries of Barberton Nature Reserve, a proclaimed protected area (nature reserve) in terms of the NEMPAA and shown in the SAPAD database. The majority of the Fairview, New Consort and Sheba MRAs are located within the proclaimed nature reserve.

Barberton Nature Reserve's current boundaries was proclaimed as a Provincial Nature Reserve in terms of the Mpumalanga Nature Conservation Act, 1998 (Act No. 10 of 1998), on 22 May 2014. SAPAD indicates that it is a National Nature Reserve and amended the boundaries of the reserve in Quarter 2 of 2018.

The NEMPAA holds that the State is the Trustee of Protected areas in the country and must implement the NEMPAA in partnership with the people of South Africa to achieve the progressive realisation of the rights contained in Section 24 of the Constitution. The NEMPAA must be interpreted and applied in accordance with the principles set out in the NEMA (Section 5(1)a) and must be read, interpreted and applied in conjunction with the National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004) (NEMBA) (Section 6).

Section 7 of NEMPAA deals specifically with conflicts with other legislation and states that:

> *"1) In the event of any conflict between a section of this Act and –*
>
> (0) *other national legislation, the section of this Act prevails if the conflict specifically concerns the management or development of protected areas;"*

The implication of this provision is essentially in conflict with provisions of the MPRDA and the pre-existing mining rights in the areas that were declared parts of the Barberton Nature Reserve. The Mining Rights were approved and valid long before the Barberton Nature Reserve was proclaimed as such, and the proclamation seemingly took no notice of existing rights of the Mining Right Holder on the properties. Regardless, the prohibition on new mining activities in Nature Reserves (including the BNR) is acknowledged. However, based on the definition of "mining" as provided in the MPRDA, the proposed reclamation activities do not constitute a "new mining activity".

3.3.1.1 Purpose of Protected Areas

Section 17 of the NEMPAA specifically deals with the purpose of protected areas and states that: *The purpose of the declaration of areas as protected areas are –*

> *(a) to protect ecologically viable areas representative of South Africa's biological diversity and its natural landscapes and seascapes in a system of protected areas;*
>
> *(b) to preserve the ecological integrity of those areas;*
>
> *I to conserve biodiversity in those areas;"*
>
> *(j) to manage the interrelationship between natural environmental biodiversity, human settlement and economic development;*
>
> *(k) generally, to contribute to human, social, cultural, spiritual and economic development;"* (among others).

Considering the current disturbed ecological state of the surface areas associated with the proposed dump reclamation and the Proposed new TSF on the old Bramber TSF footprint, the sites cannot be said to be contributing significantly to the preservation of ecological integrity of the area. The site of the proposed new TSF falls outside of the proclaimed nature reserve. The historic dumps fall within the proclaimed nature reserve. Though it is anticipated that the proposed reclamation will not be in keeping with the intended conservation-related surface land use associated with the Nature Reserve, it is posited that the existence of these historic dumps is not in keeping with the intentions either. Reclamation of these dumps could in future facilitate improved conservation practices within the boundaries of the Nature Reserve, once mining is concluded and Fairview obtains closure.

3.3.1.2 Declaration of protected areas

In terms of Section 23 of the NEMPAA, the Minister or MEC may by notice in the Gazette declare an area specified in the notice as a nature reserve, and assign a name thereto. Such declaration may only be issued –

> "*(a) to supplement the system of national parks in South Africa;*
>
> *(b) to protect the area if the area –*
>
> > *(i) has significant natural features or biodiversity;*
> >
> > *(ii) is of scientific, cultural, historical or archaeological interest; or*
> >
> > *(iii) is in need of long-term protection for the maintenance of its biodiversity or for the provision of environmental goods and services;*
>
> *(c) to provide for a sustainable flow of natural products and services to meet the needs of the local community;*
>
> *(d) to enable the continuation of such traditional consumptive uses as are sustainable; or*
>
> *(e) to provide for nature-based recreation and tourism opportunities.*"

It cannot be said that Barberton Nature Reserve, inclusive of the surface areas affected by the existing and past mining activities at Fairview (and the other mines in the area), was proclaimed to supplement the system of national parks in the country, as it is not geographically connected to any national parks and was proclaimed as a Nature Reserve and not a National Park, in terms of the NEMPAA Section 9.

The area associated with the BML Mines and surface infrastructure is disturbed and therefore does not warrant protection due to the biodiversity aspects associated with those areas. The sites of the historic dumps potentially hold biodiversity value and will be evaluated in detail in the EIA phase.

It is important to note that there are several illegal gold miners present in the area, who access gold reserves via historical shafts and adits at great risk to their personal safety. BML has sealed various of the historic adits over the years, but this does not deter the illegal miners from tunnelling into the mountain in search of gold. This activity may be described as "traditional consumptive uses" in the area, but such activities are definitely not legal in terms of the MPRDA or NEMA, and are not sustainable at all.

The NEMPAA prescribes a consultation process to be undertaken prior to the declaration of Nature Reserves, and specifically requires the Minister or MEC (as the case may be) to "*in the prescribed manner, consult any **lawful occupier with a right in land** in any part of the area affected*".

Section 33 of NEMPAA, dealing with public participation, states that the Minister or MEC must *if it is proposed to declare any private land as a protected environment, send a copy of the proposed notice by registered post to the last known postal address of each owner of land within the area to be declared, **and inform in an appropriate manner any other person whose rights in such land may materially and adversely be affected by such declaration***.

3.3.1.3 Restriction of certain activities in protected areas

Section 48 of the NEMPAA states that: "*despite other legislation, no person may conduct commercial prospecting, mining, exploration, production or related activities… in a nature reserve.*"

The Act does allow for *prospecting, mining, exploration, production or related activities* in a protected environment if the Minister of Environmental Affairs and the Minister of Mineral Resources both give their written permission.

> *"protected environment" means –*
>
> *(a) an area declared, or regarded as having been declared, in terms of section 28 as a protected environment;*
>
> *(b) an area which before or after the commencement of this Act was or is declared or designated in terms of provincial legislation for a purpose for which that area could in terms of section 28(2) be declared as a protected environment; or*
>
> *(c) an area which was a lake area in terms of the Lake Areas Development Act, 1975 (Act No. 39 of 1975), immediately before the repeal of that Act by section 90(1) of this Act,*
>
> *and includes an area declared in terms of section 28(1) as part of an area referred to in paragraph (a), (b) or (c) above;*

It is noted that BNR is a Nature Reserve, and was not declared as a protected environment. Ministerial consent is therefore not necessarily applicable to the Application.

According to the NEMPAA, the Minister was supposed to review mining activities which were lawfully conducted in nature reserves, protected areas etc. when the NEMPAA took effect, and then prescribe conditions under which those activities may continue.

The Fairview Mining Right was granted in terms of Item 7 of Schedule II of the MPRDA and the converted right registered in May 2011 (i.e. before the proclamation of the BNR in 2014). The legal status of the BNR as well as the legal status of the Fairview MRA are acknowledged.

3.3.2 National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004) (NEMBA)

The NEMBA provides for the management and conservation of South Africa's biodiversity within the framework of the NEMA. The Act relates to the protection of species and ecosystems that warrant national protection, among others.

Certain Fauna and Flora Species of Conservation Concern (SCC) are known to occur in the general vicinity of the site.

A biodiversity specialist study (Flora and Fauna) has been commissioned as part of the EIA Process. If there are protected species that must be directly affected by the proposed project, that cannot be avoided, the necessary permits for translocation of these species will have to be obtained prior to their disturbance.

3.3.3 Conservation of Agricultural Resources Act, 1983 (Act No 43 of 1983) (CARA)

CARA provides for control over the utilization of the natural agricultural resources of the Republic to promote the conservation of soil, water sources and vegetation and the combating of weeds and invader plants.

The site is not anticipated to have a high agricultural potential, but this will be confirmed through the soils / agricultural assessment as part of the EIA.

Due to past disturbance of the sites (both the proposed new TSF site, and the sites associated with the historic dumps), it is anticipated that alien invasive species are a threat to the biological diversity of surrounding areas. Fairview Mine must compile and implement a strict alien invasive species management plan.

The Act specifically prohibits any person from spreading weeds or allowing weeds to be spread or reproduced.

The Biodiversity study to be compiled as part of the EIA Process will also identify problem species on site and comment on the extent of alien invasive species encroachment on the site.

The contradictory rights of the BNR and Fairview Mine may create some conflict and confusion in assigning responsibility for the management of alien invasive species (as this is supposed to be the responsibility of the surface holder, in terms of the Act). It is recommended that BML and BNR come to a written agreement and partnership with regards to the management of alien species, which relationship could be mutually beneficial to both parties.

3.3.4 National Heritage Resources Act, 1999 (Act No. 25 of 1999) (NHRA)

The NHRA aims to promote good management and preservation of the country's Heritage Resources.

Various heritage resources are known to occur in the area. The heritage resources on and adjacent to the potentially affected sites must be managed and preserved by the implementation of appropriate buffer zones and access control.

A Heritage / Archaeological impact assessment has been commissioned as part of the EIA.

It is acknowledged that the dumps that are targeted for reclamation are older than 60 years. The NHRA prohibits any person from demolishing any structure or part thereof which is older than 60 years without a permit issued by the relevant heritage resources authority. The NHRA defines "structure" as "any building, **works**, device or other facility **made by people and which is fixed to land**, and includes any fixtures, fittings and equipment associated therewith".

Therefore, the proposed reclamation will be preceded by an application to the relevant provincial heritage resources authority. Such application will be accompanied by the opinion of a registered archaeologist as to the heritage value of the dumps.

If other heritage resources protected under the NHRA are to be affected by the project, BML will have to apply for destruction of these resources, after following the required Phase 2 heritage assessments. The requirement will be confirmed by the specialist study in the EIA Phase.

3.3.5 World Heritage Convention and the World Heritage Convention Act, 1999 (Act No. 49 of 1999).

The World Heritage Convention (Convention concerning the protection of the World Cultural and Natural Heritage) defines the kinds of natural or cultural sites which can be considered for inscription on the World Heritage List. The idea of creating an international organisation to protect heritage resources emerged from two distinct movements which focussed on the protection of cultural sites and the conservation of nature respectively.

A catalytic event was the construction of the Aswan Dam in Egypt which would have flooded the valley that contains the Abu Simbel Temples (an important site relating to Ancient Egyptian Civilisation). The Governments of Egypt and Sudan appealed the project in 1959, and UNESCO (United Nations Educational, Scientific and Cultural Organization) launched an international safeguarding campaign. In the end, the Abu Simbel and Philae Temples were dismantled and re-assembled on dry ground, thus facilitating the construction of the Aswan Dam, without causing irreplaceable loss of the important cultural resources.

Following successes in Egypt, Italy, Pakistan and Indonesia, UNESCO with the help of the International Council on Monuments and Sites (ICOMOS) prepared a draft convention on the protection of cultural heritage.

In 1965 a White House Convention in Washington DC in the United States of America called for the establishment of a "World Heritage Trust" to stimulate international cooperation to protect natural areas, scenic areas and historic sites throughout the world. In 1968 the International Union for the Conservation of Nature (IUCN) developed similar proposals. In 1972 these proposals were presented to the United Nations conference on Human Environment, following which a single text was agreed upon by all concerned parties. The "Convention Concerning the Protection of World Cultural and Natural Heritage" (the World Heritage Convention) was adopted by the UNESCO General Conference on 16 November 1972.

State Parties are countries that adhere to the World Heritage Convention, thereby agreeing to identify and nominate properties to be considered for inscription on the World Heritage List. South Africa ratified the convention on 10 July 1997 and is home to ten World Heritage Sites (Table 6):

Table 6: South Africa's World Heritage Sites

Name of the Site	Province	Date inscribed / modified
Robben Island	Western Cape	1999
iSimangaliso Wetland Park	Kwa-Zulu Natal	1999
Fossil Hominid Sites of South Africa	Gauteng, Limpopo & North-West Provinces	1999, Extension 2005
Maloti-Drakensberg Park	Kwa-Zulu Natal and Lesotho	2000 (extension 2013)
Mapungubwe Cultural Landscape	Northern Province	2003, minor boundary modification 2014

Name of the Site	Province	Date inscribed / modified
Cape Floral Region Protected Areas	Western Cape, with portions in Northern Cape and Eastern Cape	2004
Vredefort Dome	North-West and Free State Provinces	2005
Richtersveld Cultural and Botanical Landscape	Northern Cape	2007
Khomani Cultural Landscape	Northern Cape, Botswana & Namibia.	2017
Barberton Makhonjwa Mountains	Mpumalanga Province	2018

The World Heritage Convention Act, 1999 (Act No. 49 of 1999) provides for the incorporation of the World Heritage Convention into South African Law, and the enforcement and implementation of the convention in South Africa. The Act also prescribes the preparation, contents and implementation of integrated management plans for World Heritage Sites (by the appropriate authorities).

UNESCO also published Operational Guidelines for the implementation of the World Heritage Convention (the latest update is dated 12 July 2017). The Guidelines aim to facilitate the implementation of the convention by setting out procedures for:

- The inscription of properties;
- The protection and conservation of inscribed properties;
- The granting of international assistance in terms of the World Heritage Fund; and
- The mobilisation of national and international support in favour of the convention.

The Fairview MRA borders on the Barberton-Makhonjwa Mountains World Heritage Site (WHS) (Figure 2). Conventional perimeter buffer zones are not mandatory for WHSs and may be omitted with reasons. The Nomination Dossier for this WHS states that "geosites are only threatened by direct *in situ* impacts, so buffer zones protecting against external threats are redundant". Outside of the formally protected areas, geosites are managed in terms of the NHRA, and once registered with the South African Heritage Resource Agency (SAHRA) will be subject to local protection zones of 20 to 50-meter radius buffer zones. The geosites associated with the WHS are between Barberton and the Josefsdal / Bulembo border. The Project should therefore not have any direct impacts on the WHS inscription.

3.4 Provincial and Local legislation and guidelines

3.4.1 Mpumalanga Nature Conservation Act (Act No. 10 of 1998) and Mpumalanga Tourism and Parks Agency Act (Act 5 of 2005)

The Mpumalanga Tourism and Parks Agency Act (MTPA Act) provides for the establishment and management of the Mpumalanga Tourism and Parks Agency (MTPA) and the sustainable development and improvement of the tourism industry in Mpumalanga.

Section 2 of the MTPA Act establishes the MTPA as a juristic person. The MTPA came into existence on 1 April 2006 following the merger of the Mpumalanga Parks Board and Mpumalanga Tourism Authority.

The powers and functions of the MTPA in respect of conservation management of the natural resources of the Province include administration of the Mpumalanga Nature Conservation Act. The Mpumalanga Nature Conservation Act commenced on 1 January 1999 and consolidates and amends previous laws relating to nature conservation in Mpumalanga.

The Schedules to the Act list specially protected game, protected game, ordinary game and protected wild animals, and makes specific provisions regarding hunting, catching, purchase, donation and sale of such game, including the removal, receipt, handling and conveyance of dead game, and the importing and exporting of wild animals from the Province.

The Mpumalanga Nature Conservation Act states in Section 40 that no person shall establish or operate a game park, zoological garden, bird sanctuary, reptile park or snake park or similar institution without a permit (unless the institution is subject to the provisions of the Cultural Institutions Act, 1969 (Act No. 29 of 1969)[5].

Chapter 4 of the Mpumalanga Nature Conservation Act deals with Problem Animals, including black-backed jackal (*Canis mesomels*), Caracal / Red Lynx (*Felis caracal*) and Bush Pig (*Potamochoerus porcus*). Chapter 5 deals with Fisheries.

The Act also places specific restrictions on the picking, donation, sale, export, removal, purchase and receipt of protected and indigenous plants, and invader weeds and plants (Chapter 6).

3.4.2 City of Mbombela Local Municipality Spatial Development Framework 2018

The formulation of the Spatial Development Framework (SDF) for the City of Mbombela Local Municipality (COM) was primarily guided by the provisions of the Spatial Planning, Land Use and Management Act, 2013 (Act No. 16 of 2013) (SPLUMA), the Municipal Systems Act, the Local Government Municipal Planning and Performance Management Regulations and the Mbombela By-Law on spatial planning and land use management guide. The SDF has recently been updated following the amalgamation of the former Mbombela and Umjindi Local Municipalities. In terms of Section 20 of SPLUMA, the SDF is still recognised as part of the Municipality's Integrated Development Plan (IDP).

[5] The 1969 Act has been repealed and replaced by the Cultural Institutions Act, 1998 (Act No. 119 of 1998). The Act provides for the payment of subsidies to certain cultural institutions, among other provisions.

The SDF is an indicative plan intended to show desired patterns of land use, directions for future growth, indicate the alignment of urban edges and depict special development areas. The impact of the SDF is limited to provide policy to guide and inform land development and management. It does not change or confer real rights on land (City of Mbombela Local Municipality, 2018).

In 2013, mining contributed 3% of the COM's Gross Value Added (GVA) (in 2011 the contribution was 4.4% in former Umjindi and 2.2% in former Mbombela). The SDF points out that the Mpumalanga Province produces a high 17.6%, indicating that opportunities exist for COM to provide services for this growing sector in the province (City of Mbombela Local Municipality, 2018).

The SDF identifies the town of Barberton (and also the Project site) as falling within the "Southern Region" comprising Wards 13,27,28,41,42,43,44 & 45. The Fairview Mine and Project site is in ward 43.

In terms of the Draft IDP 2017-2016, the pressing needs for the COM with specific emphasis on ward 43 are summarized as follows:

- Insufficient supply of adequate housing in rural areas, and backlog in the allocation of residential stands
- Lack of social amenities in rural areas;
- Lack of primary healthcare facilities in rural areas;
- High rate of crime in rural areas;
- High level of unemployment as a result of lack of skills in rural areas;
- Poor condition of cemeteries in rural areas;
- Lack of access to waste removal services and absence of waste deposit facilities;
- Higher backlogs of ablution facilities in rural areas; and
- High incidences of illegal occupation of land.

The COM SDF 2018 identifies Structural Elements that essentially dictate the location of development and direction of growth within the Municipal Area. The Fairview main infrastructure area as well as the Moon and Harper TSFs are located within the proclaimed boundaries of the Barberton Nature Reserve, which also affects a portion of the BTRP processing plant site. The areas where the historic dumps are located are within the nature reserve boundary in areas identified by the SDF as Conservation Areas.

The Barberton Makhonjwa Mountain World Heritage Site, as well as the Barberton Nature Reserve are identified in the SDF as significant opportunities in terms of Tourism Development Potential within the COM.

3.4.3 Barberton Nature Reserve: Integrated Management Plan

In the context of the NEMPAA, it is important to understand how the Barberton Nature Reserve developed over the years. According to its integrated development Plan (MTPA, 2012) Barberton Nature Reserve consists of three distinct phases (Figure 16):

- Phase 1: The Farm Hillside 459JT and the Farm Barberton Nature Reserve 1015IT, west of the R40 road
- Phase 2: separated into three areas:

- Area 1: The Farm Barberton Nature Reserve 1016IT east of the R40 Road, and the Farm Barberton Nature Reserve 955 JU;
- Area 2: The Farm Barberton Nature Reserve 954 JU west and south of the Noordkaap River;
- Area 3: The Farm Barberton Nature Reserve 954 JU east and north of the Noordkaap River;

- Phase 3 (Mountainlands) over Portions of the following Farms: Saffraan 562 JU, Kameelspoor 563JU; Dublin 302JU, Raasblaar 651JU; Flamboyant 560JU; Moepel 559JU; Mandarin 558JU; Hayward 310JU; Mimosa 557JU; Bramber Oos 314JU; Worrall 352JU; Bickenhall 346JU; Dycedale 368JU; Wonder Scheur 362JU; Twello 373 JU; Colombo 365JU; Lancaster 359JU; Mhlahle 948JU and Sheba 949JU.

It is interesting to note that Phase 3 (Mountainlands) originally comprised a nature reserve independent of the Barberton Nature Reserve, albeit with slightly different boundaries, as shown in their Zonation Map from 2005 (Figure 15).

The BNR Integrated Management Plan (MTPA, 2012) acknowledges the presence of the active mines, and states (page 23) that the following management must be applied to these areas:

- *Stringent monitoring by parks authority should be applied to all new activities.*
- *Enforced adherence to conditions of EMP. Management of conflict with Conservation and Tourism objectives.*
- *Existing activities must be carefully monitored.*

The reference in the management plan to "new activities" implies that BNR expects and allows for expanded and continuing mining development within the MRA's that overlap with the BNR.

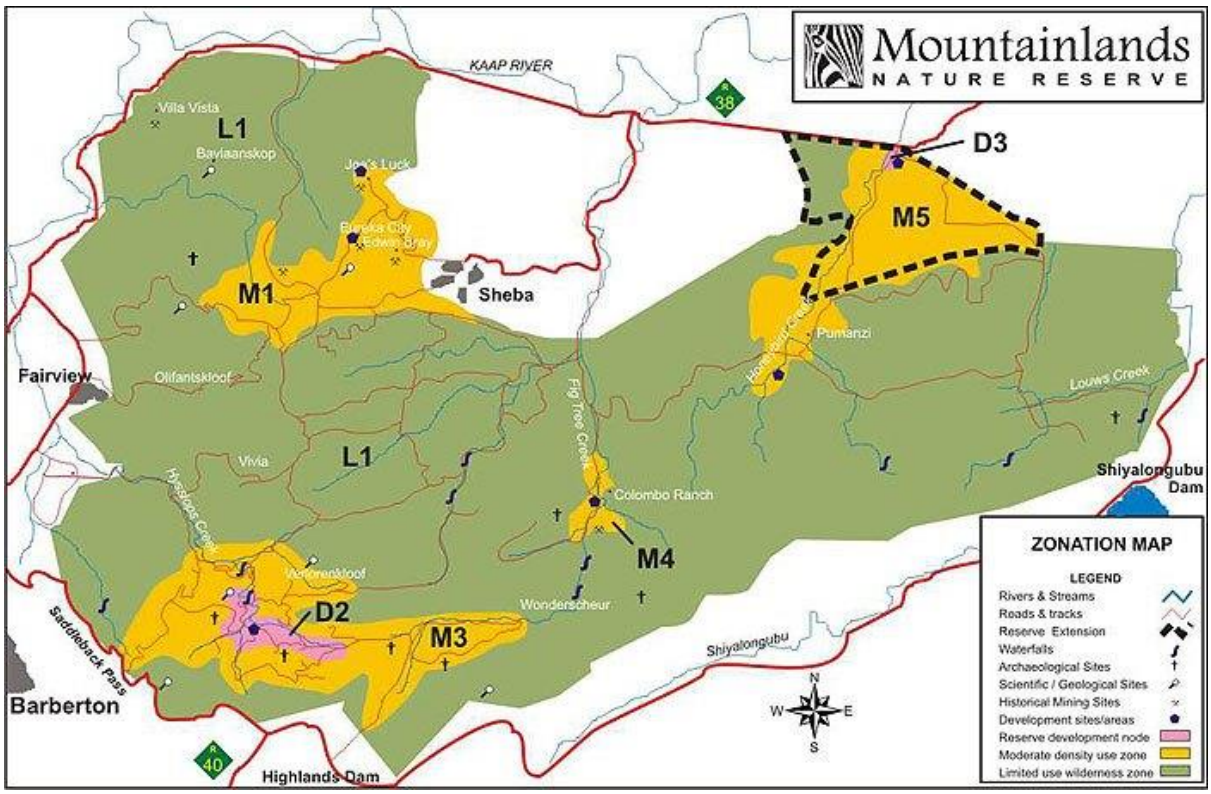


Figure 15: Mountainlands Reserve 2005 (https://www.mountainlands.co.za)

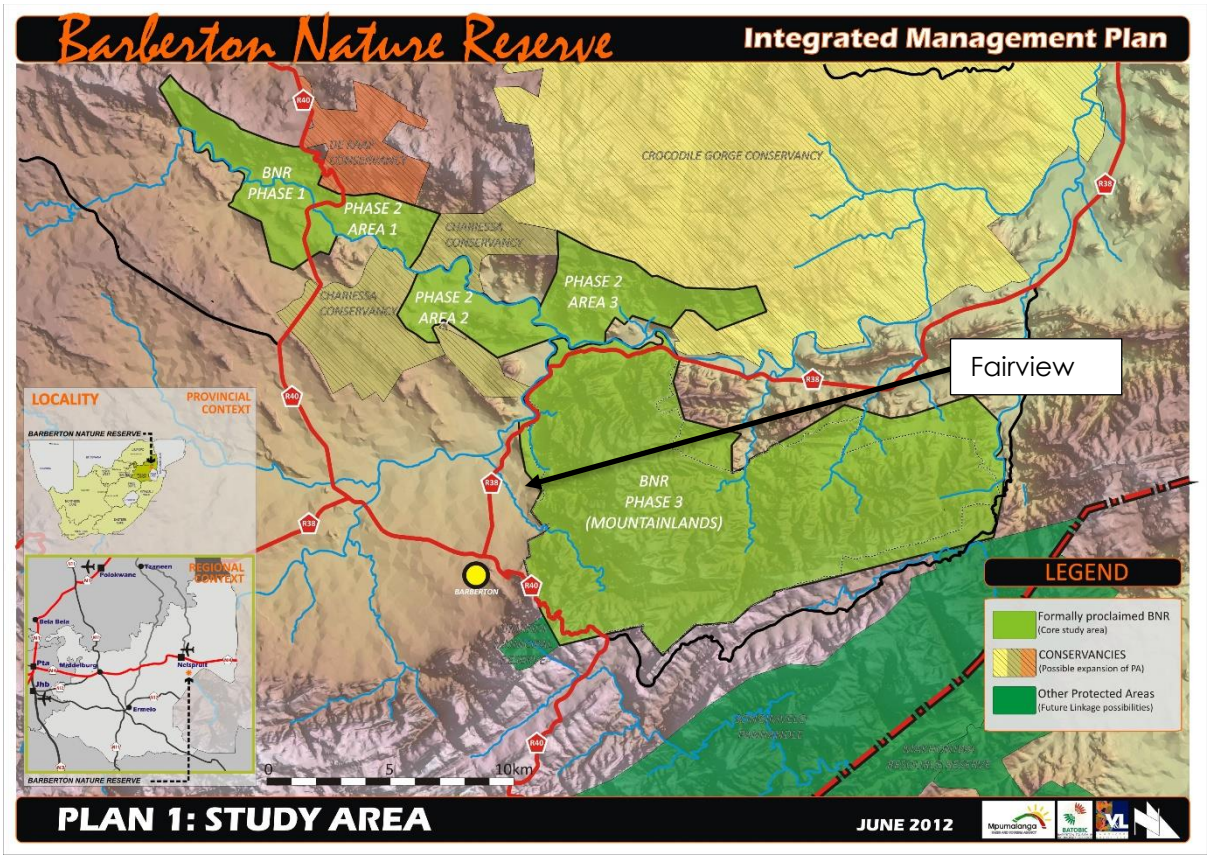


Figure 16: Barberton Nature Reserve: Development Phases (MTPA, 2012)

3.5 Other relevant Legislation

In addition to the Laws and Guidelines discussed above, Table 7 summarises some of the other key legislation and guidelines relevant to this application:

Table 7: Other Relevant legislation and guidelines

APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT	HOW THIS DEVELOPMENT COMPLIES WITH THE LEGISLATION AND GUIDELINES
NEMA: Public Participation Guidelines (GNR807).	
Department of Environmental Affairs (2017), Public Participation guideline in terms of NEMA EIA Regulations, Department of Environmental Affairs, Pretoria, South Africa.	Guidelines will be followed during the Public Participation Process (PPP).
DEA (2017), Guideline on Need and Desirability, Department of Environmental Affairs (DEA), Pretoria, South Africa	The Guideline was and will continue to be considered in assessing the need and desirability of the Project aspects.
Department of Environmental Affairs, Department of Mineral Resources,	The Mining and Biodiversity Guideline is considered and acknowledged, especially in

APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT	HOW THIS DEVELOPMENT COMPLIES WITH THE LEGISLATION AND GUIDELINES
Chamber of Mines, South African Mining and Biodiversity Forum, and South African National Biodiversity Institute. 2013. Mining and Biodiversity Guideline: Mainstreaming biodiversity into the mining sector. Pretoria.	light of the overlap of the Fairview MRA and the BNR.
The draft National Guideline on minimum information requirements for preparing EIAs for mining activities that require environmental authorisation	The Guideline was specifically followed in the compilation of this Report and will also apply to the EIA Report
Spatial Land Use and Management Act, 2013 (Act No. 16 of 2013) (SPLUMA)	SPLUMA aims to develop a framework to govern planning permissions and the lawful use of land. In terms of SPLUMA Barberton Mines should ensure that the surface rights areas where mining is undertaken, is approved as such.
Restitution of Land Rights Act, 1994, the Land Reform (Labour Tenants) Act, 1996 and the Extension of Security of Tenure Act, 1997.	Consultation with the Land Claims Commissioner has confirmed that there are land claims on the affected properties. The Claimants will be included in the I&AP database and the Mine will consult with the land claimants throughout the project.
Local Government Municipal Systems Act, 2000 (Act No. 32 of 2000) as amended	The Act requires local government to compile spatial development framework (SDF) which must include the provision of basic guidelines for a land use management system for the municipality. The objectives of an SDF are to promote sustainable functional and integrated human settlements, maximise resource efficiency, and enhance regional identity and unique character of a place. In addition, Municipalities are required to develop Integrated Development Plans (IDPs) which is a government co-ordinated approach to planning that seeks to ensure the economic and social enhancement of all within their jurisdiction. It provides a land use framework, considers infrastructure development, and the protection of the environment. The proposed project in relation to the relevant SDF is discussed in section 3.4.2.

APPLICABLE LEGISLATION AND GUIDELINES USED TO COMPILE THE REPORT	HOW THIS DEVELOPMENT COMPLIES WITH THE LEGISLATION AND GUIDELINES
Development Facilitation Act, 1995 (Act No. 67 of 1995) (DFA)	The Act promotes the integration of the social, economic, institutional & physical aspects of land development and also promotes integrated land development in rural & urban areas in support of each other. The Act encourages the availability of residential & employment opportunities in close proximity to or integrated with each other, while optimising the use of existing resources including such resources relating to agriculture, land, minerals, bulk infrastructure, roads, transportation and social facilities. The proposed projects pertain to continuation of activities at the existing Fairview Mine, which is associated with its own residential facilities and is located close to Barberton. The projects will result in continuation of employment at Fairview Mine, and optimises the use of resources (including the historic dumps) within the Fairview MRA.
NEMA Regulations pertaining to the financial provision for prospecting, exploration, mining or production activities (GNR1147 –20 November 2015) (as amended).	Financial Provision will be calculated and will be provided for by means of one of the approved mechanisms prescribed by the Financial Provision Regulations 2015 (or the 2019 Regulations if these are promulgated by the time the provision is calculated). This will be assessed during the EIA Phase.
National Road Traffic Act, Act No. 93 of 1996 (NRTA) and National Land Transport Act, Act No. 5 of 2008 (NLTA)	These Acts relate specifically to the planning and development of transport systems and the safe use of roads. The project will not directly affect any public roads after conclusion of the construction phase, other than those roads already used by Fairview Mine employees and contractors.

4 Need and Desirability

Department of Environmental Affairs (DEA) published an updated Integrated Environmental Management Guideline on Need and Desirability in 2017.

According to these guidelines, the consideration of "need and desirability" in EIA decision-making requires the consideration of the strategic context of the proposed Project along with the broader public interest and societal needs. Furthermore, the development must not exceed ecological limits and the proposed actions must be measured against the short-term and long-term public interest to promote justifiable social and economic development.

The latest Guideline Document on the assessment of Need and Desirability (DEA, 2017) includes a number of questions, the answers to which should be considered in the EIA Process. These questions (as per the Guideline) have been summarised and grouped and answers to each are presented in Table 8.

Table 8: Need and Desirability Motivation

Theme	Specific Questions	Answer related to this Application
" Securing ecological sustainable development and use of natural resources"	How will this development (and its separate elements/aspects) impact on the ecological integrity of the area?	This will be determined in the EIA Process through the specialist terrestrial biodiversity and freshwater ecology assessments.
	How were the following ecological integrity considerations considered? Threatened and sensitive Ecosystems Critical Biodiversity Areas (CBAs) and Ecological Support Areas (ESAs) Conservation targets	The state of ecosystems, biodiversity areas and conservation targets will be evaluated in the biodiversity assessments undertaken as part of the EIA Process. These will be assessed on a desktop-level first and verified on site. The historic dumps targeted for reclamation are located in a Protected area. The site of the proposed new TSF overlaps with areas identified as CBAs as identified in the Mpumalanga Biodiversity Conservation Plan (Ferrar & Lotter, 2007), despite this being the site of the old Bramber TSF. The historic dumps targeted for reclamation are located in Barberton Montane Grassland, which is regarded as vulnerable, but is well protected with a conservation target of 27% (Mucina & Rutherford, 2006). The eastern half of the proposed TSF site is located in the Kaalrug Mountain Bushveld of the Lowveld Bioregion in the Savanna Biome, which is classified as least threatened with a conservation target of 24% (Mucina & Rutherford, 2006). The western half of the proposed TSF site falls on Legogote Sour Bushveld which is endangered with a conservation target of 19% and is poorly protected (Mucina & Rutherford, 2006). Given the nature of the site (reclaimed TSF footprint) it is not representative of the original vegetation types and cannot contribute to the conservation targets.
	How does the proposed development respond to the relevant framework documents? Environmental Management Framework, Spatial Development Framework	The Proposed Project Activities are within an approved Mining Right Area and/or the existing Fairview Mine Surface Rights Areas. Alignment with municipal planning tools is further discussed in Section 3.4 of this report.

Theme	Specific Questions	Answer related to this Application
	Global and international responsibilities relating to the environment (e.g. RAMSAR sites, Climate Change, etc.).	The site is adjacent to the Barberton-Makhonjwa Mountains UNESCO World Heritage Site. This aspect is further addressed in Section 3.3.5 of this report. The site is not located in close proximity to any RAMSAR Sites, the closest being the Verloren Valei Nature Reserve more than 100km north-west of the site.
	How will this development disturb or enhance ecosystems and/or result in the loss or protection of biological diversity, or pollute or degrade the biophysical environment? What measures were explored to avoid negative impacts, or minimise and remedy (including offsetting) the impacts? What measures were explored to enhance positive impacts?	A comprehensive impact assessment process has been commissioned. This question can't be comprehensively addressed at this early stage of the project. It can be concluded at this stage the proposed new TSF will be at the footprint of the old Bramber TSF that has been reclaimed, and thus presents a brown-fields development. The proposed reclamation of material from the historic dumps is expected to enhance ecosystems in the long run to at least some degree, as the material on these dumps are potentially causing pollution (at least siltation of affected watercourses). Detailed management and mitigation will be explored in the EIA Phase and incorporated into the updated EMP.
	What waste will be generated by this development? What measures were explored to firstly avoid waste, and where waste could not be avoided altogether, to minimise, reuse and/or recycle or to safely treat and/or dispose of unavoidable waste?	Fairview Mine generates general (domestic) waste, hazardous waste and mineral waste. These will continue to be managed according to the provisions of the Mine's approved EMP. A waste classification has been commissioned to address mineral waste associated with the proposed new TSF, to ensure the facility is designed and constructed (and operated) to contain waste adequately.
	How will this development disturb or enhance landscapes and/or sites that constitute the nation's cultural heritage? What measures were explored to avoid these impacts or minimise and remedy (including offsetting) the impacts?	A heritage impact assessment has been commissioned as part of the EIA Process, which will include a desktop palaeontological assessment. Management measures will be identified as part of the study. The historic dumps that are targeted for reclamation are older than 60 years and thus all protected in terms of the NHRA.

Theme	Specific Questions	Answer related to this Application
	What measures were explored to enhance positive impacts?	
	How will this development use and/or impact on natural resources? What measures were explored to ensure responsible and equitable use of the resources? How have the consequences of the depletion of resources been considered? What measures were explored to avoid these impacts or minimise and remedy (including offsetting) the impacts? What measures were explored to enhance positive impacts?	The proposed new TSF will not occupy significant additional land but rather be situated at the site of the old TSF. Water resources are used in processing and resultant tailings deposition and the use of process water will be maximized with the use of clean water being avoided as far as possible. The proposed reclamation involves the exploitation of mineable gold remaining in the historic dumps by mechanical means. Resource use is minimal and limited to equipment use (diesel) and water requirements of personnel. Fairview Mine exploits gold reserves remaining within their MRA in line with the objectives of the MPRDA. Once the reserves are depleted, the Mine will have to close down, which will be associated with job losses and negative economic impacts, though some ecological improvements will be realized through rehabilitation of affected areas (starting with recovery of historically dumped materials).
	Does the proposed development exacerbate the increased dependency on increased use of resources to maintain economic growth or does it reduce resource dependency? Do the proposed location, type and scale of development promote a reduced dependency on resources?	The project does not exacerbate or reduce resource dependency, but addresses a demand for the exploitation of gold. The location of the reserves dictates the Mines location, type and scale.
	Does the proposed use of natural resources constitute the best use thereof? Is the use justifiable when considering intra- and intergenerational equity, and are there more	The area holds numerous natural resources, including mineral resources that Fairview Mine aims to capitalise on, and ecological, scenic and geological resources valuable to the tourism sector in the area. It is believed that through proper management, all of these resources can be used optimally, as further discussed in section 5.7 of this report.

Theme	Specific Questions	Answer related to this Application
	important priorities for which the resources should be used?	
	How were a risk-averse and cautious approach applied in identifying and assessing impacts?	The impact assessment methodology is described in section 8.1. Where information is lacking the precautionary approach is implemented.
	What are the limits of current knowledge and the risks associated therewith?	Knowledge gaps and assumptions are further discussed in section 10 of this report.
	How will the ecological impacts of this development impact on people's environmental rights?	This will be addressed in the Impact assessment. On a preliminary basis, the project will not infringe on people's environmental rights as measures will be put in place to ensure people's right to an environment that is not harmful to health and safety is not threatened by this project.
	Considering the need to secure ecological integrity and a healthy biophysical environment, describe how the alternatives identified resulted in the selection of the "best practicable environmental option"	Reclamation of the material from the historic dumps, even though these are located in a nature reserve, is expected to improve the ecological integrity of the area in the long term, by removing historic mineral waste deposits from this area, it is possible to restore natural drainage lines and vegetation. Alternatives are discussed in section 5.

Theme	Specific Questions	Answer related to this Application
" promoting justifiable economic and social development"	What is the socio-economic context of the area in terms of: The IDP and any other strategic plans, frameworks of policies applicable to the area, Spatial priorities and desired spatial patterns; Existing land uses, planned land uses, cultural landscapes etc. Municipal Economic Development Strategy ("LED Strategy")	The Fairview Mine is indicated in the Umjindi Municipality's IDP and SDF, though these documents are somewhat redundant after incorporation of the Umjindi Local Municipality into Mbombela Municipality. The Mbombela Municipality IDP also acknowledges the contribution of mining to employment. The existing Fairview Mine is recognised in the SDF, while the Nature reserve is also acknowledged. The SDF does not comment on the conflicting land uses adjacent to and overlapping one another.
	Considering the socio-economic context, what will the socio-economic impacts be of the development (and its separate elements/aspects), and specifically also on the socio-economic objectives of the area? Will the impact be socially and economically sustainable in the short- and long-term?	The socio-economic sustainability of the project will also be assessed in the EIA-Phase. At this early stage of the Project, it is confirmed that the proposed new TSF is required to ensure continued production (and associated employment) at Fairview Mine.
	In terms of location, describe how the placement of the proposed development will result in the creation of residential and employment opportunities in close proximity to or integrated with each other, reduce the need for transport of people and goods result in access to public transport or enable non-motorised and pedestrian transport compliment other uses in the area	The reclamation project location depends on the location of historic dumps containing viable gold that can be recovered. The location of the proposed new TSF was determined based on the location of the original Bramber TSF and Bramber TSF extension, as the location is operationally suitable and has already been disturbed (it is thus preferable to constructing a new TSF on a new, greenfields site). The project is associated with the retention of employment opportunities and is situated in close proximity to existing residential areas (such as Barberton and Verulam), where unemployment is very high.

Theme	Specific Questions	Answer related to this Application
	be in line with the planning for the area optimise the use of existing resources and infrastructure contribute to the correction of the historically distorted spatial patterns of settlements and to the optimum use of existing infrastructure in excess of current needs, encourage environmentally sustainable land development practices and processes the investment in the settlement or area in question will generate the highest socio-economic returns impact on the sense of history, sense of place and heritage of the area and the socio-cultural and cultural-historic characteristics and sensitivities of the area in terms of the nature, scale and location of the development promote or act as a catalyst to create a more integrated settlement?	The Project will implement a local procurement policy and source employees and supplies locally, where the required skills and goods are available locally. At least some mine employees access the mine using public transport. The proposed reclamation sites are within an existing MRA and the proposed Fairview TSF site is associated with the existing Fairview Mine Main surface infrastructure area. The wider area is well-known for various gold mines. The project optimizes the use of existing mining and processing infrastructure at Fairview Mine. The project optimises the use of existing disturbed footprint areas and existing roads. Investment in local settlements forms part of the Mine's Social and Labour Plan (SLP). The sense of history of the Barberton area is strongly associated with the history of gold mining. A heritage and archaeological impact assessment have been commissioned as part of the EIA process.
	What measures were taken to pursue environmental justice and equitable access to environmental resources, benefits and services so that adverse environmental impacts shall not be distributed so as to unfairly discriminate against any person, (who are the beneficiaries and is the development located appropriately)?	The primary beneficiaries of the Fairview Mine and thus the Project are considered to be the employees of BML. The Fairview Mine Village and Hostels house employees at the Mine and therefore beneficiaries and affected parties are in this case one in the same. The other primary affected party is expected to be the BNR, who will benefit in the long term from the proposed reclamation activities as this will improve the ecological integrity of these areas, which are located within the BNR.

Theme	Specific Questions	Answer related to this Application
	What measures were taken to meet basic human needs and ensure human wellbeing, and what special measures were taken to ensure access thereto by categories of persons disadvantaged by unfair discrimination?	The Mine's SLP programmes must contribute to meeting basic human needs. The specialist studies, specifically the groundwater and surface water studies will ensure that the mine's activities do not adversely affect the basic human or ecological water requirements.
	What measures were taken to ensure that the responsibility for the environmental health and safety consequences of the development has been addressed throughout the development's life cycle?	The mine will be operated in strict accordance with the Mine Health and Safety Act, which is beyond the scope of the EIA process and beyond the expertise of the EAP.
	What measures were taken to: ensure the participation of all interested and affected parties, provide all people with an opportunity to develop the understanding, skills and capacity necessary for achieving equitable and effective participation, ensure participation by vulnerable and disadvantaged persons ensure openness and transparency, and access to information in terms of the process, ensure that the interests, needs and values of all interested and affected parties were taken into account, and that adequate recognition were given to all forms of knowledge, including traditional and ordinary knowledge	A comprehensive public participation process (PPP) will be associated with all phases of the EIA Process. The PPP is guided by the EIA Regulations, 2014 (as amended). Extensive consultation with interested and affected parties (I&APs) is planned and will be undertaken with authorities, local land owners, communities and interest groups. Public Participation will be undertaken to ensure the opportunity for all potential I&APs to participate in meetings and the EIA process. PPP documentation will be made available in English and Siswati. The reports themselves will be compiled in English. Public meetings (open days / discussion forums) will be presented in English and will also involve a translator to Siswati. Documents for public review will be made available electronically (on the internet) and in hard copy. I&APs will be kept informed of the process and any developments / meetings / reports via e-mail and SMS communication. I&AP comments will be incorporated in to the reports, and into the comment and response report (CRR) along with the EAP's response to each comment or

Theme	Specific Questions	Answer related to this Application
		question. This process ensures that all I&AP comments are addressed in the Scoping and EIA Reports and incorporated into the studies.
	Considering the interests, needs and values of all the I&APs, describe how the development will allow for opportunities for all the segments of the community (e.g. a mixture of low-, middle-, and high-income housing opportunities) that is consistent with the priority needs of the local area (or that is proportional to the needs of an area)?	The area currently has somewhat conflicting development needs and spatial priorities, in that the project area is within an existing and approved MRA, and also partly within and adjacent to an existing Nature Reserve. I&APs associated with the nature reserve are expected to oppose the proposed reclamation activities and the proposed new TSF development, while it is expected that local communities, especially those community members employed at Fairview Mine, will welcome the project as it is aimed at continuing activities at Fairview Mine and sustained employment. Furthermore, the sites of the historic dumps, while officially within the Nature Reserve, are associated environmental liabilities, which the implementation of the reclamation could address to a large degree, as the sites will have to be rehabilitated in line with current mining and environmental legislation once reclamation is concluded. This will mean that the area will be restored to viable wilderness area, where it can contribute to the nature reserve, where in its current state the site cannot be logically incorporated into the nature reserve due to ecological degradation and unsafe conditions associated with the previous mining activities.
	What measures have been taken to ensure that workers will be informed of work that might be harmful to human health or the environment or dangerous, and what measures have been taken to ensure that the right of workers to refuse such work will be respected and protected?	An environmental awareness training program will be developed as part of the EIA phase. Additionally, the mine will be operated in strict accordance with the mine health and safety act.

Theme	Specific Questions	Answer related to this Application
	Describe how the development will impact on job creation in terms of, amongst other aspects: the number of temporary versus permanent jobs that will be created whether the labour available in the area will be able to take up the job opportunities (i.e. do the required skills match the skills available in the area) the distance from where labourers will have to travel the location of jobs opportunities versus the location of impacts (i.e. equitable distribution of costs and benefits), and the opportunity costs in terms of job creation (e.g. a mine might create 100 jobs, but impact on 1000 agricultural jobs, etc.).	The project will be associated with the retention of employment by enabling the continued operation of Fairview Mine, as well as creation of some temporary and permanent employment opportunities (See Section 2.4.10). More clarity regarding the availability of local and appropriate skills will be gained in the EIA and PPP, however the area has a long history of mining and it is expected that many of the required skills will be available locally. The mine implements a strict local procurement policy, thereby ensuring minimal travel distances between the labour force's current homes and the Fairview mine. The communities closest to the mine will be most directly impacted by the proposed projects, and should be evaluated for the availability of appropriate skills before advertising such job opportunities further afield, to ensure that the communities that are most affected, also benefit the most from the proposed project. Furthermore, the Mine's SLP should focus on the upliftment of the communities closest to the Mine, in consultation with the relevant authorities. Opportunity costs in terms of job creation: Mining is generally more labour intensive than conservation-related land uses and in this case not mutually exclusive as the Project will likely retain existing jobs in the mining industry (at the existing Fairview Mine) without adversely affecting existing employment at the BNR.
	What measures were taken to ensure: that there were intergovernmental coordination and harmonisation of policies, legislation and actions relating to the environment, and	The scoping report contains a comprehensive discussion on the relevant legislative framework, looking at national, provincial and local legislation pertaining to land uses, mining, environmental management and conservation. Various government departments at different levels were also informed of the proposed project and requested to participate in the PPP.

Theme	Specific Questions	Answer related to this Application
	that actual or potential conflicts of interest between organs of state were resolved through conflict resolution procedures?	Conflict between authorities tasked with the promotion of conservation and tourism and authorities tasked with the sustainable development of mineral resources is expected. Consultative meetings will be held early in the application process with these authorities in an attempt to come to an agreement / understanding regarding the Project development henceforth.
	What measures were taken to ensure that the environment will be held in public trust for the people, that the beneficial use of environmental resources will serve the public interest, and that the environment will be protected as the people's common heritage?	The EIA process, and development of the Environmental Management Plan (EMP) aims to achieve environmental protection (where relevant) and restoration of the environment. A closure and rehabilitation plan will be compiled in the EIA phase.
	Are the mitigation measures proposed realistic and what long-term environmental legacy and managed burden will be left?	Mitigation measures will be defined and refined in the EIA process, proportionate to the significance of the Impacts that are anticipated. It is expected that the new TSF will remain on site indefinitely, while the project also proposes to remove dumps remaining within the MRA from historic mining activity. The reclamation project therefore contributes to reduced long-term liability while the proposed new TSF will be associated with long-term management burden at least to some degree. Long-term environmental legacy and management options will be identified and assessed in the EIA phase, and as part of the rehabilitation and closure plan and financial provision report.
	What measures were taken to ensure that the costs of remedying pollution, environmental degradation and consequent adverse health effects and of preventing, controlling or minimising further pollution, environmental damage or adverse health effects will be paid	This matter will be addressed in the rehabilitation, closure and financial provision report, which will be compiled as part of the EIA process and which the mine has to update on an annual basis, to ensure the availability of sufficient funds, to implement rehabilitation plans.

Theme	Specific Questions	Answer related to this Application
	for by those responsible for harming the environment?	

5 Evaluation of Alternatives

Meaningful consideration should be given to alternative processes or practices which can be employed to meet the requirements of mine development, operation and closure (DEA, 2018).

Consideration of alternatives is one of the most critical elements of the environmental assessment process (DEAT, 2004). Key criteria that must be considered when identifying alternatives are that they should be "practicable, feasible, relevant, reasonable and viable".

The location of mining activities is, in general terms, dictated by the location of viable mineral resources. The Applicant undertakes prospecting activities within their Mining Right Areas on a continuous basis, to look for viable reserves and extend the Life of Mine at Fairview, in their own economic interest and in the interest of retaining employment at the Mine. Sufficient resources remain at Fairview to continue mining, however, the existing TSFs are nearing capacity; production cannot continue unless a feasible solution to dispose of mineral waste resulting from processing is in place.

Various alternatives are still considered in terms of the proposed new TSF, including:

- Whether to construct a new TSF to handle continued generation of Tailings, or to stop production at Fairview Mine (the No-Go Option);
- Alternative TSF locations;
- Alternative processing technologies will give rise to different types of tailings material, that can be managed in different ways, (Alternative technology);
- The deposition rate and methods to dispose of tailings onto the TSF can be evaluated;
- Location and nature of ancillary and support infrastructure (return water dam, stormwater controls etc.);
- Alternative means of TSF construction: the material that is available from the reclaimed Bramber TSF (where the new Fairview TSF is proposed) is not sufficient to facilitate the construction of the Fairview TSF Starter Walls. Alternative locations and means of obtaining construction material are investigated.

For the proposed dump reclamation, location alternatives cannot be assessed as the dumps are existing. However, access routes to the dumps can be evaluated. Additionally, the Mine can consider to mine only some of these dumps and exclude others, or exclude this aspect of the proposed project entirely (the No-Go Option).

This section discusses the various alternatives that have been considered by the Applicant, and explains how the Applicant decided on the proposed option.

5.1 Process to assess alternatives

The concept of an "alternative" can be defined as a possible course of action, in place of another, that would meet the same purpose and need as the development proposal. The starting point for the identification and evaluation of alternatives to the proposed Project is the clear identification of the purpose and need for the Project, which is twofold:

- The purpose of the proposed new TSF is to provide additional tailings storage capacity at Fairview Mine, so as to facilitate continued production. The project need primarily relates to mining and processing of Gold to meet market demand, the objectives of

the MPRDA and ensure a viable business for BML's continued operations (including retention of employment opportunities).
- The purpose of the proposed reclamation is firstly to supplement the mine's gold production, and also to reduce their financial liability for rehabilitation.

DEA (2018) identifies six potential categories of alternatives and emphasises that "the number of alternatives that are selected for an assessment should be determined by the range of potential alternatives that could be reasonable and feasible" (DEA, 2018). The alternatives that have been considered are discussed in these terms and grouped according to the six categories defined by DEA.

5.2 Property or Location

The location of the proposed reclamation activities is dictated by the location of the historical dumps targeted for reclamation. To access the dumps, pre-existing roads and tracks are used where feasible, the extremely mountainous terrain in this area influences the route possibilities.

The proposed new TSF is to be located at the footprint of the original Bramber TSF and the original Bramber TSF expansion, and abuts the existing BTRP/New Bramber TSF. The location was chosen due to the following primary considerations:

- The site previously contained a TSF, so the construction of a new TSF will be in keeping with the expectation of receptors.
- The original Bramber TSF and Bramber TSF expansion have recently been reclaimed; the site does not contain any vegetation or topsoil (topsoil was stripped prior to the original TSF construction and stockpiled), except for a small strip of land between the site of the original Bramber TSF and the current BTRP/New Bramber TSF. The site is also already relatively flat due to the reclamation of the previous TSF and site preparation requirements will be minimal.
- The site is in close proximity to the Processing plants that generate the tailings. Placing the new TSF on another site will have additional implications for pumping of tailings to the new TSF.

As the other older TSFs at Fairview Mine (Harper, Moon, Bramber) are also targeted for reclamation, and being reclaimed, these footprints will also become available in future. Continued production at Fairview Mine will cause the continued generation of tailings and these footprints are potentially ideal for development of additional new TSFs in future.

Suitable structural fill material will have to be sourced for the construction of the Fairview TSF starter embankment. Available material from the Old Bramber TSF footprint can be used, however the mass balance has not yet been finalized and it is unclear whether this material will be enough. The Mine could consider purchasing and importing this material from another approved mining operation; however, this is likely going to be associated with excessive costs. The Mine proposes rather to source material from the reclaimed TSF footprint areas where material will need to be removed as part of rehabilitation of these footprints and base preparation for the establishment of the new T=Fairview TSF.

5.3 The type of activity

The proposed project relates to two separate activity types: 1) the reclamation of historic dumps and 2) the construction of the new TSF.

The reclamation of material from historic dumps, and re-processing of this material in the existing processing plants at Fairview, holds significant benefit in that the activity will contribute to the Mine's gold production, while at the same time eliminating the environmental liabilities and pollution threats caused by the historically dumped material.

Continued gold production inevitably leads to continued generation of tailings material, which has to be disposed of. It may be considered to pump tailings underground to mined-out areas but the environmental implications of such action, especially on groundwater, is uncertain and potentially very significant, and therefore assumed to be unacceptable. The proposed new TSF is the only viable and legal option for tailings deposition.

5.4 Design and/or Layout

Mine layout refers to the mining scheduled and the corresponding location of mine disturbances to implement the mine schedule (DEA, 2018). The layout and scheduling of the mining operation is existing and was influenced by a number of factors including:

- Location, depth and grade of the ore body;
- Location and nature of overburden material; and
- Acceptable deposition rates onto the TSFs (considering allowable rate of rise).

Alternative TSF designs were considered by the Engineering team, however the best available technology and accepted design principles were implemented in the TSF design in line with best practice.

5.5 Technology Used

Alternative technologies may refer to alternative mineral processing/beneficiation methods and/or alternative pollution control methods, including waste management methods. Alternative technology is not truly relevant to the proposed activities:

- The processing facilities at Fairview will continue to operate as approved;
- best available technology will be used to convey tailings from the plant to the proposed new TSF, and the TSF will be operated according to the best available technologies in terms of water reticulation, retention of dirty water, diversion of clean water and rehabilitation;
- The historic dumps will be reclaimed via mechanical methods as this is the most viable method, and trucked to the processing plants. Consideration may be given to the construction of conveyors or aerial cable-ways but considering the limited resources remaining in the historic dumps and the relatively short time-frame associated with their reclamation, such options are not considered feasible.

5.6 Operational Aspects

These are dependent on the type of operation but may include:

- Operating hours and designating set times for specific activities.
- Setting specific traffic control mechanisms for mine vehicles and routes.
- Dust control methods such as the use of chemical dust suppressant on mine roads.

The operational hours for mining at Fairview are based on two shifts per day on a five-day production work week. It is proposed to align the reclamation activities with these operational hours.

It is also proposed that TSF construction activities are restricted to daylight hours.

The Plant at Fairview is operational 7 days per week, 24 hours a day (three shifts per day). Once complete, tailings deposition to the proposed new TSF will be 24 hours a day, 7 days per week.

Specific traffic control methods will be implemented, for safety reasons, on the routes to and from the proposed reclamation activities. The routes must be surfaced with gravel in specific areas to reduce dust generation and erosion. Dust suppression via watering cart is recommended on those road areas where dust is significant. Reclamation footprints where vegetation has been removed will also be sprayed with water to control dust emissions until reclamation is complete and rehabilitation (re-vegetation) implemented.

Specific dust control methods will be recommended in the air quality impact assessment commissioned as part of the EIA. Similarly, pollution control methods with specific reference to surface- and groundwater management will be addressed in the EIA in the respective specialist studies.

5.7 No-Development Option

The No-development option will be evaluated separately for the project components:

5.7.1 The option of not constructing the new TSF

If no additional tailings deposition capacity is provided for at Fairview Mine, production will have to cease. This implies that the beneficiation plants at Fairview Mine will close down, with all the associated job-losses and economic implications. This could also lead to a complete cessation of mining and closure of the entire Fairview mining operation, as it will be too costly to transport Run of Mine ore to another processing facility. This will also be contrary to the objects of the MPRDA and Mining Charter which promotes on-site and local beneficiation at Mines.

The no-go option has far-reaching implications for the Mine as a whole and is not considered optimal or realistic at this point.

The proposed new TSF is located on the footprint of the old Bramber TSF and will not affect any undisturbed areas that may be of conservation importance. It is proposed to incorporate these properties over which BML holds the surface rights into the Fairview MRA to ensure that one comprehensive and over-arching EMP will apply to the mining and processing (including deposition of mineral waste) activities at Fairview Mine.

5.7.2 The option of not reclaiming the historic dumps

In this scenario, the status quo would prevail and the material that was historically dumped throughout the MRA would remain in place. Some of these dumps are located immediately adjacent, or within watercourses, and are undoubtedly causing siltation of these systems. If

these dumps are not reclaimed, pollution emanating from these dumps will continue to affect downstream surface water resources (and potentially groundwater). The visual impact of these dumps would remain indefinitely.

The historical dumps are not accounted for in the Mine's latest quantum of financial provision for rehabilitation. This material was deposited within the MRA historically by unknown persons over many years. The dumps are located within the MRA, however, BML does not hold the surface rights over these areas. Assigning responsibility for their management is therefore not clear-cut. However, as Fairview Mine can derive economic benefit from reclaiming this material, it is considered mutually beneficial to the Mine and the surface rights holder (Barberton Nature Reserve) that the reclamation be allowed to continue.

It is unlikely that the surface rights holder will ever rehabilitate these areas and if the no-go option is implemented, the dumps will remain within the nature reserve area in perpetuity.

6 Public Participation

The latest Public Participation Guideline in terms of the NEMA was published by the Department of Environmental Affairs in 2017 (DEA, 2017). The NEMA requires the participation of all Interested and Affected Parties (I&APs) in environmental governance (Section (2)(4)) and holds that the beneficial use of environmental resources must serve the public interest. Decisions that may affect the environment, have to include sufficient opportunity for public participation.

The public participation process (PPP) aims to involve the authorities and I&APs in the project process; and determine their needs, expectations and perceptions. An open and transparent process was and will be followed at all times and is based on the reciprocal dissemination of information.

The PPP was designed to provide sufficient and accessible information to all I&APs in an objective manner to assist them to:

- Raise issues of concern and suggestions for enhanced benefits;
- Contribute local knowledge and experience; and
- Verify that their issues have been and will be captured.

The following steps comprise the PPP:

6.1 Identification of Stakeholders

The DMR has been identified as the competent authority in this application as it relates to NEMA, NEMWA and the MPRDA.

A number of commenting authorities have also been identified and notified of the proposed project.

The I&AP database further includes occupiers and owners of the affected property and adjacent properties, the relevant municipal ward councillor, the local and district municipalities, and various organisations and interest groups.

Please refer to the PPP Report in Appendix D.

6.2 Notification of Stakeholders

The I&APs that were identified as per the previous section of this report were notified of the proposed Project through the following means:

- Notice boards were displayed at the boundaries of the Fairview Mine in areas that are conspicuous and visible to the public.
- Notice Boards were also displayed in the town of Barberton.
- The notices referred to above were compiled and displayed in English and SiSwati and complied with the requirements of Regulation 41(3) & (4) of the EIA Regulations 2014, as amended.
- Advertisements were placed in English and SiSwati in the News Horn Newspaper. The advert complied with the requirements of Regulation 41(3) of the EIA Regulations 2014, as amended.
- Written notice in the form of Background information documents (BID) were distributed to all occupiers, owners and persons in control of the site or portions of the site and adjacent farms, and the additional I&APs identified. The BID was distributed via e-mail, fax, post and hand delivery on site.

The abovementioned notification documents presented the following information to potential I&APs:

- Details of the application and EIA Process;
- The nature and location of the proposed project;
- Details of the EAP where further information can be obtained; and
- Details of the PPP that is associated with the EIA Process.

6.3 Public Participation Process to be undertaken

The PPP will comprise the following phases / steps:

1. Make the Scoping Report available in digital and hard copy to I&APs for review and comment (this occurred from 13 November to 13 December 2019).
2. During the comment period, host a scoping-phase public meeting to present the proposed project to I&APs, and gather their comments, thought and/or concerns. This meeting was held on 28 November 2019 and comments have been incorporated into this final Scoping Report for submission to the DMR.
3. Once the DMR approves the Scoping Report (including the Plan of Study for EIA), compile the EIA Report and similarly make the Report available to I&APs for review and comment.
4. During the comment period, host an EIA-phase public meeting to present the findings of the specialist assessments and EIA to I&APs, and gather their comments. Incorporate I&AP comments into a final EIA report and EMP for submission to DMR.
5. Once the DMR approves the EIA and EMP, and communicates their decision to the Applicant, notify registered I&APs of the decision, reasons for the decision, and the appeal process that I&APs may follow if they do not agree with the decision or a part thereof.

Please refer to Appendix D for additional details and proof of the public participation undertaken to date.

7 Existing Site Attributes

A number of specialist assessments have been commissioned to form part of the EIA Process, as discussed in more detail in Section 9. This section of the report will therefore be expanded as the project progresses with information from the specialist assessments.

Just as a project is associated with certain impacts on the environment where it is undertaken, the existing environment can also influence a proposed development in terms of design, location, technology and layout. It is therefore important to define the environmental baseline conditions (*status quo*) or context of a proposed development site.

This Section describes the environmental attributes associated with the affected sites focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects. Information is presented on different scales as relevant to the information that is available:

- Regional Scale – the areas, land uses and communities surrounding the Fairview Mining Right Area including in some cases the larger municipal area;
- The Fairview Mining Right Area; and
- Site-specific:
    - The site proposed for the development of the new TSF; and
    - The sites of the historic dumps that are targeted for reclamation.

7.1 Physical Environment

7.1.1 Geology, physiography and topography

The mineralisation at Barberton Mines is classified as Achaean epigenetic hydrothermal lode gold deposits within a granite greenstone terrain. The distribution and localisation of these orebodies in the Barberton Greenstone Belt can be largely attributed to the combined influence of thermal metamorphism and structural deformation. The Barberton Greenstone Belt has produced approximately 11Moz of gold since gold was discovered in this goldfield in the early 1880s. Barberton Mines has produced more than 75% of the total production from the Barberton Greenstone Belt (http://www.panafricanresources.com/wp-content/uploads/Pan-African-Resources-integrated-annual-report-2019.pdf).

Greenstone Belts occur as belts of deformed volcanic and sedimentary strata and get their name from the presence of green minerals (Actinolite, amphiboles, Chromium muscovite "fuchsite", epidote, green chlorite and serpentine). These are among the oldest rocks in the world (http://www.mpumalangahappenings.co.za/barberton_geology.htm).

The Barberton Greenstone Belt consist of the lowermost Onverwacht Group, the Fig Tree Group and the uppermost Moodies Group.

- The **Onverwacht Group** is characterised by ultramafic meta-volcanics overlain by an upper unit consisting of mafic and felsic meta-volcanics. The Swartkoppie Formation occurs at the top of the Onverwacht Group. This formation contains a fuchsitic-bearing carbonatized ultramafic schist, which is particularly significant as being the host of the gold mineralisation (Pretorius, 2018).

- Directly overlying the Onverwacht Group is the **Fig Tree Group**, a sequence of fine-grained sedimentary rocks consisting of turbiditic greywackes, shales and banded iron formations (BIF). Although, volcanics and tuff flows are also present within the Fig Tree Group, mainly within the uppermost formation that overlies the lower sedimentary formations (Pretorius, 2018).
- Overlying the Fig Tree Group is the **Moodies Group**, an upward fining sequence of continental terrigeno-clastic sedimentary lithologies. The main lithologies occurring within this group are arenites, shales and jaspelite while minor units of amygdaloidal andesites are found in areas (Pretorius, 2018).

The Barberton Greenstone belt is one of the oldest and best exposed Archaean greenstone belts on Earth and is almost 3.5 billion years old (http://www.mpumalangahappenings.co.za).

The Fairview Mine area straddles the contact between the Moodies Group to the north (Eureka Syncline) and the Fig Tree Group's greywacke and shale to the south (Ulundi Syncline). The contact is marked by the presence of the regionally identifiable Sheba Fault. The two synclines are refolded due to the immense force present during deformation, resulting in back-to-back isoclines that dip steeply to the south. Tight isoclinal, thrust fault-related anticlines of Onverwacht Group schist (Zwartkoppie Formation) occur within the greywacke of the Fig Tree Group http://www.panafricanresources.com/wp-content/uploads/Pan-African-Resources-MRMR-report-2018.pdf. Please see Figure 17 and Figure 18

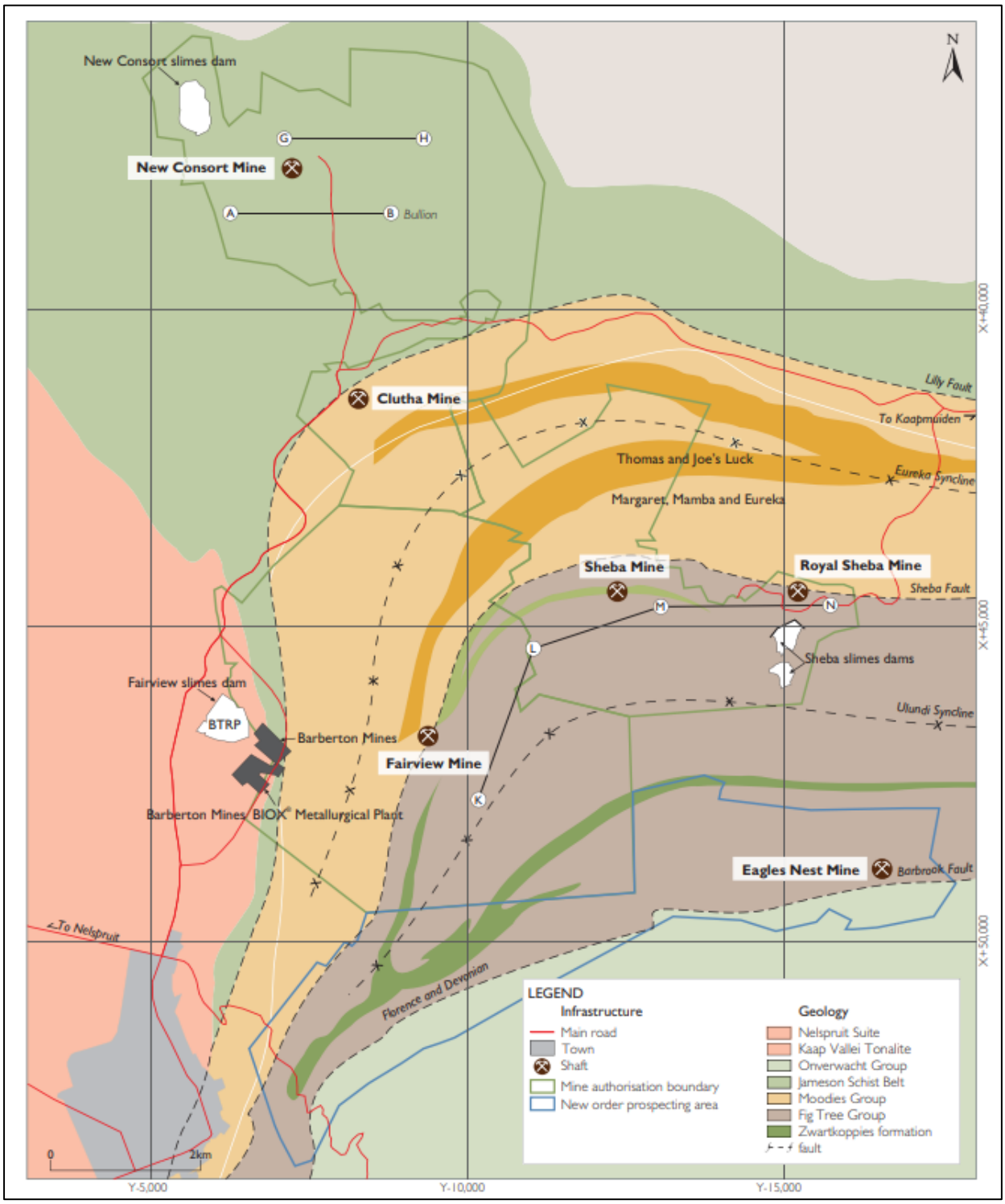


Figure 17: Geological Map – http://www.panafricanresources.com/wp-content/uploads/Pan-African-Resources-integrated-annual-report-2019.pdf

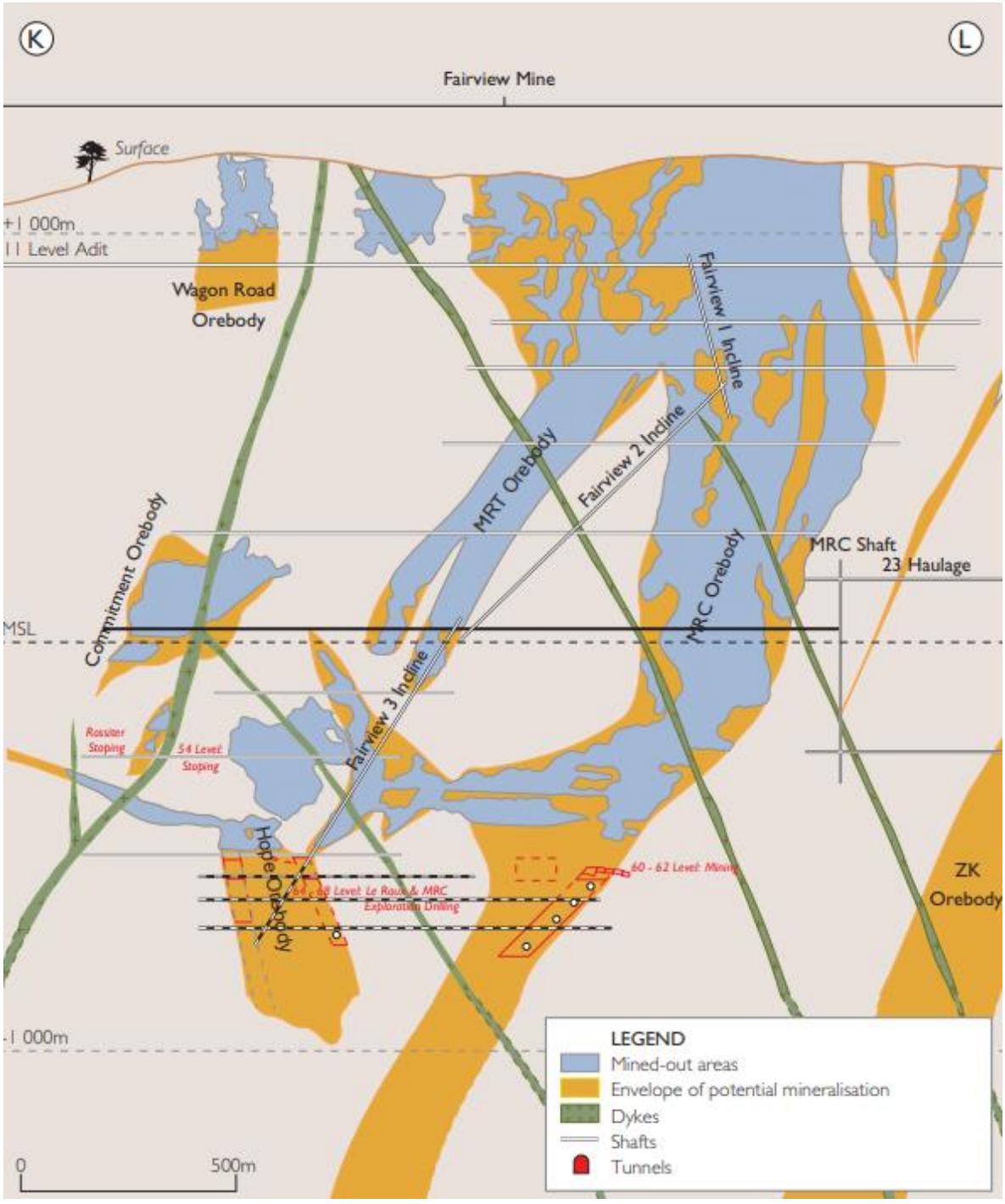


Figure 18: Geology at Fairview Mine http://www.panafricanresources.com/wp-content/uploads/Pan-African-Resources-MRMR-report-2018.pdf

The proposed reclamation sites are located in extremely mountainous terrain. The following elevations pertain to each target dump (based on Google Earth):

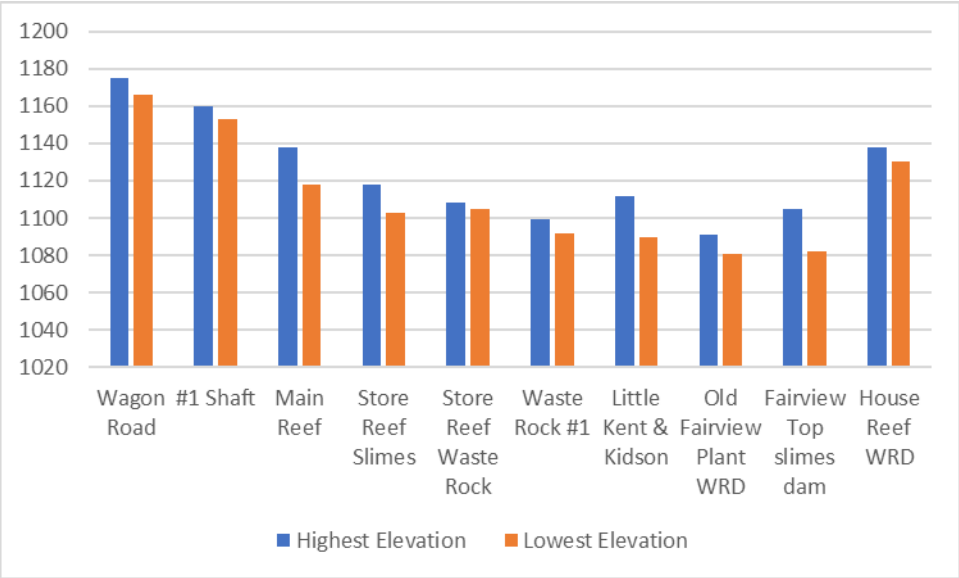


Figure 19: Topographic elevations of the target dumps

Dump Name	Highest Elevation	Lowest Elevation	Elevation difference
Wagon Road	**1175**	**1166**	**9**
#1 Shaft	**1160**	**1153**	**7**
Main Reef	**1138**	**1118**	**20**
Store Reef Slimes	**1118**	**1103**	**15**
Store Reef Waste Rock	**1108**	**1105**	**3**
Waste Rock #1	**1099**	**1092**	**7**
Little Kent & Kidson	**1112**	**1090**	**22**
Old Fairview Plant WRD	**1091**	**1081**	**10**
Fairview Top slimes dam	**1105**	**1082**	**23**
House Reef WRD	**1138**	**1130**	**8**

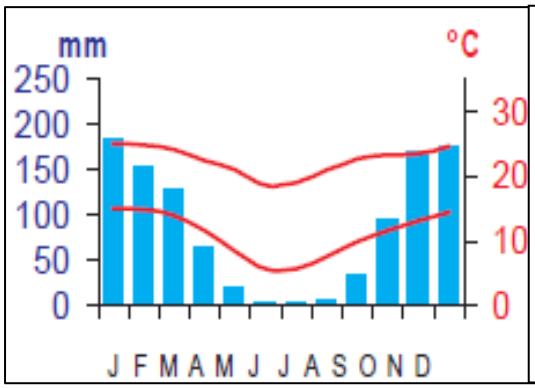
The proposed new TSF site ranges in elevation from approximately 652m to 680m and is located on relatively flat land, given the reclamation activities that have recently been undertaken there.

The regional topography is extremely mountainous, typical of the Barberton Mountains and associated river valleys. Slopes are generally quite steep varying between 12˚ to 35˚ (Van Der Merwe, August 2010).

7.1.2 Climate and meteorology

Fairview Mine is located in the Mpumalanga Lowveld where the climate is warm to hot with fairly high humidity in general, though cooler weather characterises the escarpment (Van Der Merwe, August 2010).

Mucina & Rutherford (2006) identified the reclamation projects as falling within the Barberton Montane Grassland, which generally occurs along the high-lying grassland areas at altitudes ranging from 760m in the north to 1640m in the south-west. The region experiences early summer rainfall concentrated from November to March. Mean Annual Precipitation varies between 950mm in the west to about 1,470mm in the east. Frost is infrequent and hot, dry winds are experienced from August to October. Please see Figure 20.



Mean Annual Precipitation: 1194mm

Annual Precipitation Coefficient of Variation: 16%

Mean Annual Temperature: 16.7˚C

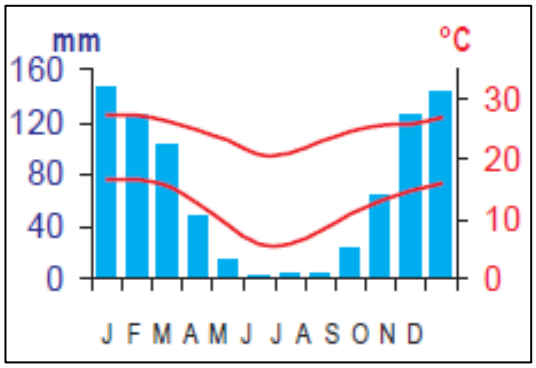
Mean Frost Days: 3 days

Mean Annual Potential Evaporation: 1779 mm

Mean Annual Soil Moisture Stress (*% of days when evaporative demand was more than double the soil moisture supply): 62%*

Figure 20: Climate diagram for the Barberton Montane Grassland (Mucina & Rutherford, 2006)

The New TSF site is located over two regions defined by Mucina & Rutherford (2006), Legogote Sour Bushveld to the west and Kaalrug Mountain Bushveld to the east. These both also experience summer rainfall with dry winters. Key climatic information is shown in Figure 21.



Legogote Sour Bushveld:

Mean Annual Precipitation: 942mm

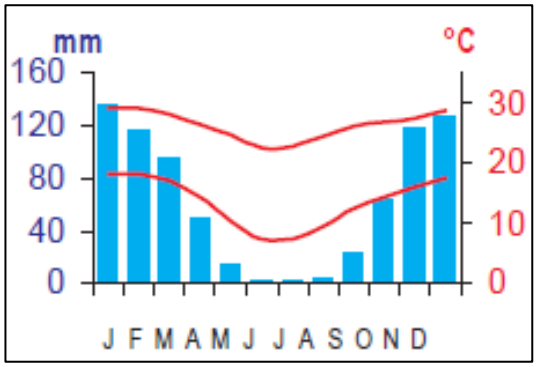
Annual Precipitation Coefficient of Variation: 21%

Mean Annual Temperature: 18.4˚C

Mean Frost Days: 2 days

Mean Annual Potential Evaporation: 1911 mm

Mean Annual Soil Moisture Stress (% of days when evaporative demand was more than double the soil moisture supply): 69%



Kaalrug Mountain Bushveld:

Mean Annual Precipitation: 894mm

Annual Precipitation Coefficient of Variation: 22%

Mean Annual Temperature: 19.8˚C

Mean Frost Days: 1 days

Mean Annual Potential Evaporation: 1899 mm

Mean Annual Soil Moisture Stress (% of days when evaporative demand was more than double the soil moisture supply): 70%

Figure 21: Climate diagrams for Legogote Sour Bushveld and Kaalrug Mountain Bushveld (Mucina & Rutherford, 2006)

The prevailing wind direction is from the north east at an average speed of 3.6 m/s. The greatest frequency of wind occurs in September and October (with wind speeds exceeding 4m/s). The mountainous terrain causes the wind direction in the area to vary considerably. Day and Night-time wind roses are shown in Figure 22 (Van Der Merwe, August 2010).

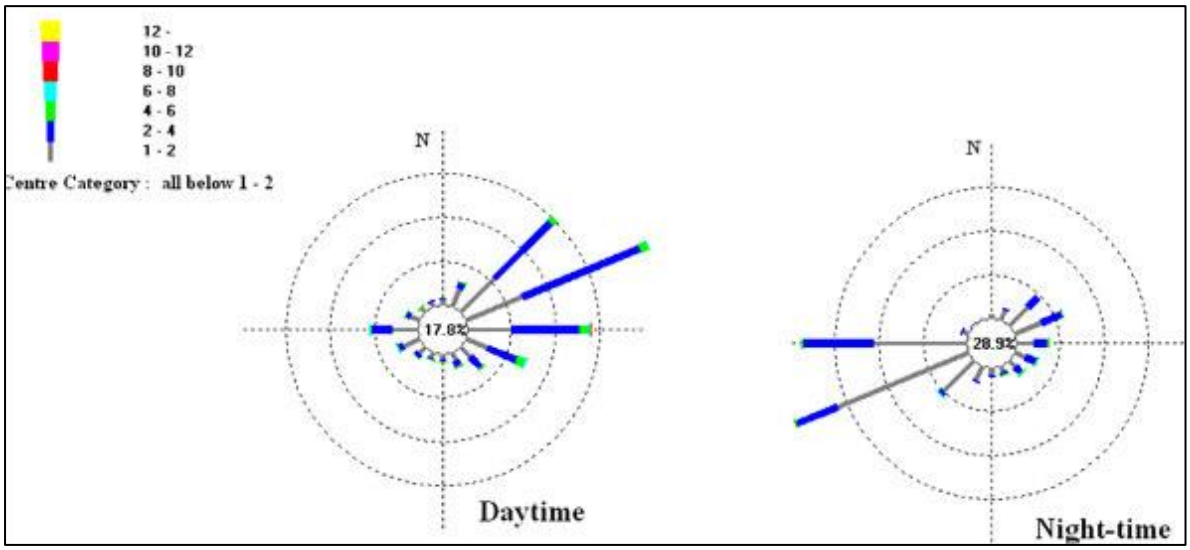


Figure 22: Day and Night Time wind roses for January 2007 to December 2008 (Van Der Merwe, August 2010)

7.1.3 Soils, land use and land capability

The Fairview MRA is mountainous with steep inclines, resulting in the presence of soils that are thin red-yellow apedal, freely drained, dystrophic to mesotrophic soils in which lime is rare to absent. On the steep slopes, which predominate in the area, abundant angular rock fragments occur (Van Der Merwe, August 2010).

Erosion potential in the mountainous areas is very low. At the flatter terrain to the west, where the proposed TSF site is located, erosion is also very low to moderate (Mucina & Rutherford, 2006). The approved EMP identifies the majority of the MRA (including the areas where the historic dumps are located) as containing soils with minimal development, usually shallow, on hard or weathering rock. The TSF site is located on red soils with high base status (Van Der Merwe, August 2010).

The following soil forms are generally found in the Barberton area:

- Low lying areas contain Hutton and Clovelly Soil forms. Hutton soil forms are 600 – 800 mm in depth while the Clovelly soil forms are 500 – 800mm in depth.
- Steep slopes contain Glenrosa and Mispah soil forms varying from 100 to 600mm in depth;
- Mountains contain Avalon soil forms ranging in depth from 400 to 600mm.

The South African National Biodiversity Institute (SANBI) describes the soils at the proposed TSF site as red soils with high base status, and the soils in the mountains as Soils with minimal development, usually shallow, on hard or weathering rock, with or without intermittent diverse soils, with Lime being rare or absent in the landscape (http://bgisviewer.sanbi.org).

The Chamber of Mines defines land capability classes as follows:

- Arable land has a soil depth exceeding 600mm;
- Grazing land has a soil depth between 250 – 600mm;
- Wilderness land has a soil depth less than 250mm; and
- Wetland land capability has clay soils.

In general terms, the mountainous areas will be regarded as predominantly wilderness and grazing potential. Soils in the valleys are deeper and may have limited agricultural potential. The proposed new TSF is located on the site of the reclaimed Bramber TSF, from where topsoil was stripped and stockpiled. The stockpiles remain on site currently and are available for use in rehabilitation where needed.

The Mpumalanga Conservation Plan identifies the mountainous areas as non-arable, with grazing potential varying from low in the higher-lying areas, to low-moderate in the lower lying areas. The area west of the MRA, where the TSFs are located, is mapped as moderate potential arable land, however it is noted that the proposed TSF is on land previously also hosting a TSF and the arable potential has thus been greatly affected by past land uses.

The pre-mining land use in the area was probably associated with low quality grazing (Van Der Merwe, August 2010). Mining activities commenced in the late 1880's. visual observations suggest that historically, commercial forestry was also practiced within parts of the current MRA.

The entire MRA overlaps with the proclaimed Barberton Nature Reserve. Surface land uses associated with the Fairview Mine's main infrastructure area on the western side of the BNR and MRA have been excluded from the fence-line of the BNR. The BNR Management plan indicates that the fence in this portion of the reserve follows the Eskom Servitude located there. The operational No 11 Adit is located within the Nature Reserve, as are remnants of mining activities that have been taking place in the mountains for the past 100 years. Illegal mining activity is also extremely common in these mountains.

Neighbouring land uses includes mining, conservation and informal settlements. A preliminary land use map is shown in Figure 23.

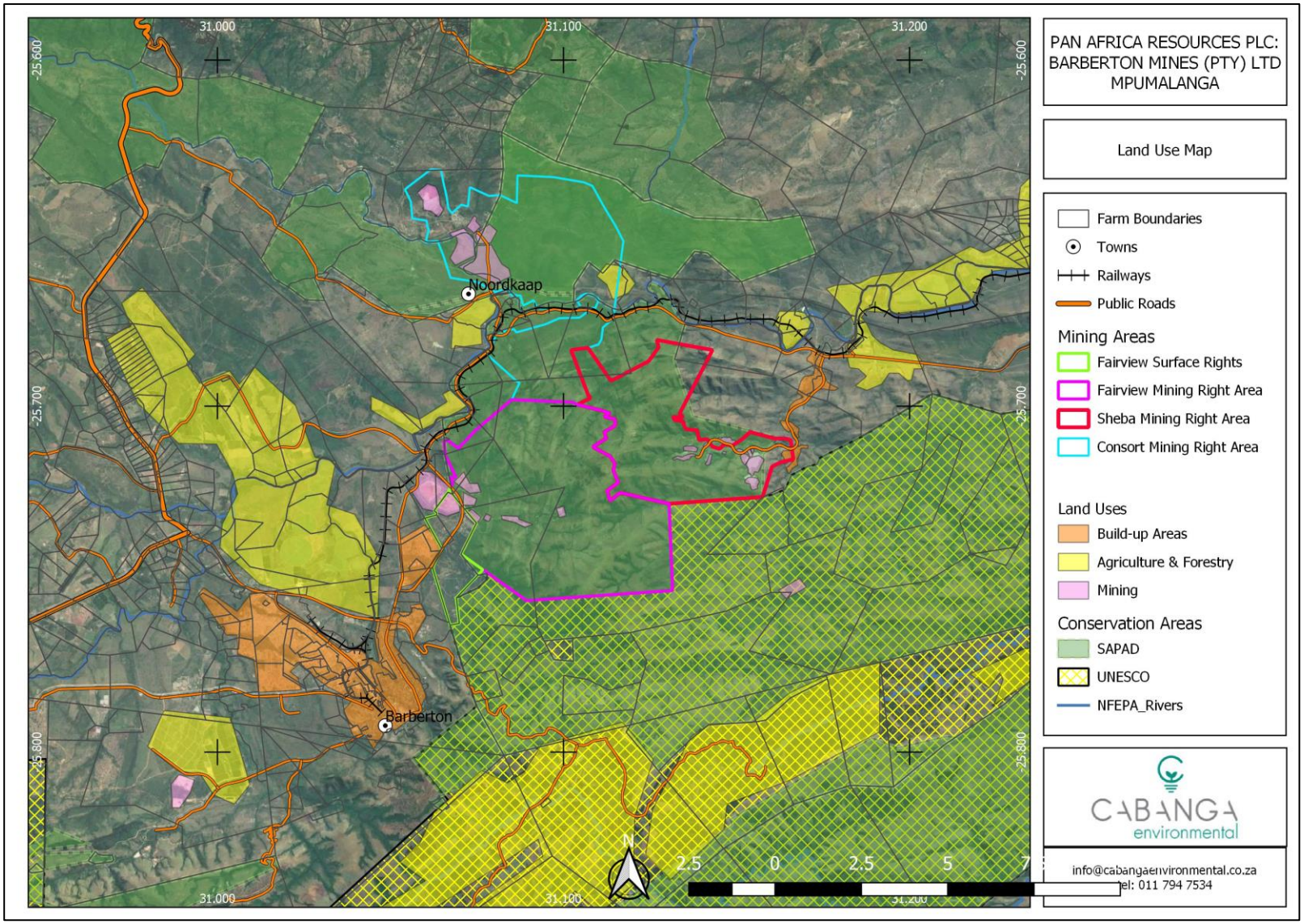


Figure 23: Land Use Map

7.1.4 Hydrogeology (Groundwater)

Based on available data the depth of the water table at Fairview Mine is typically between five and thirty metres. Numerous boreholes are drilled in and around the Fairview MRA including monitoring boreholes, scavenger boreholes and boreholes for potable water supply (Van Der Merwe, August 2010).

The minimum water level recorded for the March 2018 monitoring run is 6.49 metres below ground level (mbgl) with the maximum measured as 21.95 mbgl. Available data shows correlation between groundwater levels and topographic elevation and it can thus be assumed that deeper underground mining operations do not affect the shallow aquifer by dewatering (Mostert, August 2018).

The groundwater flow direction in the vicinity of the project area is in a general north-western direction towards the lower lying drainage system of the Suidkaap River (Mostert, August 2018).

Key constituents at high concentrations that are present in gold tailings and operational areas of the mine include nitrates, sulphate, arsenic and cyanide. Due to the stable character of sulphate (SO_4), this parameter is a good indicator for detecting the contamination impacts of mining activities i.e. pollution plume emanating from TSFs. Time series data from existing monitoring boreholes were evaluated to determine the current extent of the pollution plume (Mostert, August 2018). Please refer to Figure 24.

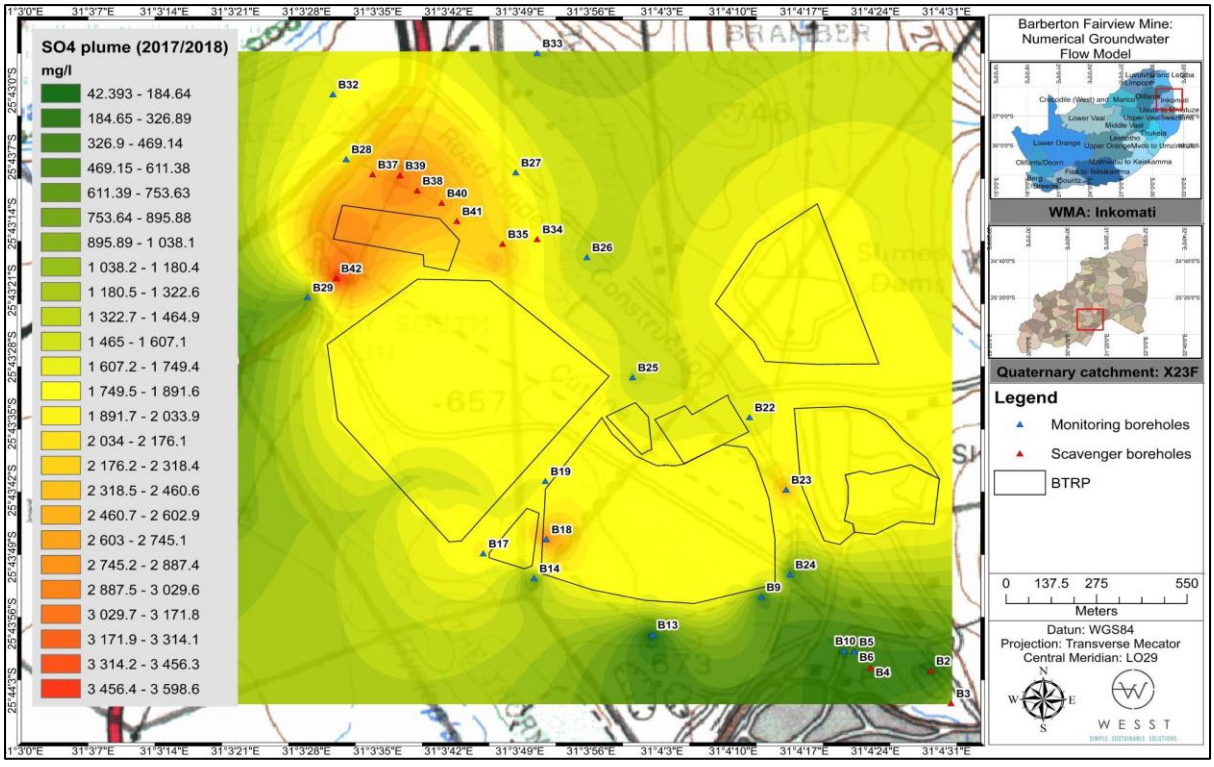


Figure 24: Extent of the existing SO4 pollution plume (average values for monitoring period 2017).

Many water users in the area rely on boreholes for water supply (irrigation and domestic water, including potable water requirements).

Metago Water Geosciences (Pty) Ltd were appointed by Barberton Mines to carry out geochemical test work related to mine operations in Barberton in 2011. The assessment included analysis of 1 waste rock sample and 1 tailings sample from Fairview Mine.

All tested waste rock and tailings samples showed a positive net neutralising potential (NNP) indicating the potential to neutralise any generated acidity. The Fairview tailings sample achieved neutralisation potential ratio above 4 (at 17), rendering the material non-acid-generating (Bolton, 2011).

Representative samples from the tailings generated at the Fairview Plant, which would be deposited on the proposed new TSF, have been submitted to an accredited laboratory for geochemical characterisation and classification. These tests have not yet been concluded.

The Water Research Commission (WRC) reports that groundwater utilisation in the Inkomati-Usuthu Water Management Area (WMA) where the site is located is relatively small, due to the "well-watered nature of most of the area". The Barberton Greenstone belt has a generally high mineralogical risk rating due to Acid Rock Drainage (ARD) and potentially toxic trace elements of antimony, lead and nickel (Water Research Commission (WRC)).

The WMA contains two major aquifer systems: Integranular and fractured aquifers with borehole yields between 0.5 and 2.0ℓ/s, and fresh water (<70mS/m) karst aquifer systems with borehole yields of more that 5.0ℓ/s.

7.1.5 Hydrology (Surface water)

The majority of the Fairview MRA and the entirety of the Fairview Surface areas fall within quaternary catchment X23F, which forms part of the Inkomati-Usuthu Water Management Area (WMA). The Inkomati-Usuthu WMA is situated in the north-eastern part of South Africa and borders on Mozambique and Swaziland. All rivers from this area flow through Mozambique to the Indian Ocean (Water Research Commission (WRC)).

The MRA is drained by the Suidkaap River, via the Olifantskloof Creek, Laubscher's Creek and Hyslops Creek that traverse the Mine Area.

Water quality monitoring results indicate that water in the Olifantskloof Creek upstream of the TSF and downstream of the mine contains elevated total dissolved solids (TDS), sulphates and magnesium. TDS, total hardness, calcium, magnesium, sodium, chloride, sulphate and manganese are elevated in the Laubscher Creek, which is a cause for concern and should be investigated. Water quality in the Hyslops Creek upstream of the Olifantskloof Creek confluence was determined to be good, downstream of the confluence with the Olifantskloof Creek, water quality in the Hyslops Creek deteriorated (Van Der Merwe, August 2010)

Surface water users downstream of Fairview include livestock watering and irrigation agriculture.

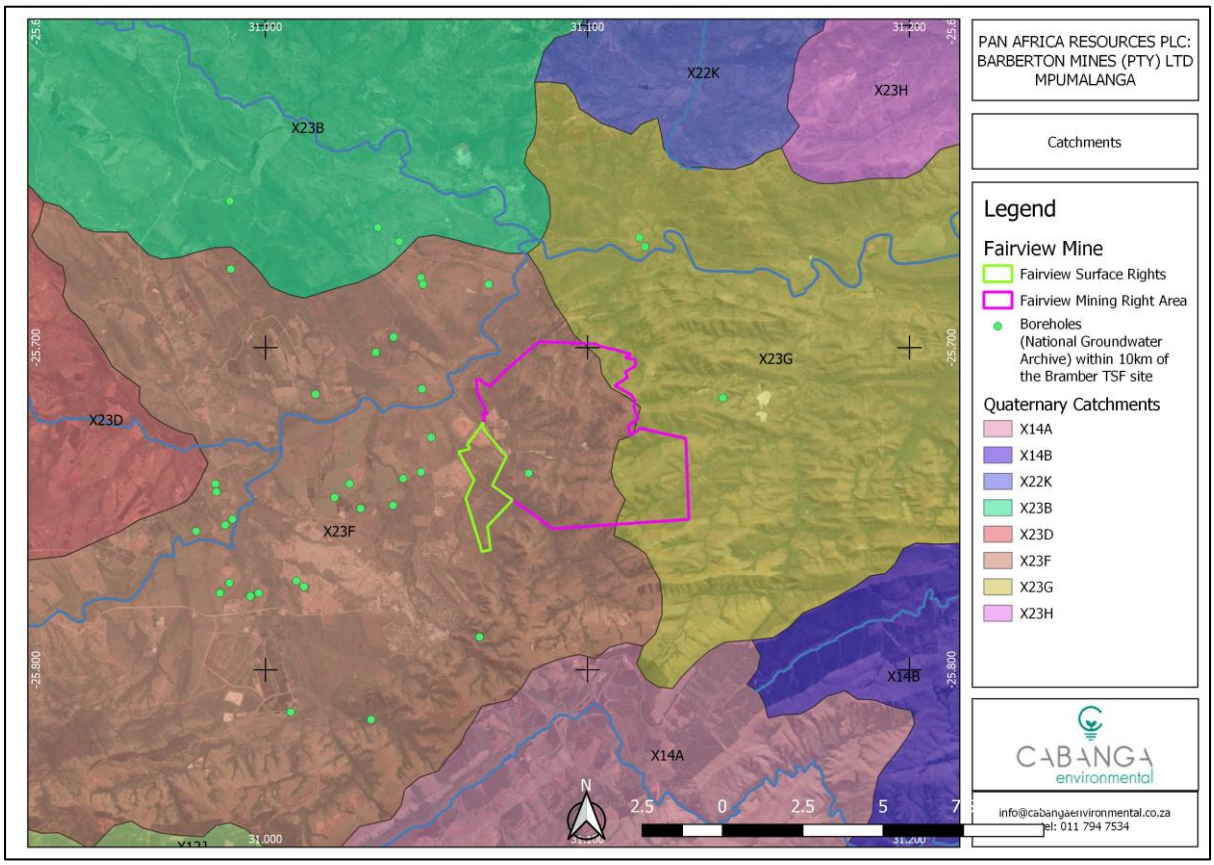


Figure 25: Quaternary Catchments

7.1.6 Wetlands

Wetlands are defined in the NWA (Act 36 of 1998) as "land which is transitional between terrestrial and aquatic systems where the water table is usually at or new the surface, or the land is periodically covered with shallow water, and which land in normal circumstances supports or would support vegetation typically adapted to life in saturated soil".

"Watercourse" is defined in the Act as any river or spring, any natural channel in which water flows regularly or intermittently, a wetland, lake or dam into which or from which water flows and any other collection of water declared by the Minister to be a watercourse.

The National Freshwater Ecosystems Priority Areas (NFEPA) Project was a collaboration between the CSIR, SANBI, the WRC, DWS and DEA and many other role-players and attempted to map the freshwater ecosystem priority areas, including rivers and wetlands, throughout South Africa.

The NFEPA Project identified two natural, unchanneled valley bottom wetlands on the site of the Bramber TSF. It cannot be said that any wetlands exist within this footprint. A freshwater ecology study will be undertaken as part of the EIA.

None of the creeks traversing the MRA or surface rights areas are regarded as NFEPA Rivers or wetlands, however the Suidkaap River is identified in the NFEPA data and designated Class C: Moderately modified.

Figure 26 shows the NFEPA rivers and wetlands, along with the Mpumalanga Biodiversity Sector Plan (MBSP) Freshwater Assessment, in relation to the project area.

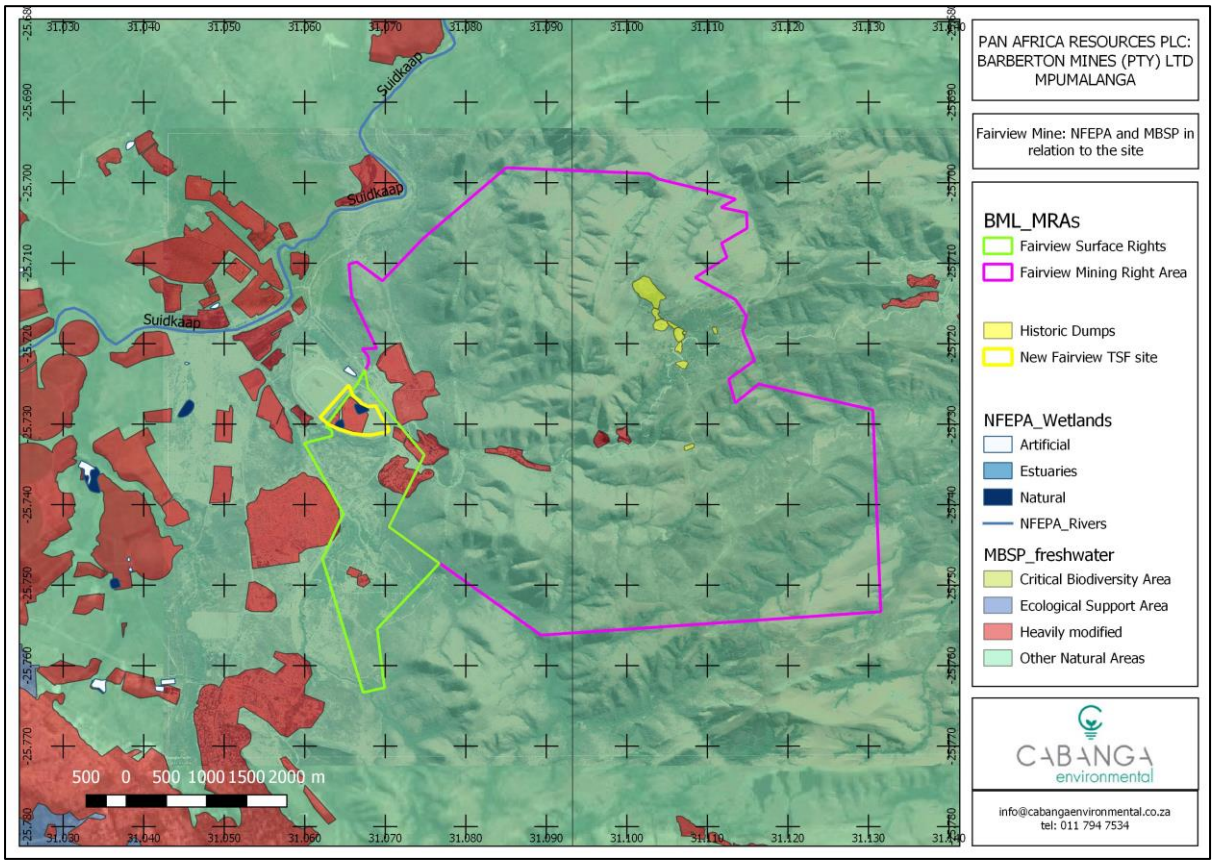


Figure 26: NFEPA and MBSP in relation to the site

7.1.7 Air Quality

Mining is the primary activity in the area contributing to dust and gaseous emissions from crushing and mineral processing as well as vehicle movement. Vehicle movement on unpaved roads in the vicinity likely contributes significantly to dust fallout levels in the area.

Residential areas in the vicinity will be considered sensitive receptors. In addition to residential receptors, conservation land uses in the area are also regarded as sensitive to deterioration in air quality.

Dust fallout monitoring is undertaken monthly at thirteen monitoring points in the vicinity of Fairview Mine surface activities, illustrated in Figure 27. The monitoring points are concentrated around the current No 11 Adit and Plant, Main Infrastructure Area and TSFs and the Fairview Mine Village which is the only residential point being monitored as it is the closest to the emission sources associated with the Mine.

Single exceedances of the residential dust fallout limit of 600mg/m^2/day have been recorded. Exceedances are permissible so long as there are no more than two per year and not in sequential months. No exceedances of the industrial limit of 1200m g/m^2/day has been recorded for 2019.

Existing dust monitoring data therefore indicates that the current mining activities do not lead to excessive dust generation.

An air quality impact assessment (AQIA) has been commissioned as part of the EIA Process. The AQIA will determine the likely dust fallout and emissions arising from the proposed Project, to determine whether the Project would comply to the air quality standards and recommend management actions to be implemented at the Project to ensure compliance and the prevention of potential pollution.

Table 9: Dust fallout monitoring network

Locality No	Classification	Co-ordinates	
FAAS1	Industrial	25°43'56.64"S	31° 6'3.12"E
FAAS 2	Industrial	25°43'54.24"S	31° 5'59.82"E
FAAS 3	Industrial	25°43'57.54"S	31° 5'57.90"E
FAAS 4	Industrial	25°43'51.00"S	31° 5'57.90"E
FAAS 6	Industrial	25°43'55.62"S	31° 4'30.18"E
FAAS 7	Industrial	25°43'58.62"S	31° 4'36.60"E
FAAS 8	Residential	25°44'5.94"S	31° 4'19.20"E
FAAS 9	Industrial	25°43'53.28"S	31° 4'10.98"E
FAAS 9B	Industrial	25°43'53.04"S	31° 3'56.64"E
FAAS 12	Industrial	25°43'43.60"S	31° 4'13.63"E
FAAS 13	Industrial	25°43'45.48"S	31° 4'38.94"E
FAAS 14	Industrial	25°43'10.62"S	31° 3'50.28"E
FAAS 15	Industrial	25°43'17.88"S	31° 3'28.98"E

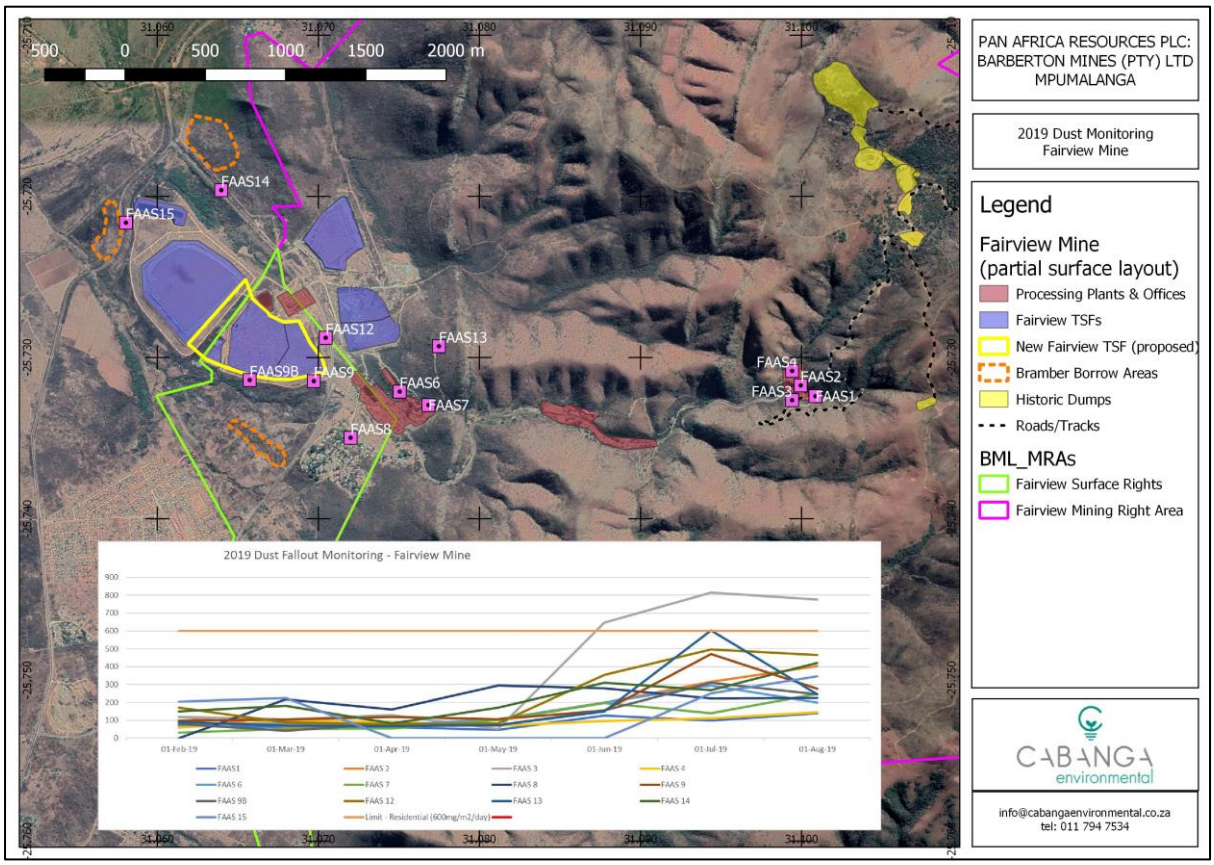


Figure 27: Dust Monitoring Points and Results of 2019 Dust Fallout Monitoring to date

7.2 Biological Environment

Mucina & Rutherford (2006) identifies three distinct vegetation types potentially affected by the proposed project aspects:

- The historic dumps are located in Barberton Montane Grassland (Gm17);
- The proposed new TSF is located on Legogote Sour Bushveld (SVI9) and Kaalrug Mountain Bushveld (SVI12).

The vegetation types also marks the transition between the Savanna Biome (containing the Kaalrug Mountain Bushveld and Legogote Sour Bushveld) and the Grassland Biome (Barberton Montane Grassland) (Figure 28).

The **Legogote Sour Bushveld** is characterized by dense woodland including medium to large shrubs often dominated by *Parinari curatellifolia* and *Bauhinia galpinii* with *Hyperthelia dissolute* and *Panicum maximum* in the undergrowth. Less rocky sites often host short thicket dominated by *Acacia ataxacantha*. The succulent herb *Aloe simii* is endemic to this region. *Englerophytum magalismontanum*, *Aloe petricola* and *Myrothamnus flabellifolia* are typically found on exposed granite outcrops with low vegetation cover. Scattered alien plants include *Lantana camara, Psidium guajava* and *Solanum mauritianum*. Legogote Sour Bushveld is regarded as Endangered, with a conservation target of 19% and only 2% statutorily conserved.

The vegetation unit has been greatly transformed (50%) by plantations, cultivation and urban development (Mucina & Rutherford, 2006).

Kaalrug Mountain Bushveld occurs in the Mpumalanga and extends slightly into Swaziland. This vegetation type comprises open to dense, short mountain savanna or thickets with a denser grassy layer at higher altitudes. The vegetation type is regarded as Least Threatened, with a 24% conservation target and some 16% conserved in the Mountainlands Nature Reserve (now part of Barberton Nature Reserve) and another 9% conserved in Cwantalala and Boondocks Private Reserves. Approximately 12% of the vegetation unit has been transformed, mainly by cultivation and plantations. Erosion is generally low. The Succulent Shrub: *Euphorbia complexa* and *Geophytic Herb: Ledebouria cremnophila* are endemic to this vegetation unit. (Mucina & Rutherford, 2006)

Barberton Montane Grassland extends from Barberton westwards towards Nelshoogte, Northwards towards Kaapmuiden and south-west towards Piggs Peak at altitudes ranging from 760m to 1640m. The vegetation unit is associated primarily with the high mountains above Barberton. Dominant vegetation is short, rocky grassland that gradually transitions to woodland along the lower slopes. The vegetation unit contains numerous biogeographically important taxa and endemic species including (but not limited to) *Encephalartos heenanii*; *Protea caffra* subsp. *Falcata*; *P. roupelliae* subsp. *Hamiltoni; Tinnea barbata*; *Euryops discoideus; Helichrysum calocephalum; Hemizygia stalmansii; Holothrix culveri; Streptocarpus pogonites; Thorncroftia thorncroftii; Disa intermedia* and *Aloe albida*. The conservation status of the unit is Vulnerable, with 26% of the vegetation unit being protected in nature reserves and a conservation target of 27 %. Almost 40% of the unit has been transformed by plantations (Mucina & Rutherford, 2006).

The vegetation at Fairview has been greatly disturbed due to current and past mining activities and associated infrastructure such as tailings dams, processing plants and housing developments. Both indigenous and alien pioneer species have re-colonised some of the disturbed areas, while tracts of natural vegetation are still found on the hills, where little transformation has taken place (Van Der Merwe, August 2010).

Due to the extremely varied topography in the MRA expected habitats vary from riverine bush to sour bushveld to mountain sourveld. The Mine is located in the Barberton Centre of Plant Endemism and it is expected that protected species and species of conservation concern (SCC) exist in the area.

The area contains distinctive soils due to the unique geology of the Barberton Greenstone Belt, which host a variety of plant species including the endemic *Encephalartos heenanii* (Woolly Cycad) which is listed as Critically Endangered in the IUCN Red List (World Heritage Committee, 2018).

Exotic and invader species are abundant in the vicinity of the existing surface disturbances associated with the current and historic mining activities throughout the MRA and surface rights areas.

Invader species identified include Syringa (*Melia azadarach*), Jacaranda, Lantana (*Lantana camara*), Paraffin Weed (*Chromolaena oderata*) and Sesbania (*Sesbania punicia*).

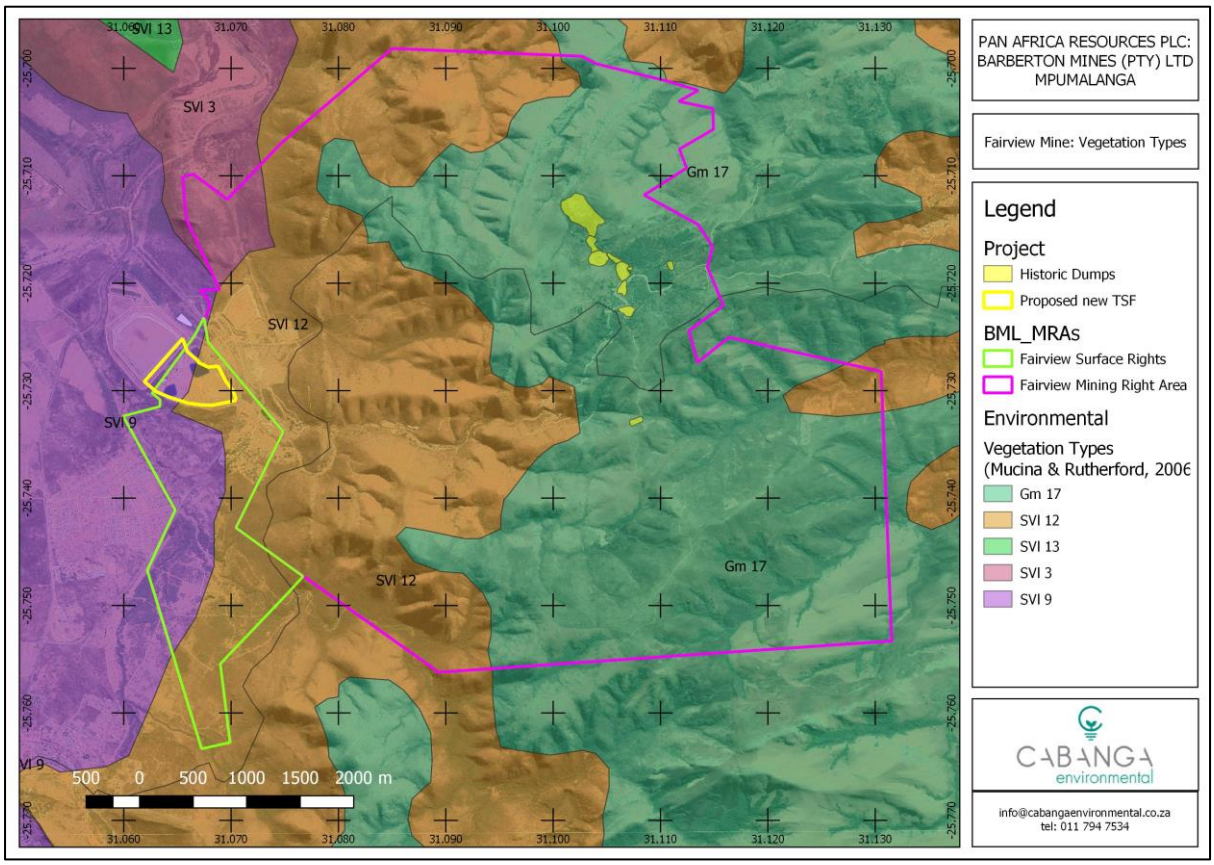


Figure 28: Vegetation Types (Mucina & Rutherford, 2006)

The total mammal list of the BNR phase 3 comprises 16 species. In additional to naturally occurring game there have been a number of introductions including Blue Wildebeest, Impala, Eland, Red Hartebeest, Waterbuck, Warthog, Kudu and Zebra. Five White Rhino have been donated to the reserve from Kruger National Park, however these animals have not yet been introduced due to concerns over security and population size/viability (MTPA, 2012). Mammals occurring in the BNR are listed in Table 10. In addition, carnivores such as leopard, brown hyena, caracal, civet, genet, serval and jackal occur in the area. A study of bat fauna was conducted in 2004. The historic mine adits provide good habitat for a number of bat species (MTPA, 2012).

Over 300 bird species have been recorded in the BNR, primarily by the Barberton Bird Club. The South African Bird Atlas Project (SABAP) recorded a total of 246 bird species in the area.

No detailed reptile or amphibian surveys have been undertaken on the area. The Lepidopterists Society has conducted numerous visits to Mountainlands Nature Reserve (now phase 3 of the BNR) and has compiled a list of species from observation. This includes the endemic species *Aloeides barbarae* and other Red Data species including *Lepidochrysops jefferyi* and *L. swanepoeli* (MTPA, 2012).

Table 10: Mammals of the BNR Phase 3 (MTPA, 2012)

Type	Common Name	Type	Common Name
Bulk Feeders	Zebra	Selective: Tall Grass Feeders	Red Hartebeest
	Bushpig		Mountain Reedbuck
	Waterbuck		Common Reedbuck
	Cattle	Selective: Short Grass	Black Wildebeest
Browsers	Grey Duiker		Blue Wildebeest
	Red Duiker		Impala
	Kudu		Eland
	Klipspringer		Warthog
	Bushbuck		Goats

A Terrestrial Biodiversity specialist assessment has been commissioned as part of the EIA Process, which will delineate specific habitats associated with the Project Area and its immediate surroundings. The study will further identify specific species found on the project site, with emphasis on identifying those species that may be of conservation concern or protected species, as well as alien or invasive species which require specific management.

An aquatic ecological assessment has also been commissioned.

Scientific Aquatic Services (SAS) undertook an aquatic and toxicological assessment of the Suidkaap River in the vicinity of Fairview (as part of an ongoing monitoring programme) in June 2019. The monitoring event included four strategic points namely:

- SK1: located on the Suidkaap River in a fairly remote area upstream of the activities associated with the Fairview Mine;
- SK2: located on the Suidkaap River at a bridge crossing, downstream of the Fairview Mine activities;
- Hyslops: seasonal stream that receives discharge from the Fairview Mine, which joins the Suidkaap River between SK1 and SK2 (Note: Hyslops Creek was dry at the time of the June 2019 assessment) and
- FWSP10: located in the Laubscher's Creek, downstream of the TSFs at Fairview. The Creek joins the Suidkaap River between SK1 and SK2.

This latest assessment concludes that it is possible Fairview Mine is having a limited impact on the water quality in the Suidkaap River. Water quality in the Laubscher's Creek shows elevated Electrical Conductivity, possibly as a result of the hydraulic reclamation activities that are taking place just upstream of the Creek. The assessment showed decreases in a downstream direction of the macro-invertebrate community diversity and integrity, habitat integrity and SASS5 Classification.

7.3 Socio-Cultural Environment

The Project Site is located in the Fairview MRA which lies within the Mbombela Local Municipality of the Ehlanzeni District Municipality in the Mpumalanga Province of South Africa. This section of the report describes the historic and current social and economic environment in the immediate vicinity and the wider region that could be affected by the Fairview Mine and proposed Projects.

The site falls within the former Umjindi Local Municipality (ULM), which was disestablished and merged with the Mbombela Local Municipality (MLM) on 3 August 2016. Barberton was the seat of the ULM and historic data and information relevant to the Municipality is still relevant to some extent in describing the local socio-economic environment, as the statistics related to ULM will be more focussed on the relevant area than information related to the existing MLM which covers a much larger area.

7.3.1 Demographics

Census 2011 recorded 67,156 people in the ULM, which increased from the 2001 Census which recorded the total population at 53,744. The majority of the population (87%) are black African, 9.8% are white, with other groups making up the remaining 3.2%. 52.3% of the population are male, and 47.7% are female. Of those aged over 20 years, 10.4% have no form of schooling, 4.5% have completed primary school, 32.2% have some secondary education, 30.7% have completed matric and 9.2% have some form of higher education. SiSwati is by far the dominant language (72.7%), with Afrikaans, English, IsiZulu, Sepedi, Sesotho and Xitsonga comprising the other languages spoken (http://www.statssa.gov.za).

Of the total population, 28,575 persons (42.5%) are economically active (employed or unemployed but looking for work). Of these 27.3% (7,681) are unemployed. 36.5% of the 14,917 economically active youth (aged between 15 to 34 years) are unemployed.

Census 2011 recorded the majority of the ULM population to live in urban areas (72.2%) (with 17% living on farms and 10.4% living in tribal / traditional areas. 89.2% of the ULM population had access to cell phones with only 7% having access to Landline telephones. Roughly 68.5% of the population has access to television and radio (only 25% has access to satellite television and only 17% have access to computers). 23% of the ULM population has access to a motor car indicating some dependence on public transport (http://www.statssa.gov.za).

The majority of households reportedly receive water from a water scheme, have flush toilets connected to a sewer system and have refuse removal from the local authority (http://www.statssa.gov.za).

7.3.2 Economic activities and sources of employment

Mining in the Barberton area dates back to 1874 when the first gold was discovered locally. The town of Barberton largely owes its existence to mining. The major sources of employment in the area currently are mining, forestry and agriculture (Van Der Merwe, August 2010).

Main Economic Sectors of the ULM comprised of Community services (22.9%), manufacturing (17.8%), trade (16.3%), finance (14.1%), transport (13.5%), and agriculture (9.3%) (https://municipalities.co.za/overview/1146/umjindi-local-municipality). The ULM Draft IDP 2015-16 indicates that agriculture was the dominant economic sector in the ULM (based on

the % contribution to the Ehlanzeni District Municipality's GVA, namely 13.1%). This was followed by Manufacturing (8%), Transport (6.2%) and Utilities (5.7%). Mining only contributed 3.2%. ULM was the lowest contributor to the District's GVA in 2012 implying that ULM was by far the smallest economy in the District (ULM, 2015).

In 2001 mining contributed 13.41% to the over-all ULM economy but by 2012 this number reduced to just 2.2%. Agriculture remained relatively constant from 8.51% in 2001 to 9.39% in 2012. Manufacturing was the biggest contributor in 2001 (20.52%) but by 2012 Community Services was the biggest economic contributor by sector (22.98%), with manufacturing still contributing significantly with 17.88%. Community Services grew to 22.98% from the 2001 contribution of 18.62% (ULM, 2015).

Agriculture is by far the most important employer in the ULM, providing 40% of jobs in the ULM in 2001 (and 33% in 2012) as compared to mining contributing 2.8% in 2001 increasing slightly to 3% in 2012. Jobs in the community services sector increased significantly from 8.8% in 2001 to 14% in 2012.

7.3.3 Sites of archaeological and cultural interest

"Heritage resource" as defined in the NHRA means any place or object of cultural significance. "Cultural significance" means aesthetic, architectural, historical, scientific, social, spiritual, linguistic or technological value or significance.

The Barberton area has been extensively mined since the 1870's when the first gold was discovered in the area and as such the Barberton Mines property contains several sites that may be of cultural significance, including cemeteries, Eureka City and the sites of the old workings on the mountains within the MRAs. The Fairview, Sheba and New Consort Mine's may also be considered heritage structures due to their operating age. The Sheba Mine has the oldest working adit in South Africa.

It should be noted that given the age of the mine, the mine infrastructure and adits may be considered to be of heritage value as much of the infrastructure dates back more than 60 years (Van Der Merwe, August 2010).

The entire Barberton Region is of cultural heritage significance, due not only to the history of mining in the area, but also due to the geology associated with the region.

Heritage resources of South Africa which are of cultural significance or other special value for the present community and for future generations are considered part of the national estate. Such resources include geological sites of scientific or cultural importance.

The dumps that are being targeted for reclamation are older than 60 years. The NHRA prohibits any person from demolishing any structure or part thereof which is older than 60 years without a permit issued by the relevant heritage resources authority. The NHRA defines "structure" as "any building, **works**, device or other facility **made by people and which is fixed to land**, and includes any fixtures, fittings and equipment associated therewith". An archaeological impact assessment has been commissioned as part of the EIA to verify the historical significance of these dumps and identify any other heritage resources that may be affected by the proposed projects.

Just south of the Fairview MRA lies the Barberton Makhonjwa Mountains World Heritage Site (BMM WHS). The site was inscribed to the World Heritage List in 2018, due to the significance of the geological structures associated with the Barberton Greenstone Belt.

The Department of Environmental Affairs reports that the BMM represents the best-preserved, oldest and most diverse succession of volcanic and sedimentary rock dating back 3.6 to 3.25 billion years, when the first continents were starting to form. It features meteor-impact fallback breccias resulting from the impact of meteorites formed just after the Great Bombardment (4.6 to 3.8 billion years ago), which are particularly well preserved (DEA, January 2017).

The ancient geology associated with the BMM is core to the Outstanding Universal Value (OUV) of the property included as a WHS. Over the past 50 years, geological fieldwork in the Barberton Greenstone Belt has identified hundreds of geosites that collectively define the key features of the processes and products in the very early stages of the earth's development.

7.3.4 Noise

The main source of noise in the area emanates from the operation of the existing processing plant at Barberton Mines and compressors used for underground mining. The closest receptors that can be impacted by increases in environmental noise are the town of Barberton, neighbouring houses, informal settlements located near the mine and people living in the Fairview Mine residential areas (Van Der Merwe, August 2010).

There are no specific activities associated with the BNR (other than conservation) in the immediate vicinity of the site and it is considered unlikely that the existing or proposed activities at Fairview will generate enough noise to be disturbing to visitors to the BNR. Potential impacts of increased environmental noise on game in the reserve is not known but it is anticipated that sensitive species would migrate further to the south of the reserve if they are impacted at all, and may return to the MRA once the reclamation activities have been completed and the areas rehabilitated.

7.3.5 Visual Aspects and Light

The existing TSFs located at Fairview are probably the most visually conspicuous elements associated with Fairview. These have an average height of about 30m. The mine site is however not visible from major tourist routes although it is visible from the ruined Eureka City which is infrequently visited by tourists (Van Der Merwe, August 2010).

8 Impact Assessment and Management

On 09 February 2018 the Department of Environmental Affairs (DEA) published Draft National Guidelines on minimum information requirements for preparing EIAs for Mining Activities that require environmental authorisation. Requirements for the assessment of impacts are stipulated in Section 4 of the Guideline.

The Impact Assessment Methodology proposed below (Section 8.1) was developed with due cognisance of the guideline.

The purpose of the impact assessment is to determine the Significance of potential impacts, so that those activities that are expected to result in high impacts can be altered, or management measures imposed to lessen the impact significance.

A detailed impact assessment will be undertaken as part of the EIA Phase. This section of the report serves to identify preliminary anticipated impacts and their anticipated significance.

8.1 Impact Assessment Methodology

Impact Significance is calculated by the following formula:

Impact Significance = Consequence x Likelihood

Likelihood refers to the probability that an impact will occur at some time throughout the project.

The Matrix which is proposed to determine Likelihood is as follows:

Table 11: Matrix used to determine likelihood

Likelihood	Unlikely: Impact Could occur in extreme events. Less than 15% chance of the impact ever occurring.	1
	Possible: possibility of impact occurring is very low. 16% - 30% chance of the impact occurring.	2
	Probable There is a distinct possibility of the impact occurring. 31% to 60% chance.	3
	Highly Probable: The impact is expected to occur. Between 61% and 85 % chance.	4
	Definite: There are sound scientific reasons to expect that the impact will occur	5

Consequence is calculated by considering the **duration**, spatial **scale** and **intensity** of an impact.

Duration relates to the time-frame that an aspect will be impacted upon. For example, any impact to a heritage resource is considered permanent, while the impact of increased traffic related to a construction activity will only last as long as the construction phase. Duration is rated according to the following criteria:

Table 12: Matrix used to rate duration

Duration	Short term: Less than 1 year and is reversible.	1
	Short to medium term: 2 - 3 years	2
	Medium term - 3 to 10 years	3
	Long term: 11-20 years	4
	Permanent: in excess of 20 years	5

Spatial **Scale** relates to the physical extent of the zone of influence of an impact. Where groundwater or air quality impacts, for example, can extend far beyond the footprint of the

activity, it is not expected that the impact of vegetation removal should extend beyond the footprint of the activity of vegetation removal.

Scale is rated according to the following criteria:

Table 13: Matrix used to rate scale

Scale / Extent	Isolated: Limited footprint within the site will be affected (less than 50% of the site)	1
	Site Specific: The Entire Site will be affected	2
	Local: Will affect the site and surrounding areas	3
	Regional: Will affect the entire region / catchment / province	4
	National: Will affect the country, and possibly beyond the borders of the country	5

The **Intensity** of an impact is calculated by considering the **severity of the impact** (how it will change the aspect, will it be destroyed completely, or altered slightly?) and the **sensitivity of the aspect** (is the aspect sensitive to change, and is the aspect important to ecosystem processes or social dynamics?). For example, if the impact is anticipated to completely destroy a local plant population, but the plant population is commonly found and protected in nearby surroundings, the over-all intensity is lowered. If, however, the plant population in question is unique or protected, the intensity increases proportionately.

The Matrix which is proposed to determine Intensity is as follows:

Table 14: Matrix used to rate Intensity

Intensity	2	Not significant	**Magnitude**	Slight: Little effect, negligible disturbance / benefit	1
				Slight to Moderate: Effects are observable but natural process continue	2
	3	Slight		Moderate: ecosystem processes / social dynamics are permanently altered, but functioning.	3
	4	Slight - Moderate		Moderate - High: natural / social processes are altered to the point where function is limited	4
	5	Moderate		High: The aspect is affected so that its functioning is compromised and this effect is irreversible	5
	6	Moderate - High	**Sensitivity**	Not sensitive: The aspect is not sensitive to change (No irreplaceable loss of resource)	1
	7	High		Somewhat sensitive: The affected aspect is of not of significant value but is sensitive to change	2
	8	Very High		Sensitive: The affected aspect is of moderate value and is slightly resilient to change	3
	9	Extremely High		Very Sensitive: The affected aspect is of significant value and only slightly resilient to change	4
	10	Fatal Flaw		Irreplaceable: The affected aspect is valued and sensitive to change. Irreplaceable loss of significant resource	5

Therefore, considering the formula:

Significance = Consequence x Likelihood

Where ***Consequence = Duration + Scale + Intensity***

And ***Intensity = Severity of the Impact + Sensitivity of the Aspect***

The over-all Significance rating can be calculated as a value between 4 and 100. The score is then categorised as follows:

- 4 to 19 = Insignificant Impact, no mitigation is required beyond standard best practice;
- From 20 to 39 = Low Impact, specific mitigation should be included in the EMP and monitoring should be undertaken;
- From 40 to 59 = Moderate Impact, specific mitigation with strict monitoring is required;
- From 60 to 79 = High Impact, mitigation should consider alteration of the design or process to reduce the impact significance;
- >Higher than 80 (100 max) = The Impact is so Significant that the project design must be reconsidered to avoid the impact.

Impacts will be rated as per the abovementioned methodology without consideration of mitigation measures first, however there may be some mitigation already inherent in the design of the Project (i.e. by using existing TSF footprint as the site for the proposed new TSF instead of disturbing new areas, incorporating existing roads into the project design and re-use of dirty water in the existing processing activities).

Those impacts that are rated as having a moderate impact or above will be investigated further and management measures identified to attempt to reduce the Consequence or Likelihood of the impact. These impacts will then be rated again, while considering the mitigation measures that have been imposed.

8.2 Preliminary Impact Identification, assessment and Mitigation

Each of the activities associated with the proposed project aspects may be associated with various impacts to environmental aspects. These impacts are generally regarded as cumulative in light of the historic mining at the Fairview Mine and in the wider region.

Table 15 summarises the ways in which the proposed Project could impact on various environmental aspects. Each impact was then rated on a preliminary basis according to the criteria discussed in Section 8.1.

Please see Appendix C for the complete preliminary impact assessment tables.

Table 15: Activities and Impact Identification, preliminary significance and management

Activity	Aspect	Impact / Risks	Significance	Significance (without Mitigation)		Mitigation	Significance (with Mitigation)	
Removal of vegetation from new TSF footprint	Terrestrial Biodiversity	Direct loss of species & habitat	Vegetation clearance will definitely take place. Given the site location at the old Bramber TSF footprint, vegetation is not regarded as sensitive. The impact will be of high severity as vegetation will be destroyed entirely on footprint areas. The duration will be permanent, given the TSF will remain after closure. The Impact will be isolated to the footprint area. Over-all, impact significance is regarded as Moderate. Impact duration can be reduced by rehabilitation (re-instating vegetation on the TSF) but this does	55	Moderate	Demarcate footprint area clearly and prevent vegetation clearance outside of the area absolutely required for construction of the proposed new TSF. Verify the presence / absence of protected or sensitive species prior to initiating vegetation clearance, and ensure the necessarily permits are obtained if required prior to disturbing such species. Ensure concurrent rehabilitation of the TSF side slopes as it is developed, and the implementation of final rehabilitation measures after Life of the facility is reached.	50	Moderate

Activity	Aspect	Impact / Risks	Significance	Significance (without Mitigation)		Mitigation	Significance (with Mitigation)	
			not significantly reduce impact significance.					
Removal of Vegetation for road upgrades and reclamation of material from historic dumps	Terrestrial Biodiversity	Direct loss of species & habitat	In the absence of detailed vegetation studies, vegetation is regarded as very sensitive. Vegetation clearance will definitely take place and impact severity will be high. Mitigation and rehabilitation will be able to reduce the duration and extent of the impact.	75	High	Keep affected footprints to the absolute minimum required and demarcate areas clearly to prevent unnecessary clearance of vegetation. Ensure permits for the relocation of protected species (if any) are obtained prior to any clearance taking place. Retain species for use in rehabilitation. Implement concurrent rehabilitation and ensure rehabilitation is successful by monitoring and adjusting rehabilitation measures as required.	55	Moderate
Presence of employees on site for construction of TSF, roads and	Terrestrial Biodiversity	Illegal harvesting of plants and animals (Poaching)	Illegal harvesting is considered highly likely in the absence of mitigation measures. In the absence of detailed studies,	56	Moderate	Employee awareness training could reduce the likelihood of illegal harvesting taking place and reduce the impact severity and scale.	22	Low

Activity	Aspect	Impact / Risks	Significance	Significance (without Mitigation)		Mitigation	Significance (with Mitigation)	
reclamation activities.			affected fauna and flora is regarded as highly sensitive and impact severity is rated as High. The risk will cease as activities conclude and employees leave the areas. Without mitigation the impact could extend to the wider areas.			Prevent access to adjacent areas and the nature reserve by providing proper oversight and transportation to construction crews.		
Site disturbance, construction activities (roads, TSF), reclamation activities and material transport. Operation of new TSF.	Terrestrial Biodiversity	Habitat degradation due to dust, emissions, water quality impacts and general disturbance of the sites	Habitats in the mountainous areas are considered sensitive in the absence of detailed ecological studies. Road construction and reclamation activities will most likely result in habitat degradation. Mitigation measures can reduce impact severity, duration and scale.	56	Moderate	Control dust and emissions arising from activities. Minimize activity footprint. Implement measures to prevent water pollution (sedimentation from erosion and pollution from spillages). Rehabilitate areas once reclamation from a dump is complete (shape and vegetate).	30	Low

Activity	Aspect	Impact / Risks	Significance	Significance (without Mitigation)		Mitigation	Significance (with Mitigation)	
Disposal of removed alien vegetation leading to establishment of alien species	Terrestrial Biodiversity	Increased proliferation of alien invasive species.	Disposal of vegetative material could possibly result in alien or invasive species spread. The aspect is regarded as very sensitive and the impact will manifest in the long term over the local area without mitigation. Severity is regarded as moderate and overall significance is Low without mitigation. Mitigation can reduce the scale and duration of the potential impact.	28	Low	Ensure plant material that is removed from site is disposed of legally and so as to prevent the spread of alien species from seeds which may be present in the removed vegetative material.	24	Low
General disturbance	Terrestrial Biodiversity	Increased proliferation of alien invasive species.	Further disturbance of the site is highly likely to result in proliferation of alien and/or invasive species throughout the site, which could spread to a local scale without mitigation.	60	High	Compile and Implement alien invasive species identification and management plan throughout the project. Rehabilitate areas and continue to monitor and manage until viable	27	Low

Activity	Aspect	Impact / Risks	Significance	Significance (without Mitigation)		Mitigation	Significance (with Mitigation)	
			Such an impact would be of moderate to high severity, on a very sensitive aspect, in the long term. Over-all significance is regarded as high without mitigation. Management measures can potentially reduce the likelihood, extent, duration and magnitude of the impact.			ecosystems have re-established.		
Increased construction and mine vehicles on roads - accidental collisions.	Terrestrial Biodiversity	Fauna mortalities	Fauna mortalities on roads is highly likely to increase due to increased vehicular activity, especially in the mountains. Fauna of the area is regarded as very sensitive in the absence of detailed studies. The impact will be of high severity and	56	Moderate	Strict speed limits and driver awareness training. Vehicles will use only existing and approved routes. No driving on these roads will be allowed at night-time.	26	Low

Activity	Aspect	Impact / Risks	Significance	Significance (without Mitigation)		Mitigation	Significance (with Mitigation)	
			medium term, but will be limited in extent. Impact likelihood can be reduced by mitigation measures.					
Lighting at the site attracting insects.	Terrestrial Biodiversity	Fauna mortalities	It is highly probable that lighting will attract insects resulting in their death, which is regarded as a high severity impact to a sensitive aspect. Lighting will probably not affect insect populations beyond the site. The impact duration at the new TSF is permanent. Mitigation can reduce the probability and extent of the impact.	64	High	Use appropriate downlights and only where necessary.	28	Low
Incorrect waste management and bad housekeeping	Terrestrial Biodiversity	Attracting problem animals to site	It is possible that problem animals will be attracted by incorrect waste management. The impact is of	22	Low	Ensure proper housekeeping and adequate waste management in designated facilities to	20	Low

Activity	Aspect	Impact / Risks	Significance	Significance (without Mitigation)		Mitigation	Significance (with Mitigation)	
			moderate severity, medium term and may affect the whole site. Over-all significance is considered low, and is further reduced by proper waste management at the site.			ensure separation of waste and that waste is not stored on site for excessive periods of time.		
Vegetation clearance, soil stripping and construction of new TSF	Aquatic Biodiversity	Deterioration of surface water quality	It is highly probable that construction activities will lead to sedimentation in the absence of mitigation. The receiving water body (Suidkaap River) is regarded as highly sensitive. Impact severity of sedimentation is considered moderate, and short-term given the duration of the construction phase, but impacts could	52	Moderate	Implement erosion control measures and sediment traps to reduce impact probability, severity and extent.	22	Low

Activity	Aspect	Impact / Risks	Significance	Significance (without Mitigation)		Mitigation	Significance (with Mitigation)	
			manifest beyond the local area.					
Operation of new TSF	Aquatic Biodiversity	Deterioration of surface water quality	Unchecked surface water runoff and potential seepage from the new TSF will probably lead to pollution of very sensitive downstream water resources if not mitigated. The impact will be permanent given the nature of the TSF, of moderate severity and potentially extending beyond the local area.	48	Moderate	Design and construction of the new TSF will be to the relevant engineering standards to prevent seepage and contaminated runoff from entering downstream water resources. Aquatic Biomonitoring and Water monitoring and reporting as per the IWUL conditions should continue (per updated IWUL for the proposed new TSF).	28	Low
Construction of roads to access historic dumps	Aquatic Biodiversity	Deterioration of surface water quality	The routes to the historic dumps affect several drainages on the mountainsides. The planned road upgrades could cause siltation of receiving waterbodies. In the absence of detailed	33	Low	Implement erosion control measures and sediment traps to reduce impact probability, severity and extent.	18	Insignificant

Activity	Aspect	Impact / Risks	Significance	Significance (without Mitigation)		Mitigation	Significance (with Mitigation)	
			studies, receiving water bodies are deemed very sensitive. The impact will be moderate, given the distance from the roads to nearby streams, and will only manifest during the construction phase, and likely be limited to the site.					
Reclamation of historic dumps in/near watercourses	Aquatic Biodiversity	Deterioration of surface water quality	Physical reclamation of material that was dumped within watercourses, will cause sedimentation of the watercourses are flowing. Watercourses are regarded as very sensitive in the absence of detailed studies. Impact severity will be moderate-high but only last for the duration of	48	Moderate	Implement erosion control measures and sediment traps to reduce impact severity and extent. Once the dumps are reclaimed, it is expected that surface water quality will improve as drainage lines will no longer be affected by the historically dumped material.	36	Low

Activity	Aspect	Impact / Risks	Significance	Significance (without Mitigation)		Mitigation	Significance (with Mitigation)	
			reclamation activities and be limited to the site.					
Stripping of remaining topsoil in preparation for TSF construction (limited to previously vacant area between the Old Bramber TSF and the New Bramber/BTRP TSF)	Soils, land use and capability	Loss of topsoil	At least some topsoil (regarded as a sensitive resource) will definitely be lost if the impact is not mitigated. The area is small (6.5 Ha). Mitigation should aim to reduce impact likelihood.	55	Moderate	Strip topsoil ahead of construction and stockpile separately. Protect stockpiles from erosion, compaction and pollution. Limit stockpile height and slope angle. Vegetate long term stockpiles (material that will not be used in rehabilitation within three months).	22	Low
Stripping of soils for road upgrades and recovery of material from historic dumps	Soils, land use and capability	Loss of topsoil	It is considered unlikely that any topsoil remains on the road footprints, or on the historic dumps.	24	Low	The specialist soil study will verify the status of soils on the site. It is anticipated that reclamation of the historically dumped material will expose underlying topsoil	24	Low

Activity	Aspect	Impact / Risks	Significance	Significance (without Mitigation)		Mitigation	Significance (with Mitigation)	
						resources which may recover.		
Stockpiling of topsoil	Soils, land use and capability	Loss of topsoil	Without mitigation, it is highly likely that stockpiles will become polluted or erode. Topsoil is regarded as sensitive. Mitigation should reduce the impact likelihood.	52	Moderate	Protect stockpiles from erosion, compaction and pollution. Limit stockpile height and slope angle. Vegetate long term stockpiles (material that will not be used in rehabilitation within three months). Prevent vehicle access on stockpiles. Prevent use of chemicals on stockpiles. Prevent alien invasive species from establishing on stockpiles and eradicate / control if these do establish despite prevention methods.	26	Low
Vehicle movement, road construction, establishment of new TSF	Soils, land use and capability	Soil compaction (leading to reduced infiltration, increased runoff etc.)	Soils on roadways and infrastructure areas will definitely be compacted. Soils are regarded as sensitive in the absence of detailed studies. The	70	High	Limit vehicle movement and construction footprints to approved, minimum required area. Rehabilitate roads once no longer required to access historic dumps.	50	Moderate

Activity	Aspect	Impact / Risks	Significance	Significance (without Mitigation)		Mitigation	Significance (with Mitigation)	
			impact severity is moderate – high and may manifest over the whole site in the long term, without mitigation. Management and rehabilitation can reduce the scale and duration of the impact.					
Reclamation of historic dumps from the MRA that overlaps with the Nature Reserve	Land Use	Perceived change in land use from conservation to mining	At a distance, the historic dumps within the nature reserve are not identified by the layman as such. Reclamation activities will most likely look out of place to tourists and conservationists. The issue of conflicting land uses is deemed very sensitive and the severity will be moderate - high. It is anticipated that the impact will be of short	40	Moderate	Ensure adequate public consultation to manage public perception and expectation (avoid surprise). Ensure the area is adequately rehabilitated and limit affected footprint as far as possible to reduce impact severity.	32	Low

Activity	Aspect	Impact / Risks	Significance	Significance (without Mitigation)		Mitigation	Significance (with Mitigation)	
			duration and isolated due to screening afforded by vegetation and topography.					
New TSF construction & operation	Land Use	Reduced Land Capability	The site was previously used for a TSF and land capability is only reduced in the additional 6.5 Ha affected between the existing BTRP/New Bramber TSF and reclaimed Bramber TSF, which area is not regarded as sensitive.	35	Low	No mitigation available or required, the affected land (6.5 Ha between the original Bramber and BTRP/New Bramber TSFs) will be the only land affected.	35	Low
Exposed areas, Vehicle and machinery operation causing dust and fugitive emissions	Air Quality	Deterioration in air quality	Vehicle and machinery operation, and exposed areas after vegetation clearing, will almost definitely give rise to increased dust and emissions. Air quality is deemed a sensitive aspect. The impact is not expected to be severe given the	40	Moderate	Limit exposed areas (extent and duration). Ensure vehicles and machinery are in good working order to avoid excessive emission when machines are in disrepair. Expand the mine's dust fallout monitoring programme and ensure compliance to dust	27	Low

Activity	Aspect	Impact / Risks	Significance	Significance (without Mitigation)		Mitigation	Significance (with Mitigation)	
			context and will be short-lived (cease once construction and reclamation is complete and areas rehabilitated). Air quality impacts can affect regional air quality beyond the site.			standards. Monitor PM10 and PM2.5 and report to NAEIS. if standards are exceeded, implement stricter dust control measures (wetting, chemical suppressants, road surfacing to name a few options to consider).		
Fires (accidental or deliberate)	Air Quality	Deterioration in air quality	If not mitigated, it is highly likely that the construction workforce will have cooking fires and potentially burn waste on site. This could easily lead to accidental veld fires which could spread regionally. The aspect is regarded as very sensitive and severity would be high. The risk is eliminated once the workforce leaves the site.	56	Moderate	Fires will not be allowed on site. Awareness training will also emphasize the risks and impact of fires. All waste to be managed in accordance with the Mine's waste management plan and applicable norms and standards. As a local land owner it is recommended that BML adheres to the guidelines set out by the local Fire Protection Association (LEFPA, http://www.lefpa.co.za/) and maintain the relevant	40	Moderate

Activity	Aspect	Impact / Risks	Significance	Significance (without Mitigation)		Mitigation	Significance (with Mitigation)	
						permits and fire-breaks in areas of their control.		
Vegetation clearance and soil stripping leading to erosion and subsequent downstream sedimentation	Surface Water	Deterioration of surface water quality	Erosion is considered highly likely if not mitigated. Local surface water resources are very sensitive and the impact severity will be moderate-high and could affect the local catchment as long as construction and/or reclamation activities occur.	56	Moderate	Prevent erosion on site. Keep cleared areas to the minimum area required and install silt traps at discharge points of clean water systems to reduce impact likelihood, severity and extent.	24	Low
Use of chemicals and chemical toilets on site during construction / reclamation activities	Surface Water	Deterioration of surface water quality	If not managed, spills are highly probable. Chemical / sewage spills will have a high severity, and can affect the whole local area in the long term. Management measures will aim to prevent spills, and	64	High	Contain dirty water on site as per GN704. Ensure facilities are constructed to prevent spills, and contain spills in the event of an accident. Implement Emergency Response Plans in the event of accidental spills. Appoint reputable contractor to service	28	Low

Activity	Aspect	Impact / Risks	Significance	Significance (without Mitigation)		Mitigation	Significance (with Mitigation)	
			contain the extent of accidental spills.			temporary toilets to ensure prevention of sewage spills.		
Surface water runoff contaminating downstream environments.	Surface Water	Deterioration of surface water quality	There is always a possibility for water management infrastructure to overtop or leak. If this happens, it could affect the local catchment in the medium term in moderate-high severity.	28	Low	All infrastructure will be designed in accordance with GN704, and to contain the 1:100-year flood to prevent overtopping of dirty water containment infrastructure into clean water systems. Water containment infrastructure to be operated with adequate freeboard.	28	Low
Containment of water on site (in dirty water catchments)	Surface Water	Reduced surface water availability	The impact will definitely manifest as it is a legal requirement to contain dirty water on site. Due to the location of the new TSF at the old Bramber TSF footprint (which is also part of the dirty-water catchment) the	65	High	Maintain the Mine's dirty water footprint as small as possible. Ensure adequate rehabilitation of the TSF at closure to allow surface runoff to report back to the clean water system.	55	Moderate

Activity	Aspect	Impact / Risks	Significance	Significance (without Mitigation)		Mitigation	Significance (with Mitigation)	
			impact is expected to be slight but will be permanent and could affect the local catchment.					
Spills on site leaching to groundwater.	Groundwater	Deterioration of groundwater quality	Spills on site are highly probable if not managed/prevented. Groundwater is regarded as sensitive (specialist study in the EIA phase will confirm this). Impact severity will be moderate in the long term and could affect the whole local area.	52	Moderate	Spill prevention and management on site. Ensure dirty water is contained on site and treated prior to discharge. Ensure vehicle/machinery servicing, chemical storage etc. only occurs in purpose-built facilities with impervious floors. Groundwater monitoring as per IWUL.	26	Low
TSF and RWD impacts on groundwater quality.	Groundwater	Deterioration of groundwater quality	It is highly likely that the new TSF (and the existing BTRP/New Bramber TSF and other TSFs on site) may have a permanent, moderate-high impact on regional groundwater. The EIA-	64	High	Ensure that seepage of contaminated water to groundwater from the new TSF is prevented (i.e. by lining of the facility and/or intercepting potential seepage and returning water to the dirty-water system). The	56	Moderate

Activity	Aspect	Impact / Risks	Significance	Significance (without Mitigation)		Mitigation	Significance (with Mitigation)	
			phase specialist study will confirm this.			EIA-Phase specialist study will model the extent of potential contaminant transport and provide possible mitigation measures. It is expected that mitigation will be able to lessen the extent and severity of the impact.		
Construction and presence of the new Fairview TSF	Visual Resources	Alteration of the Visual Resource	The new TSF will definitely alter the visual resource, which is not regarded as sensitive against the backdrop of the other TSFs and mining infrastructure in this area. The severity of the impact will be slight to moderate (at most) considering the existing BTRP/New Bramber TSF. The Impact will be permanent and likely be visible on a local scale	55	Moderate	Implementation of the Mine's rehabilitation plan will lessen impact severity and duration to an extent (the TSF will still be present but blend in with its surroundings). Careful consideration to night-time lighting can also reduce impact severity and extent at night.	35	Low

Activity	Aspect	Impact / Risks	Significance	Significance (without Mitigation)		Mitigation	Significance (with Mitigation)	
Reclamation of the historic dumps	Visual Resources	Alteration of the Visual Resource	Reclamation activities will alter the visual resource, which is sensitive within the BNR. Severity is expected to be rather high but duration is not extensive and the topography will probably limit the zone of visual influence.	45	Moderate	Ensure the affected footprints are limited as far as possible and that adequate and concurrent rehabilitation (including shaping and re-vegetation) is implemented. No nigh-time activities should be allowed.	35	Low
Operation of machinery and equipment and movement of vehicles	Noise	Increased ambient noise	It is likely that the project activities will contribute to the generation of noise. In the context of the existing Mine, the aspect is not considered sensitive and the severity is not expected to be significant or audible beyond the activity footprints.	30	Low	No construction or reclamation activities should occur at night-time. Vehicles and machinery should be serviced regularly to prevent the noise these machines can generate if they are in disrepair.	27	Low

Activity	Aspect	Impact / Risks	Significance	Significance (without Mitigation)		Mitigation	Significance (with Mitigation)	
Movement of vehicles to and from reclamation activities	Employee safety	Accidents / collisions on mountain roads	If not mitigated, it is highly probable that employee safety will be negatively affected, considering the mountainous terrain. If the impact manifests it may be of high severity, permanent nature on an irreplaceable aspect (loss of life). Such impact would have a local extent and is regarded as high. Mitigation reduces the impact likelihood.	72	High	Ensure the road upgrades on the mountain roads include adequate safety measures (mirrors, line-of-sight where possible, speed-reducing-measures). Implement driver training. Prevent pedestrian use of roads in this area.	36	Low
Presence of employees on site for construction of TSF, roads and reclamation activities.	Safety & Security	Workers accessing restricted areas outside of the site.	It is possible that workers at the mine may access areas outside of the site and give rise to security concerns. People employed by the mine are less likely to engage in criminal	32	Low	Implement Environmental awareness training programs. Prevent access to unauthorised areas. Set up a community safety forum.	32	Low

Activity	Aspect	Impact / Risks	Significance	Significance (without Mitigation)		Mitigation	Significance (with Mitigation)	
			activity than unemployed individuals. This is regarded as a very sensitive aspect given the crime statistics of the country, and the problems experienced with illegal mining in the area.					
Presence of new Fairview TSF	Community Safety	TSF Failure	The TSF is being designed by qualified engineering teams to acceptable standards. However, there is always some possibility of failure which could result in loss of life (permanent loss of an irreplaceable aspect impacting on a local scale). The probability of this occurring is however regarded as low.	36	Low	There is always a risk of failure of impoundment infrastructure. All relevant engineering standards to be implemented in design and construction. Monitoring to be undertaken to ensure stability of infrastructure and prevent failure, which would impact downstream land uses and people.	36	Low

Activity	Aspect	Impact / Risks	Significance	Significance (without Mitigation)		Mitigation	Significance (with Mitigation)	
Reclamation of dumps older than 60 years	Heritage Resources	Destruction of historic "structures"	The impact will definitely manifest as the applicant is applying to reclaim material from these dumps. The specialist study in the EIA phase will confirm, but it is not expected that these dumps are sensitive. Impact severity will be high and permanent, but isolated.	60	High	No mitigation is possible, other than the no-go option which would mean the dumps will remain as they are (definitely obstructing and potentially polluting water resources).	60	High
Construction and reclamation activities	Heritage Resources	Damage to or destruction of undetected heritage resources	It is possible that other heritage resources, as yet unknown, may be damaged by the activities. Impacts to heritage resources are considered permanent, high-severity impacts on irreplaceable resources.	32	Low	Undertake an Archaeological Impact Assessment in the EIA Phase to identify All heritage resources in proximity of potentially affected footprints, and implement the recommendations of the specialist.	32	Low

9 Plan of Study

The purpose of this section of the Scoping Report is to map a way forward to ensure that the EIA study will be undertaken in a manner that will include all relevant aspects of the proposed project in the context of the Project Site. This Plan of Study is set out as per the required contents of the Plan of study as contained in the EIA Regulations, 2014 (as amended), as follows:

(i) a description of the alternatives to be considered and assessed within the preferred site, including the option of not proceeding with the activity;
(ii) a description of the aspects to be assessed as part of the environmental impact assessment process;
(iii) aspects to be assessed by specialists;
(iv) a description of the proposed method of assessing the environmental aspects, including aspects to be assessed by specialists;
(v) a description of the proposed method of assessing duration and significance;
(vi) an indication of the stages at which the competent authority will be consulted;
(vii) particulars of the public participation process that will be conducted during the environmental impact assessment process; and
(viii) a description of the tasks that will be undertaken as part of the environmental impact assessment process;
(ix) identify suitable measures to avoid, reverse, mitigate or manage identified impacts and to determine the extent of the residual risks that need to be managed and monitored.

The alternatives identified in this Scoping Report will be included in the EIA investigations to further refine the feasible Project options. Additional alternatives identified through the Public Participation Process (PPP) will also be included where feasible and where these are not further investigated, reasons will be provided.

The Aspects that will be assessed as part of the EIA Process will be the same aspects as identified in Section 8 of this Scoping Report. If additional aspects are identified through the PPP these will be added to the assessment as necessary. These aspects will in most instances be assessed by specialists. The terms of reference for the specialist studies commissioned as part of the EIA Process are provided in Section 9.1.

The impact assessment methodology proposed in Section 8.1 will be used in the EIA Phase to assess the significance of the identified impacts, though it is anticipated that a number of specialists will adopt alternative assessment methodologies specific to the relevant specialist field. Specialist studies will be attached to the EIA Report as appendices and the findings of the specialist impact assessments will be summarised in the EIA Report, according to the Impact Assessment Methodology described herein.

The future planned PPP, including authority consultation, is described in Section 6 of this report.

As the project description is further refined and the design of the new TSF completed, the activities associated with the Project which could be associated with impacts (either positive or negative) on the receiving environment (physical, biological and socio-cultural) will be expanded. Each activity associated with the proposed project throughout its development

phases (construction, operation, decommissioning & closure) will be included in the assessment. In summary, the tasks that will be undertaken as part of the EIA Process include:

1. Refine the project description to such an extent that the detail is sufficient to identify each project-related activity that could impact on the surrounding environment;
2. Describe the likely nature of the impacts (what aspect(s) of the environment are the activities likely to impact upon, is the impact positive or negative, is the impact avoidable or reversible, will the impact result in irreplaceable loss of resources etc.)
3. Define the significance of each impact, in the absence of management and mitigation measures, according to the Impact Assessment Methodology (Section 8.1).
4. Rank the impacts in order of significance and identify avoidance, management and/or mitigation measures for each that are appropriate to the impact significance.
5. Re-assess the impact significance taking the proposed management measures into account. Compile the management measures into a comprehensive EMP that must be implemented during the different project phases and against which compliance can be audited.
6. In addition to the management measures, formulate a monitoring and auditing plan for the proposed project to ensure the EIA/EMP is regularly updated and will remain valid and relevant throughout the LoM at Fairview, and that potential non-compliances can be addressed immediately.
7. Additional emphasis is placed on project completion and closure – residual risk is anticipated and monitoring programmes prescribed along with a calculation of the financial provision required to ensure the Fairview Mine, specifically the proposed new TSF, will be rehabilitated satisfactorily.
8. Based on the impact significance, after mitigation measures have been applied, formulate a professional opinion on the benefits and risks of the project to assist the decision-making authorities in assessing the merit of the Project and reaching a decision on the Project (in its totality, or as pertains to different elements).
9. All the preceding steps go hand-in-hand with public and authority consultation as well as specialist input.

9.1 Specialist studies to be undertaken in the EIA Phase, and the specialists' terms of reference

A number of specialist assessments have been commissioned as part of the EIA process. The terms of reference for each study is provided in the sections below. These may be updated / refined based on feedback received from the authorities and/or during the PPP.

9.1.1 Groundwater Study

This investigation will focus on updating the existing status quo of the regional groundwater system and quantify and qualify potential impacts of newly proposed activities on sensitive environmental receptors. The main objectives of the study are to:

- Determine the site baseline conditions (*status quo*) including the identification of sensitive environmental receptors and the status of the regional groundwater system (including aquifer classification, delineation and vulnerability assessment);
- Assess the results of geochemical test work undertaken by the Mine and Engineers and assess the potential for the long-term occurrence of acid mine drainage (AMD);
- Develop a numerical groundwater flow model and contaminant transport model with a source-term derived from the geochemical assessment; and
- Undertake a groundwater impact assessment including management and mitigation measures that could reduce or avoid impacts, and compile an integrated groundwater monitoring network and protocol.

9.1.2 Surface water Study

The study will be initiated by the collation of all available surface water data to gain an understanding of the baseline hydrology of the affected areas. This will include climatic data and reports, topographical information, floodline and survey data and water quality monitoring data. Geographic Information Systems (GIS) software will be used to delineate catchments for the project area and define the hydrological characteristics thereof.

A floodline determination will then be undertaken on nearby watercourses, based on survey data provided by the Mine. Data will be converted into a digital elevation model (DEM) which can be used to calculate peak flows and delineate the 1:50-year and 1:100-year flood lines.

A stormwater management plan (SWMP) will be compiled for the new TSF as per the requirements of GN704 of the NWA pertaining to the separation of clean- and dirty water systems. The Mine's water balance will be updated to include the proposed new TSF.

A surface water impact assessment will be undertaken to determine all of the hydrological impacts associated with the proposed project aspects and formulate mitigation measures to alleviate impacts to surface water resources.

9.1.3 Terrestrial Biodiversity (Flora and Fauna)

The Terrestrial Biodiversity assessment will be approached over two phases. As part of Phase 1 (Scoping), desktop information will be gathered to obtain background information on the project. As part of Phase 2 (EIA), field assessments will be undertaken, and assessment methods will be applied to characterise the Present Ecological State (PES) and Ecological Importance and Sensitivity (EIS) of the site and to identify ecosystems and biological assemblages at risk.

Once site specific issues have been identified, an impact assessment will be undertaken according to a pre-defined impact assessment methodology. The baseline ecological assessment reports will also highlight all management and mitigation measures deemed necessary in order to avoid and mitigate impacts associated with the proposed project.

The floral assessment will identify habitat types that could be affected by the proposed project, describe each habitat type in terms of conservation importance and PES and identify floral species associated with each habitat type. Focus will be on identifying protected or sensitive species of conservation concern (SCC) as well as alien invasive species that require management.

Faunal assessments will include assessment of mammals, avifauna, herpetofauna and invertebrates.

The aim is to identify all species that could potentially occur in the area, as well as confirm species that actually occur in the area. A Probability of Occurrence (POC) assessment will also be considered in order to quantify the importance of the study area in terms of faunal Species of Conservation Concern (SCC) conservation.

Based on the findings a detailed baseline study and impact assessment on all identified significant risks will take place and recommendations on management and mitigation measures (including opportunities and constraints) with regards to the proposed projects will be put forward to manage and mitigate impacts on the flora and fauna of the area.

9.1.4 Freshwater ecological assessment

The Scope of Work includes an investigation of the freshwater resources within the study area, as well as the delineation of those freshwater resources within 500m thereof in fulfilment of Government Notice (GN)509 of 2016 as it relates to the National Water Act, 1998 (Act No. 36 of 1998) (NWA).

Current industry 'best practice' assessment methods will be applied to characterise the Present Ecological State (PES) and Ecological Importance and Sensitivity (EIS) of the freshwater ecological environment and to identify ecosystems and biological assemblages at risk.

A watercourse classification assessment will be undertaken according to the Classification System for Wetlands and other Aquatic Ecosystems in South Africa. User Manual: Inland systems (Ollis *et al*., 2013). Applicable buffer zones and/or zones of regulation according to relevant legislation or provincial guidelines will then be delineated around the watercourses

A detailed report will be generated for the environmental authorisation process, providing both qualitative and quantitative data on the PES of the freshwater resources associated with the study area. The studies will generate detailed site sensitivity maps and all results will be used to inform a detailed impact assessment, which will be undertaken according to a pre-defined impact assessment methodology, and key mitigatory measures in order to minimise impacts on both local and regional wetland and aquatic ecology will be highlighted.

9.1.5 Hydropedological Assessment

Wetland hydrology is influenced by surrounding soil conditions and landscape position, amongst other factors. Whereas the ability of soils to recharge downstream wetlands and/or groundwater is largely driven by the hydraulic conductivity, which is influenced by porosity according to particle size distribution (texture). The hydro-pedological study investigates the inter-relationships between groundwater flow, surface flow and interflow.

Surveys will be undertaken using the signatures of the soil/water interaction visible in the morphology of soils to identify where water flows and to characterise the hydrological response. A conceptual hydrological response will then be developed for each affected hillslope to estimate and quantify stormwater controls.

9.1.6 Heritage and Palaeontology

The National Heritage Resources Act (Act 25 of 1999) and the National Environmental Management Act (Act 107 of 1998) requires that the presence or absence of Heritage and/or palaeontological resources that may be affected by the proposed development be confirmed prior to initiating the development. If Heritage or palaeontological resources are identified on the project site, additional studies must be undertaken to ensure that the resources are protected.

In order to determine the likelihood of fossils occurring in the affected area geological maps, literature, palaeontological databases and published and unpublished records will be consulted. If fossils are likely to occur then a site visit must be made by a qualified palaeontologist to locate and assess the fossils and their importance. The only potential fossils in the area are microscopic and extremely old. A site visit is not considered necessary at this stage.

A site visit will be undertaken by a registered archaeologist to verify the heritage and archaeological resources that may be present at the site. It is known that the dumps targeted for reclamation are considered heritage resources by virtue of their age. Significant heritage resources (including graves) are known to occur in the area and will be identified by the archaeological impact assessment, and appropriate mitigation prescribed.

9.1.7 Air Quality Impact Assessment

The Air Quality Impact Assessment (AQIA) will include a baseline assessment, emissions inventory, dispersion modelling and reporting.

The AQIA is required to ensure that dust and particulates from the proposed activities will remain within regulatory limits and that emissions management at the site will meet minimum standards.

The AQIA will involve the following:

- Baseline Assessment including a brief project description and description of the study site, surrounding sensitive receptors, surrounding land use and topography.
- Meteorological assessment: Met data will be evaluated to determine the local prevailing weather conditions, and its influence on the dispersion and dilution potential of pollutants released into the atmosphere. Should this not be available from the South African Weather Services, MM5 modelled met data, for input into the AERMOD model, from Lakes Environmental will be used as an alternative.
- Identification of existing sources of emissions and characterisation of ambient air quality at or near to the project site using available monitoring data.
- Discussion on the current legislative and regulatory air quality requirements.
- Literature review of the potential health effects associated with the criteria air pollutants of concern, and detailed literature review of emissions from all activities on site. Where information is not available on emission rates, USEPA or NPI emission factors will be used.
- Compilation of an emissions inventory for the project for criteria air pollutants and TSP.
- Dispersion modelling, using the AERMOD model, will be conducted in line with the South African National Regulations Regarding Air Dispersion Modelling, 2014. Potential

emissions from the proposed construction and operation and associated activities will be modelled, to determine the predicted ambient air pollutant concentrations. Comparison of the predicted concentrations will be made with the South African National Ambient Air Quality Standards and Dust Control Regulations to determine compliance

General recommendations will be provided regarding the mitigation and management of the identified potential impacts. This may include the implementation of an air quality monitoring programme.

9.2 Closure and Rehabilitation Assessment

NEMA prescribes that mines must comply with the prescribed financial provision for the rehabilitation, closure and on-going post decommissioning management of negative environmental impacts arising from the mining operation.

The Financial Provision Regulations, 2015 (as amended), regulates the determination and provision as contemplated in NEMA for the costs associated with the management, rehabilitation and remediation of environmental impacts resulting from mining operations. The Regulations apply to applicants and holders of mining rights and permits. Draft Regulations have been published for comment in 2019, and if these are gazetted prior to completion of this study, they will be the primary regulations considered in calculating the quantum of financial provision for closure.

It is proposed that the financial liability associated with the proposed new TSF be calculated as a stand-alone quantum which can be added to the over-all Fairview financial provision should the project be approved. The scope will involve the compilation of an integrated report combining the Annual Rehabilitation Plan, Final Rehabilitation Plan, and Environmental Risk Assessment Report.

Rates will be obtained for demolition and / or removal of the various types of infrastructure and structures and the rehabilitation of areas from three different contractors, and an average cost will be calculated for the different rehabilitation activities that will be required.

10 Assumptions and Limitations relevant to this Report

This Scoping Report has been made available for a review and comment period of 30 days, and has been updated with comments received from authorities and the public. This doesn't imply an end to the PPP, which is ongoing and comments received from I&APs at any time during the application process will be incorporated in subsequent reports in due course.

The specialist studies that have been commissioned as part of this proposed project have not yet been completed. Where specialists contributed to the assimilation of baseline information, impacts or mitigation measures, such inputs have been referenced. Other information presented in this report is based on available desktop information. This report will therefore be updated as more site-specific specialist input is received.

The level of project detail presented in this report will be refined as engineering designs progress. It is not realistic to expect applicants in mining operations to undertake detail designs of the proposed operations prior to commencing with EIA –

- the early commencement of the Scoping & EIA Process enables the engineering teams to take environmental matters into consideration in their designs of project infrastructure, often resulting in improved options analysis and sustainable development; and
- undertaking of detailed designs is associated with significant expenditure. It is fair to allow an applicant the opportunity to evaluate the environmental and permitting feasibility of a project prior to advancing to a detailed design stage.

The level of project detail presented in this report is sufficient to ensure a realistic identification of potential impacts. In assessing the potential significance of those impacts, the precautionary principle was implemented and a worst-case scenario assessed in each instance.

11 Conclusion

This scoping report pertains to the proposed development of a new TSF at the site of the old Bramber TSF, and the reclamation of historic waste dumps within the Fairview MRA.

It is acknowledged that the site of the proposed reclamation activities is located within an area which has been proclaimed as a nature reserve in terms of the NEMPAA, and it is also acknowledged that the Fairview Mining Right significantly predates the proclamation of the nature reserve. The Mining Right is a limited real right which grants the Holder (Barberton Mines Limited) the right to access, search for and mine and process gold resources within the Mining Right Area.

It is anticipated that the proposed project will be associated with a number of environmental impacts, associated with vegetation clearance, road upgrades and the TSF construction and operation. These potential impacts have been identified in this report and will be subject to specialist investigation and quantification in the EIA phase of the Project.

11.1 Specific Information required

The scoping report must also address the matters referred to in section 24(4)(a) and (b) of the NEMA. The provisions of this section, and how these are addressed in this report are shown in Table 16:

Table 16: How the provisions of NEMA Section 24(4)(a) and (b) are addressed in this report

Provision of NEMA	Relevance to this application and report
(4) Procedures for the investigation, assessment and communication of the potential consequences or impacts of activities on the environment – *(a) must ensure, with respect to every application for an environmental authorisation—*	

Provision of NEMA	Relevance to this application and report
(i) coordination and cooperation between organs of state in the consideration of assessments where an activity falls under the jurisdiction of more than one organ of state;	The DMR has been identified as the competent authority in terms of the applications under the MPRDA, NEMA and NEMWA. The IWULA is being managed by Escon Consulting as a separate process, however the DWS is still included in the I&AP database and an integrated PPP is proposed. The relevant conservation authorities are also included in the consultation process.
(ii) that the findings and recommendations flowing from an investigation, the general objectives of integrated environmental management laid down in this Act and the principles of environmental management set out in section 2 are taken into account in any decision made by an organ of state in relation to any proposed policy, programme, process, plan or project;	It is assumed that the decision-making authorities will take the provisions of section 2 of the NEMA into account when evaluating the Project.
(iii) that a description of the environment likely to be significantly affected by the proposed activity is contained in such application;	Please see the baseline description in section 7 of this report. This information will be updated as specialist studies are concluded.
(iv) investigation of the potential consequences for or impacts on the environment of the activity and assessment of the significance of those potential consequences or impacts; and	A preliminary impact identification and assessment is presented in section 8 of this report. This will be expanded upon, refined and updated as the project and specialist assessments progress.
(v) public information and participation procedures which provide all interested and affected parties, including all organs of state in all spheres of government that may have jurisdiction over any aspect of the activity, with a reasonable opportunity to participate in those information and participation procedures; and	The PPP is discussed in section 6 of this report.
(b) must include, with respect to every application for an environmental authorisation and where applicable—	
(i) investigation of the potential consequences or impacts of the alternatives	This is the scoping report and does not yet include detailed investigation of potential

Provision of NEMA	Relevance to this application and report
to the activity on the environment and assessment of the significance of those potential consequences or impacts, including the option of not implementing the activity; *(ii) investigation of mitigation measures to keep adverse consequences or impacts to a minimum;*	impacts or management measures. These can only be assessed in detail in the EIA Phase of the project. Alternatives are however discussed in this report, including the no-development option.
(iii) investigation, assessment and evaluation of the impact of any proposed listed or specified activity on any national estate referred to in section 3(2) of the National Heritage Resources Act, 1999 (Act No. 25 of 1999), excluding the national estate contemplated in section 3(2)(i)(vi) and (vii) of that Act;	Listed activities relevant to the proposed project are identified in this report. The impact(s) of these activities must be assessed in further detail in the EIA Phase. A specialist archaeological and palaeontological impact assessment have also been commissioned as part of this project.
(iv) reporting on gaps in knowledge, the adequacy of predictive methods and underlying assumptions, and uncertainties encountered in compiling the required information;	Current assumptions, limitations and gaps are highlighted in this report. This will be expanded upon as the studies progress.
(v) Investigation and formulation of arrangements for the monitoring and management of consequences for or impacts on the environment, and the assessment of the effectiveness of such arrangements after their implementation;	Monitoring and management measures are not included in detail in this scoping report but will be included in the EIA phase.
(vi) consideration of environmental attributes identified in the compilation of information and maps contemplated in subsection (3); and	The baseline environment is described in this report and will be expanded upon as the studies progress.
(vii) provision for the adherence to requirements that are prescribed in a specific environmental management Act relevant to the listed or specified activity in question.	Provisions of the Waste Act, Heritage Resources Act, Water Act and other relevant legislation are included in this report.

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Appendix A: Maps and Plans

Appendix B: Existing Rights and Licenses

Appendix C: Impact Assessment Tables

Appendix D: Details of the PPP