Environmental Impact Assessment
And
Environmental Management Programme

for Listed Activities Associated with the Proposed Dalyshope Coal Mining Project, Situated in the Magisterial District of Lephalale, Limpopo Province

DMRE Reference Number: LP 30/1/2/3/2/1 (10183) MR

Environmental Authorisation in Support of the Dalyshope Coal Mining Project

SUBMITTED FOR ENVIRONMENTAL AUTHORISATIONS IN TERMS OF THE NATIONAL ENVIRONMENTAL MANAGEMENT ACT, 1998 (ACT NO. 107 OF 1998) (NEMA) AND THE NATIONAL ENVIRONMENTAL MANAGEMENT WASTE ACT, 2014 (ACT NO. 26 OF 2014) (NEM:WA) IN RESPECT OF LISTED ACTIVITIES THAT HAVE BEEN TRIGGERED BY APPLICATIONS IN TERMS OF THE MINERAL AND PETROLEUM RESOURCES DEVELOPMENT ACT, 2002 (ACT NO. 28 OF 2002) (MPRDA) (AS AMENDED).

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File Reference Number SAMRAD:	LP 30/1/2/3/2/1 (10183) MR

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ENVIRONMENTAL

This document has been prepared by Digby Wells Environmental.

Report Type:	**Environmental Impact Assessment and Environmental Management Plan Report**
Project Name:	**Integrated Environmental Impact Assessment for the Proposed Dalyshope Coal Mining Project, Situated in the Magisterial District of Lephalale, Limpopo Province**
Project Code:	**UCD6170**

Name	**Responsibility**	**Signature**	**Date**
Modiegi Monaledi	Report Compiler		September 2020
Xanthe Taylor	1st Reviewer		January 2021
Barbara Wessels	2nd Reviewer	BWessels	February 2021

IMPORTANT NOTICE

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

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

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

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

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

OBJECTIVE OF THE ENVIRONMENTAL IMPACT ASSESSMENT PROCESS

The objective of the environmental impact assessment process is to, through a consultative process: -

- determine the policy and legislative context within which the activity is located and document how the proposed activity complies with and responds to the policy and legislative context;
- describe the need and desirability of the proposed activity, including the need and desirability of the activity in the context of the preferred location;
- identify the location of the development footprint within the preferred site based on an impact and risk assessment process inclusive of cumulative impacts and a ranking process of all the identified development footprint alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects of the environment;
- determine the: -
    - nature, significance, consequence, extent, duration and probability of the impacts occurring to inform identified preferred alternatives; and
    - degree to which these impacts: -
    - can be reversed;
    - may cause irreplaceable loss of resources, and
    - can be avoided, managed or mitigated.
- identify the most ideal location for the activity within the preferred site based on the lowest level of environmental sensitivity identified during the assessment;
- identify, assess, and rank the impacts the activity will impose on the preferred location through the life of the activity;
- identify suitable measures to manage, avoid or mitigate identified impacts; and
    - identify residual risks that need to be managed and monitored.

EXECUTIVE SUMMARY

Introduction

Anglo Operations Pty) Ltd (hereafter Anglo or the Applicant) has partnered with Universal Coal Development IV (Pty) Ltd (hereafter Universal) to participate in the proposed Dalyshope Coal Mining Project (the Project) through funding and managing the project development, including the Mining Right application.

Universal, on behalf of Anglo, is applying for the following authorisations and licences, which are required prior to the commencement of mining operations:

- A Mining Right in terms of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002);
- An Environmental Authorisation in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA);
- A Waste Management Licence (WML) in terms of the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008) (NEM: WA);
- An Integrated Water Use Licence (IWUL) in in terms of the National Water Act, 1998 (Act No. 38 of 1998) (NWA); and
- Tree Permit in terms of the Constitution of South Africa, 1996 (Act No. 108 of 1996) (Constitution) (Section 24– Environment); National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004) (NEM: BA); Limpopo Environmental Management Act, 2003 (Act No. 7 of 2003) (LEMA) Schedule 12 (Protected Plants); and the National Forests Act, 1998 (Act No. 84 of 1998) (NFA).

The Mining Right boundary will include the following farms:

- Buurmanshulp 136 LQ
- Bergen Op Zoom 188 LQ
- Greenwich 113 LQ (is now Greenrust 708 LQ)
- Gaylad 208 LQ
- Rooiboslaagte 144 LQ
- Hilton 190 LQ
- Stellenbosch 203 LQ
- Surrey 18 LQ
- Virginia 6 LQ
- Vryplaats 163 LQ
- Canada 229 LQ (now subdivided into Canada and Matopi 705 LQ)
- Wynberg 215 LQ
- Boompan 237 LQ
- Breda 147 LQ (Portion now known as Beska 180 LQ)
- Ecarte 156 LQ
- Fairfield 154 LQ (Portion 1, 2 and RE)
- Kromhoek 193 LQ (Portion 1 and RE)
- Lhea 437 LQ (Portion 1, 2 and RE)
- Vucht 436 LQ (Portion 1, 4 and RE)
- Weltevreden 200 LQ (Portion 1 and RE)
- Wolvendraai 481 LQ
- Constantia 122 LQ (as subdivided to form a Portion of Fig Tree 716 LQ)

- **Dalyshope 232 LQ** (a Portion of Dalyshope 232 was subdivided to form Nazarov 685 LQ)
- **Klaarwater 231 LQ** (a Portion of Klaarwater 231 was subdivided to form Nazarov 685 LQ)

The Farms Dalyshope 232 LQ and Klaarwater 231 LQ are the directly affected farm portions with respect to mining and mining-related activities. The farms are located near the settlement of Steenbokpan within the jurisdiction of the Lephalale Local Municipality, situated in the Waterberg District Municipality in the Limpopo Province.

The mining reserves shall be mined by utilising truck and shovel opencast mining method, producing approximately 2.4 Million tonnes per annum (Mtpa) of thermal coal product for approximately five years. After five years, the mine will ramp up production to approximately 12 Mtpa of product for approximately 25 years from a single open pit, giving a total Life of Mine (LoM) of approximately 30 years.

Digby Wells Environmental (hereinafter Digby Wells) has been appointed by Universal, on behalf of Anglo, as the independent Environmental Assessment Practitioner (EAP) to facilitate the application for Environmental Authorisation through the Scoping and EIA process.

Project Applicant

The details of the Project Applicant are included in the table below.

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Project Overview

The proposed Dalyshope Coal Mining Project is situated within the Waterberg Coalfield of the Limpopo Province. Anglo proposes to extract coal from Opencast Pit 1 (OC1) (409.32 ha) through opencast mining using selective mining techniques. All mining related infrastructure covers a surface area of approximately 47.33 ha (excluding linear infrastructure and OC1).

The proposed infrastructure required includes the following:

- Contractors laydown yard
- Temporary stockpiles for construction
- Diesel/wash bay and oil separator
- OC1 pit
- ROM stockpiles;
- Slew product stockpiles
- Discard facility
- Laboratory
- Laundry facility
- Water tanks
- Potable water Pipeline and distribution
- Dirty water pipeline;
- Sewage Treatment Plant (STP)
- Water Treatment Plant (WTP)

- Washing (Coal Handling and Preparation) plant
- Weighbridges
- Conveyer belts
- Workshop
- Two PCDs
- Stores
- Crush and screening plant
- Offices
- Change-house
- Brine pond
- Topsoil and subsoil stockpiles
- Coal stockpiles and/or storage (silos and bins)
- Temporary Pollution Control Dam (PCD) for construction
- Explosives magazine
- Stormwater management infrastructure
- Powerline/s
- Substation
- Rail link and rail loadout facility
- Brake-test ramp/ wash bay
- LDV and light vehicle access road
- Truck access road
- Road upgrade (Steenbokpan to site)
- Overburden (Hards/ Softs) stockpiles

Purpose of this Report

The purpose of an EIA process is to ensure that the potential environmental and social impacts associated with the construction, operation and closure and rehabilitation phases of a project are identified, assessed and appropriately managed. There are two primary phases of an EIA process, namely the Scoping Phase and the Impact Assessment Phase. Identification of potential impacts occurs during the Scoping Phase, whilst the assessment and mitigation of those impacts occurs during the Impact Assessment Phase. The impact assessment and mitigation management are presented in this EIA and Environmental Management Programme (EIA/EMPr) Report. Various specialist studies were undertaken during the Project evaluation to inform the EIA/EMP; these include:

- Soils, Land Use and Land Capability Assessment;
- Surface Water Assessment;
- Groundwater Assessment;
- Geochemical and Waste Classification Assessment;
- Fauna and Flora Assessment;
- Aquatics Assessment;
- Wetlands Assessment;
- Air Quality Assessment;
- Noise Assessment;
- Blast and Vibration Assessment;
- Social Assessment;
- Heritage Assessment;

- Traffic and Transport Assessment; and
- Rehabilitation and Closure Assessment.

A summary of the baseline environment is presented in Section 10 (Part A). Environmental monitoring plans suggested by various specialists are included in Section 8 (Part B) of this report and should be implemented to measure compliance, determine whether mitigation measures are effective and determine trends over the life of the Project.

Environmental Consultants

The contact details for the independent EAP are provided in the table below.

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Approach and Methodology for the Public Participation Process

A Public Participation Process was initiated during the Scoping Phase, which is central to the investigation of environmental and social impacts, as it is important that stakeholders who are affected by the project are given an opportunity to identify concerns and to ensure that local knowledge, needs and values are understood and taken into consideration as part of the impact assessment process. The comments from the stakeholders are included in the Comment and Response Report.

The Draft EIA/EMP has been submitted to the public for input and comments for a period of 30 days. The commenting period is from **11 February 2021** and ends on **11 March 2021**. The electronic Draft EIA/EMP can be accessed and downloaded from the Digby Wells website www.digbywells.com (Public Documents) and the data-free service portal.

Due to COVID-19 Regulations, no hard copies were made available. Focus Group meetings are planned to be held during this commenting period to present the Draft EIA/EMP and obtain comments from the Interested and Affected Parties (I&APs). The Draft EIA/EMP will be updated with the comments received from the I&APs prior to submission of the Final EIA/EMP to the DMRE for consideration. Once the Department of Mineral Resources and Energy (DMRE) has made a decision, it will be communicated to all the registered I&APs.

Project Alternatives

Section 9.1, Part A, provides the details of the development footprint alternatives considered for this Project. The following alternatives were considered in this EIA/EMP:

- Location;
- Design and layout;
- Mining method;
- Water supply;
- Routing; and
- The 'No-Go" alternative.

Environmental Impact Summary

The EIA Report, the associated specialist studies and the public participation process were undertaken and completed in line with the legislative requirements discussed in Section 9.2 (Part A) of this report. A quantitative impact rating methodology was applied to determine the significance of the expected impacts pre-mitigation and post-mitigation. Table A provides a summary of the key impacts (of high, moderate and major significance only) expected during the various phases of the Project. This report lists and assesses all the potential impacts, together with the associated mitigation measures.

Table A: Summary of the Key Impacts Associated with the Proposed Activities

Activity	Aspect	Impacts	Rating (Pre-Mitigation)	Rating (Post Mitigation)
Construction Phase				
Site/vegetation clearance.	Fauna and Flora	• Loss of plant communities including floral Species of Conservation Concern (SCC); • Loss of biodiversity; • Increased erosion; • Potential for Alien Invasive Plants (AIPs) proliferation; • Loss of faunal habitat including faunal SCC; and • Loss of vegetation types including Woodland and Pan vegetation.	Major (negative)	Moderate (negative)
Construction activities	Wetlands	• Loss and disturbance of watercourse habitat and fringe vegetation.	Moderate (negative)	Moderate (negative)
Infrastructure Construction	Visual	• The surface infrastructure will change the sense of place of the Project area. This change in landscape and land use will draw attention to the project area.	Moderate (negative)	Moderate (negative)
Topsoil Stockpiling	Visual	• Negative visual impact due to the proposed height and footprint size; and • Dust from the stockpile will also affect receptors.	Moderate (negative)	Moderate (negative)
Access and haul roads construction.	Fauna and Flora	• Removal of vegetation and basal layer; • Increased proliferation of AIPs; and • Increased faunal casualties.	Moderate (negative)	Minor (negative)
Rock blasting	Fauna and Flora	• Heavy machinery utilised increasing vehicle movement in the area, increasing soil compaction, habitat disturbances and vegetation removal; • Blasting will increase loss of habitat, faunal casualties, loss of ecosystem functioning and encourage habitat fragmentation; • Natural vegetation will be removed for the Open Pits working promoting edge effects and AIP proliferation; and • Increased dust pollution and erosion.	Moderate (negative)	Minor (negative)
Vegetation removal and surface water redirection.	Wetlands	The sources of this impact include the compaction of soil, the removal of vegetation and surface water redirection. Opencast mining through pan wetlands or upslope from pan wetlands will irrevocably alter their water flow characteristics.	Moderate (negative)	Minor (negative)
Site / Vegetation Clearance.	Visual	• Site / vegetation clearance will reduce the screening properties that the natural vegetation has on the environment making the project more visible to receptors.	Moderate (negative)	Minor (negative)
All project related activities associated with construction and operations.	Socio-economic	• Change to the Sense of Place.	Moderate (negative)	Minor (negative)
All project related activities associated with construction and operation.	Socio-economic	• Impacts associated with Population Influx such as increased competition for residential land and other natural resources as well as an increased strain in accessing government services.	Moderate (negative)	Minor (negative)
All project related activities associated with construction and operation	Socio-economic	• Community unrest due to perceived lack of economic opportunities and unfulfilled promises.	Moderate (negative)	Minor (negative)

Activity	Aspect	Impacts	Rating (Pre-Mitigation)	Rating (Post Mitigation)
Site clearing, and preparation by the removal of vegetation, and topsoil, leading to the exposure of soils.	Soil, Land Use and Land Capability	• Soil loss by wind and water erosion from cleared land surfaces; • Soil compaction; • Increased wind, and water erosion, and consequently sedimentation potential; • Removal of vegetation, basal cover, and thus increasing the potential of loss of topsoil, organic material, and increased erosion potential; and • Compaction, ponding, and landscaping of the area.	Moderate (negative)	Negligible (negative)
Construction of infrastructure, including, workshop, PCD's, offices, stores, water distribution, diesel farm, brake-test ramp, heavy, and light vehicle access roads, truck access roads, and provincial road upgrade from Steenbokpan to the mining site.	Soil, Land Use and Land Capability	• Increased vehicle movement in the area, increasing soil compaction, and runoff potential; • Increased hardened surfaces; • Potential spillage of hydrocarbons such as oils, fuels, and grease, thus contamination of the soils; • Impacting agricultural activities in short, medium and long term; • Increased dust, erosion, and sedimentation; and • Removal of natural vegetation, and loss of basal cover.	Moderate (negative)	Negligible (negative)
Construction activities during the day	Noise	• Noise disturbance – NSD R1	High (negative)	Low (negative)
Construction activities at night	Noise			
Construction Activities	Socio-economic	• Creation of Employment Opportunities.	Minor (positive)	Minor (positive)
		• Opportunities and Capabilities within the Supply Chain.	Minor (positive)	Moderate (positive)
Operational Phase				
Water use and storage on-site – during the operation water will be required for various domestic and industrial uses.	Socio-economic	• Increased competition for water resources.	Major (negative)	Major (negative)
Establishment and Operation of Stockpiling Infrastructure	Visual	• The overburden, product and discard stockpile will have a negative visual impact due to their proposed height and footprint size; and • Dust from the stockpiles will also affect receptors.	Major (negative)	Major (negative)
Coal Transportation	Visual	• Dust and heavy traffic in the area will change the visual character of the area.	Major (negative)	Major (negative)
• Open pit establishment; • Removal of rock (blasting); and • Stockpiling (rock dumps, soft dumps, soils, ROM, product, discard dump) establishment and operation.	Socio-economic	• Potential economic impacts on eco-tourism operators and establishments.	Major (negative)	Major (negative)
All project related activities associated with construction and operation.	Socio-economic	• Occupational health and safety risks to mine workers such as dust-induced occupational lung diseases and noise induced hearing loss.	Major (negative)	Major (negative)
OC1 establishment	Soil, land use and land capability	• Removal of soil, and decreased soil depth; • Increased erosion, and sedimentation potential; and	Major (negative)	Minor (negative)

Activity	Aspect	Impacts	Rating (Pre-Mitigation)	Rating (Post Mitigation)
		• Soil compaction, and increased surface runoff.		
Blasting (only when dikes and other geological features are encountered).	Soil, land use and land capability	• Movement of the soil strata; and • Changes to the landscape, causing ponding, and undulating topographies.	Major (negative)	Minor (negative)
Operating crush, and screen, and coal washing plant.	Soil, land use and land capability	• Soil contamination from wastewater, and spillages; and • Impacting agricultural activities in short, medium and long term (Soil and water contamination).	Major (negative)	Negligible (negative)
Open-pit establishment, stockpiles, rock blasting and dumping.	Fauna and Flora	• Removal of vegetation, habitats and increased soil erosion and compaction; • Loss of faunal SCC; • Destruction of and changes to the habitats; • Increased dust pollution due to erosion and vehicular activity; and • Risk of AIP proliferation.	Moderate (negative)	(Minor negative)
Continuous development of Open Pit, Removal of Material, Stockpiling, Operation of the Plant and Infrastructure.	Air quality	• Dust generation and reduction in ambient air quality.	Major (negative)	Negligible (negative)
Continuous development of the opencast pit Establishment.	Visual	• Blasting to remove rock will result in noise and dust thereby attracting attention to the Project area; and • The opencast pit will dramatically contrast with the surrounding area as it will result in a scar on the landscape.	Major (negative)	Minor (negative)
Blasting	Socio-economic	• Impacts associated with blasting on neighbouring landowners such as dust, noise, vibrations from blasting activities, road closures, etc.	Major (negative)	Minor (negative)
All project related activities associated with construction and operation.	Socio-economic	• Occupational health and safety risks to mine workers such as dust-induced occupational lung diseases and noise induced hearing loss.	Major (negative)	Minor (negative)
Blasting operations	Blasting	• Ground vibration impact on: • Farmstead; • Ruins (inside pit); • Borehole (DH2) (inside pit); • Cement Dam; and • Borehole (LD04).	Moderate (negative)	Negligible (negative)
	Blasting	• Air blast impact on: • Farmstead; • Borehole (DH2) (inside pit); • Borehole (GT02); and • Borehole.	Moderate (negative)	Negligible (negative)
	Blasting	• Fly rock impact on Borehole (DH2) (inside pit).	Moderate (negative)	Negligible (negative)
• Continuous development of the open pit and operation; and • Stockpiling (Runoff from the dirty water areas or catchments (coal	Surface water	• Surface water contamination and deterioration of water quality on the natural water resources.	Moderate (negative)	Negligible (negative)

Activity	Aspect	Impacts	Rating (Pre-Mitigation)	Rating (Post Mitigation)
stockpile areas, mine processing plant, workshops etc.).				
All project related activities associated with construction and operation	Socio-economic	• Creation of employment, work skills development and experience.	Minor (positive)	Moderate (positive)
All project related activities associated with construction and operation.	Socio-economic	• Opportunities and Capabilities within the Supply Chain; • Multiplier effects on the local and regional economy; and • Social Development as part of the Social Labour Plan (SLP).	Minor (positive)	Moderate (positive)
Decommissioning and Post-Closure Phase				
• Demolition and removal of infrastructure; and • Rehabilitation and closure.	Surface water	• Restoration of pre-mining streamflow regime in nearby watercourses.	Major (positive)	
	Surface water	• Water contamination from AMD decant into surface water resources	Moderate (negative)	Minor (negative)
	Air Quality	• Dust generation and reduction in ambient air quality	Major (negative)	Negligible (negative)
Rehabilitation	Visual	• Rehabilitation is expected to have a moderate negative visual impact on the receiving environment.	Moderate (negative)	Minor (negative)
Decommissioning	Socio-economic	• Economic boom-bust after the construction and operation phases.	Moderate (negative)	Minor (negative)

Conclusions and Recommendations

The specialist studies that were undertaken during the EIA Phase aimed to identify and weigh anticipated impacts and risks associated with the proposed Dalyshope Project. The findings of the impact assessments have shown that the activities will have impacts on the receiving environment. The most significant negative impacts identified are associated with site clearing during the construction phase and general operational and maintenance activities during the operational phase. These activities may result in soil erosion, soil compaction, topsoil loss, subsequent sedimentation of watercourses leading to water quality deterioration. The Dalyshope Project will have a visual impact on the receiving environment. The most significant visual impact of the proposed Project will be from the opencast pit, and the overburden, topsoil and discard stockpiles due to the proposed height of this infrastructure. These cover a large area and will dramatically change the natural landscape and contrast with its surroundings thereby drawing attention to the Dalyshope Project from a distance of up to 20 km.

A key finding is that the proposed mining activities will have a major impact on protected fauna and flora. The site is characterised by ecologically sensitive areas, especially with regards to flora and fauna. Vegetation or habitat loss and the removal of protected species are unavoidable during the construction phase of the Project. This will, however, be limited to the footprint of the infrastructure and opencast pit. Care must be taken to manage any species of special concern. A Tree Removal Permit application will be submitted to the relevant component authority prior to the removal of protected tree species identified within the development footprint. Baboon Spider nests were also identified within the Project area. An Offset Assessment is recommended to compensate for biodiversity impacts associated with the Project.

In addition, three wetlands were recorded on or directly adjacent to OC1, which are ecologically important and sensitive on a provincial or local scale. Only small sections of these wetlands and the associated buffer zones are located on the OC1 area. All three of these wetlands are classified as Non-Perennial Episodic Endorheic Depression Pans. No mining or development will occur within the wetland areas or the associated buffer zones. It is recommended that water courses (wetlands and pans) be avoided and not impacted with at least 100 m from the zones of regulation buffers to any infrastructure and construction activities.

Furthermore, the Project is not likely to result in significant impacts on the receiving Limpopo River if the recommended mitigation measures are implemented. It should be noted that the Project area is located in a catchment with scarce water resources and water availability, which is exacerbated by low mean annual precipitation, high evaporation and endoreic areas within the catchment. Therefore, an adequate external water supply is required prior to the commencement of the Dalyshope Project.

Adequate mitigation measures have been included into the EMP to reduce the significance of all the identified negative impacts. Most negative impacts can be reduced through the implementation of mitigation measures. Nevertheless, the fauna, flora and visual impact assessments, for example, revealed major impacts which cannot be mitigated.

The socio-economic study has identified key positive impacts which will result from the Project. If the proposed Project is authorised some positive social and economic impacts will be realised at local, regional and national level. Nationally, the Project will contribute to coal requirements to meet the demand for electricity supply. At regional and local level, the Project has the potential to improve local socio-economic profiles through job creation.

Monitoring plans, which should be implemented throughout the life of the mine, have also been provided to ensure that adverse impacts are recognised, and continuous improvements are developed and monitored throughout the lifespan of the Project. Based on the assessment of the impacts associated with the Project, it is recommended that the proposed Dalyshope Project should be authorised, provided that the mitigation measures proposed herein are applied diligently. It should, however, be noted that the feasibility of the Project depends on securing the required external water supply.

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LIST OF ACRONYMS AND ABBREVIATIONS

AIPs	Alien Invasive Plant Species
AMD	Acid Mine Drainage
Anglo	Anglo Operations (Pty) Ltd
AQIA	Air Quality Impact Assessment
ASPT	Average Score Per Taxon
ASTM	American Standard Test Method
CARA	Conservation of Agricultural Resources
CBAs	Critical Biodiversity Areas
CDP	Community Development Plan
CEC	Cation Exchange Capacity
CEMPr	Closure Environmental Management Programme
CFP	Chance Finds Protocol
CITES	Convention on International Trade in Endangered Species
CRR	Comments and Response Report
CSV	Comma-separated values
DAFF	Department of Agriculture, Forestry and Fisheries
DEA	Department of Environmental Affairs
Digby Wells	Digby Wells Environmental
DMRE	Department of Mineral Resources and Energy
DSM	Digital Surface Model
DTM	Digital Terrain Model
DWS	Department of Water and Sanitation

EA	Environmental Authorisation
EAP	Environmental Assessment Practitioner
ECO	Environmental Control Officer
EIA	Environmental Impact Assessment
EIS	Ecological Importance And Sensitivity
EMPr	Environmental Management Programme
EN	Endangered
EP	Environmental Practitioner
ESAs	Ecological Support Areas
FRAI	Fish Response Assessment Index
GDP	Gross Domestic Product
GN	Government Notice
GRP	Grave Relocation Program
Ha	Hectares
HDPE	high-density polyethylene lined
HGM	hydro geomorphic
HIA	Heritage Impact Assessment
HRAs	Heritage Resources Authorities
HRM	Heritage Resources Management
I&APS	Interested and Affected Parties
IDP	Integrated Development Plan
IHAS	Integrated Habitat Assessment System
IUCN	International Union for the Conservation of Nature
IWUL	Integrated Water Use License
IWULA	Integrated Water Use Licence Application
Km	Kilometres
km^2	Square Kilometres
KV	Kilovolt
kWhr	kilowatt-hour
LED	Local Economic Development
LEDET	Limpopo Department of Economic Development, Environment and Tourism

LEMA	Limpopo Environmental Management Act, 2003 (Act No. 7 of 2003)
LLM	Lephalale Local Municipality
LoM	Life of Mine
m	Metres
m/s	Metres per Second
mamsl	Metres Above Mean Sea Level
MAP	Mean Annual Precipitation
MAR	Mean Annual Runoff
mbgl	Metres Below Ground Level
MCWAP	Mokolo-Crocodile West Water Augmentation Project
MIRAI	Macroinvertebrate Response Assessment Index
MPRDA	Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 Of 2002)
MR	Mining Right
MRA	Mining Right Application
Mtpa	million tonnes per annum
MVA	megavolt amperes
NAAQS	National Ambient Air Quality Standards
NCRs	National Noise-Control Regulations
NEMA	National Environmental Management Act, 1998 (Act No. 107 Of 1998)
NEMAQA	National Environmental Management: Air Quality Act, 2004 (Act No. 39 Of 2004)
NEM:BA	National Environmental Management: Biodiversity Act, 2004 (Act No. 10 Of 2004)
NEM: WA	National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008)
NEM: PAA	National Environmental Management Protected Areas Act, 2003 (Act No. 57 of 2003)
NFA	National Forests Act
NFEPA	National Freshwater Ecosystem Priority Areas
NGOs	Non-Governmental Organisations
NHRA	National Heritage Resources Act, 1999 (Act No. 25 Of 1999)
NSD	Noise-Sensitive Development
NT	Near Threatened

NWA	National Water Act, 1998 (Act No. 36 of 1998)
OC1	Opencast Pit 1
OHS	Occupational Health and Safety
PCD	Pollution Control Dam
PES	Present Ecological Status
PFC	power factor correction
PHRA-G	Provincial Heritage Resources Authority of Gauteng
PIIM	Project Induce In-Migration
POIs	Points of Interests
PPE	Personal Protective Equipment
PRECIS	Pretoria Computerised Information System
QDSs	Quarter Degree Squares
RCP	Rehabilitation and Closure Plan
RE	Remaining Extent
ROM	Run of Mine
S&EIR	Scoping and Environmental Impact Reporting
SAAELIP	South African Atmospheric Emission Licensing & Inventory Portal
SABAP	South African Bird Atlas Project
SADC	Southern Africa Development Community
SAHRA	South African Heritage Resources Agency
SAICE	South African Institute of Civil Engineers
SAMRAD	South African Mineral Resources Administration System
SANAS	South African National Accreditation System
SANBI	South African National Biodiversity Index
SANS	South African National Standards
SASS	South African Scoring System
SAWQG	South African Water Quality Guidelines
SCC	Species of Conservation Concern
SDF	Spatial Development Framework
SEP	Stakeholder Engagement Plan
SIA	Social Impact Assessment
SLP	Social and Labour Plan

SOP	Standard Operating Procedure
SQR	Sub-Quaternary Reach
STP	Sewage Treatment Plant
SSC	Species of Special Concern
SWMP	Stormwater Management Plan
TIA	Traffic Impact Assessment
TMP	Topsoil Management Plan
TOPS	Threatened or Protected Species
TSP	Total Suspended Particulate
UNFCCC	United Nations Framework Convention on Climate Change
Universal	Universal Coal Development IV (Pty) Ltd
VIA	Visual Impact Assessment
Vu	Vulnerable
WDM	Waterberg District Municipality
WESSA	Wildlife and Environment Society of South Africa
WMA	Water Management Area
WML	Waste Management Licence
WTP	Water Treatment Plant
WUL	Water Use Licence
WULA	Water Use Licence Application

Part A: Scope of Assessment and Environmental Impact Assessment Report

1 Introduction

Universal Coal Development IV (Pty) Ltd (hereafter Universal) has appointed Digby Wells Environmental (hereinafter Digby Wells) as the Environmental Assessment Practitioner (EAP) to undertake environmental authorisations required for the proposed Dalyshope Coal Mining Project. Anglo Operations Limited (Anglo) entered a joint venture with Universal for the development of the Dalyshope Project. Anglo is the holder of two Prospecting Rights approved by the Department of Mineral Resources and Energy (DMRE), reference numbers LP 30/5/1/1/2/10648 PR (as renewed) and LP 30/5/1/2/2/10649 PR (as renewed) and authorised in terms of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002) (MPRDA) to prospect for coal on an area of 4957.7 hectares (ha). The proposed Mining Right boundary includes the following farms, as captured in the Prospecting Rights:

- Buurmanshulp 136 LQ
- Bergen Op Zoom 188 LQ
- Greenwich 113 LQ (is now Greenrust 708 LQ)
- Gaylad 208 LQ
- Rooiboslaagte 144 LQ
- Hilton 190 LQ
- Stellenbosch 203 LQ
- Surrey 18 LQ
- Virginia 6 LQ
- Vryplaats 163 LQ
- Canada 229 LQ (now subdivided into Canada and Matopi 705 LQ)
- Dalyshope 232 LQ (a Portion of Dalyshope 232 was subdivided to form Nazarov 685 LQ)
- Wynberg 215 LQ
- Boompan 237 LQ
- Breda 147 LQ (Portion now known as Beska 180 LQ)
- Ecarte 156 LQ
- Fairfield 154 LQ (Portion 1, 2 and RE)
- Kromhoek 193 LQ (Portion 1 and RE)
- Lhea 437 LQ (Portion 1, 2 and RE)
- Vucht 436 LQ (Portion 1, 4 and RE)
- Weltevreden 200 LQ (Portion 1 and RE)
- Wolvendraai 481 LQ
- Constantia 122 LQ (as subdivided to form a Portion of Fig Tree 716 LQ)
- Klaarwater 231 LQ (a Portion of Klaarwater 231 was subdivided to form Nazarov 685 LQ)

However, for the purpose of this application, the initial mining activities and associated surface infrastructure will only be established on the Farms Dalyshope 232 LQ and Klaarwater 231 LQ. The application processes requiring authorisation for mining to proceed includes:

- A Mining Right in terms of the MPRDA;
- An Environmental Authorisation in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA);
- A Waste Management Licence (WML) in terms of the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008) (NEM: WA);

- An Integrated Water Use Licence Application (IWULA) in in terms of the National Water Act, 1998 (Act No. 38 of 1998) (NWA); and
- Tree Permit in terms the Constitution of South Africa, 1996 (Act No. 108 of 1996) (Constitution) (Section 24– Environment); National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004) (NEM: BA); Limpopo Environmental Management Act (Act No. 7 of 2003) (LEMA) Schedule 12 (Protected Plants); and the National Forests Act, 1998 (Act No. 84 of 1998) (NFA).

This EIA and Environmental Management Programme (EIA/EMPr) is for the proposed opencast coal mine and associated infrastructure in the Limpopo Province of South Africa, approximately 54 km to the west of Lephalale, 39 km northwest of the Matimba and Medupi power stations, close to the Botswana border that is demarcated by the Limpopo River.

Anglo submitted the Mining Right Application (MRA) and Integrated Environmental Authorisation application to the DMRE on 17 April 2020 and received the reference number LP 30/1/2/3/2/1(10183) EM. The Final Scoping Report was submitted to the DMRE on 11 August 2020 and was approved on 18 September 2020, thereby allowing Anglo to continue into the EIA Phase. An extension application in terms of Regulation 3(7) of GN R982 was submitted to the DMRE on 29 October 2020 and the motivation was due to the Applicant requiring additional boreholes to be drilled on site and provide detailed core logs to undertake the waste classification of the open pit area. An extension of 50 days was granted on 03 November 2020.

The Dalyshope Project lies within the Waterberg Coalfield, which occurs in the Ellisras Basin and contains the largest coal resource in South Africa. The surface topography of the area is generally flat, with a gentle dip to the north towards the Brak River Valley. No human settlements are within the planned opencast mining area. The land is predominantly used for game farming. The mining reserves shall be mined by utilising truck and shovel opencast mining method, producing approximately 2.4 Million tonnes per annum (Mtpa) of thermal coal product for approximately five years. After five years, the mine will ramp up production to approximately 12 Mtpa of product for approximately 25 years from a single open pit, giving a total Life of Mine (LoM) of approximately 30 years.

2 Item 3: Project Applicant

Anglo is the proponent in this application. The details of the applicant are presented in Table 2-1.

Table 2-1: Contact Details of the Applicant

Name of Applicant:	Anglo Operations Proprietary Limited		
Registration number (if any):	1921/006730/07		
Trading name (if any):	N/A		
Responsible person: ***(E.g. CEO, Director, etc.)***	Mineral and Property Rights Department		
Contact person:	Leonore van Wyk		
Physical address:	55 Marshall Street, Johannesburg, 2107, South Africa		
Postal address:	55 Marshall Street, Johannesburg, 2107, South Africa		
Postal code:	2107		
Telephone:	+27 (0)11 638 3596 +27 (0)76 822 0399	**Fax:**	-
Email:	Leonore.vanwyk@angloamerican.com		

2.1 Item 3(a)(i): Details of EAP

Digby Wells has been appointed by Universal, on behalf of Anglo, as the independent Environmental Assessment Practitioner (EAP) to conduct the Environmental Authorisation Application and the IWULA processes, as well as the associated specialist studies and the required Public Participation Process for the proposed Project. The details of the EAP are contained in Table 2-2 below.

Table 2-2: Contact Details of the EAP

Company Name	Digby Wells and Associates (South Africa) (Pty) Ltd
Name of Practitioner:	Xan Taylor
Telephone:	+27 11 789 9495
Fax:	011 789 9498
Email:	Xan.Taylor@digbywells.com

2.2 Item 3(a)(ii): Expertise of the EAP

This section provides details regarding the EAP's qualifications and experience. The EAP's Curriculum Vitae (CV) and qualifications are attached as Appendix A of this report.

2.2.1 The Qualifications of the EAP

Ms Xan Taylor holds the following degrees/diplomas:

- BA Honours Environmental Management – University of South Africa (2013)
- BA English and Psychology – University of South Africa (2009)

2.2.2 Summary of the EAP's Experience

Xan Taylor started working as a Consultant in 2012 and joined Digby Wells in 2015. She has nine years' experience. The majority of Xan's experience pertains to the mining sector applying for applications governed by the NEMA for both the 2010 and 2014 Regulations thereunder, the MPRDA, the NWA, as well as international legislation: including International Finance Corporation Performance Standards and World Bank Guidelines. Her experience comprises managing integrated mining applications: Basic Assessments, Scoping and Environmental Impact Assessments reports, Environmental Management Programmes, international Environmental and Social Impact Assessments, NEMA Regulation 29 and Regulation 31 Amendment reports, Section 102 Amendment reports, exemption applications, Appeal processes, and auditing.

3 Item 3(b): The Location of the Development Footprint of the Activity on the Approved Site as Contemplated in the Accepted Scoping Report

The Dalyshope Coal Mining Project is situated approximately 30 km north of Steenbokpan in the jurisdiction of Lephalale Local Municipality (LLM). The nearest major town is Lephalale situated approximately 50 km southeast of the Project area. Table 3-1 provides a summary of the properties that are directly affected by the proposed Project.

The western portion of the proposed Project area will be mined and will accommodate the mining-related infrastructure (refer to Figure 5-1 and Figure 5-2). The initial 28-year planned mining area consists of an economically mineable opencast block, Opencast 1 (henceforth known as OC1). OC1 is situated on the Farm Dalyshope 232 LQ. Therefore, OC1 forms the main focus area of the report together with the proposed infrastructure located on a small section of Dalyshope 232 LQ and Klaarwater 231 LQ. The approximate centre point coordinates of the proposed opencast pit (OC1) are 23°34'11.17"S and 27°14'6.27"E.

Refer to Figure 3-1 for the Land Tenure Map (also attached in Appendix B).

Table 3-1: Property Description

Farm Name:	Mining and mining-related activities will take place on the following properties: • The Remaining Extent of the Farm Klaarwater 231 LQ; and • The Remaining Extent of the Farm Dalyshope 232 LQ.
Application Area (Ha):	The Project area covers an area of approximately 4957.7 ha.
Magisterial District:	The proposed Dalyshope Coal Mining Project falls under the Lephalale Magisterial District.
Distance and direction from nearest town:	The nearest major town is Lephalale situated approximately 50 km southeast of the Project area.
21-digit Surveyor General Code for each farm portion:	• T0LQ00000000023100000 • T0LQ00000000023200000

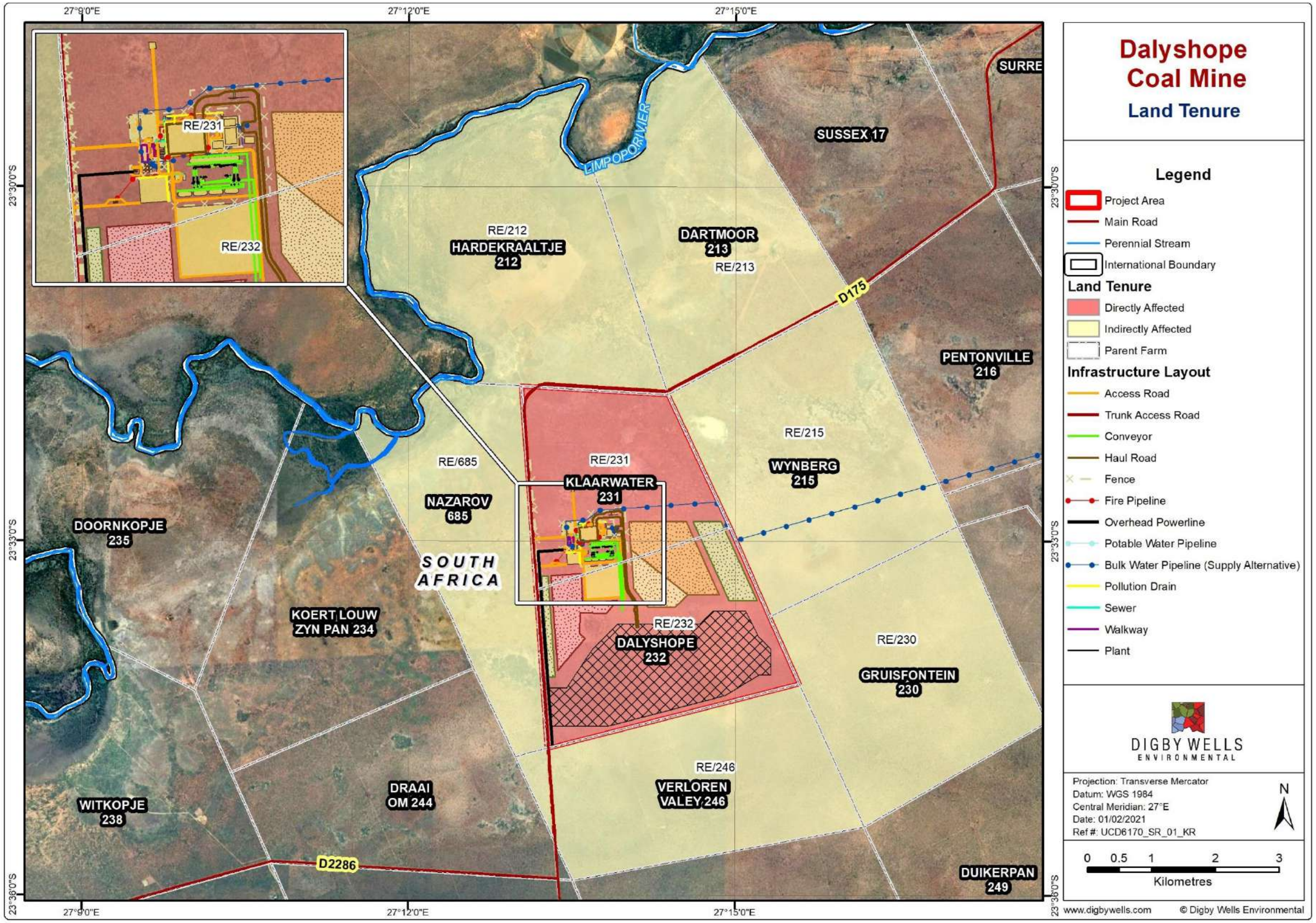

Figure 3-1: Land Tenure Map

4 Item 3(c): Locality Map

Figure 4-1 illustrates the regional setting of the Project area. The plan is also attached in Appendix B.

The Project site extends to the South African and Botswana border (refer to Figure 4-2 for the locality map), however, mining activities will take place approximately 3 km as estimated from the nearest point of the border. It is situated near the town of Lephalale within the LLM, located in the north-western part of Waterberg District, Limpopo Province (South Africa). The Dalyshope Coal Mining Project is situated approximately 30 km north of Steenbokpan, which is the nearest settlement.

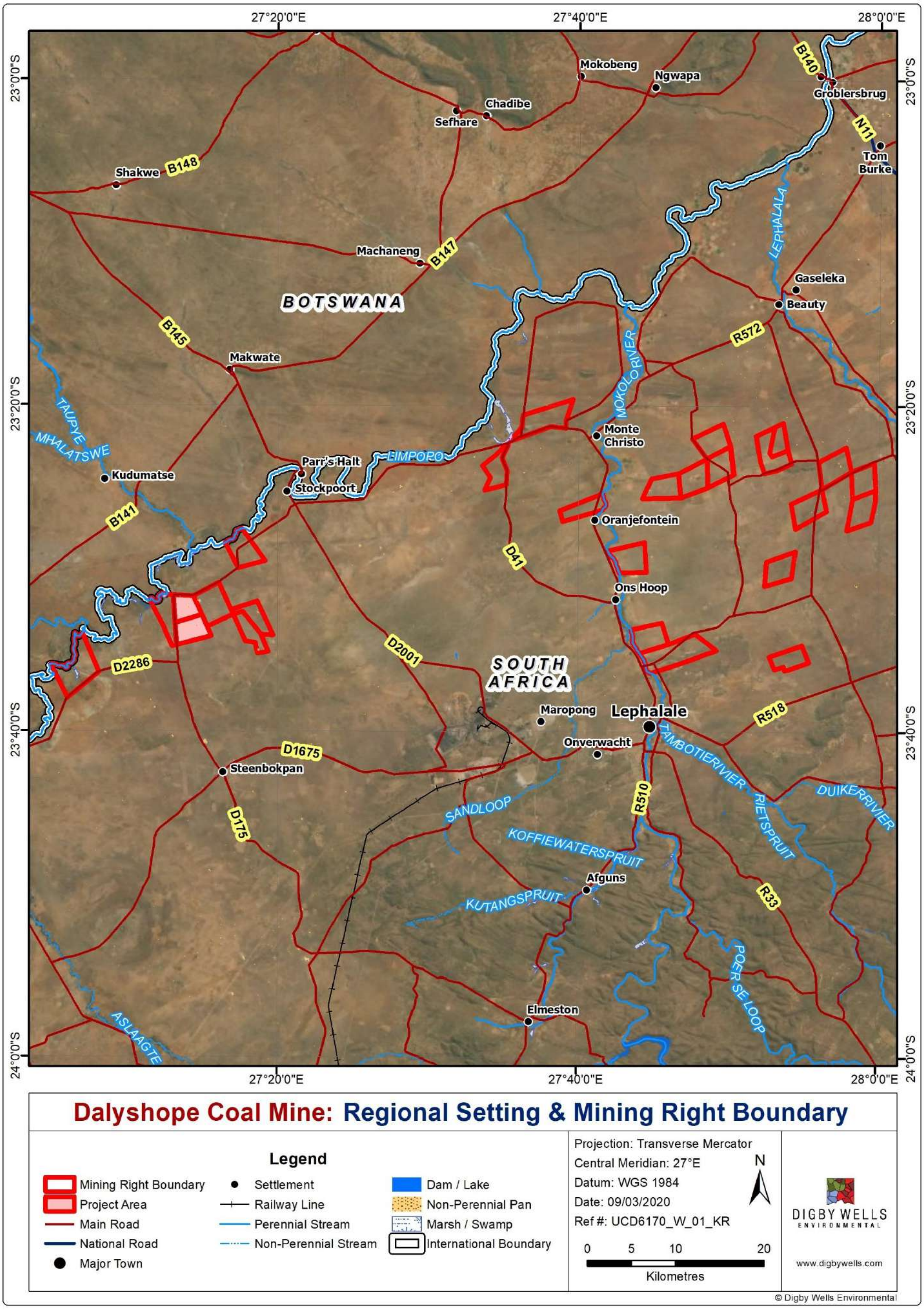

Figure 4-1: Regional Setting and Full Extent of Mining Right Boundary

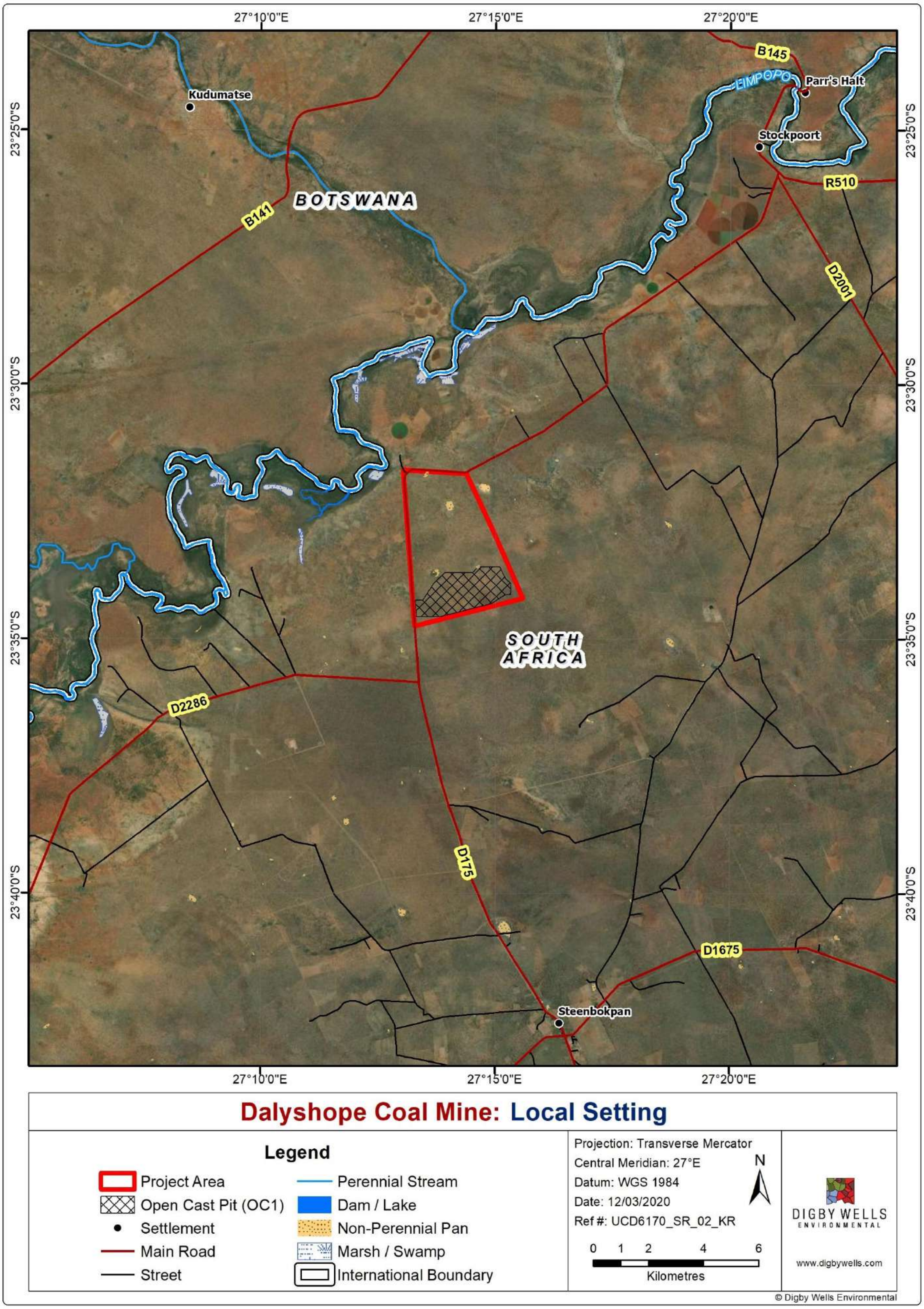

Figure 4-2: Locality Map

5 Item 3(d): Description of the Scope of the Proposed Overall Activity

The proposed infrastructure layout plans, as shown in Figure 5-1 and Figure 5-2 below, are included in Appendix B.

For the purpose of the report, the following terms apply:

- Mining Right area defines the farms included in the Mining Right boundary;
- Project area defines farm portions directly affected by mining and mining-related infrastructure i.e. Dalyshope and Klaarwater; and
- Study Area is determined by each specialist and the zone of influence in terms of potential impact the Project Area will have, relevant to the individual specialist fields.

5.1 Item 3(d)(i): Listed and specified activities

This section details the proposed Project activities to be undertaken on site, as well as the Listed Activities in terms of the EIA Regulations, 2014 (as amended). Table 5-1 details the Project activities per phase (construction, operational and decommissioning phases). Table 5-2 provides the identified Listed Activities as provided by the EIA Regulation, 2014 (as amended). As indicated in Table 5-2 below, Regulations GN R.983, GN R.984 and GN R.921 will be triggered, and therefore a Scoping and Environmental Impact Reporting (S&EIR) process must be undertaken, and approval received prior to the activities being commended with.

Table 5-1: Proposed Project Activities

Project Phase	Project Activity
Construction Phase	Site/vegetation clearance
	Temporary PCD
	Contractors laydown yard
	Access and haul road construction
	Infrastructure construction
	Diesel storage and explosives magazine
	Topsoil stockpiling
Operational Phase	Continuous development of the open pit
	Removal of rock (blasting)
	Stockpiling (rock dumps, soft dumps, soils, ROM, product, discard dump) establishment and operation
	Diesel storage and explosives magazine
	Operation of the open pit workings

Project Phase	Project Activity
	Operating crush and screen and coal washing plant
	Operating sewage treatment plant and water treatment plant
	Water use and storage on-site – during the operation water will be required for various domestic and industrial uses. Water Management infrastructure including two PCDs will be constructed that capture water from the mining area, which will be stored and used accordingly. • Workshop and storage of chemicals; • Laundry and Laboratory services; • Backfilling and concurrent rehabilitation; • Weighing of coal trucks; • Coal transportation through trucking, rail and conveyer belts; • Washing of mine vehicles; and • Fuelling of diesel on site.
	Storage, handling and treatment of hazardous products (including fuel, explosives and oil) and waste
	Maintenance activities – through the operations maintenance will need to be undertaken to ensure that all infrastructure is operating optimally and does not pose a threat to human or environmental health. Maintenance will include haul roads, crushing and washing plant, machinery, water and stormwater management infrastructure, stockpile areas, dumps, etc.
Decommissioning Phase	Demolition and removal of infrastructure – once mining activities have been concluded infrastructure will be demolished in preparation of the disturbed land rehabilitated
	Rehabilitation – rehabilitation mainly consists of spreading of the preserved subsoil and topsoil, profiling of the land and re-vegetation
	Post-closure monitoring and rehabilitation

Table 5-2: Listed and Specified Activities

Name of Activity	Aerial extent of the activity (Ha or m^2)	Listed Activity	Corresponding Listed Activities in terms of EIA Regulations, 2014 (as amended)	Waste Management Authorisation
All infrastructure including, change houses, offices, ablutions, laundry facility, workshops, Fencing and Laboratory	47.33 ha (excludes linear infrastructure and OC1)	*Not listed*	-	-
Blasting	OC 1 – 410 ha	*Not listed*	-	-
Weighbridges and access control office	Less than 1 ha	*Not listed*	-	-
Topsoil and Subsoil stockpiles	70.27 ha	*Not listed*	-	-
Potable water pipeline	Approximately 30 m	*Not listed*	-	-
Process water from STP	Approximately 30 m	*Not listed*	-	-
Stormwater infrastructure	Channels: 14.5 km Berms: 16.4 km	X – 9	GN R 983, Listing Notice 1	-
STP pipelines	Approximately 160 m	X – 10	GN R 983, Listing Notice 1	-
Substation and powerlines	Less than 1 ha	X – 1 and X – 11(i)	GN R 983, Listing Notice 1	-
Plant area and OC1 (within 32m of a watercourse)	440 ha	X – 12	GN R 983, Listing Notice 1	-
Diesel bay	Less than 1 ha	X – 14	GN R 983, Listing Notice 1	-

Name of Activity	Aerial extent of the activity (Ha or m^2)	Listed Activity	Corresponding Listed Activities in terms of EIA Regulations, 2014 (as amended)	Waste Management Authorisation
Explosives magazine	Less than 1 ha	X – 14	GN R 983, Listing Notice 1	-
Haul roads (on site)	8 km	X - 24 (ii)	GN R 983, Listing Notice 1	-
Access road into the Mine & Upgrade of Steenbokpan road	20 km	X – 24 (ii)	GN R 983, Listing Notice 1	-
Two PCDs	0.6 ha	X – 13	GN R 983, Listing Notice 1	-
Storage water tank	Less than 1 ha	X – 13	GN R 983, Listing Notice 1	-
Power line construction	3.4 km	X- 11	GN R 983, Listing Notice 1	-
WTP	0.37 ha	X – 16	GN R 983, Listing Notice 1	-
STP	0.03 ha	X – 25	GN R 983, Listing Notice 1	-
Infrastructure requiring WUL (OC1, PCDs, wash plant, WTP, brine pond, WRD)	Approximately 500ha	X – 6	GN R 984, Listing Notice 2	-
Rail	*Not yet available*	X – 12	GN R 984, Listing Notice 2	-
Site/vegetation clearance (Protected tree species)	525.37 ha	X – 30 X – 15	GN R 983, Listing Notice 1 GN R 984, Listing Notice 2	-
Conveyor belt	Discard to pit – 390m Conveyor from pit – 580m Plant conveyors – 3417m *Throughput to be confirmed*	X – 7 (iii)	GN R 984, Listing Notice 2	-

Name of Activity	Aerial extent of the activity (Ha or m^2)	Listed Activity	Corresponding Listed Activities in terms of EIA Regulations, 2014 (as amended)	Waste Management Authorisation
OC1 with related infrastructure Washing plant area	525.37 ha Approximately 30 ha	X – 17	GN R 984, Listing Notice 2	-
Product and ROM stockpile with tip Crushing and Screening	Approximately 6 ha	X – 17	GN R 984, Listing Notice 2	-
Internal access road within CBA1	2 km	X – 4 e.i.(ee) and 4 e.i.(gg)	GN R 985, Listing Notice 3	-
Diesel bay	Less than 1ha	X – 10 e.i.	GN R 985, Listing Notice 3	-
Vegetation clearance	525.37 ha	X – 12 e.ii	GN R 985, Listing Notice 3	-
Road upgrade	20km	X – 18 e.(ee) and e.i.(gg)	GN R 985, Listing Notice 3	-
Hard /Softs and/ or Rock dump	Hard: 97.49 ha Softs: 41 ha	Category A: X – 10, X – 11 and X – 12	GN R 921 under NEM: WA	Required
Residue storage (Discard facility) Processing plant	80m^2 Approximately 30 ha	Category B: X – 1 and 11	GN R 921 under NEM: WA	Required

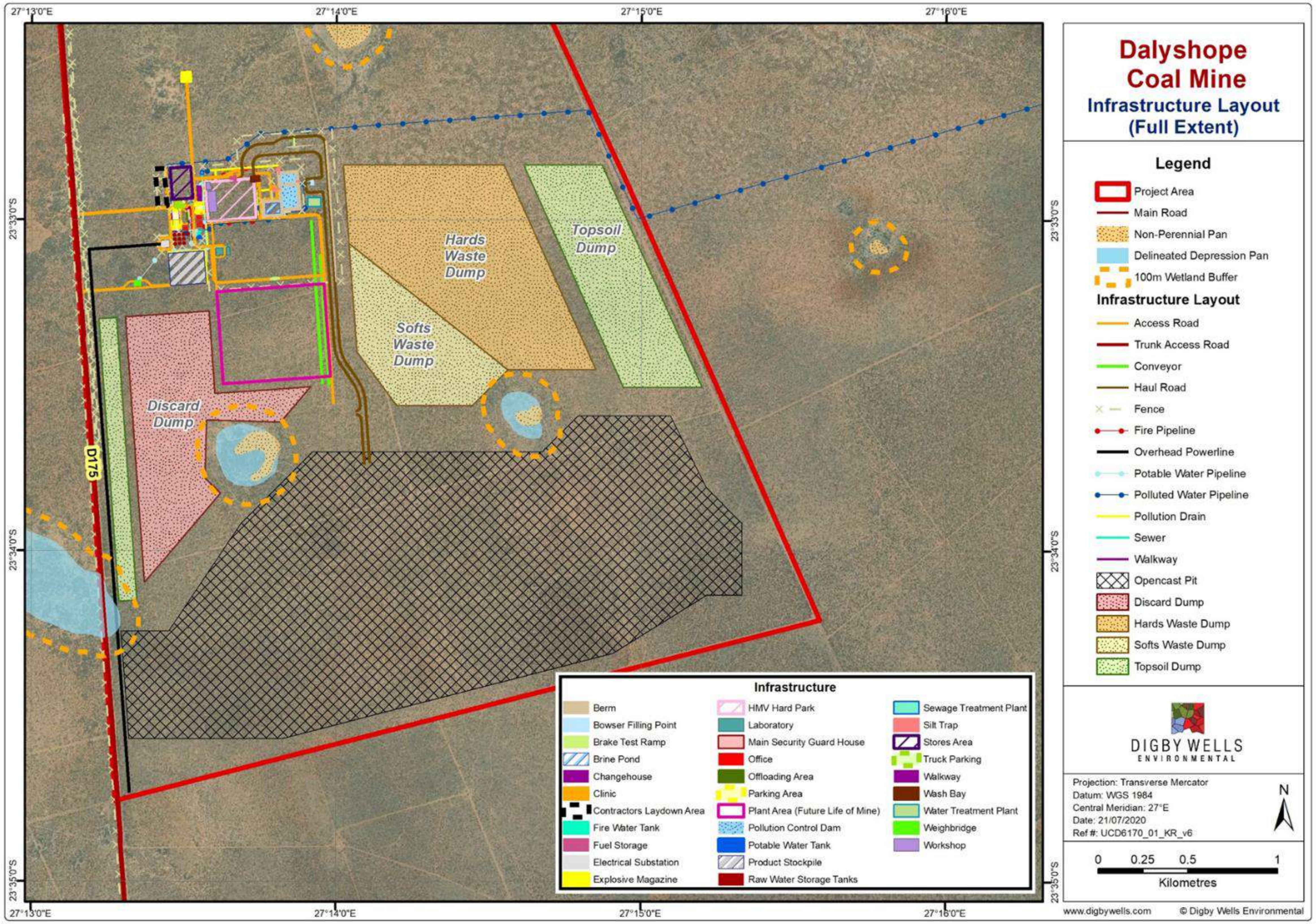

Figure 5-1: Preliminary Infrastructure Layout Plan

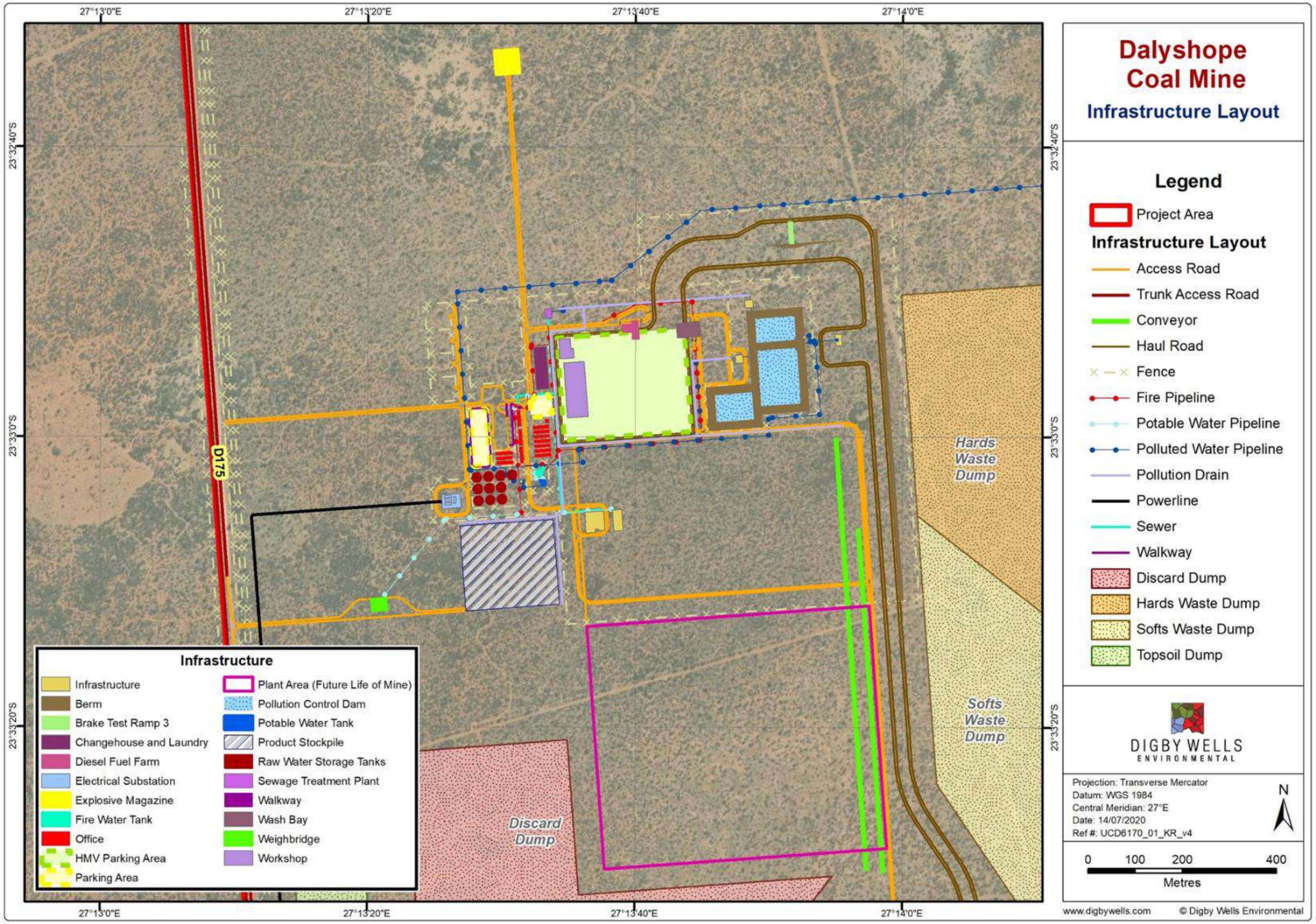

Figure 5-2: Detailed Layout of Mining-Related Infrastructure

5.2 Item 3(d)(ii): Description of the Activities to be Undertaken

5.2.1 Mineral Deposit and Resource Reserve

Anglo intends to develop a coal mine in the Waterberg area on the farms Klaarwater 231 LQ and Dalyshope 232 LQ. The quantity of coal to be extracted from the proposed pit is approximately 2.4 million tonnes per annum (Mtpa) of thermal coal product for approximately five years. After five years, the mine will ramp up production to approximately 12 Mtpa of product for approximately 25 years from a single open pit (OC1), giving a total LoM of approximately 30 years.

5.2.2 Mining

Opencast strip mining using selective mining techniques is proposed for extracting the resource. Mining shall commence in OC1 that shall be mined for approximately 30 years.

The mining reserves shall be mined by utilising truck and shovel opencast method of mining due to the reserves being shallow with favourable strip ratios. The mine will be accessed via a boxcut and ramp arrangement located in the north-eastern corner of the farm Dalyshope with an east to west orientation. The basis of the selected position of the boxcut is on the optimal relation between the strip ratio and product yield.

Overburden material will be hauled to spoil until such time as sufficient void has been created within the pit to allow for in-pit tipping. Selective mining of the coal seams is not required due to the specification of the product required but selective mining of the partings will be conducted.

Run of Mine (ROM) coal from the pit will be crushed in a primary crusher at the pit head. The crushed coal will be transported by conveyor belt from the pit head to stockpiles before the washing plant. Coal will be removed from the stockpile and fed into the plant. The coal will be screened to remove -50mm coal. The oversize coal will be crushed in a secondary crusher before re-joining the -50mm coal. The ROM shall be washed in a single-stage dense medium washing plant. The single stage shall be a high gravity wash at a medium RD of 1.8. During this stage, all the non-coal material will be removed as discard. The washing plant will be in modular format, with two modules each capable of a throughput of 1 000 tons per hour.

The discard will be taken by conveyor belt back to the pit head where it will be loaded into trucks to be deposited back into the bottom of the pit.

The product will be placed on stockpiles before being transported to market. The product will either be transported by road haulers on the district/provincial road or by means of a rail line.

5.2.3 Infrastructure Associated with the Proposed Mine

All the necessary mine infrastructure for the Project area shall be established on the LP30/5/1/1/2/10649PR Prospecting Right area and located on the southern part of the farm Klaarwater 231 LQ of the Dalyshope Project area. The main infrastructure (Refer to Figure 5-1 and Figure 5-2 above) associated with the mine includes, but is not limited to:

- Contractors laydown yard
- Temporary stockpiles for construction
- Diesel/wash bay and oil separator
- OC1 pit
- ROM stockpiles;
- Slew product stockpiles
- Discard facility
- Washing (Coal Handling and Preparation) plant
- Weighbridges
- Conveyer belts
- Workshop
- Two PCDs
- Stores
- Crush and screening plant
- Offices
- Change-house
- Brine pond
- Topsoil and subsoil stockpiles
- Coal stockpiles and/or storage (silos and bins)
- Laboratory
- Laundry facility
- Water tanks
- Potable water Pipeline and distribution
- Dirty water pipeline;
- Sewage Treatment Plant (STP)
- Water Treatment Plant (WTP)
- Temporary Pollution Control Dam (PCD) for construction
- Explosives magazine
- Stormwater management infrastructure
- Powerline/s
- Substation
- Rail link and rail loadout facility
- Brake-test ramp/ wash bay
- LDV and light vehicle access road
- Truck access road
- Road upgrade (Steenbokpan to site)
- Overburden (Hards/ Softs) stockpiles

5.2.4 Water Supply

During the construction phase, water will be supplied from a borehole well area on site. The water from the borehole will also be used for dust suppression. The full extent of the water sources and water uses for the operation is still being investigated.

5.2.4.1 *Surface Run-off Water*

Run-off water collected from disturbed areas shall be collected and stored in holding ponds located near the pits. The water shall be routed to the holding area, utilising a series of diversion berms. Collected water shall be used for the mining and treatment processes. All water generated by the mining activities shall be stored in a high-density polyethenelined (HDPE) PCD and re-used in the beneficiation plant as well as for dust-control purposes on the haul roads.

5.2.4.2 *Mine Closure*

The prediction is that the pit shall start decanting post-closure and allowance has been made in the capital and operating costs for a water treatment plant. Any water that decants from the rehabilitated mining pits shall be treated in the water treatment plant before release into a natural watercourse.

5.2.5 Electricity Supply

Based on the position of the resource, there is potentially suitable Eskom infrastructure within 10 km to 18 km from the Dalyshope site. Eskom's Limpopo division shall be engaged to establish potential scenarios for the power supply to the site. There is an option to tie into the existing national grid at 132 kilovolts (kV) or 88 kV high voltage level at the existing Eskom substations. The power would be conveyed to the sites by single overhead lines.

The reticulation concept for the site would comprise the following:

- A continuous connected supply from the national grid that is generated and controlled by Eskom at a 'notified maximum demand' level.
- Onsite automated standby' power supply generators that would be enough to maintain the operation of critical machines, emergency plant operations, and essential lighting and security requirements of the mine site.

Eskom supply distribution at Dalyshope shall consist of a switching yard that shall be constructed at the site and comprise of the following:

- A 132/88 kV supply line connected to the national network, terminated in a distribution yard constructed on Anglo/Universal Coal property.
- Envisaged one 16 megavolt amperes (MVA) 132/88 kV to 11 kV transformers shall connect to the 132/88 kV yard distribution network at the site.
- The 11 kV terminals from the respective transformers shall connect to an 11 kV distribution network via the site main intake substation that shall supply power to the site.

An intake substation shall be constructed adjacent to the Eskom yard that shall house the incoming supply and distribution switchgear supplying the various major plant sections. This substation shall also house the power supply 'maximum demand' and kilowatt-hour (kWhr) metering, surge protection instrumentation, and power factor correction (PFC) equipment.

An earlier power supply point for the early development operations shall be required. A containerised substation would satisfy the supply and distribution requirement. The equipment installed would be repositioned into the main incomer substation when constructed.

5.2.6 Waste Management

General and hazardous waste will be generated as a result of the Dalyshope Project. The waste will be handled, separated, stored and disposed of at an appropriate accredited facility.

The following waste types are anticipated to be generated at the operation:

- General waste;
  - Domestic waste;
  - Paper;
  - Plastic;
  - Cardboard;
  - Tins; and
  - Glass.
- Hazardous Waste:
  - Hydrocarbon waste such as oily rags as a result from the hydrocarbon stored onsite;
  - Chemical waste from the chemicals that may be utilised for cleaning purposes;
  - Light bulbs (i.e. containing mercury); and
  - Coal residue and mine water.

General waste will be stored in different colour coded bins on site. It is anticipated that all general waste will either be recycled or disposed of at a registered local municipality landfill site. Hazardous waste will be removed offsite by a hazardous waste contractor. A safe disposal certificate for the removal of hazardous waste will be retained as proof of safe disposal.

6 Item 3(e): Policy and Legislative Context

This section aims to provide a description of the policy and legislative context within which the Project is being proposed. This section has been divided into national and provincial legislation and policies, plans, guidelines and development planning frameworks and tools. Table 6-1 provides a description of the national legislation and guidelines that are considered applicable to the Project and its activities.

Table 6-1: Policy and Legislative Context

Applicable legislation and guidelines used to compile the report	Reference where applied
<u>The Constitution of the Republic of South Africa, 1996</u> Under Section 24 of the Constitution of the Republic of South Africa, 1996 (the Constitution) it is clearly stated 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 -* *(i) Prevent pollution and ecological degradation;* *(ii) Promote conservation; and* *(iii) Secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development.*	Digby Wells is undertaking an EIA process to identify and determine the potential impacts associated with the Project. Mitigation measures recommended will aim to ensure that the potential impacts are managed to acceptable levels to support the rights as enshrined in the Constitution.
<u>National Environmental Management Act, 1998 (Act No. 107 of 1998) and EIA Regulations, 2014 (as amended)</u> The Environmental Management Act, 1998 (Act No 107 of 1998) (NEMA), as amended was set in place in accordance with Section 24 of the Constitution. Certain environmental principles under NEMA have to be adhered to, to inform decision making for issues affecting the environment.	Activities associated with the proposed mine are identified as Listed Activities in the Listing Notices in accordance with the EIA Regulations, 2014 (as amended) and therefore require environmental authorisation prior to being undertaken. The Environmental Authorisation Application was submitted to the DMRE on 17 April 2020. The Scoping report was accepted on 18 September 2020. An application for a

Applicable legislation and guidelines used to compile the report	Reference where applied
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 Regulation, 2014 was published under GN R 982 on 4 December 2014 (EIA Regulations) and came into operation 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) in terms of Sections 24(2) and 24D of the NEMA, as amended. The EIA Regulations have been made applicable to prospecting and mining activities.	request for extension to submit the final EIA report was submitted to the DMRE on 29 October 2020 and an extension of 50 days was granted on 03 November 2020. This EIA/EMPr is be informed by the requirements of the NEMA and Regulations thereunder.
Mineral and Petroleum Resource Development Act. 2002 (Act No. 28 of 2002) (MPRDA) The MPRDA sets out the requirements relating to the development of the nation's mineral and petroleum resources. It also aims to ensure the promotion of economic and social development through exploration and mining related activities. The MPRDA requires that mining companies assess the socio-economic impacts of their activities from start to closure and beyond. Companies must develop and implement a comprehensive Social and Labour Plan (SLP) to promote socio-economic development in their host communities and to prevent or lessen negative social impacts.	The Applicant has applied for a Mining Right to mine coal on the Farms Dalyshope 232 LQ and Klaarwater 231 LQ. The EIA process is undertaken to meet the requirements of the MPRDA read with the EIA Regulations, 2014 (as amended). Financial Provisioning and Closure Costs are included herein, and the report is appended hereto as Appendix R.
National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008) On 29 November 2013, the list of waste management activities published under GN R718 of 3 July 2009 (GN R718) was repealed and replaced with a new list of waste management activities under GN R921 of 29 November 2013. Included in the new list are activities listed under Category A, B and C. These activities include inter alia the following:	A Waste Management License (WML) has been applied for due to the nature of mining activities.

Applicable legislation and guidelines used to compile the report	Reference where applied
Category A describes waste management activities requiring a Basic Assessment process to be carried out in accordance with the EIA Regulations supporting an application for a waste management licence; Category B describes waste management activities requiring an Environmental Impact Assessment process to be conducted in accordance with the EIA Regulations supporting a waste management licence application; and Category C describes waste management activities that do not require a WML, but these activities will have to comply with the prescribed requirements and standards as prescribed by the Minister, which includes the Norms and Standards for Storage of Waste, 2013. These activities include the storage of general waste at a facility with a capacity to store in excess of 100 m^3 and storage of hazardous waste in excess of 80 m^3. The Waste Classification and Management Regulations published under GN R 634 of November 2013 require that all wastes be classified according to SANS10234 and managed according to its classification.	
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 can only be entitled to use water if the use is permissible under the NWA. GN R 704 was published in June 1999 and aims to regulate the use of water for mining and related activities for the protection of water resources and states the following: • Regulation 4: No residue deposit, reservoir or dam may be located within the 1:100-year flood line, or less than a horizontal distance of 100 m from the nearest watercourse. Furthermore, person(s) may not dispose of any substance that may cause water pollution;	An IWULA and an associated Integrated Water and Waste Management Plan (IWWMP) are required in terms of Section 21 of the NWA for the Project.

Applicable legislation and guidelines used to compile the report	Reference where applied
• Regulation 5: No person(s) may use substances for the construction of a dam or impoundment if that substance will cause water pollution; • Regulation 6 is concerned with the capacity requirements of clean and dirty water systems, and • Regulation 7 details the requirements necessary for the protection of water resources.	
<u>DWS[1] Best Practice Guideline – G1: Storm Water Management Plan (SWMP)</u> These are guidelines provided by the DWS for the development of a SWMP. The following will be undertaken to develop the conceptual SWMP: • Delineate the clean and dirty area contributing to runoff (based on the final layout plans) and site-specific hydrological assessments to determine volumes that require to be handled. The SWMP should ensure that temporary drainage installations should be designed, constructed, and maintained for recurrence periods of at least a 25-year, 24-hour event, while permanent drainage installations should be designed for a 50-year, 24-hour recurrence period; and • Site specific assessments to establish the appropriate mitigation measures and surface water monitoring programme.	All water management infrastructure must be designed for a 1:100-year, 24-hour rainfall event.

[1] Previously the Department of Water Affairs (DWA)

Applicable legislation and guidelines used to compile the report	Reference where applied
DWS Best Practice Guideline – G4: Impact Prediction The impacts of mine activities on the groundwater environment must be assessed as part of the MRA, as well as for the IWULA. The baseline conditions must be assessed to define the current aquifer systems, groundwater use and groundwater conditions before mine commencement and to determine the extent of possible future impacts on the groundwater resources.	An IWULA and an associated IWWMP are required in terms of Section 21 of the NWA. The EIA as part of the MRA assessed potential impacts on groundwater resources as a result of the Project.
National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004) (NEM:BA) The NEM:BA regulates the management and conservation of the biodiversity of South Africa within the framework provided under NEMA. This Act also regulates the protection of species and ecosystems that require national protection and also takes into account the management of alien and invasive species. The following regulations which have been promulgated in terms of the NEM:BA are also of relevance: • Alien and Invasive Species Lists, 2014 published (GN R.599 in GG 37886 of 1 August 2014); • National Environmental Management: Biodiversity Act, 2004: Threatened and Protected Species Regulations; and • National list of Ecosystems Threatened and in need of Protection under Section 52(1)(a) of the Biodiversity Act (GG 34809, GN R.1002, 9 December 2011).	A Fauna and Flora Impact Assessment is appended hereto as Appendix I. Further to this, Universal undertook a protected tree assessment and permit application for the Dalyshope Coal Mining Project. The process is still on-going. The application was submitted to the Department of Agriculture, Forestry and Fisheries (DAFF) and/or the Limpopo Department of Economic Development, Environment and Tourism (LEDET) and/or the South African National Biodiversity Institute (SANBI) for consideration, due to known protected tree species on the site.
National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004) The prevailing legislation in the Republic of South Africa with regards to the Air Quality field is the National Environment Management: Air Quality Act, 2004 (Act No. 39 of 2004) (NEM: AQA). According to the Act, the 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 NEM: AQA.	An Air Quality Impact Assessment has been summarised in this EIA/EMPr and is appended hereto as Appendix L.

Applicable legislation and guidelines used to compile the report	Reference where applied
A fundamental aspect of the new approach to the air quality regulation, as reflected in the NEM: AQA is the establishment of National Ambient Air Quality Standards (NAAQS). 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. The NEM: AQA provides for the identification of priority pollutants and the setting of ambient standards with respect to these pollutants.	
<u>National Dust Control Regulation 2013</u> The Minister of Water and Environmental Affairs, released on the 01 November 2013 the National Dust Control Regulation, in terms of Section 53, read with Section 32 of the National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004) (NEM: AQA). In the published National Dust Control Regulations, terms like target, action and alert thresholds were omitted. Another notable observation was the reduction of the permissible frequency of exceedance from three to two incidences within a year. The standard actually adopted a more stringent approach than previously and would require dedicated mitigation plans now that it is in force.	An Air Quality Impact Assessment has been summarised in this EIA/EMPr and is appended hereto as Appendix L.
<u>National Noise Control Regulations, R.154 of 1992 (the Noise Regulations) promulgated in terms of Section 25 of the Environmental Conservation Act, 1989 (Act No. 73 of 1989)</u> The National Noise-Control Regulations (GN R154 in Government Gazette No. 13717 dated 10 January 1992) (NCRs) form part of the Environmental Conservation Act and these Regulations apply to external noise. The NCRs differentiates between Disturbing Noise levels (which is objective and scientifically measurable which are generally compared to existing ambient noise level) and Noise Nuisance (which is a subjective measure and is defined as noise that "*disturbs or impairs or may disturb or impair the convenience or peace of any person*"). Local Authorities use Controlled Areas to identify areas with high noise levels. Restrictions have been set out for development that occurs in these Controlled Areas. These regulations make	A Noise Impact Assessment has been summarised in this EIA/EMPr and the report is appended hereto as Appendix M.

Applicable legislation and guidelines used to compile the report	Reference where applied
provision for guidelines pertaining to noise control and measurements. The regulations make reference to the use of the South African National Standards 10103:2008 (SANS) guidelines for the Measurement and Rating of Environmental Noise with Respect to Land Use, Health, and Annoyance and to Speech Communication. As such, a Noise Impact Assessment in accordance with the NCRs must be undertaken for submission to determine the potential disturbing and nuisance noise levels associated with a particular development.	
<u>The National Heritage Resources Act, 1999 (Act No. 25 of 1999) (NHRA)</u> The National Heritage Resources Act, 1999 (Act No. 25 of 1999) (NHRA) is the overarching legislation that protects and regulates the management of heritage resources in South Africa. The Act requires that Heritage Resources Agency's in this case the South African Heritage Resources Agency (SAHRA) and Provincial Heritage Resources Authority of Gauteng (PHRA-G), be notified as early as possible of any developments that may exceed certain minimum thresholds. This act is enforced through the National Heritage Regulations GN R 548 (2000).	For the Scoping Phase, a Notice of Intent to Develop (NID) was submitted to SAHRA. A Heritage Impact Assessment has been undertaken and included as Appendix N.
<u>GN R 1147 (Financial Provisioning Regulations), 2015</u> The Financial Provisioning Regulations prescribe methods for determining the quantum of financial provision for rehabilitation and mechanisms for providing for it. Section 41 (1) of the MPRDA has been repealed and Section 24P of the NEMA, as amended, which provides that the holder of a mining right must make financial provision for rehabilitation of negative environmental impacts. The financial provision must guarantee the availability of sufficient funds.	The Financial Provisioning Regulations are applicable to rehabilitation and closure plans as they prescribe the minimum content of an annual rehabilitation plan and the minimum content of a final rehabilitation, decommissioning and mine closure plan. The Closure and Rehabilitation Report is attached as Appendix P and summarised in this EIA/EMPr.

Applicable legislation and guidelines used to compile the report	Reference where applied
GN R 527 (MPRDA Regulations), 2004 Regulation 527 (GN R. 527) specifies that the EMP must include environmental objectives and specific goals for mine closure. The applicant for a mining right must make prescribed financial provision for the rehabilitation or management of negative environmental impacts, which must be reviewed annually. R527 provides specific principles for mine closure including safety and health, residual and latent environmental impacts etc.	The EMPr is provided in Part B, Sections 5 and 6 of this report.
Integrated Development Plan Each municipality has an Integrated Development Plan (IDP) which considers all local municipality districts and the needs to be met in these districts.	This report considers the IDP for the Waterberg District Municipality, specifically with reference to the Lephalale Local Municipality where the proposed Project is based.

7 Item 3(f): Need and Desirability of the Proposed Activities

Globally, coal plays a vital role in electricity generation. South Africa is primarily reliant on electricity generation from coal-fired power stations. A significant contribution of the coal fired power stations made up 83% to the maximum generating capacity mix in 2018 (the South African Energy Sector Report, 2019). Renewable and alternative energy sources cannot yet meet the demands of the country's electricity needs. Coal mining is, therefore, crucial for the supply of coal to meet the energy needs of the country's economy and until alternative energy generation options can be implemented on a sufficiently large scale, South Africa remains mainly dependent on coal mining.

The proposed Dalyshope Coal Mining Project shall produce one product, namely a thermal product. The basis of the Project is producing a 22.5 MJ/kg to 23.00 MJ/kg thermal product. The product will be produced for the local Eskom market, thereby assisting with the alleviation of the shortage of supply, as well as for export to the Indian power and cement markets.

The Limpopo Employment, Growth and Development Plan (2009-2014) recognises that the development of the coal, energy and petrochemicals cluster is critical to the achievement of its employment, growth and development objectives. The LLM's economy is dominated by current coal mining and power generation activities. The coal mining industry is an important employer.

The positive aspects of the proposed mining operations on the farm Dalyshope include the benefits of additional income generation in the area. The proposed Project will result in the development of the mine within the LLM and thus ensure that the mining activities create economic benefits to support the local and national economic and social needs. The employment of local labour will decrease the unemployment rate (by implementing a Social Labour Plan) in the area, as well as allow for the uplifting of the local communities. Thus, the proposed Project will result in employment opportunities and skills development in the area.

7.1 Questions to be Engaged with when Considering Need and Desirability

The Guideline 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. Table 7-1 present the needs and desirability analysis undertaken for the Dalyshope Coal Mine Project.

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Table 7-1: Need and Desirability

Theme	No.	Question	Response
Securing ecological sustainable development and use of natural resources”	1	How will this development (and its separate elements/aspects) impact on the ecological integrity of the area?	The proposed Project is within an ecologically sensitive area. During the EIA Phase, the impacts to each environmental aspect were assessed according to the Digby Wells impact assessment methodology. Section 11.1 provides details on the impacts and risks identified for the Project. Based on an environmental screening of the Mining Right area, the Applicant has adjusted the Mine plan to reduce the areas impact of mining on sensitive pans and terrestrial ecology areas.
	1.1	How were the following ecological integrity considerations taken into account?	
	1.1.1	Threatened Ecosystems	A Fauna and Flora Assessment was conducted and is included in Appendix I. The Project is located within the Least threatened Limpopo Sweet Bushveld biome with three protected floral species and one declining yet least concern species occurring on site. A total of 17 mammals and 14 avifaunal species found in the Project area are listed in the International Union for the Conservation of Nature (IUCN) Red List of Threatened Species. This includes Endangered (EN), Near Threatened (NT), and Vulnerable (VU) species. Additionally, a total of 25 avifauna species found on site are endemic or near endemic to South Africa. These have been listed in the Section 10.10. In addition, the findings in the Wetlands Assessment (Appendix J) show that three wetlands were recorded on or directly adjacent to OC1, which are considered to be ecologically important and sensitive on a provincial or local scale. Only small sections of these

Theme	No.	Question	Response
			wetlands and the associated buffer zones are located on the OC1 area. All three these wetlands are classified as Non-Perennial Episodic Endorheic Depression Pans. No mining/development will occur within the wetland areas or the associated buffer zones. The impacts and proposed mitigation measures are detailed in the sections below.
	1.1.2	Sensitive, vulnerable, highly dynamic or stressed ecosystems, such as coastal shores, estuaries, wetlands, and similar systems require specific attention in management and planning procedures, especially where they are subject to significant human resource usage and development pressure.	A desktop investigation identified that the landscape comprises of depressional pans, which are small (deflationary) depressions circular or oval in shape; usually found on the crest positions in the landscape. The identified wetlands were all classified as non-Perennial Episodic Endorheic Depression Pans based on the principles of the hydro geomorphic (HGM) approach to wetland classification. A freshwater specialist study was undertaken. Three wetlands were identified within the proposed Project area (OC1), with a wetland cluster occurring to the north of the Farm Klaarwater 231. The layout plan was revised to take into consideration the 100 m wetland buffer. The impact assessment reflects impacts ranging from a medium score to a low score with the implementation of mitigation measures. Further to this, the permitting process to relocate protected trees (*Boscia albitrunca, Combretum imberbe* and *Vachellia erioloba)* is also being undertaken (see section 10.9).

Theme	No.	Question	Response
	1.1.3	Critical Biodiversity Areas (CBAs) and Ecological Support Areas (ESAs)	A Critical Biodiversity Area and Protected Area were identified within a close proximity to the study area (see Figure 10-20 and Figure 10-21). Majority of the infrastructure layout lies within an identified CBA. The proposed Project area falls largely within the 'CBA Irreplaceable' (CBA 1), which is an area characterised by natural landscapes with no disturbances, and which are irreplaceable in terms of reaching conservation targets within the district. The mine will have to avoid, minimise and mitigate impacts as far as possible as per recommendations of all specialist studies. What cannot be avoided, offsets should be negotiated and conservation actions should be implemented. There is an offset forum for the mines and the municipality have a forum. Areas not used by the mine can be managed and conservation efforts can be instilled to control AIPs, poaching, erosion and permit rehabilitation, wildlife and veld management.
	1.1.4	Conservation targets	The Project is located within the Limpopo Sweet Bushveld biome. The conservation status of the unit is **Least Threatened**, with approximately 5% of the area being transformed, mainly by cultivation. This can be attributed to the overall low rainfall of the area. These areas have the potential for game and cattle farming due to the high grazing capacity of the sweet veld.
	1.1.5	Ecological drivers of the ecosystem	For the most part, mitigation measures have been suggested which will reduce the adverse effects identified during this EIA Phase. However, the Project will have adverse effects on the protected tree species and identified Baboon Spider nests in the area. Wetlands were identified within the Project area. The extent

Theme	No.	Question	Response
			of potential impacts and potential mitigation is outlined in Section 11.1. No mining will occur within the delineated pans. However, mining will occur within the respective catchment areas, which will affect their hydrology.
	1.1.6	Environmental Management Framework	Multiple environmental management frameworks were taken into consideration while compiling the specialist reports. These frameworks were instrumental as guidelines to assess the necessary environmental capacities and ensure compliance to the country's laws. The Waterberg Environmental Management Plan is one such framework. Other frameworks included the Constitution of the Republic of South Africa (Act No.108 of 1996), NEM: BA, MPRDA, NEMA, National Forests Act (NFA) (Act No. 84 of 1998), National Environmental Management Protected Areas Act, 2003 (Act No. 57 of 2003) (NEM: PAA) and Limpopo Environmental Management, 2003 (Act 7 of 2003) (LEMA), to name a few.
	1.1.7	Spatial Development Framework (SDF)	The Waterberg District Municipality IDP, informed by the SDF, was referenced for the compilation of this EIA Report.
	1.1.8	Global and international responsibilities relating to the environment (e.g. RAMSAR sites, Climate Change, etc.)	A desktop survey of wetlands was carried out for the Scoping Phase which referenced National Freshwater Ecosystem Priority Areas (NFEPA) wetlands. An Aquatic Assessment is appended in this EIA report. It references NFEPA wetlands, the landscape comprises of channelled valley bottom, depression and bench flat wetlands. No RAMSAR sites are present in the vicinity of the Project area. Coal mining does not align with the Paris Agreement

Theme	No.	Question	Response
			in terms of reducing CO_2 emissions, due to the ultimate emissions the coal-fired plants will produce.
	1.2	How will this development disturb or enhance ecosystems and/or result in the loss or protection of biological diversity? What measures were explored to firstly avoid these negative impacts, and where these negative impacts could not be avoided altogether, what measures were explored to minimise and remedy (including offsetting) the impacts? What measures were explored to enhance positive impacts?	Three Nationally Protected Tree species and one declining yet Least Concern species were identified during the field investigations. Tree Removal Permit applications will be submitted for the removal of identified protected tree species within the development footprint. An offset strategy is proposed to compensate for biodiversity losses.
	1.3	How will this development pollute and/or degrade the biophysical environment? What measures were explored to firstly avoid these impacts, and where impacts could not be avoided altogether, what measures were explored to minimise and remedy (including offsetting) the impacts? What measures were explored to enhance positive impacts?	The habitats within the proposed area of development will be directly impacted on, as the existing vegetation, which is considered the woodlands and pan vegetations will be removed to facilitate the construction of the mine and related infrastructure. The placement of the infrastructure will include the complete removal of vegetation present on the footprints of the mine infrastructure. Three wetlands were identified within the Project area, these will be avoided and not impacted with at least 100 m zones of regulation buffers to any infrastructure and construction activities. The project will also ensure job opportunities. The Company will implement the SLP Community Development projects and initiatives which are based on the requirements identified by surrounding communities through the SLP consultation process. The positive impact from the Project will be recognised through implementing the Community.

Theme	No.	Question	Response
			These have been investigated and included in Section 11 and are more detailed in the Specialist Studies found in the appendices of this report.
	1.4	What waste will be generated by this development? What measures were explored to firstly avoid waste, and where waste could not be avoided altogether, what measures were explored to minimise, reuse and/or recycle the waste? What measures have been explored to safely treat and/or dispose of unavoidable waste?	General and hazardous waste will be generated as a result of the Dalyshope Project. The waste will be handled, separated, stored and disposed of accordingly. It is anticipated that all general waste will either be recycled or disposed of at the local municipality landfill site. Hazardous waste will be removed offsite by a hazardous waste contractor. A safe disposal certificate for the removal of hazardous waste will be retained as proof of safe disposal.
	1.5	How will this development disturb or enhance landscapes and/or sites that constitute the nation's cultural heritage? What measures were explored to firstly avoid these impacts, and where impacts could not be avoided altogether, what measures were explored to minimise and remedy (including offsetting) the impacts? What measures were explored to enhance positive impacts?	All heritage resources identified within the Project area are of negligible cultural significance. The Cultural Heritage sites in the Project area were investigated during this EIA Phase and are presented in Appendix N.
	1.6	How will this development use and/or impact on non-renewable natural resources? What measures were explored to ensure responsible and equitable use of the resources? How have the consequences of the depletion of the non-renewable natural resources been considered? What measures were explored to firstly avoid these impacts, and where impacts could not be avoided altogether, what measures were explored to minimise and remedy (including offsetting) the impacts? What measures were explored to enhance positive impacts?	Coal extraction used for electricity generation is a non-renewable energy resource, however, South Africa is dependent on coal and until the energy supply and demand can feasibly be replaced with renewable energy, non-renewable energy sources will be required. Mitigation measures aimed at avoiding, reducing and / or managing the negative impacts are found in this report. The extent of positive impacts associated with this Project are conveyed in Section 11 and associated specialist studies which have been appended.

Theme	No.	Question	Response
	1.7	How will this development use and/or impact on renewable natural resources and the ecosystem of which they are part? Will the use of the resources and/or impact on the ecosystem jeopardise the integrity of the resource and/or system taking into account carrying capacity restrictions, limits of acceptable change, and thresholds? What measures were explored to firstly avoid the use of resources, or if avoidance is not possible, to minimise the use of resources? What measures were taken to ensure responsible and equitable use of the resources? What measures were explored to enhance positive impacts?	The EIA Phase has confirmed the presence of wetlands. The extent of potential impacts and potential mitigation is outlined in Section 11. No mining will occur within the delineated pans. However, mining will occur within the respective catchment areas, which will affect their hydrology. It is further recommended that all proposed excavations should be signed off by a hydropedologist. This is to advise on the impact of moisture displacement the proposed activities may have on the sustainability of infrastructure development and the environment. It must be noted that avoidance of this impact would result in the No-Go alternative being implemented, as the coal seam is too shallow to motivate underground mining.
	1.7.1	Does the proposed development exacerbate the increased dependency on increased use of resources to maintain economic growth or does it reduce resource dependency (i.e. de-materialised growth)? (note sustainability requires that settlements reduce their ecological footprint by using less material and energy demands and reduce the amount of waste they generate, without compromising their quest to improve their quality of life)	Historically, Eskom has struggled to secure coal from South African mining operations due to international prices of coal yielding more profit for mines. South Africa will be a coal-dependent country for the foreseeable future. While the mining and use of coal has its disadvantages for the environment, it is an important part of South Africa's development. The socio-economic impacts of coal mining include employment and increasing the country's economic value through the support of various industries.
	1.7.2	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 important priorities for which the resources should be used (i.e. what are the opportunity costs of using these resources this the proposed development alternative?)	

Theme	No.	Question	Response
	1.7.3	Do the proposed location, type and scale of development promote a reduced dependency on resources?	A sensitivity map was generated in the pre-application phase which identified all the natural sensitivities identified thus far. The Project increases dependency on resources (i.e. non-renewable resources).
	1.8	How were a risk-averse and cautious approach applied in terms of ecological impacts?	The risks still being investigated include an external water source since the Project is located in a water scarce catchment. Risk management procedures implemented include the protected tree species application which will investigate beneficial ways to repurpose trees which cannot be relocated. Also, mitigation measures contained in this report reduce environmental risks. However, it should be noted that mining has irreversible environmental impacts that cannot be avoided. Environmental legislation and frameworks were applied while compiling reports for the EIA Phase. These were important as they helped consider the limits of the ecosystems and contained current knowledge about the consequences of decisions and actions.
	1.8.1	What are the limits of current knowledge (note: the gaps, uncertainties and assumptions must be clearly stated)?	Part A, Section 20 outlines the gaps, uncertainties and assumptions which were presented in each of the special studies undertaken.
	1.8.2	What is the level of risk associated with the limits of current knowledge?	
	1.8.3	Based on the limits of knowledge and the level of risk, how and to what extent was a risk-averse and cautious approach applied to the development?	
	1.9	How will the ecological impacts, resulting from this development impact on people's environmental right in terms following:	

Theme	No.	Question	Response
	1.9.1	Negative impacts: e.g. access to resources, opportunity costs, loss of amenity (e.g. open space), air and water quality impacts, nuisance (noise, odour, etc.), health impacts, visual impacts, etc. What measures were taken to firstly avoid negative impacts, but if avoidance is not possible, to minimise, manage and remedy negative impacts?	As with all coal mining, there will be a general deterioration of the environment. Specifications on the negative impacts and their mitigation measures are found in the Section 11 below. For the detailed methodology used to determine the significance of the identified impacts, refer to Part A, Section 12.
	1.9.2	Positive impacts: e.g. improved access to resources, improved amenity, improved air or water quality, etc. What measures were taken to enhance positive impacts?	As part of the specialist studies conducted for the Project, Impact Assessments were undertaken. The most positive impacts were noted in the Social Impact Assessment, particularly during the Operational Phase. For the significance assigned to the positive and negative impacts, refer to Part A, Section 11.1. For the detailed methodology used to determine the significance of the identified impacts, refer to Part A, Section 12.
	1.10	Describe the linkages and dependencies between human wellbeing, livelihoods and ecosystem services applicable to the area in question and how the development's ecological impacts will result in socio-economic impacts (e.g. on livelihoods, loss of heritage site, opportunity costs, etc.)?	Appendix O provides the Social Report. A total of 15 socio-economic impacts were identified for the proposed Project, of which six were positive and nine negative impacts. The SLP commitments to local employment, skills development, procurement, and community development Projects are essential to ensuring that members of local communities as well as local businesses and small, medium, and micro enterprises (SMMEs) benefit from the Project. While none of the negative impacts can be avoided if the Project is approved, their intensity, duration and significance can be reduced if the mitigation measures are implemented effectively.
	1.11	Based on all of the above, how will this development positively or negatively impact on ecological integrity objectives/targets/considerations of the area?	
	1.12	Considering the need to secure ecological integrity and a healthy biophysical environment, describe how the alternatives identified (in terms of all the different elements of the development and all	Alternatives in terms of infrastructure placement were investigated in the pre-application phase, through the identification of sensitive

Theme	No.	Question	Response
		the different impacts being proposed), resulted in the selection of the "best practicable environmental option" in terms of ecological considerations?	areas on site. Sensitive areas on site were avoided as far as possible.
	1.13	Describe the positive and negative cumulative ecological/biophysical impacts bearing in mind the size, scale, scope and nature of the project in relation to its location and existing and other planned developments in the area?	Cumulative impacts were investigated and presented under Section 11.2.
Promoting justifiable economic and social development	2.1	What is the socio-economic context of the area, based on, amongst other considerations, the following considerations?	
	2.1.1	The IDP (and its sector plans' vision, objectives, strategies, indicators and targets) and any other strategic plans, frameworks of policies applicable to the area,	The socio-economic baseline took the Waterberg District Municipality IDP into consideration. The IDP presents issues and requests raised by residents in the Waterberg Municipality. The vision and mission of the WDM was revised during the strategic planning session to inform the 2019-2020 IDP document. The vision and mission both centre around energy and minerals, as well as ecotourism. The IDP identified the development potential of the mining industry within the Waterberg District Municipality. This includes beneficiation, mining tourism, the platinum corridor and a mining logistics hub. The proposed Dalyshope Project LoM will be approximately 30 years, thus allowing Dalyshope Project to continue supplying jobs at that the mine for a longer time period. The surrounding communities will also continue to benefit through direct and indirect income, as well as the mine's use of local contractors and suppliers.
	2.1.2	Spatial priorities and desired spatial patterns (e.g. need for integrated of segregated communities, need to upgrade informal settlements, need for densification, etc.),	The spatial and economic development projects will be implemented through the Municipality IDP. The proposed Project will promote and support the sustainability of existing business, as

Theme	No.	Question	Response
	2.1.3	Spatial characteristics (e.g. existing land uses, planned land uses, cultural landscapes, etc.), and	well as assist in increasing local beneficiation and shared economic growth, through the LoM by 30 years.
	2.1.4	Municipal Economic Development Strategy (“LED Strategy”).	
	2.2	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?	The proposed Project will result in limited job opportunities. The positive impact from the Project will be recognised through implementing the Community Development Projects as presented in the SLP.
	2.2.1	Will the development complement the local socio-economic initiatives (such as local economic development (LED) initiatives), or skills development programs?	Yes, LED initiatives and skills development form part of the identified Community Development Projects as included in the SLP.
	2.3	How will this development address the specific physical, psychological, developmental, cultural and social needs and interests of the relevant communities?	The Company will implement the SLP Community Development projects and initiatives which are based on the requirements identified by surrounding communities through the SLP consultation process.
	2.4	Will the development result in equitable (intra- and inter-generational) impact distribution, in the short- and long-term? Will the impact be socially and economically sustainable in the short- and long-term?	The aim of the SLP is to initiate projects which develop the surrounding communities which may be impacted by a proposed mining project. The mine itself will have a LoM of 30 years and therefore will present long-term sustainable employment. The SLP initiatives must also provide long-term sustainable projects that the community can adopt and manage.
	2.5	In terms of location, describe how the placement of the proposed development will	
	2.5.1	result in the creation of residential and employment opportunities in close proximity to or integrated with each other	The mine will employ approximately 1200 employees for the Dalyshope operation.

Theme	No.	Question	Response
	2.5.2	reduce the need for transport of people and goods	Coal product will be trucked or transported via rail to various markets. Anglo/ Universal will also provide employee transport to and from the mine thereby mitigating increased traffic for individual road users.
	2.5.3	result in access to public transport or enable non-motorised and pedestrian transport (e.g. will the development result in densification and the achievement of thresholds in terms public transport),	
	2.5.4	compliment other uses in the area,	A Traffic Impact Assessment was undertaken to establish potential congestion on surrounding roads and provide mitigation measures to manage the impact. This is appended as Appendix Q. The Applicant is required to upgrade the D1675 (Steenbokpan road) as well as the D175 (road which serves as an access route for the farms situated near the Project area) to accommodate impacts related to haul trucks using this road.
	2.5.5	be in line with the planning for the area,	The proposed LoM is 30 years and the Closure and Rehabilitation Report considered end-land use in line with the LED Strategy.
	2.5.6	for urban related development, make use of underutilised land available with the urban edge,	Not applicable. The proposed Dalyshope Project area is outside an urban area.
	2.5.7	optimise the use of existing resources and infrastructure,	No infrastructure is available on site which can be utilised as part of the mining operation; however, the proposed infrastructure on site will all be removed during decommissioning and will therefore not create unwanted infrastructure either.
	2.5.8	opportunity costs in terms of bulk infrastructure expansions in non-priority areas (e.g. not aligned with the bulk infrastructure planning for the settlement that reflects the spatial reconstruction priorities of the settlement),	A water supply source is still being investigated and the opportunity costs in terms of bulk infrastructure expansions in non-priority areas dependent on the development of water supply infrastructure (if this is not found on site) and the railway line.

Theme	No.	Question	Response
	2.5.9	discourage "urban sprawl" and contribute to compaction/densification,	The project area and surrounds are fairly rural and is situated approximately 30 km north of the town of Steenbokpan.
	2.5.10	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,	The Community Development projects associated with the SLP will prioritise Historically Disadvantaged South Africans as beneficiaries.
	2.5.11	encourage environmentally sustainable land development practices and processes,	Mining is inherently unsustainable and a destructive activity involving the taking of a non-renewable resource. The successful rehabilitation of the area will contribute to mitigating the impacts caused by mining.
	2.5.12	take into account special locational factors that might favour the specific location (e.g. the location of a strategic mineral resource, access to the port, access to rail, etc.),	Various designs and layouts for the mining operation have been considered and the final layout has been developed based on the availability of coal seam as indicated by the prospecting conducted on site. The footprint of the opencast pit was also revised to take the wetland buffer into consideration. In terms of the infrastructure areas, the layout has already been altered to ensure that structures are situated far away from sensitive pans and terrestrial ecology areas. The layout was therefore designed and revised to reduce associated impacts to the environment.
	2.5.13	the investment in the settlement or area in question will generate the highest socio-economic returns (i.e. an area with high economic potential),	The proposed Project will allow the mine to continue contributing to the local, regional, and national Gross Domestic Product (GDPs), and also to the local communities through continued employment of workers and local contractors, as well as other influences and community upliftment programmes that are undertaken by the mine through their SLP.

Theme	No.	Question	Response
	2.5.14	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, and	All heritage resources identified within the Project area are of negligible cultural significance. Mitigation, where possible, is presented in Appendix N.
	2.5.15	in terms of the nature, scale and location of the development promote or act as a catalyst to create a more integrated settlement?	The proposed Project will result in job opportunities. The positive impact from the Project will be recognised through implementing the Community Development Projects as presented in the SLP.
	2.6	How were a risk-averse and cautious approach applied in terms of socio-economic impacts?	Socio-economic impacts have been investigated and presented as Appendix O.
	2.6.1	What are the limits of current knowledge (note: the gaps, uncertainties and assumptions must be clearly stated)?	Part A, Section 20 outlines the gaps, uncertainties and assumptions which were presented in each of the special studies undertaken.
	2.6.2	What is the level of risk (note: related to inequality, social fabric, livelihoods, vulnerable communities, critical resources, economic vulnerability and sustainability) associated with the limits of current knowledge?	
	2.6.3	Based on the limits of knowledge and the level of risk, how and to what extent was a risk-averse and cautious approach applied to the development?	
	2.7	How will the socio-economic impacts, resulting from this development impact on people's environmental right in terms following:	
	2.7.1	Negative impacts: e.g. health (e.g. HIV- Aids), safety, social ills, etc. What measures were taken to firstly avoid negative impacts, but if avoidance is not possible, to minimise, manage and remedy negative impacts?	The Social Impact Assessment (appended as Appendix O) considered community health, safety and security impacts which includes the implementation of HIV/AIDS and substance abuse prevention campaigns for the construction and operational phases. These campaigns can be expanded to the broader community at a later stage.

Theme	No.	Question	Response
	2.7.2	Positive impacts. What measures were taken to enhance positive impacts?	Positive impact will result from employment creation, multiplier effects on the local and regional economy, community development, and growth of local economy. Each of these impacts are provided with mitigation measures to enhance the positive impact. For the detailed methodology used to determine the significance of the identified impacts, refer to Part A, Section 12.
	2.8	Considering the linkages and dependencies between human wellbeing, livelihoods and ecosystem services, describe the linkages and dependencies applicable to the area in question and how the development's socio-economic impacts will result in ecological impacts (e.g. over utilisation of natural resources, etc.)?	The Social Report (appended as Appendix O) states impacts related to loss of agricultural and grazing land. This will be problematic to those whose primary livelihood surrounds livestock keeping. Additionally, dust from Project activities may adversely impact human and animal health. Increased pressure on water resources for local community because of the demand for drinking water and water for agriculture from in-migrants will also be problematic. Mitigation measures have been included in Section 11 below.
	2.9	What measures were taken to pursue the selection of the "best practicable environmental option" in terms of socio-economic considerations?	Should the proposed mitigations and required off-sets (protected tree species) be implemented as suggested by the specialists, this will result in the preferred mining approach to be adopted.
	2.10	What measures were taken to pursue environmental justice so that adverse environmental impacts shall not be distributed in such a manner as to unfairly discriminate against any person, particularly vulnerable and disadvantaged persons (who are the beneficiaries and is the development located appropriately)?Considering the need for social equity and justice, do the alternatives identified,	The aim of the SLP is to initiate projects which develop the surrounding communities which may be impacted by a proposed mining project. The mine itself will have a LoM of 30 years and therefore will present long-term sustainable employment. The Community Development projects associated with the SLP will

Theme	No.	Question	Response
		allow the "best practicable environmental option" to be selected, or is there a need for other alternatives to be considered?	prioritise Historically Disadvantaged South Africans as beneficiaries.
	2.11	What measures were taken to pursue equitable access to environmental resources, benefits and services 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?	
	2.12	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?	Monitoring suggestions have been provided for the construction, operational and closure phases of the Project. These will help assess the effective assessment of specific environmental aspects and the degree to which they are affected by the mining operation. This includes soils, surface water, groundwater, fauna and flora aquatics, air quality, noise and blasting. Refer to Part B, Section 8 for the monitoring programme.
	2.13	What measures were taken to:	
	2.13.1	ensure the participation of all interested and affected parties,	During the pre-application and Scoping Phase, an I&AP database was developed to identify and verify the directly and indirectly affected landowners or land occupiers as well as the potentially affected surrounding communities. This was updated and used throughout the EIA process as well.
	2.13.2	provide all people with an opportunity to develop the understanding, skills and capacity necessary for achieving equitable and effective participation,	Digby Wells will maintain and update the I&AP database to ensure communication with all registered I&APs. Site notices have been erected in various locations around the site and in the nearest communities to announce the Project, SMS notifications will be utilised to provide progress reports to I&APs as well as Digby Wells contact information for further consultation. Focus Group meetings

Theme	No.	Question	Response
			will be held during the EIA Phases to engage with I&APs, and the Project will be presented at these meetings as well as the findings of the impact assessments. A stakeholder engagement plan was developed and will be followed throughout the EIA Phase.
	2.13.3	ensure participation by vulnerable and disadvantaged persons,	Site notices have been placed, and a meeting held in areas easily accessible to the most disadvantaged affected community. The Background Information Document was translated from English into Setswana and a translator will also attend all public meetings to fully engage with all affected stakeholders.
	2.13.4	promote community wellbeing and empowerment through environmental education, the raising of environmental awareness, the sharing of knowledge and experience and other appropriate means,	The consultation process seeks to inform affected communities of the positive and negative impacts associated with a proposed Project and provide opportunity for any stakeholder to raise concerns which will be responded to both on record in the reports and through direct written response (where possible).
	2.13.5	ensure openness and transparency, and access to information in terms of the process,	Digby Wells is bound by legislation and regulations to share information pertaining to the Project, to be transparent and impartial.
	2.13.6	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, and	All stakeholder needs will be accommodated as far as is reasonable.
	2.13.7	ensure that the vital role of women and youth in environmental management and development were recognised and their full participation therein was be promoted?	The EAP cannot force participation from specific demographics. Cultural norms will be respected and adhered to; however, no demographic can be excluded from public consultation and

Theme	No.	Question	Response
	2.14	Considering the interests, needs and values of all the interested and affected parties, 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)?	therefore all registered stakeholders and meeting attendees will be considered intrinsic to the public consultation process and outcomes. COVID-19 Regulations will be taken into consideration during the public consultation process. Therefore, Focus Group meetings will be held with neighbouring landowners, closest community (Lesedi community) and Ward Committee members only.
	2.15	What measures have been taken to ensure that current and/or future workers will be informed of work that potentially might be harmful to human health or the environment or of dangers associated with the work, and what measures have been taken to ensure that the right of workers to refuse such work will be respected and protected	Anglo/Universal will produce a Health and Safety policy and best practice on site, compliant with the Mine Health and Safety Act, 1996 (Act No. 29 of 1996).
	2.16	Describe how the development will impact on job creation in terms of, amongst other aspects:	
	2.16.1	the number of temporary versus permanent jobs that will be created,	The total number of employees will be approximately 1200. The Dalyshope Coal Mining Project will be a contractor-run operation, meaning most of the staffing will be employed by the mining and engineering contractors.
	2.16.2	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),	Provision has been made in the SLP to address some of the skills required for the operation, specifically for low-level skills development.
	2.16.3	the distance from where labourers will have to travel,	A total of 1200 job opportunities will be created as a result of the Project, however, it is too early in the process to confirm from what distance labourers will be required to travel, as the labour force has not yet been appointed. Anglo/Universal is committed to source labour from the nearest affected community and only search
	2.16.4	the location of jobs opportunities versus the location of impacts (i.e. equitable distribution of costs and benefits), and	

Theme	No.	Question	Response
			beyond the constraints of the immediate employment catchment zone if the skills required cannot be accommodated.
	2.16.5	the opportunity costs in terms of job creation (e.g. a mine might create 100 jobs, but impact on 1000 agricultural jobs, etc.).	The main land uses of the farmland include cattle breeding and keeping and hunting. There are no farm dweller households who will be displaced when the land is acquired for the Project. The farms Dalyshope and Klaarwater are owned by the Applicant.
	2.17	What measures were taken to ensure:	
	2.17.1	that there were intergovernmental coordination and harmonisation of policies, legislation and actions relating to the environment, and	Digby Wells has identified the relevant government organisations which must be consulted throughout the EIA Process. Furthermore, this application is in terms of the One Environmental System and Digby Wells shall endeavour to align the various procedures to reduce stakeholder fatigue.
	2.17.2	that actual or potential conflicts of interest between organs of state were resolved through conflict resolution procedures?	The Scoping and EIA process requires governmental departments to communicate regarding any application. In addition, all relevant Departments and key stakeholders have been notified about the project by the EAP and registered as Interested and Affected Parties who will continue to be notified and engaged with regarding the project throughout the EIA process.
	2.18	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?	As part of the EIA Process, Financial Liability for the Applicant was calculated to determine the cost of decommissioning and rehabilitating the mine site to an end-land use which is sustainable and in the best interest of both the surrounding communities and the environment. The purpose of the EIA is to propose mitigation
	2.19	Are the mitigation measures proposed realistic and what long-term environmental legacy and managed burden will be left?	

Theme	No.	Question	Response
	2.20	What measures were taken to ensure that he 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 for by those responsible for harming the environment?	measures to reduce or avoid the impacts as a result of the mine proceeding.
	2.21	Considering the need to secure ecological integrity and a healthy bio-physical environment, describe how the alternatives identified (in terms of all the different elements of the development and all the different impacts being proposed), resulted in the selection of the best practicable environmental option in terms of socio-economic considerations?	The layout of the proposed mining infrastructure was informed by sensitivity mapping of the farms directly impacted by the mining activities.
	2.22	Describe the positive and negative cumulative socio-economic impacts bearing in mind the size, scale, scope and nature of the project in relation to its location and other planned developments in the area?	Cumulative impacts were investigated and presented under Section 11.2.

8 Item 3(g): Motivation for the Preferred Development Footprint within the Approved Site as Contemplated in the Accepted Scoping Report

The location of the Project has been decided by the location of the identified coal seams and determined the pit areas based on the location of coal. An initial sensitivity analysis was undertaken to determine sensitive features that needed to be considered within the proposed Project site. Based on an environmental screening of the affected farms (i.e. Dalyshope and Klaarwater), the Applicant has adjusted the Mine plan to reduce the areas impact of mining on sensitive pans and terrestrial ecology areas. These sensitivities informed the proposed mine layout. Therefore, areas of environmental sensitivity were avoided as far as practically possible.

9 Item 3(h): Full Description of the Process Followed to Reach the Proposed Preferred Alternatives within the Site

9.1 Item 3(h)(i): Details of the Development Footprint Alternatives Considered

A project alternative is defined as a possible course of action, in place of another, that would meet the same purpose and need (DEAT, 2004).

In an EIA process, project alternatives serve to determine the most effective way of meeting the objectives of that project. This is generally done through either enhancing the benefits of an activity and/or mitigating the negative impacts and risks of an activity.

According to the Department of Environmental Affairs (DEA) Criteria for Determining Alternatives in EIA Guideline (2004), there are various types or categories of alternatives, including:

- Location alternative – alternative project sites in the same geographic area;
- Process/design alternative – alternative process/design/equipment;
- Activity alternative – consideration of different means to achieve the same project objective;
- Routing alternative – consideration of different routes for linear infrastructure;
- Site layout alternative – consideration of the different options to place project infrastructure; and
- No-go alternative – the proposed project/activity does not proceed, implying that the current situation or status quo remains.

Six alternative types were considered for the Project. These are discussed in the sections below.

9.1.1 Location Alternatives

Mineral resources are by nature very difficult to locate as it requires extensive prospecting and calculated determination of stock. Since minerals can only be mined where they exist, it is not feasible to consider alternative locations. Minerals can only be mined where identified and verified, therefore it was not practical to select any other sites. The proposed property has indicated the presence of coal.

No alternatives have been investigated in terms of location of the Dalyshope Project. Anglo currently holds the PR to the areas under investigation and will not consider any other properties that are not contained within the PR area.

9.1.2 Design and Layout of the Project

A sensitivity map was produced in the pre-application phase of the Project to determine "no-go" areas on site. The initial proposed mining design layout included four open pits, however, environmental sensitivities on site were mapped and areas of mining were reduced to avoid sensitive environmental areas. Therefore, alternative locations for placement of infrastructure include Dalyshope 232 LQ and Klaarwater 231 LQ.

Various designs and layouts for the mining operation have been considered and the final layout has been developed based on the availability of coal seam as indicated by the prospecting conducted on site. The footprint of the opencast pit was also revised to take the wetland buffer into consideration (Figure 5-1). In terms of the infrastructure areas, the layout has already been altered to ensure that structures are situated far away from sensitive pans and terrestrial ecology areas. The layout was therefore designed and revised to reduce associated impacts to the environment.

The Fauna and Flora study has confirmed the presence of protected tree species and two Baboon Spider nests within the development footprint, which will need to be removed. Relocation of the Baboon Spiders is recommended. The location of the protected tree species and Baboon Spider nests are portrayed in the composite map shown in Figure 10-23 (Part A).

9.1.3 Mining Methods Alternative

The nature of the coal seams determines the preferred mining method. The proposed alternatives for coal extraction considered underground versus opencast mining. Due to the shallow depth and thickness of the coal seams, the strip ratios for surface mining are regarded as very favourable. The Dalyshope Project shall, therefore, be an opencast mine operated by a selected opencast mining contractor. With opencast mining, the main advantage over underground mining is the much higher resource extraction.

The mining method shall be a standard truck and shovel application where the topsoil is removed and stored. Subsequently, softs shall be removed and stored at the designated material stockpiles. Drilling and blasting shall be undertaken for hard materials. The proposed method will incorporate a roll-over method of concurrent backfilling of the void left behind by mining. This opencast mining method suits shallow coal seams in a consistent, flat lying orientation, thus deemed most economically viable for the proposed Project.

9.1.4 Water Supply Alternatives

The Limpopo Water Management Area (WMA) is a water scarce catchment. Regional water balance calculations completed in 2010 by O'Beirne indicate the Limpopo WMA water resource is depleted, dictated by basic human needs, ecological reserve requirements and industrial demands. Water supply schemes and systems currently proposed for the catchment will help alleviate the current supply and demand requirements, but the negative impacts already established on the ecosystem and groundwater resource will not be rectified by these schemes. Increased industrialisation and human need requirements associated with the increase in job creation will potentially worsen the impacts to the groundwater resource and ecosystem requirements (Digby Wells, 2013b). Initial groundwater assessments indicate that 84.8 m^3/day could potentially be sourced from groundwater resources in a 10 km to 15 km radius of the Dalyshope Coal Mining Project. Effective spacing between water supply (production) boreholes in addition to controlling abstraction to sustainable limits (based on recharge potential) is vital to maintaining the groundwater resource for prolonged use (Digby Wells, 2014a and 2014b).

An initial assessment of the predicted raw and potable water demand for the mining operation has been made. Approximately five megalitres per day (5ML/d) of water will be required for the first five years of the operation. Various options have been considered for the source of the raw water. **These options are:**

- Raw water sourced from the Anglo-American coal bed methane project situated approximately 36 km east of the mine;
- Water sourced from local sewage treatment plants in Lephalale – this source could already be allocated to third parties and an agreement may be made with said third parties for excess allocation and therefore may not be viable;
- Boreholes in the vicinity of the mine;
- Allocation form the proposed Phase 2 Mokolo-Crocodile West Water Augmentation Project (MCWAP); and
- Raw water drawn from the Limpopo River.

It has been concluded that water will be supplied from a borehole well area on site. An external water supply source is still being investigated.

9.1.5 Transportation of Coal

Currently, the market for the Dalyshope coal shall be Eskom. During the start-up of Dalyshope, the Mine shall investigate alternative options for the coal. The coal product will either be transported by haul trucks on the Steenbokpan road (preferred route) or by means of a rail line.

9.1.5.1 Routing alternatives

The Project is reachable via four routes. One potential access road to Dalyshope site is by the paved R510 provincial road that runs through Lephalale town and continues up to the Limpopo River where it turns westward towards Dalyshope. At the end of the R510 paved road, a gravel road continues for approximately 15 km to Dalyshope. A second access route is from the R510 at Lephalale past the Grootegeluk Coal Mine from where a gravel road runs north to join up with the R510 where the paved section ends and then the same gravel road follows to Dalyshope. The third potential access route is also from the R510 at Lephalale up to the Matimba Power Station from where a gravel road runs west to join the D175 gravel district road that runs north to Dalyshope. The fourth access route is by the D175 gravel road that runs north to Dalyshope from the R510, approximately 38 km before Lephalale.

Two routing alternatives were considered in the Traffic Impact Assessment, namely, the Steenbokpan Road (D1675) and D175. Both routes are preferred, and the Applicant has been advised to upgrade the roads. A full access with an access road from the D175 situated about 18.5 km north of the intersection of the D1675 and the D175 is proposed.

9.1.5.2 Rail alternatives

The mine is investigating rail as an alternative to the road for the future scenario.

The current rail link between the Waterberg region and Gauteng consists of a single-track general freight line, extending from Pretoria North through Brits, to Rustenburg, Thabazimbi and on to Lephalale. The rail link serves the existing coal, iron-ore and chrome mines in the area. The section from Lephalale to Thabazimbi is congested due to insufficient passing opportunities resulting from the short passing loops. The extensive clay formations also limit the maximum axle load en route, which makes increasing the load from 20 tonnes per axle (t/axle) to 26t/axle problematic. CIH/Resgen has constructed a rail line link, with a loadout loop, from the existing rail line, near Lephalale, up to a position approximately 15 km from the Dalyshope Project. CIH shall be approached to negotiate to share this rail link.

Alternatively, the coal shall be trucked to the existing rail line at Grootegeluk Mine. This line links into the general rail network at Lephalale that allows coal to be hauled to Maputo or Richards Bay or to Matimba/ Medupi.

9.1.6 The No-Go Alternative

The No-go alternative is the option of not mining coal in the area. This option also means that all potential negative impacts associated with the proposed mine and its associated infrastructure would not occur. However, the potential benefits associated with the Project would also not occur. According to the Waterberg District Environmental Management Framework, the area within which the proposed Project falls has been earmarked for mining and power generation development as these two sectors currently drive the economic value of production in the LLM. With the proven coal reserve in the Waterberg area, prohibiting the Project from proceeding will not only impede valuable socio-economic opportunities in the LLM but South Africa as a whole.

9.2 Item 3(h)(ii): Details of the Public Participation Process Followed

The public participation process was developed to ensure compliance with environmental regulatory requirements and to provide I&APs with an opportunity to evaluate the proposed Project. During this process stakeholders are able to provide inputs and to receive feedback from the environmental specialists and/or proponent.

During the public participation process, the following core activities were undertaken:

- Identification of the stakeholders and creation of database;
- Development and distribution of public participation process material;
- Stakeholder communication and consultation; and
- Recording and responding to suggestions and concerns raised during the public meetings and during the comment period.

9.2.1 Stakeholder Identification

Windeed and desktop searches were conducted in and around the Project area to verify land ownership and obtain contact details. This information is used to create a stakeholder database which will be continually updated throughout the public participation process with new stakeholders (refer to Appendix C, the PP Report).

Stakeholders for the proposed Project were grouped into the following categories:

- **Government:** National, Provincial, District and Local authorities;
- **Landowners:** Directly affected and surrounding landowners;
- **Land occupiers:** Directly affected and surrounding land occupiers;
- **Communities:** Surrounding communities;
- **Non-Governmental Organisations (NGOs):** Environmental and social organisations;
- **Agriculture:** associations or organisations focussed on agricultural activities; and
- **Business:** small and medium enterprises and formal organisations.

The directly affected farms (Dalyshope and Klaarwater) are owned by the Applicant.

9.2.2 Consultation with Stakeholders during the Scoping Phase

A notification letter and Short Message Service (SMS) were utilised to distribute invitations to the I&APs. Telephonic discussions were also undertaken throughout the Scoping Phase to inform I&APs about upcoming meetings, as well as to obtain comments. These three methods were employed to ensure that the stakeholders were well informed and given the opportunity to attend the meetings, affording them an opportunity to raise comments related to the Project.

As part of planning for face-to-face stakeholder consultations, Digby Wells submitted a Stakeholder Engagement Plan (SEP) as per the Covid-19 Regulations (GN R 650 of 5 June 2020) of the Department of Environment, Forestry and Fisheries. It should be noted that the

SEP was approved by the DMRE prior to the commencement of the public participation activities. The purpose of the stakeholder meetings was to disseminate detailed Project information to the I&APs. During the engagement the various stages of the Scoping process, and the public participation process were explained, as well as the related legislated timeframes. Having various stakeholder meetings (i.e. public and focus group meetings) was important in order to address the differing needs and concerns of the I&APs, for example employment, social development and land acquisition. A translator was available at the stakeholder meetings to assist with conveying the information presented in the appropriate language(s). Focus Group Meetings for the EIA Phase are planned to be held between 24 – 26 February 2021. This will, however, be confirmed with stakeholders.

9.2.2.1 Stakeholder meetings

A Focus Group Meeting and one-on-one meetings were held on 16 July 2020 and 17 July 2020, respectively. The Focus Group Meeting was held for select community members and Ward Committee Representatives at Lesedi Tshukudu Thusong Centre. The one-on-one meetings, on the other hand, were held for directly affected land occupiers at their respective residences.

The purpose of these meetings was to disseminate detailed information about the proposed Project, address comments already raised by the community representatives where possible, and to obtain further comments. A formal presentation was conducted by the EAP, during which maps showing the Project area and extent were made available.

Comments raised by the stakeholders were captured in the Comments and Response Report (CRR). The comments received during the Scoping phase were addressed by the Project team. Responses have been included in the CRR and were incorporated into the PP Chapter Report (see Appendix C).

9.2.3 Public Participation Activities

Table 9-1 provides a summary of the PP activities undertaken during the Scoping Phase together with the relevant reference for proof.

Table 9-1: Public Participation Activities

Activity	Details	Reference in Report
Identification of stakeholders	Stakeholder database which represent various sectors of society, including directly affected and adjacent landowners, in and around the proposed Project area.	**Appendix C1** Stakeholder Database
Distribution of BID announcement letter	A BID with registration and comment form was emailed to stakeholders on 20 April 2020 and 24 June 2020. An SMS was also sent to stakeholders announcing the availability of the Draft Scoping Report.	**Appendix C2** Announcement Materials

Activity	Details	Reference in Report
Placing of newspaper advertisement	A newspaper advertisement was placed in the Mogol Post to announce the extended public comment period once the national lock down ends and consultation can commence.	**Appendix C3** Proof of Advertisement
Putting up of site notices	Site notices were put up at the proposed Project site, a community centre, municipal offices and frequently visited shops on 25 February 2020. *A site notice placement report and map were developed to indicate the locations of site notices in and around the Project area.*	**Appendix C4** Proof of Site Notices
Announcement of Draft Scoping Report	Announcement of availability of the Draft Scoping Report was emailed and sent via SMSs to stakeholders together with the formal project announcement on 20 April 2020 and 24 June 2020. The Draft Scoping Report was released electronically and made available to stakeholders on the Digby Wells website (www.digbywells.com under Public Documents) and could be accessed via our data-free service portal. **Note:** *Due to COVID-19 Regulations, no documents were placed at public areas. Stakeholders were sent a data-free link where they could access the reports. http://view.datafree.co/PublicDocuments/* .	**Appendix C2** Announcement Materials
Stakeholder Consultations	A Focus Group Meeting was held with the closest community to the project site in Lesedi at Lesedi Tshukudu Thusong Centre on 16 July 2020. The meeting was attended by a combination of community members and Ward Committee Members.	**Appendix C5** Stakeholder Consultations
	One-on-one meetings were held with landowners at their respective residences on 16 and 17 July 2020.	
Obtaining comments from stakeholders	Comments, issues of concern and suggestions received from stakeholders were captured in the Comment and Response Report (CRR). The CRR is appended to this report (refer to Appendix C).	**Appendix C6** Comment and Response Report

9.2.4 Consultation with Stakeholders during the EIA Phase

During the Impact Assessment Phase, the following main Public Participation activities were undertaken:

- Feedback was provided on the findings of the specialist studies conducted and mitigation measures proposed by means of consultation with I&APs;
- Environmental reports were made available for public comment;

- Consultation with I&APs was conducted; and
- I&APs were again provided an opportunity to comment on specialist findings, impacts assessments and recommendations.

Table 9-2 provides more detail regarding the Stakeholder Engagement activities undertaken thus far, together with referencing materials.

Table 9-2: EIA Phase Public Participation Process Activities

Activity	Details
Update of stakeholder database	The stakeholder database was updated.
Announcement of EIA	Stakeholders were contacted through SMS and email on **11 February 2021,** announcing the availability of the Draft EIA Report. The Draft Scoping Report was released electronically and made available to stakeholders on the Digby Wells website (www.digbywells.com under Public Documents) and could be accessed via our data-free service portal. ***Note:*** *Due to COVID-19 Regulations, no documents were placed at public areas. Stakeholders were sent a data-free link where they could access the reports. http://view.datafree.co/PublicDocuments/* ***(30-day comment period for the Draft EIA Report: 10 February 2021 to 11 March 2021)***
Stakeholder Meeting	Focus Group Meetings are planned to be held between 24 – 26 February 2021. This will, however, be confirmed with stakeholders.
Obtained comments from stakeholders	The stakeholders were provided with an opportunity to comment on the Draft EIA Report. Comments, issues of concern and suggestions received from stakeholders will be captured in the final CRR.

9.3 Item 3(h)(iii): Summary of Issues Raised by I&APs

The CRR has been compiled capturing all stakeholder comments obtained during the Scoping Phase public comment period. The CRR will be updated to include stakeholder comments provided during the EIA Phase. Comments received to date are presented in Table 9-2 below.

Table 9-3: Comments and Responses Received During Scoping Phase

Category	Comment Raised	Contributor	Organisation / Community	Date	Method	Response
			Scoping Phase			
Stakeholder Engagement	If I understand correctly, the comments can only be given after the stakeholder engagement and discussion of related documents and reports.	Bernard Enslin	Servitudewatch CC	20-Apr-20	Email	The Scoping Report was released during the South African national lockdown period. It was therefore communicated via the associated notification to inform I&APs that the comment period will be extended beyond the usual 30-day comment period. It was communicated to registered I&APs on 24 June, that the Draft Scoping Report was available via Digby Wells website on the data-free portal for a further 30 days public comment from 24 June 2020 to 24 July 2020. Comments were, however, accepted and captured from 20 April 2020 to 24 July 2020.
Violation of people's constitutional rights	In the absence of public meetings – esp. given that not everyone has access to the internet where they can review the report and provide comments. The client should park the project until SE can be undertaken properly.				Telephonic	The comment period will be extended as per the DMRE's instructions published on the 9th April and that we will explore other avenues to engage with stakeholders once we have been instructed by the government on the next steps re the lockdown.
Registration I&AP	Hi there Please register WESSA as an I@AP for this process: UCD6170 Patrick Dowling Wildlife and Environment Society of South Africa – Environmental Governance group	Patrick Dowling	Wildlife and Environment Society of South Africa – Environmental Governance group	20-Apr-20	Email	Good day, Thank you for your response. Please note that we have registered WESSA as an I@AP, and have sent notifications to the emails below: wessa@limpopomail.co.za/ info@wessanorth.co.za Could you please provide us with additional emails if there are any
Documents receipt confirmation	Dear Janet Thank you for your notification and information document. We hereby confirm receipt and will go through the documents. Please do keep us informed of the engagement meetings	Lerato Ratsoenyane	Ledjadja Coal (Pty) Ltd	20-Apr-20	Email	As a registered I&AP, all further communications will be provided throughout the remainder of the project.

Category	Comment Raised	Contributor	Organisation / Community	Date	Method	Response
	to follow as we will participate as neighbouring mine and landowners.					
Registration I&AP	Good day, Attached please find Registration form on behalf of Eskom Distribution Limpopo	Mr Xander Neethling	Eskom Distribution Limpopo	20-Apr-20	Email	Good day Xander, Your email has been received with thanks. Please note that your comments will be captured on the CRR and you will be registered as an I&AP for the project.
Impact of the Project	Existing Eskom electrical network and future supply to the customer				Registration and Comment sheet	Power requirements for the project will be determined during the feasibility study and any impact to the existing and future supply will be discussed and addressed with Eskom once fully understood.
Project impacts on infrastructure you might have (e.g. houses, buildings, roads)?	Eskom powerlines					Noted.
Registration of I&AP and Request for EIA documents	Dear Madam Herewith included please find the I&AP registration form for the above-mentioned project. This registration is on behalf of the Wildlife and Environment Society of South Africa (WESSA) and correspondence must be directed in future to myself (above email address) and Dr Jeremy Anderson at conserva@global.co.za. The comments submitted on the accompanying document are based on the Announcement Letter and BID and are thus not comprehensive or complete. It will be necessary to be furnished with the EIA document and specialist reports and to be fully informed of the EA process including public participation process meetings for this project as these become available in the future. Please acknowledge receipt of this email. Thanking you in advance.	Dr Llew Taylor	Wildlife and Environment Society of South Africa (WESSA)	29-Apr-20	Email	Good day Dr Llew Taylor Your email has been received with thanks. Kindly note that your comments will be captured on the CRR and you will be registered as an I&AP for the project. Please Note: Due to the COVID-19 national lock down, the Draft Scoping report for the project has been made available on the Digby Wells website www.digbywells.com under public documents, for your perusal and comments. Furthermore, the public engagement process will be extended, and this timeframe will be shared with I&APs once the timeframe can be determined. Please do not hesitate to contact us for any additional information required. Kindest Regards, Stakeholder Engagement Team All registered I&APs were notified on 24 June 2020 of the data-free download and extended comment period. The EIA will be provided to the public for comment when available and all registered I&APs will be informed of its availability and methods of access.

Category	Comment Raised	Contributor	Organisation / Community	Date	Method	Response
How do you think the project might impact (affect) you?	Not necessarily, Interest taken in respect of representative of WESSA				Registration and Comment sheet	WESSA representative registered as an I&AP in April 2020.
Are there any environmental, social or heritage features on the proposed project area we need to be aware of?	1. Proximity to Limpopo Rive and Airport. 2. Question of classification of area by Limpopo Government- in terms of Limpopo Bioregional plan					**Proximity to Limpopo River**: The amend boundary of the study area occurs approximately 780 m away from the Limpopo River at its closest point. In addition, the landscape and topography is relatively flat with a number of isolated pans within the vicinity of the Project Area, so drainage into the Limpopo is believe to be limited, especially if the water utilised on-site is contained within the relevant Storm Water Management infrastructure. **Airport**: The airports or landing strips identified in the area are listed below with their distance from the proposed mining activity: • Exxaro Manketti runway – 35km from site • Fahad N R Balala Lodge – 47km from site • Macheneng Airport (Botswana) – 50km from site • Ellisras Airport – 50 km from site • Kera Landing Strip - 63km from site It is unlikely any of these airports will be impacted but should Digby Wells be unaware of any privately owned landing strips in the area, kindly provide us with the relevant information. **Question of classification of area by Limpopo Government- in terms of Limpopo Bioregional plan**: As per Section 3.4.2 in the Aquatic Biodiversity and Impact Assessment, the northern portion of the Project Area is classified as a Critical Biodiversity Area 1, while two of the pans within the southern portions are regarded as Ecological Support Areas. In each of these cases, the intention is to strive to achieve the Land Management Objectives for each respective category with the implementation of the Mitigation Hierarchy. However, it is recommended the Terrestrial Biodiversity and the Wetland studies also be referenced in terms of the appropriate considerations and the validity of these desktop-based classifications.
Where are these found?	Impact a local communities' agricultural activities in short, medium and long term.					Recommendations are made to ensure that the rehabilitation plan, mitigation measures, and continuous monitoring measures are in place, and encourage a concurrent rehabilitation plan. Therefore: • Impacts to Agricultural activities will be restricted the Dalyshope MRA and access road.

Category	Comment Raised	Contributor	Organisation / Community	Date	Method	Response
						However, if the proposed mitigation, rehabilitation and continuous monitoring are not followed it can lead to, but not limited to: • Degradation of agricultural potential; • Soil contamination by hydrocarbons; • Sedimentation and erosion of the wetlands; • Loss of soil depth; • Water quality and quantity degradation; and • Changes from a high land capability to a low land capability (from agriculture to wilderness).
If so, how can these impacts (affects) be managed, avoided or fixed?	Require Scoping Report and EIA report/ process (in time) to tackle valued judgements and comments.					The Scoping Report was available for download from 20 April 2020 until 24 July 2020 (data-free download available from 24 June to 24 July). All registered I&APs will be informed of the EIA Report availability and the dates for comment.
Registration I&AP	Hi, Please register me and Michael Taffa as interested and affected parties on this project (see attached). Regards	Alan Bosman	Eskom Holdings (Pty) Ltd	26-Jun-20	Email	Dear Alan, Thank you for your communication and interest in the Dalyshope Coal Mining Project. Kindly note that your comments will be captured on the Comment and Response Report and you will be registered as an I&AP for the project. Warm Regards,
How do you think the project might impact (affect) you?	Road, Rail traffic, potential pollution and crime.				Registration and Comment sheet	The Air Quality Impact Assessment, Socio-economic Impact Assessment and Traffic Impact Assessment undertaken as part of the EIA Phase are appended to this report as Appendix L, Appendix O and Appendix Q, respectively. The Applicants are responsible for security from their site. This will include ensuring neighbouring farms are not illegally accessed, nor allow any unauthorised entry onto the mine site. The Standard Operating Procedure (SOP) will be developed and shared with neighbouring landowners once the mine has been approved.
Project impacts on socio-economic conditions (e.g. livelihoods, farm, business, household)?	Possible air quality and groundwater impacts as well as traffic and crime.					The Air Quality Impact Assessment, Socio-economic Impact Assessment and Traffic Impact Assessment undertaken as part of the EIA Phase are appended to this report as Appendix L, Appendix O and Appendix Q, respectively. **Groundwater:** The surface water assessment identified potential impacts on the Limpopo River in terms of water quality and quantity. The water quality concerns pertain to contaminated runoff flowing into the River from the mining area. This risk was quantified, and mitigation measures recommended to ensure minimal impacts on the River. A stormwater management plan has been proposed to ensure that dirty water does not mix with clean water in the Limpopo

Category	Comment Raised	Contributor	Organisation / Community	Date	Method	Response
						River. Furthermore, the water storage structures have been designed to spill, on average, once in a 50-year return period in accordance with the relevant legislation (i.e. GN704). **Crime**: The SIA (appended as Appendix O) addresses in detail potential impacts to Community Health Safety and Security and provides relevant management actions to be adopted by the Applicant in collaboration with the local police and health services.
How can these impacts be managed, avoided, and/or fixed?	Careful impact assessment, planning and successful implementation of mitigation measures.					Impacts and the associated mitigation have been investigated by the various specialists during the EIA Phase of the Project. These are provided in Section 11.1. Should this Project be approved, the Applicant will be committed to environmental audits conducted by independent environmental consultants to measure compliance with the Environmental Management Plan.
If you are a landowner or occupier, what is your land currently being used for?	Industrial, agricultural and game management.					Thank you for the information provided.
Are there any environmental, social or heritage on the proposed project area we need to be aware of?	Not known.					Thank you for your response.
Project impacts on infrastructure you might have (e.g. houses, buildings, roads)?	Road and Rail Impacts.					The Traffic Impact Assessment undertaken as part of the EIA Phase is appended to this report as Appendix Q. All infrastructure within the blast radius were also considered in the Blast Impact Assessment which is appended to this report as Appendix P.
If so, how can these impacts (affects) be managed, avoided or fixed?	Careful planning and implementation of mitigation measures.					Impacts and the associated mitigation have been investigated by the various specialists during the EIA Phase of the Project. These are provided in Section 11.1. Should this Project be approved, the Applicant will be committed to environmental audits conducted by independent environmental consultants to measure compliance with the Environmental Management Plan.
General comments	Concern over impact on international River (Limpopo); Potential pollution; Crime impact; and Traffic management					**Limpopo River:** The surface water assessment identified potential impacts on the Limpopo River in terms of water quality and quantity. Concerns over the reduction in the runoff reporting to the Limpopo River were also quantified. The findings of the study indicate that the MAR in quaternary

Category	Comment Raised	Contributor	Organisation / Community	Date	Method	Response
						catchment A41E is equivalent to 0.8% of MAP. Furthermore, the quaternary catchment is dominated by endoreic areas, which do not contribute to any runoff. Therefore, the proposed mine development is unlikely to contribute to substantial changes in runoff flowing into the Limpopo River as the project area did not contribute much flow into the River even prior the proposed mining activities.
Registration I&AP	Good day, I would like to register as an I & A party. I object against this proposed project due to quite a few reasons. Will there be any public participation? If so, when? Please send me the information. Regards E Greyling	Elana Greyling	Community	01-Jul-20	Email	Good day Ms. Greyling, Thank you for your email. Can you please complete the attached so that we have all your contact information and written comments. Kind regards, Stakeholder Engagement Team Ms Greyling has been registered as an I&AP and has been included in all correspondence pertaining to public participation. No further communication was received during the Scoping Phase public comment period. Due to Covid, no public meetings were held but data free access to the Scoping Report was provided to all I&APs. Focus Group Meetings were held with community representatives on 16 July and with directly affected landowners on 17 July.
Air Quality impacts	Ambient Air Quality Standards within the Waterberg District Municipality is affected	Vincent Raphunga (Air Quality Officer)	Waterberg District Municipality	01-Jul-20	Registration and Comment sheet	The Air Quality Impact Assessment undertaken as part of the EIA Phase considered the cumulative impacts with respect to air quality. Mitigation measures have been provided to minimise identified potential negative impacts (please see Appendix L).
Project impacts on socio-economic conditions (e.g. livelihoods, farm, business, household)?	Health of the Community could be negatively affected and comprised.					Consultation with the Lephalale Municipality indicated that air quality has deteriorated due to the power stations in the region. The Air Quality Impact Assessment looked at the baseline air quality (i.e., the air quality in the area before the project is implemented) and the potential for increased air pollution if the project is implemented. (please see Appendix L).
Impacts mitigation	All activities must be done according to Air Quality Acts and Regulations.					The Air Quality Impact Assessment report is compliant with NEMA, NEM:AQA and relevant regulations.
General comments	Please find attached Eskom general comments for works at or near Eskom infrastructure. Please send me a KMZ file of the affected property / proposed mining	John Geeringh	Eskom Transmission Division	09-Jul-20	Email	The Applicant, Anglo, acknowledges these comments. Eskom is a registered I&AP and will be informed throughout

Category	Comment Raised	Contributor	Organisation / Community	Date	Method	Response
	area. Kind regards					the remainder of the Environmental Authorisation Application process. These comments have been provided to the Applicant as some of these comments fall outside the current process to which this report pertains.
General comments	1. Eskom's rights and services must be acknowledged and respected at all times.					
General comments	2. Eskom shall at all times retain unobstructed access to and egress from its servitudes.					
General comments	3. Eskom's consent does not relieve the developer from obtaining the necessary statutory, landowner or municipal approvals.					The wayleave applications are separate application processes to the Environmental Authorisation process.
General comments	4. Any cost incurred by Eskom as a result of non-compliance to any relevant environmental legislation will be charged to the developer.					
General comments	5. If Eskom has to incur any expenditure in order to comply with statutory clearances or other regulations as a result of the developer's activities or because of the presence of his equipment or installation within the servitude restriction area, the developer shall pay such costs to Eskom on demand.					The Applicant has been made aware of this input. Eskom inputs and compliance will be adhered to.
General comments	6. The use of explosives of any type within 500 metres of Eskom's services shall only occur with Eskom's previous written permission. If such permission is granted the developer must give at least fourteen working days prior notice of the commencement of blasting. This allows time for arrangements to be made for supervision and/or precautionary instructions to be issued in terms of the blasting process. It is advisable to make application separately in this regard.					The Applicant has been made aware of this input. Eskom inputs and compliance will be adhered to.
General comments	7. Changes in ground level may not infringe statutory ground to conductor clearances or statutory visibility clearances. After any changes in ground level, the surface shall be rehabilitated and stabilised so as to prevent erosion.					The Applicant has been made aware of this input. Eskom inputs and compliance will be adhered to.

Category	Comment Raised	Contributor	Organisation / Community	Date	Method	Response
	The measures taken shall be to Eskom's satisfaction.					
General comments	8. Eskom shall not be liable for the death of or injury to any person or for the loss of or damage to any property whether as a result of the encroachment or of the use of the servitude area by the developer, his/her agent, contractors, employees, successors in title, and assignees. The developer indemnifies Eskom against loss, claims or damages including claims pertaining to consequential damages by third parties and whether as a result of damage to or interruption of or interference with Eskom's services or apparatus or otherwise. Eskom will not be held responsible for damage to the developer's equipment.					The Applicant has been made aware of this input. Eskom inputs and compliance will be adhered to.
General comments	9. No mechanical equipment, including mechanical excavators or high lifting machinery, shall be used in the vicinity of Eskom's apparatus and/or services, without prior written permission having been granted by Eskom. If such permission is granted the developer must give at least seven working days' notice prior to the commencement of work. This allows time for arrangements to be made for supervision and/or precautionary instructions to be issued by the relevant Eskom Manager					The Applicant has been made aware of this input. Eskom inputs and compliance will be adhered to.
General comments	10. Eskom's rights and duties in the servitude shall be accepted as having prior right at all times and shall not be obstructed or interfered with.					The Applicant has been made aware of this input. Eskom inputs and compliance will be adhered to.
General comments	11. Under no circumstances shall rubble, earth or other material be dumped within the servitude restriction area. The developer shall maintain the area concerned to Eskom's satisfaction. The developer shall be liable to Eskom for the					The Applicant has been made aware of this input. Eskom inputs and compliance will be adhered to.

Category	Comment Raised	Contributor	Organisation / Community	Date	Method	Response
	cost of any remedial action which has to be carried out by Eskom.					
General comments	12. The clearances between Eskom's live electrical equipment and the proposed construction work shall be observed as stipulated by Regulation 15 of the Electrical Machinery Regulations of the Occupational Health and Safety Act, 1993 (Act 85 of 1993).					The Applicant has been made aware of this input. Eskom inputs and compliance will be adhered to.
General comments	13. Equipment shall be regarded electrically live and therefore dangerous at all times.					The Applicant has been made aware of this input. Eskom inputs and compliance will be adhered to.
General comments	14. In spite of the restrictions stipulated by Regulation 15 of the Electrical Machinery Regulations of the Occupational Health and Safety Act, 1993 (Act 85 of 1993), as an additional safety precaution, Eskom will not approve the erection of houses, or structures occupied or frequented by human beings, under the power lines or within the servitude restriction area.					The Applicant has been made aware of this input. Eskom inputs and compliance will be adhered to.
General comments	15. Eskom may stipulate any additional requirements to highlight any possible exposure to Customers or Public to coming into contact or be exposed to any dangers of Eskom plant.					The Applicant has been made aware of this input. Eskom inputs and compliance will be adhered to.
General comments	16. It is required of the developer to familiarise himself with all safety hazards related to Electrical plant.					The Applicant has been made aware of this input. Eskom inputs and compliance will be adhered to.
General comments	17. Any third-party servitudes encroaching on Eskom servitudes shall be registered against Eskom's title deed at the developer's own cost. If such a servitude is brought into being, its existence should be endorsed on the Eskom servitude deed concerned, while the third party's servitude deed must also include the rights of the affected Eskom servitude.					The Applicant has been made aware of this input. Eskom inputs and compliance will be adhered to.

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Request for clarification	Is this meeting intended to continue with the Social and Labour Plan discussion?	L Molefe (Ward Committee Representative)	Lesedi Community	16-Jul-20	Focus Group Meeting	No, the purpose of this meeting is to present the project and its potential impacts as identified in the Scoping Phase. The Scoping Phase looks at the environmental baseline (the environment before the project is implemented). The next phase of the application process is the Impact Assessment Phase, which includes specialist studies which look at the project impacts in detail. Specialist studies are currently underway. The Environmental Impact Assessment Report will include a summary of the specialist studies, and all the specialist studies will be made available to the public for review. The SLP discussions will be resumed at a later date once Digby Wells and Universal Coal have received DMR directives related to the draft SLP submitted.
SLP to address the demands	We understand that the municipality does not perceive the Lesedi as a formal settlement; however, we need the SLP to address issues related to water and other infrastructure development in the area.	D. Majapholo (Community Rights Defender)	Lesedi Community	16/07/2020	Focus Group Meeting	Noted.
Access to Permits	Digby Wells will undertake several licensing permits for the mine. How do we as a community get hold of these permits so that we can hold the mine to account for its negative impacts?		Lesedi Community	16/07/2020	Focus Group Meeting	The EIA Report will be made available, as well as the report associated with the Water Use Licence Application. The public therefore will be provided the opportunity to review Digby Well's reports before these reports are submitted to government. Once a licence or authorisation is issued bu a government department, all registered I&APs will be informed. If any I&AP disagrees with the outcome or decision of a department, the decision can be appealed.
Understand the background of the proposed site.	Mining companies wanting to work in the area should seek to understand our history.	L Molefe (Ward Committee Representative	Lesedi Community	16/07/2020	Focus Group Meeting	Noted. The Heritage Impact Assessment report (Appendix N) presents a summary of the cultural heritage baseline which is based on available literature and is not considered exhaustive. Should the community be aware of references which represent their history, and which have not been included in the baseline, they can make these references known through the Public Participation Process.
Unlawful relocation of graves	One of the mines in the area relocated people's graves (about 15 graves) without any notifications given to the population or compensation. The mine then changed its name when people started questioning what happened to their graves and it was		Lesedi Community	16/07/2020	Focus Group Meeting	Noted. A Grave Relocation Process (GRP) is beyond the current scope of the Heritage Resources Management (HRM) process. Where a GRP may be considered necessary, this process must be undertaken in compliance with Section 36 of the NHRA and Chapter XI of the NHRA Regulations.

Category	Comment Raised	Contributor	Organisation / Community	Date	Method	Response
	eventually sold. So Universal should not do the same.					
Request for consultation	We used to work and live full time on some of these farms, and we buried our people in some of them; thus, we need to be consulted if there are graves that will be affected. Which farms will be affected by the project, are there any graves on the site?	J Nkoati (Representative from the Chief)	Lesedi Community	16/07/2020	Focus Group Meeting	Noted, the project affected farms are Dalyshope and Klaarwater. These are owned by Anglo Coal. The cultural heritage specialist report has been appended to this report as Appendix N. No graves were identified during the pre-disturbance survey or the verification survey. Where graves are known by the community to occur on the farms Dalyshope or Klaarwater, the community can make the location of these graves known so that they can be included in the HRM process and impact assessment.
The upskilling of the community	Most middle-aged people in the community have only primary schooling as there were no secondary schools in the area. How does Universal plan to upskill such people so that they can take up employment opportunities with the mine?	L Molefe (Ward Committee Representative)	Lesedi Community	16/07/2020	Focus Group Meeting	Targets for training and capacity building for the community will be outlined in the mine’s SLP which has been submitted to DMRE for review and comment. The SLP will also be a public document so you will be able to hold Universal to account on non-delivery.
Water Issues	We understand that water and transportation of the coal from the area is still a challenge for the project. Our advice to Universal is to process the coal elsewhere - the newly opened mine in the area mines then transports the coal to Witbank for processing.		Lesedi Community	16/07/2020	Focus Group Meeting	This not practical, Dalyshope is in Lephalale, to transport the coal to Witbank is uneconomical. During the feasibility study, methods will be investigated to reduce water consumption, such as filtration of tailing streams and recycling of water. In addition, the erection of fully enclosed water storage tanks to minimise the evaporation of water will be considered.
Royalties	Have you heard about royalties? Can Universal consider paying the community royalties instead of implementing SLP programs as the municipality will never allow infrastructure development in the area?		Lesedi Community	16/07/2020	Focus Group Meeting	Noted, we will share your suggestion with Universal.
Relocation	Universal should be aware that the Lesedi community is not interested in being relocated regardless of the project impacts. Our people will never be able to afford to live in a township situation.	D. Majapholo (Community Rights Defender)	Lesedi Community	16/07/2020	Focus Group Meeting	Noted.
Project Impacts	How will influx related impacts be managed?		Lesedi Community	16/07/2020	Focus Group Meeting	The project alone is not expected to induce significant in-migration of people in the area. However, mitigation measures tailored towards managing and reducing impacts

Category	Comment Raised	Contributor	Organisation / Community	Date	Method	Response
						associated with Project Induce In-Migration (PIIM) have been included in the SIA. An in-migration management plan will need to be developed in the future, if other proposed mines in the area are established. This will need to be a collaborative effort between the different mines and local government.
Local Business	What can we do to ensure that our locally registered companies are offered procurement contracts?		Lesedi Community	16/07/2020	Focus Group Meeting	Apply for tenders, attend tender meetings and make sure that you present all the requested information on your proposal. Before universal starts its operations, attend some tender clarification meetings for another mine in order to familiarise yourselves with the processes, attend any training offered by business incubator agencies such as SEDA; draft your business plan so that you can qualify for some government funding, etc
Meeting Invite	Whenever you are planning to hold a meeting here, make sure you invite the Chief's representative that reside in the community as he was not invited to the previous meetings		Lesedi Community	16/07/2020	Focus Group Meeting	Noted with thanks. We were not aware there is the residing chief in the area.
Vote of thanks.	Thank you for involving the community in the proposed project, the community appreciate your efforts and initiatives. Keep us posted with all the developments (Chief's Representative).	J Nkinati (Community Member)	Lesedi Community	16/07/2020	Focus Group Meeting	Thank you, all developments will be communicated with the community.
Socio-economic	Will the project proceed?	Tharina Pelser	Landowner	16/07/2020	Focus Group Meeting	From a legal perspective, the Applicant is required to have all the necessary licences and authorisations in place for the project to proceed. This process will take approximately a year to finalise. If approved the Applicant is usually provided a period of time to implement the project, and if mining activities do not commence within that timeframe, the authorisation will lapse.
Traffic	1. With regards to the road upgrade, will the road be tarred? 2. The roads to Stockpoort and Steenbokpan have been damaged by trucks. If the project goes ahead, to what extent will the surrounding road networks be impacted?					1. The design of the roads will be done in conjunction with the Provincial Roads Department following a Traffic Impact assessment. The recommendations of the Provincial Roads Department will be implemented. 2. A traffic impact assessment was undertaken during the EIA Phase to determine the impact coal trucks from this operation will have on the surrounding road network. The Applicant was advised to upgrade the Steenbokpan Road (D1675) and D175.

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Groundwater	The borehole on the Farm Canada has dried out. Will there be enough water for this project and how will this impact surrounding land users?					As part of the Groundwater Impact Assessment, the effect on groundwater as a result of the mining operation was modelled. It is unclear at this stage where the operation will get water from, but several options must be investigated. If the project does rely on borehole water, the resource boreholes will need to be included in the model to predict the zone of influence.
Blasting	What impact will blasting have on boreholes and structures?					A Blast Impact Assessment (Appendix P) was conducted as part of the EIA Phase. This I recorded all structures within the specified blast radius and determined to what level these structures will be impacted.
Visual	How close can the rock dumps come to the fence? We are concerned about dust being blown off of these dumps.					The dumps are quite close to the fence, but the potential of rock being blown off from the rock dumps is highly unlikely. Measures will be put in place to suppress the emission of dust and other small particles from the dumps.
Visual	What is the long-term plan for the discard dump? And will they use topsoil to cover the dumps?					The discard will be taken by conveyor belt back to the pit head where it will be loaded into trucks to be deposited back into the bottom of the pit. While it is being stockpiled on site, topsoil will be used to cover the dump.
Water	Can the mine abstract water from the Limpopo?					Although it is possible, this will be an unlikely option for the mine. The Limpopo is a shared resource with Botswana which requires international agreements to be in place, as well as permission to do so. Other water source options will be investigated before abstraction from the Limpopo is considered.
Socio-economic	Where will the mine staff live and how will they be transported?					The staff will be required to get their own accommodation in town or surrounding areas. Transport to and from the mine will be provided from designated points.
Socio-economic & Visual (sense of place)	We are concerned that we won't be able to attract foreign hunters to our lodge with a coal mine next door. We rely on international travellers to generate enough income to survive.					It is understood that the proposed development will have a negative visual impact on the surrounding areas; however, measures and recommendations have been put in place from a visual perspective to ensure that the sense of place is not lost entirely.
Life of Mine	Aren't there coal reserves to the north of Klaarwater? Will they mine these reserves after this pit is fully mined?					OC1 has a life of approximately 20 to 25 years. Should the Applicant want to mine any other reserve not contained in this application, the Applicant will need to apply to do so and undertake the necessary environmental investigations.

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Socio-economic & Visual (sense of place)	If the mining area expands, it's better for the mine to buy the farm than to live next to a mine.					This application only considers the current proposed mining layout and a single opencast pit with an approximate 30-year LoM. Should the Applicant wish to expand the mining area, a new application and consultation process will need to be undertaken.
Socio-economic	What is the market for the coal to be mined?	Piet Nel	Landowner	17/07/2020	Focus Group Meeting	The market is currently Eskom/local
Visual	What kind of visual barriers will be in place to prevent neighbouring farms from being exposed to the mine?					The following visual barriers have been recommended: • Increased vegetation in areas where there is no infrastructure to assist in the screening of the project; • Topsoil covering and vegetation of stockpiles so it blends in with the surrounding landscape; and • Ensure trees and plants are planted along the fence line to provide visual screening.
Socio-economic	What is the project timeline?					The Application process will take approximately two years. Once all the necessary licences and authorisations are in place, the Applicant can commence with construction.
Groundwater & Cumulative impacts	This project will deplete all groundwater in the area. There are so many approved mining projects on the surrounding farms, that all these operations will deplete our groundwater resources. These mining companies must be held liable and a regional study must be undertaken to understand the far-reaching implications to groundwater and farming.					A Groundwater Impact Assessment, which will also consider cumulative impacts, will be undertaken in the EIA Phase.
Socio-economic & Visual	We can't hunt with an operational mine next door. We will lose international hunting clients.					It is understood that the proposed development will have a negative visual impact on the surrounding areas; however, measures and recommendations have been put in place from a visual perspective to ensure that the sense of place is not lost entirely.
Groundwater	The environmental baseline needs to be done accurately to assess the actual impact of the project to groundwater.					A hydrocensus has been undertaken and the environmental baseline has been provided in the Groundwater Report and summarised in the EIA Report.
Security	How will Universal Coal keep their employees out of neighbouring farms?					All necessary security measures will be implemented on the mine. Strict access control into and exiting the mine will be implemented. All mine personnel will be issued with ID cards and be required to carry these ID cards.

Category	Comment Raised	Contributor	Organisation / Community	Date	Method	Response
Public participation	We prefer smaller meetings to large public meetings, as not everyone gets a chance to speak during large meetings.	Louw Swanepoel & Dewald de Beer	Landowner & attorney	17/07/2020	Focus Group Meeting	Due to Covid-19, Digby Wells is taking necessary precautions to avoid gathering groups of people. We will most likely conduct face-to-face meetings will essential stakeholder during the EIA Phase.
Blasting	How will neighbouring farms be impacted by blasting, especially the wildlife because it may scare the animals.					A Blast Impact Assessment (Appendix P) was conducted during the EIA Phase and determined how far the air blast and rock blast radii will extend. This also determined to what extent the neighbouring farms will be affected.
Security	How will Anglo maintain the boundary fences?					Boundary fences will be inspected on a regular basis, generally daily but could be longer, to ensure no breaches. If a breach is detected during inspection the breach is mended as soon as possible.
Groundwater	We are dependent on boreholes for water on the farm. We have four boreholes on the farm, one of which is very close to the Dalyshope.					Thank you for the information. Digby Wells will consider this during the EIA Phase. GPS co-ordinates for the boreholes have been requested.
Traffic	The roads are in a bad condition in the area and haul trucks will cause the roads to further deteriorate.					A Traffic Impact Assessment was undertaken during the EIA Phase which considered the impacts to the surrounding road network. The Applicant is required to upgrade the D1675 (Steenbokpan road) as well as the D175 (road which serves as an access route for the farms situated near the Project area) to accommodate impacts related to haul trucks using this road.
Noise and Blasting	Will the mine blast and how will they blast so that the noise doesn't affect the neighbouring farms?					A Blast Impact Assessment was conducted during the EIA Phase and determined how far the air blast and rock blast radii will extend. This also determined to what extent the neighbouring farms will be affected.
Blasting	Houses and dams have already been affected by the existing mines in the area.					The Blast Impact Assessment considered all structures in the surrounding blast radius and determined to what extent these structures may be affected. The mine must also keep a record of structures and should a neighbouring landowner believe the mine has affected their property, the mine must investigate.
Environmental Legal Process	Do impact studies happen before or after mining starts?					The specialist impact assessments are required as part of the Environmental Authorisation application process. Generally, a mine requires at least three authorisations/licences before they are allowed to operate. These include: • Mining Right in terms of the MPRDA; • Environmental Authorisation in terms of NEMA; and • Water Use Licence in terms of the NWA.

Category	Comment Raised	Contributor	Organisation / Community	Date	Method	Response
Socio-economic	We farmers have been waiting for years to have confirmation whether the project will proceed or not. We need time to plan our future. We already face difficulties with financial planning with factors like draught. We need to know if Anglo plans to buy these farms so we can plan for our future. By not proceeding, Anglo is holding up development in the area in some respects. We need to know and be informed of what is going on. We need to prepare.					Only land required for mining activity will be purchased and negotiations will be held with those individual landowners at the appropriate time. Landowners should proceed with normal activities until they are approached by an authorised mine representative.
Cumulative impacts	Will Digby Wells consider the impact to surrounding farms? We've had so many specialists on our farm over the years so we hope this information will be used to provide an accurate impact from the project to the area.					Digby Wells looks at various aspect (ie, soil, water, social, air quality, etc) and determine how the mine infrastructure will impact the natural and social environment and must determine the extent of the impact. During the specialist site inspections, each specialists identified the various farms in the area which they wanted to survey, so the project impact is not necessarily focused on Klaarwater and Dalyshope. Older studies can be referenced; however, it must be noted that the environment is ever-changing and older data my no longer be relevant. As part of this process, each specialist considered cumulative impacts for their respective filed of expertise. The older studies can be utilised for this purpose.
Mine infrastructure	Is there coal beneath the plant area?					No, the infrastructure layout considered the coal deposits in the area, and place infrastructure in such a way to avoid sterilising coal reserves.
How do you think the project might (affect) you?	The proposed mine is in an area of very high importance to free roaming cheetah (a naturally protected species), who would be impacted by the development of the mine and the associated infrastructure-which will also impact other species of fauna and flora.	Ashleigh Dare	The Endangered Wildlife Trust	24-Jul-20	Registration and Comment sheet	Although the mining right extends over many farm portions, this application and related mining activities will only take place on Dalyshope and Klaarwater. These two farms are used for grazing, cattle breeding and hunting. Should the Applicant wish to expand mining activities beyond this scope, additional studies and applications must be undertaken. A protected tree assessment is being undertaken on Klaarwater and Dalyshope, and a Fauna and Flora Impact Assessment will also form part of the EIA Phase.
Project impacts on socio-economic-conditions (e.g. livelihoods, farms, business, household)	Fauna and Flora. We are greatly concerned about the resultant habitat destruction, movement barriers and wildlife vehicle collisions that will occur. From a socio-economic perspective we					The protected tree assessment pertains to identifying protected trees and applying to relocate these trees from the impacted mining area to preserve the species. Ecosystem services were considered in the EIA Phase by the relevant specialists. Protected species are proposed to be relocated through an offset strategy in order to compensate for

Category	Comment Raised	Contributor	Organisation / Community	Date	Method	Response
	are concerned about the loss of ecosystem services.					biodiversity impacts or losses caused by the proposed Project. Please see the fauna and flora study undertaken as part of this phase (Appendix I).
How can these impacts be managed, avoided or fixed?	The impacts can be avoided by not mining the area.					The "No-go" alternative, preserving the status quo, was also considered and is presented in this EIA Report.
Are there any environmental, social or heritage features on the proposed project area we need to be aware of?	Detailed above. This area is of high importance to free roaming cheetah (a listed species in the TOPS list, listing un vulnerable). Further this Coal Mine could impact on the water of the Limpopo River.					Thank you, these concerns will be considered in the EIA Phase.
Where are these found?	Both occur naturally within the proposed mining area.					Noted. Thank you for this information.
General comments	Risks related to cheetah, the Limpopo River, and other species of fauna and flora, which may be impacted by the infrastructure development (including but not limited to habitat degradation, fragmentation, movement barriers, and collisions with vehicles) must be fully considered and addressed.					The specialist impact assessments, as mentioned, were undertaken in during this EIA Phase, and the identified impacts have been presented in this report.
How do you think the project might impact (affect) you?	The project might assist the Leseding community with the necessary interventions to classify the area as a formal settlement.	Ditiro Jan Majapholo	Community Member	24-Jul-20	Registration and Comment sheet	The determination of a formal settlement is the responsibility of the municipality and therefore these concerns must be raised with the local municipality and directed through the correct channels of communication.
How do you think the project might (affect) you?	The project has the potential to contaminate the soil and air quality in the area which might negatively impact on agricultural activities and the wellbeing of the community. Wildlife will also be impacted as the project will contribute to habitat destruction.					Soil: Recommendations are made to ensure that the rehabilitation plan, mitigation measures, and continuous monitoring measures are in place, and encourage a concurrent rehabilitation plan. Recommendations include, but is not limited to: • Runoff must be controlled, and managed by use of proper stormwater management measures; • Vehicles should regularly be serviced and checked that oils spill and other contaminants are not exposed to the soils; • Fuel, grease, and oil spills should be remediated using a commercially available emergency clean up kits. However, for major spills (>5L), if soils are contaminated, they must be stripped, and disposed of at a licensed waste disposal site;

Category	Comment Raised	Contributor	Organisation / Community	Date	Method	Response
						• Ensure proper lining of the temporary PCD, and maintenance to prevent spillage, and leakages into the soils, and water resources; • Soil pollution monitoring should be conducted at selected locations on the project site to detect any extreme levels of pollutants; • Monitor decant of AMD and implement management measures which include in-situ passive treatment or neutralisation, and electrolytic treatment using a Water Treatment Plant (WTP) to get purified water for discharge to the natural environment or other beneficial uses; and • Seal the shaft by placing concrete plugs as well as implement a monitoring plan to ensure no decant. Therefore: • Impacts to Agricultural activities and the wellbeing of the local community will be restricted the Dalyshope MRA and access road and will be rehabilitated and monitored through and beyond the Life of Mine. An Air quality Impact Assessment has been appended to this report as Appendix L.
How can these impacts be managed, avoided or fixed?	By following all relevant legislations pertaining to mining and the environment. The project team should continuously involve and engage with the local community.					Your details have been captured in the Stakeholder database for the environmental-legal application processes and you will continue to receive communications for the remainder of the Project. During the EIA Phase, further public consultation will be undertaken and therefore further opportunity exists to provide comments into this environmental process.
Do you think the project could impact (affect) infrastructure you might have? (e.g. houses, buildings, roads)	Increased traffic and portholes on roads. Infrastructures more especially farmhouses will hugely be impacted by the blasting					A traffic Impact Assessment was undertaken during the EIA Phase which considered the impacts to the surrounding road network. The Applicant is required to upgrade the D1675 (Steenbokpan road) as well as the D175 (road which serves as an access route for the farms situated near the Project area) to accommodate impacts related to haul trucks using this road. A Blast Impact Assessment has also been conducted during the EIA Phase and determined how far the air blast and rock blast radii will extend. This also determined to what extent the neighbouring structures will be affected.
If so, how can these impacts (affects) be	Construction of new roads and maintenance of the current Steenbokpan road					The Applicant is proposing to upgrade the access road to accommodate the haul trucks.

Category	Comment Raised	Contributor	Organisation / Community	Date	Method	Response
managed, avoided or fixed?	Farm owners should be involved in decision-making regarding infrastructures in the vicinity of the mining area					All directly affected landowners are being consulted and will continue to be consulted throughout the environmental legal application process.
	The local community should be given first preference when awarding business tenders					The mine must consider local work force and services should local businesses be capable of providing the required services.
	The community, more especially women and youth should be given the necessary training before the mining activities can begin					This operation will be a contractor operation, meaning the staff requirements will be provided by a mining contractor. Any new opportunities that can be provided to the local communities must consider training and hiring form the community.
	The mining company should collaborate with the local municipality to build schools and houses for the community					The Applicant has submitted a Social and Labour Plan which has been negotiated with the local community, the municipality and the DMRE.
	Focus should be given to youth organisations in educating and improving the lives of the local youth					
	The local community should be given first preference when coming to permanent employment					This operation will be a contractor operation, meaning the staff requirements will be provided by a mining contractor. Any new opportunities that can be provided to the local communities must consider training and hiring form the community.
	The mine is responsible for all the environmental liabilities in terms of the ‘Duty of Care” principle.					Yes, should the application be approved, and mining proceed, the duty of care will be the responsibility of the mine.

10 Item 3(i): The Environmental Attributes associated with the Development Footprint Alternatives

This section provides a description of the baseline environment associated with the Project area and region (where relevant). The purpose of understanding the environmental baseline conditions relates to the potential of the project to impact on the existing environment, and the potential for existing environmental aspects to influence a proposed development in terms of design, location, technology and layout.

A number of specialist studies were undertaken as part of the environmental regulatory process during the EIA phase for the proposed Project, as shown in Table 10-1 below.

Table 10-1: Specialist reports and associated appendices

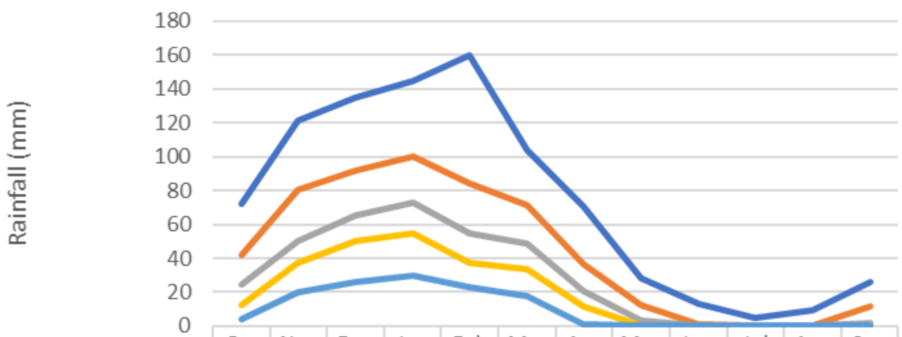
Specialist Study	Appendix
Visual Impact Assessment	Appendix D
Soil, Land Use and Land Capability Assessment	Appendix E
Surface Water Assessment	Appendix F
Groundwater Assessment	Appendix G
Geochemical and Waste Classification Assessment	Appendix H
Fauna and Flora Assessment	Appendix I
Wetland Assessment	Appendix J
Aquatics Impact Assessment	Appendix K
Air Quality Assessment	Appendix L
Noise Assessment	Appendix M
Heritage Assessment	Appendix N
Social Assessment	Appendix O
Blast and Vibration Assessment	Appendix P
Traffic and Transport Assessment	Appendix Q
Rehabilitation and Closure Assessment	Appendix R

The subsection below provides the baseline bio-physical and socio-economic environmental conditions currently present on the Project site. The information provided in this section has been obtained from the abovementioned specialist reports.

10.1 Regional Climate

The Mining Right area falls within the Northern Arid Bushveld climatic region, which is characterised by warm, wet summers and dry winters. Summer temperatures can reach a maximum average of 33°C between November and February, which drops to a minimum average temperature of 5°C during the winter months of June and July. Frost is infrequent in the area. The area is further characterised as generally low lying, dry to arid, hot region with altitudes ranging from 300 – 1100 m above mean sea level (mamsl).

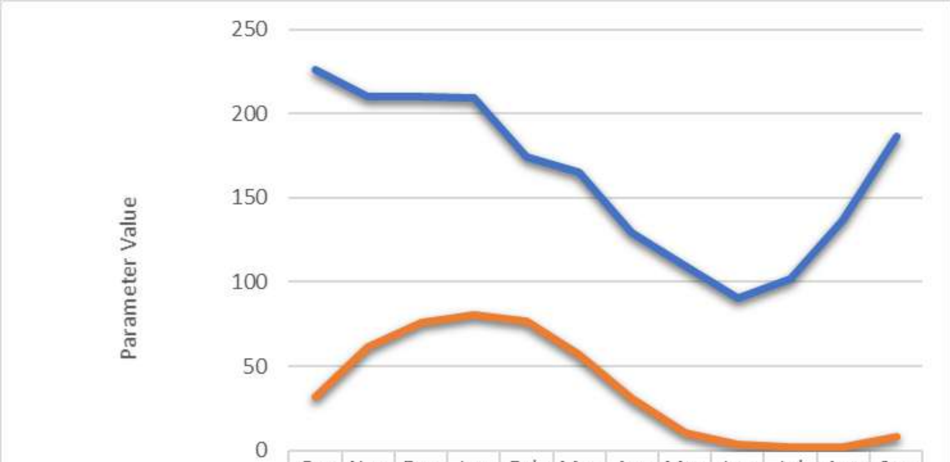
Rainfall occurs predominantly during the summer months (November and December) with a Mean Annual Precipitation (MAP) of 438 mm (WRC, 2015), which is likely to be distributed as indicated in Figure 10-1. The 90th percentile of the wettest month (January) is 145 mm while the 10th percentile is indicated to be 30 mm for the same month. This implies that this region generally receives low to moderate rainfall during the rainy season.



	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
90 Percentile	72	121	135	145	160	104	70	28	13	5	9	26
70 Percentile	42	80	92	100	84	71	37	13	1	0	0	11
50 Percentile	25	50	65	73	55	49	21	4	0	0	0	2
30 Percentile	13	37	50	54	38	34	12	0	0	0	0	0
10 Percentile	4	20	26	30	23	17	1	0	0	0	0	0

Figure 10-1: Monthly Rainfall Distribution for Quaternary Catchment A41E

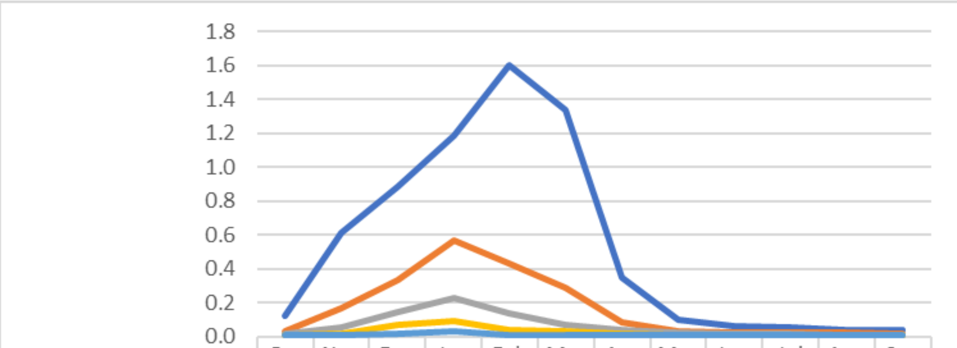
The Mean Annual Evaporation (MAE) (1 950 mm) (WRC, 2015) is much higher than the MAP (438 mm) for the area, which indicates a region characterised by distinct dry and wet seasons with a negative natural water balance. The monthly distribution of potential evaporation and rainfall can be seen in Figure 10-2.



	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Evaporation(mm)	226	210	210	209	174	165	129	110	91	102	137	186
Rainfall(mm)	31	62	76	80	76	57	31	10	4	2	2	8

Figure 10-2: Monthly Evaporation and Rainfall for Quaternary Catchment A41E

The Mean Annual Runoff (MAR) depth for the area was calculated to be 3.4 mm. This runoff accounts for approximately 0.8% of the MAP for the area. The 90th and 10th percentile runoff during the wettest month of December is 1.2 mm and 0 mm, respectively. Owing to considerable antecedent soil moisture conditions in the following month of January, the 90th percentile value increases to 1.6 mm, while no change occurs in the 10th percentile (Figure 10-3).



	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
90 Perecentile	0.1	0.6	0.9	1.2	1.6	1.3	0.3	0.1	0.1	0.1	0.0	0.0
70 Percentile	0.0	0.2	0.3	0.6	0.4	0.3	0.1	0.0	0.0	0.0	0.0	0.0
50 Percentile	0.0	0.1	0.1	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0
30 Percentile	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10 Percentile	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Figure 10-3: Monthly Runoff Distribution for Quaternary Catchment A41E

10.2 Topography and Drainage

The topography of the Project area, as depicted in Figure 10-4, is generally flat with small depressions and alluvial deposits in lower lying areas of the landscape. The Project area is on gentle slopes, averaging from 0 to 0.7° (Figure 10-5). The elevation range varies from 883 mamsl to 825 mamsl at the Limpopo River.

The main drainage system in the vicinity of the Project area is the Limpopo River, which also forms the border with Botswana. Drainage predominantly flows in a northern direction towards the Limpopo River. Topographic maps and aerial imagery available for the Project area indicate that there are no other perennial or non-perennial streams located near the Project area. However, two small pans were identified within the Project area. Clear signs of water accumulation take place in the identified depression areas during the rainy season (September to April), however, dries up during the rest of the year. As such these pans can be described as non-perennial pans, which receive surface water runoff.

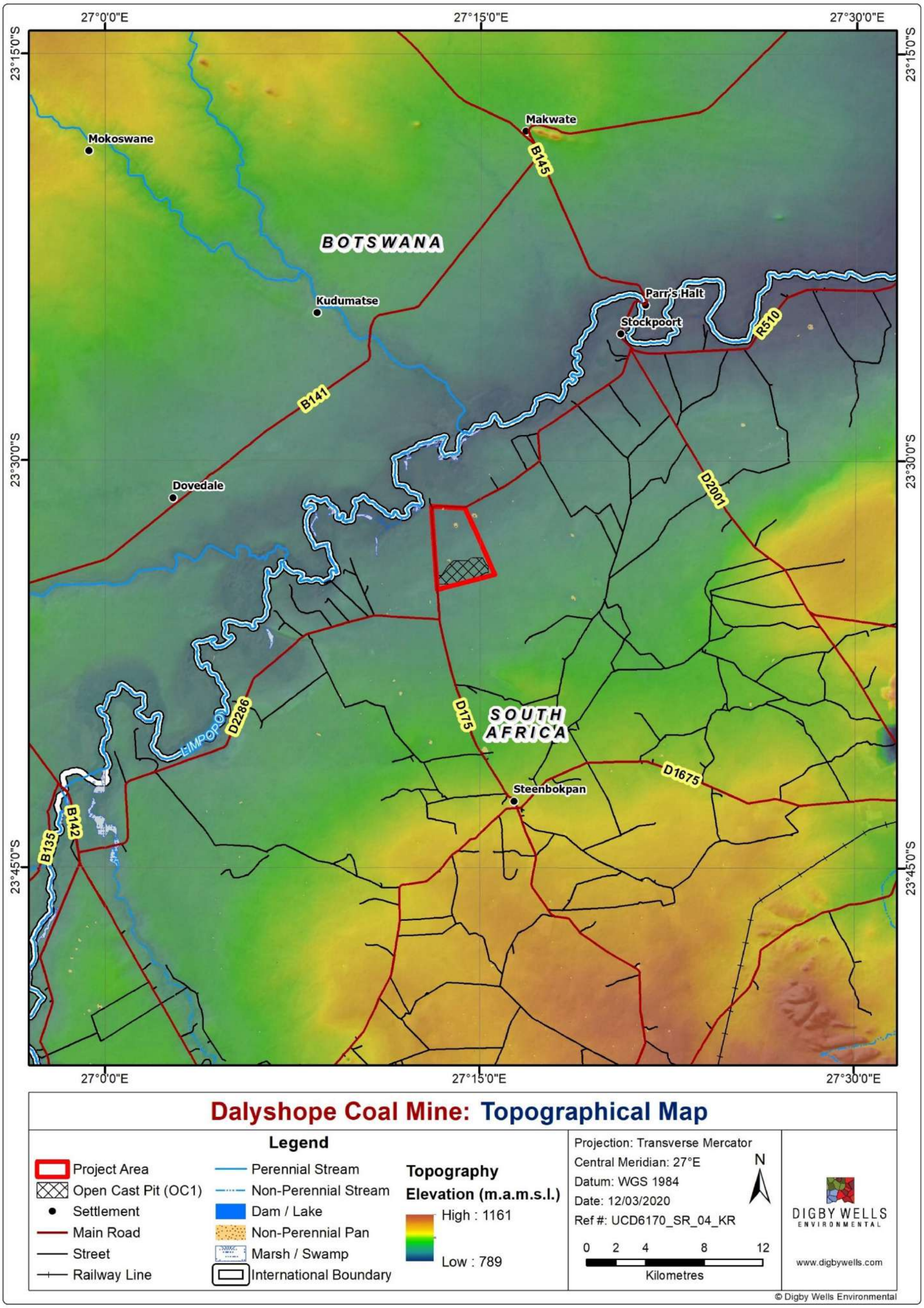


Figure 10-4: Topographical Map of the Project Area

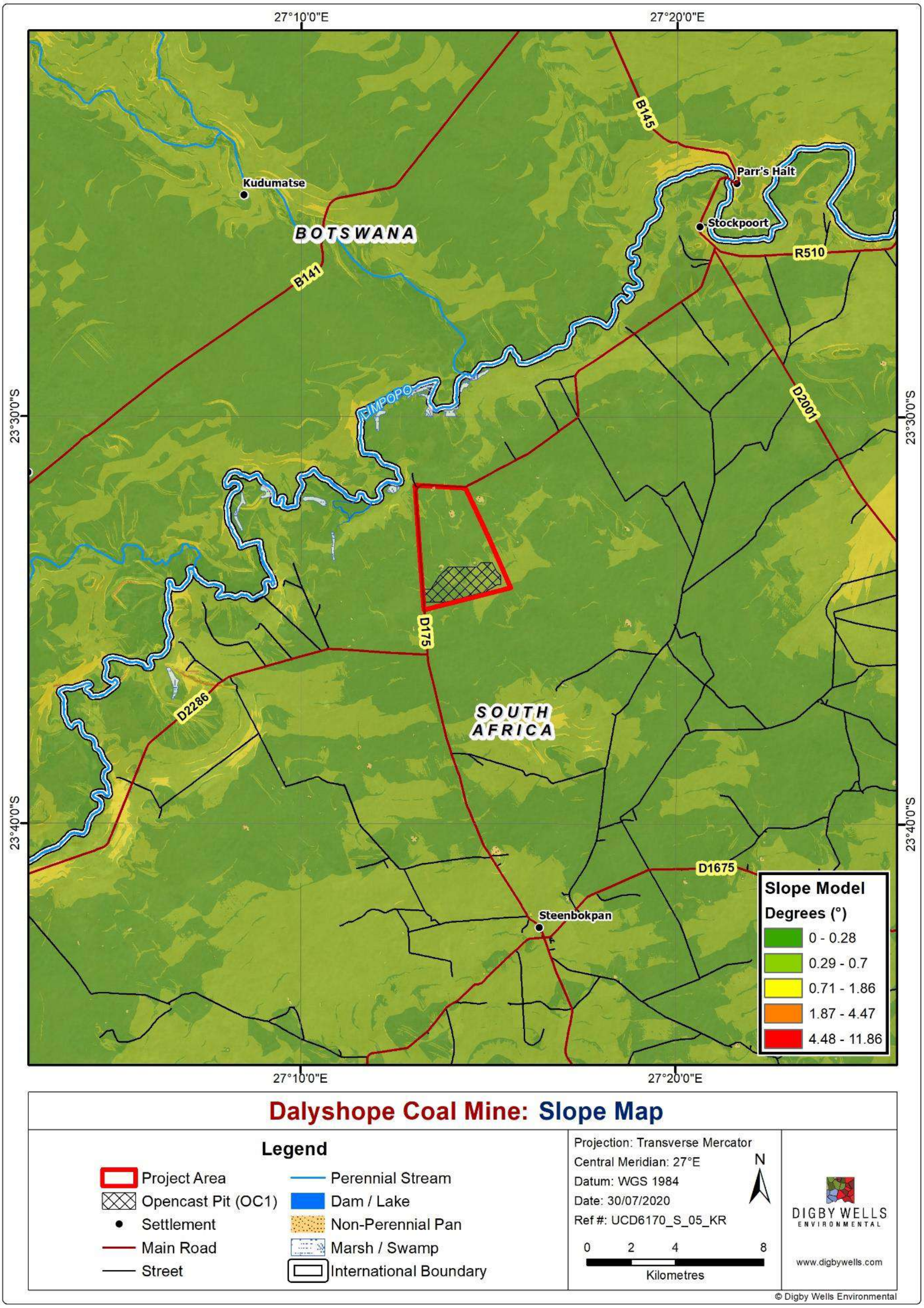


Figure 10-5: Slope Model of the Project Area

10.3 Visual

A Visual Impact Assessment (VIA) undertaken during the EIA Phase is appended to this report as Appendix D.

10.3.1 Visual Environment

The vegetation in the Project area is characterised by Limpopo Sweet Bushveld vegetation. The bushveld vegetation is comprised of grassland, bushes and trees, which are often *Vachellia* (previously known as *Acacia*) dominated. The vegetation in the Project area and surrounds is relatively dense and has an average height of 4-m. During the site visit, it was observed that such vegetation is expected to provide moderate natural screening of the proposed project (Figure 10-6).

Figure 10-6: Typical Vegetation in the Project Area

10.3.2 Viewshed Analysis

A viewshed is a geographical area, defined by the topography, within which a particular feature will be visible (Oberholzer, 2005). Viewshed models were created for daytime conditions only. These viewshed models are based on the topography only and do not take the screening effect of vegetation into account. The viewshed models depict worst case scenarios and show the areas from which the Project may potentially be visible. Visual exposure and the visual impact of a development diminish exponentially with distance (Oberholzer, 2005).

Based on the visibility of the existing infrastructure and the location of the main sensitive receptors and based on the heavily disturbed peripheral environment, the zone of influence was determined to be within 20 km for the purpose of this study. Given the presence of visual screening in the form of natural vegetation screening, the impact beyond 20 km was deemed negligible.

Based on the findings of fieldwork conducted, the following categories were used for the viewshed models:

- 0 – 5 km: Potentially high visual exposure;
- 5 – 10 km: Potentially moderate visual exposure;
- 10 – 15 km: Potentially low visual exposure; and
- 15 – 20 km: Potentially very low visual exposure.

10.3.3 Sensitive Receptors

The receptors identified within the viewshed area include residents of Steenbokpan and Stockpoort settlements in South Africa; and Dovedale and Kudumatse settlements in Botswana, as well as farm residences, game lodges and mining activity in the Project area and surroundings. The models also indicate that the proposed Dalyshope Project will potentially be visible to road users on the R510 regional road in South Africa and several secondary roads (including the D175, D1675, D2001 and D2286 in South Africa and the B141 and B145 in Botswana) and farm roads in the vicinity of the Project area. The list of identified receptors is shown in Figure 10-7.

Table 10-2 below provides the potential visual receptors identified within the viewshed of each proposed infrastructure and gives a percentage of the number of receptors with potential visual exposure. A comprehensive list of the sensitive receptors can be found in the Visual Impact Assessment report (appended as Appendix D). The visual sensitivity of receptors is dependent on the nature of the receptors (Oberholzer, 2005). Receptors in settlements, farm residences and game lodges have a high sensitivity, while receptors in mining areas have a low sensitivity. The table below shows that the dumps have the highest visual impact as it affects 59 of the identified receptors, while the built infrastructure affects 36 of the receptors and the opencast pit affects only 22 receptors.

Table 10-2: Sensitive Receptors per Category

	Dumps		Buildings		Opencast Pit	
Visual Impact Category	**Number of Receptors Impacted**	**Percentage**	**Number of Receptors Impacted**	**Percentage**	**Number of Receptors Impacted**	**Percentage**
High	7	12%	6	17%	4	18%
Moderate	26	44%	21	58%	7	32%
Low	21	36%	6	17%	3	14%
Very Low	5	8%	3	8%	8	36%
TOTAL	**59**	**100%**	**36**	**100%**	**22**	**100%**

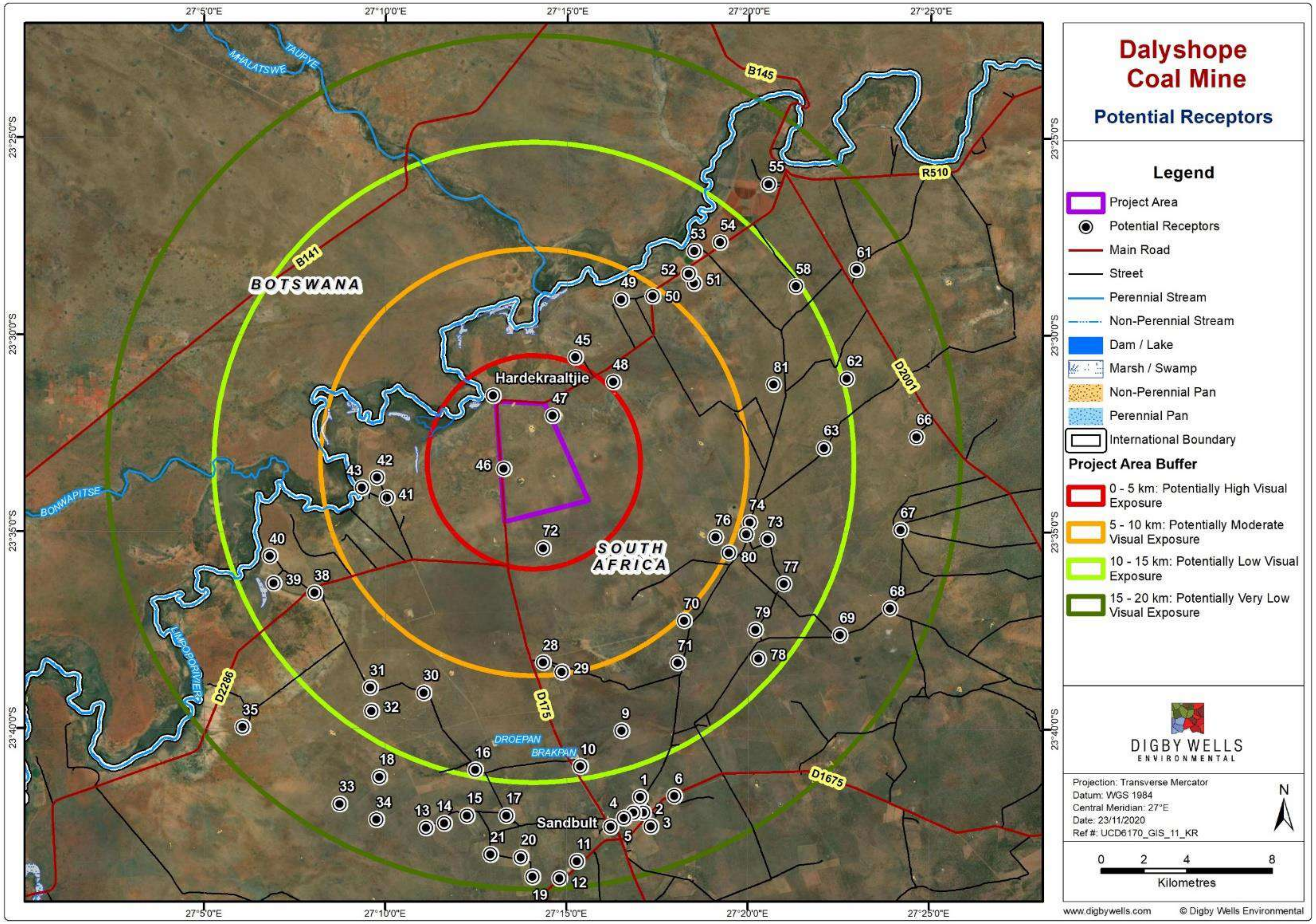


Figure 10-7: Potential Receptors in the Vicinity of the Project Area

10.4 Geology

This section identifies and discusses the regional and site-specific geology.

10.4.1 Regional Geology

The coal resources of South Africa are hosted within the Karoo Supergroup, which have been divided into 19 coal fields. The coal extracted from the Karoo Supergroup has significant differences in grade, type, rank, lateral extent and thickness which are dependent on the variations in depositional environments, climate, plant communities and structural disturbances of the various coal fields (Johnson *et al*., 2006).

The coal seams in the Waterberg Coalfield are in the Ecca Group in the Swartrant and Grootegeluk Formations of the Karoo Supergroup. (Universal Coal, 2020). The depositional environment of this basin is accepted to be a meandering river and floodplain environment with repeat flooding and crevasse splays causing the rapid alternation between coal and mudstone lithologies (Johnson *et al*., 2006).

The main structural disturbances to the Karoo Supergroup are associated with the intrusion of dolerite dykes and sills, which displace, replace and devolatilise the coal resource (Johnson *et al*., 2006). There are no dolerite exposures mapped on the 1:250 000 geological map of the Ellisras Basin (Figure 10-8), however, the Ellisras Basin is bounded by the east-west orientated Eenzaamheid (southern boundary) and Zoetfontein (northern boundary) faults and northwest-southeast orientated Daarby (eastern boundary) fault with extensive minor faulting and magnetic lineaments present within the Ellisras Basin itself.

10.4.2 Site-specific Geology

The Project area itself is predominantly underlain by the Swartrant and Grootegeluk Formations. The coal seams of the Swartrant Formation comprise of three distinct seams varying in thickness from 0.5 m to 8 m, which are separated by sandstone, siltstone and mudstone interburden (Universal Coal, 2020).

Overlying the Swartrant Formation, the Grootegeluk Formation is considered to be the economically important formation in the Ellisras Basin, containing several, relatively thick coal seams, totalling an approximate 80 m thick deposit, which is interbedded with mudstones. For this proposed Project, the top of the coal seam is approximately 20 meters below ground level (mbgl) (Universal Coal, 2020).

The Eendragtpan Formation overlies the Grootegeluk Formation in the Project area as mapped on the 1:250 000 geological map. This formation comprises entirely of variegated mudstones (Johnson *et al*., 2006). The weathering profile extends to a depth of 15 mbgl. Calcrete formation is commonly found in drainage channels and small pans as a result of the arid bushveld climate (Universal Coal, 2020).

Exploration drilling has intersected very little dolerite in the proposed resource and seismic surveys indicate the presence of faults are few and small (less than 5 m throws) (Universal Coal, 2020).

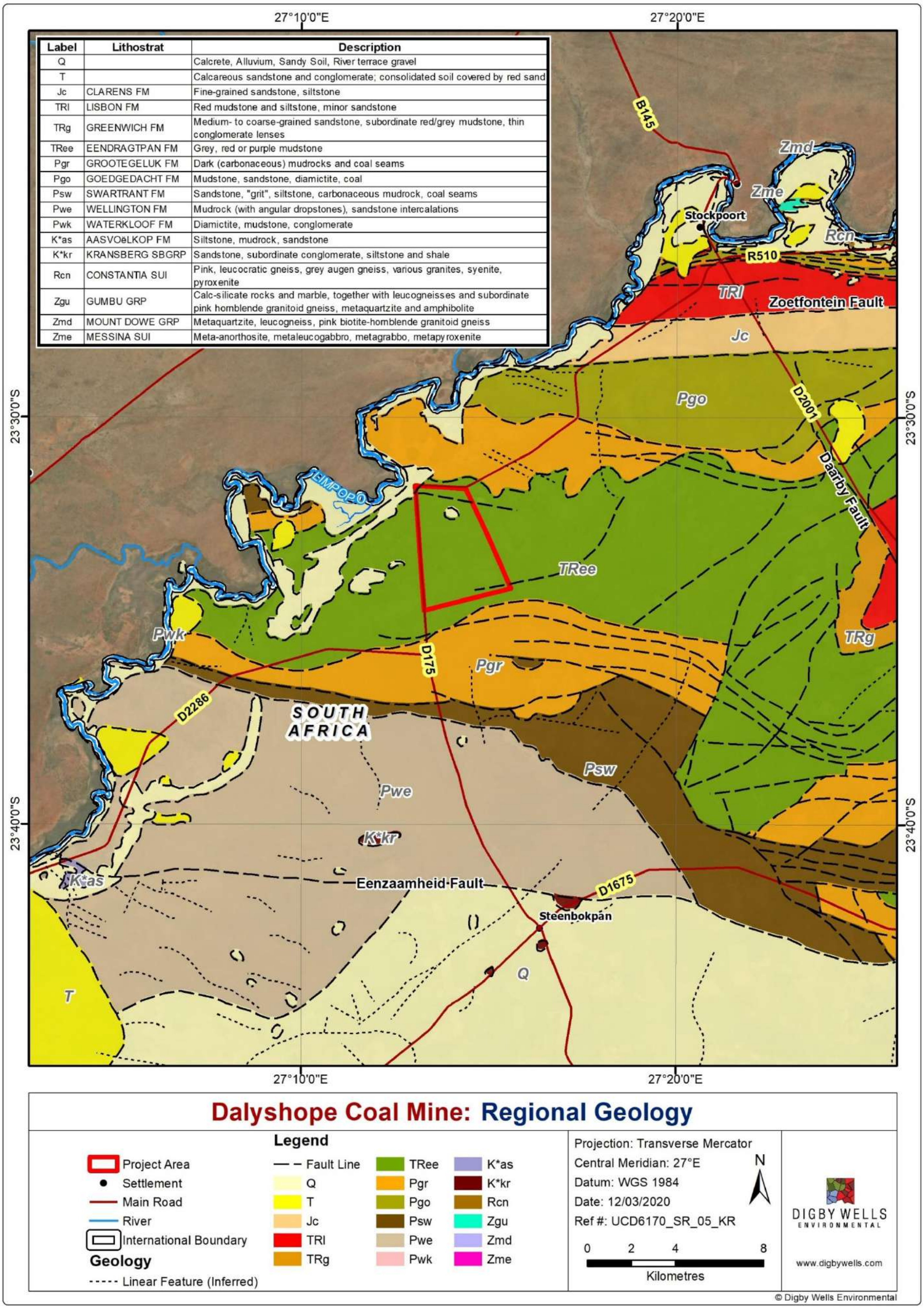


Figure 10-8: Regional Geology

10.5 Soils, Land Use and Land Capability

The Soil, Land Use and Land Capability Assessment undertaken during the EIA Phase is appended to this report as Appendix E. The baseline Soil, Land Use and Land Capability Assessment focusses on the proposed OC1 area as well as on the proposed infrastructure area on the Farm Klaarwater 231 LQ. The subsections below provide a summary of the baseline findings.

10.5.1 Land Type

Existing Land Type and soil data was used to obtain generalised soil patterns and terrain types for the Project area. Land Type data exists in the form of published 1:250 000 maps. These maps indicate delineated areas of similar climate and pedo-systems, which include areas of uniform terrain and soil patterns (Land Type Survey Staff, 1972 – 2006).

The land type data gathered suggested that the land types for the Project area are predominantly of the Ah86 type with a small portion of the Ae257 type. Soils as part of these land types are red to yellow apedal sandy soils, which are generally freely drained and have a high base status. Soils under land type Ah86 have greater than 15% clay content while Ae257 land type indicate deep, sandy soils with depths usually deeper than 300 mm (Figure 10-9).

The red, sandy nature of the soils in the Project area are commonly an indication of moderate potential soils for agriculture. The dominant soils in the Project area are described as low in clay content and thus low water holding capacity and base saturation with only a small portion of high clayey soils within the pan areas. The soils are susceptible to leaching and possible sodification, increasing the pH of the soil. Maintaining the productivity of such soils requires control of the flocculation-dispersion behaviours. Poor land management of these soils can also lead to induced secondary salinity. The dominant land types and soil forms as per the Land Type Survey Staff, (1972 – 2006) within the Project area are briefly described in Table 10-3, and illustrated in Figure 10-9 below.

Table 10-3: Land Type and Dominant Soil Forms

Land Type	Soil Forms	Geology	Characteristics
Ae257	• Hutton • Shortlands • Valsrivier • Oakleaf • Clovelly • Arcadia • Mispah • Glenrosa	• Sandstone, and siltstone of the Clarens Formation • Undifferentiated shale, sandstone, mudstone, alluvium, and coal of the Karoo Sequence.	• 500 ha estimated area unavailable for agriculture; • Slopes are between 0, and 4%; • Depths mainly deeper than 1200 mm, with some areas with shallow soils of 50 mm; • 93% of the soils occurring in the foot slope terrain; • Dominant soil types are well-drained, sandy, red apedal soils; and • Clay content varying between 8, and 25 % in the B-horizon.
Ah86	• Hutton • Clovelly • Fernwood • Kroonstad • Avalon • Glencoe • Valsrivier • Oakleaf • Katspruit	• Sandstone, alluvium, and mudstone of the Waterberg Group (Matlabas subgroup). • Undifferentiated shale, sandstone, and coal of the Karoo Sequence.	• 1000 ha estimated area unavailable for agriculture; • Slopes are between 1, and 3%; • Depths mainly deeper than 1200 mm; • 83% of the Ah86 occurs in the foot slope terrain; and • Dominant soil types are well-drained, sandy, red apedal soils.

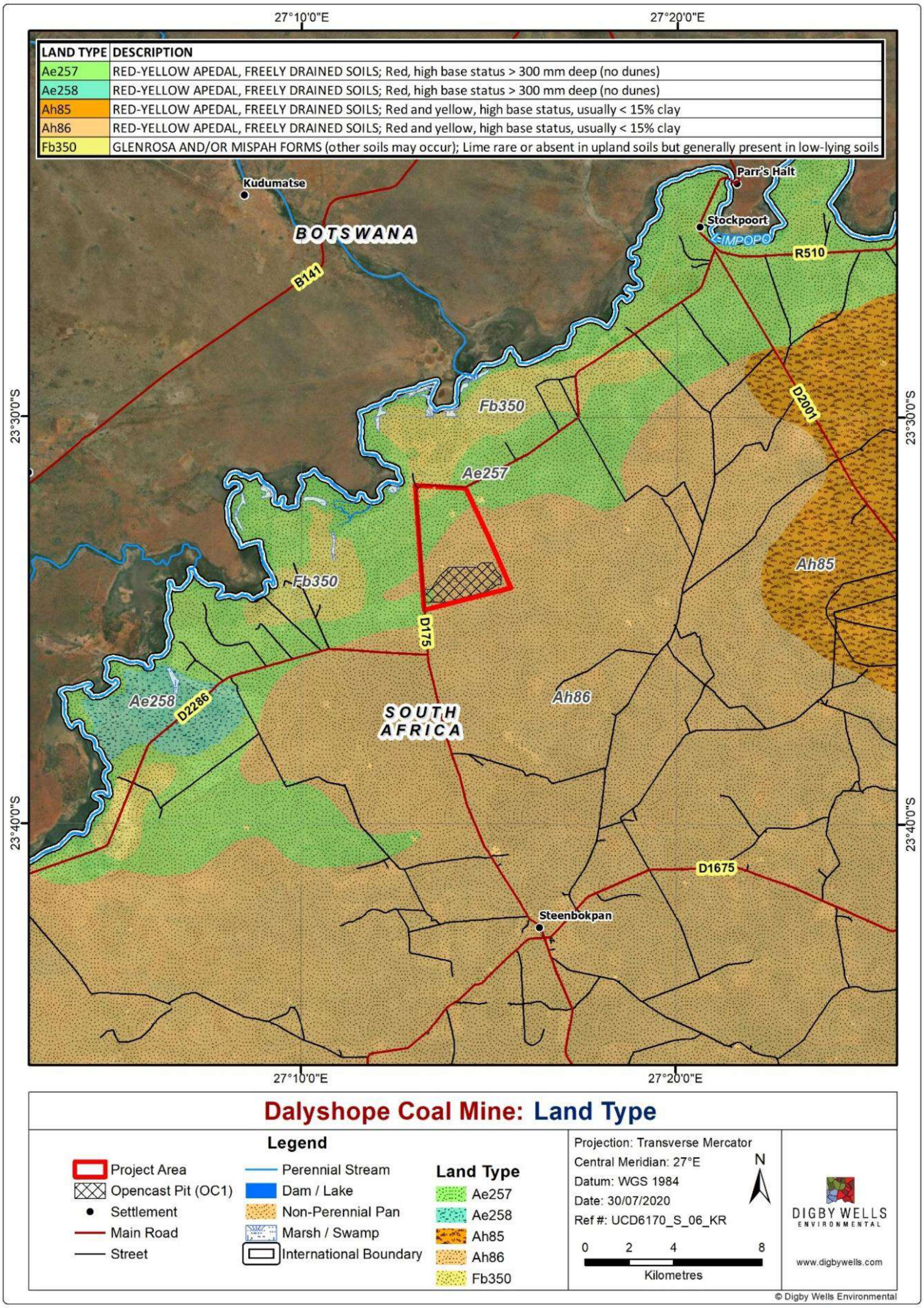


Figure 10-9: Land Type map for Dalyshope Mine (Land Type Survey Staff, 1976-2006)

10.5.2 Soil Forms

The soil forms within the OC1 Project area are described in the subsections below together with photos taken during the field survey. Hutton, Clovelly, Oakleaf, Glencoe, and Kroonstad soil forms dominate the OC1 Project area (Figure 10-10).

Existing diggings, holes and excavations were used to assess soil profiles. The typical augured soil profiles were identified as dominantly Orthic A-horizons, overlying Yellow brown to Red Apedal B-horizons with a Hard-plinthic B2-horizon. The soils in the pan areas as well as the direct areas around the pans were dominated by soils with a high clay content as indicated by the Soft Plinthic, G and Neo-cutanic B-horizons.

The Orthic A-horizons are generally low in organic carbon while the Apedal B-horizons consist of uniform yellow brown to red, iron rich pigmented chroma soils. Apedal soils are deep, sandy, well drained soils which are generally low in organic carbon but are rather easily manageable soils for cultivation.

Some areas within the OC1 Project area showed limited soil depths with high volumes of peds (an individual, natural soil aggregate), gravel and stones. These characteristics caused restricted handheld auguring, and will restrict rooting depth, and root development. This may limit the cultivation potential of the area and can lead to underestimated volumes of calculated soil volumes.

The soil types within the close vicinity of the pans were dominated by soils with a high clay content overlying structured B-horizon. These high clay-containing soils are an indication of alluvial processes. These soils are young soils with clear evidence of emerging soil development in the form of colour variations and clay lamellae.

Hutton and Clovelly soils are typically deep soils, dominated by a red to yellow-brown apedal (non-structure), sandy B-horizons with a clayey underlying material such as Soft-Plinthic. The clayey horizon increases the water holding capacity, organic material, and CEC of the soil, and therefore increasing the agricultural potential. Oakleaf soils consist of a neo-cutanic B-horizon, indicating unconsolidated material from alluvial or colluvial origin typically found within the pans or low-lying areas in the topography. Kroonstad and Glencoe soils consist of sandy, from yellow-brown B-horizons to bleached B-horizons indicating interflow soils, high drainage, and high leaching potential, however, these soils have a high leachability, and often low in soil organic material. Sections 10.5.2.1 to 10.5.2.5 give a detailed description of soil types found within the Project area.

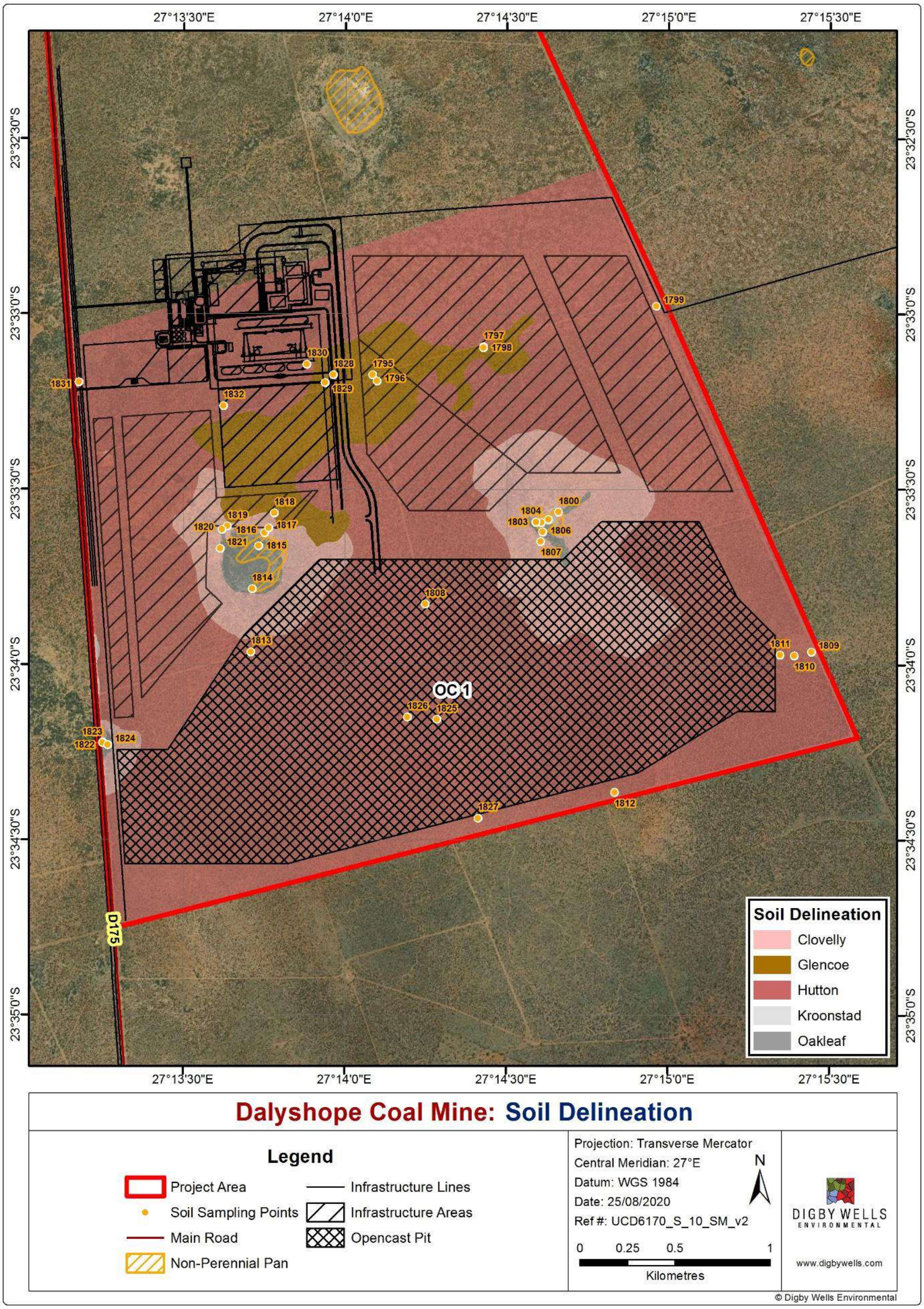


Figure 10-10: Soil Delineation

10.5.2.1 Hutton Soil Form

Hutton soil forms are usually deep, uniformly red, sandy (apedal) soils that are well-drained, and has low organic carbon content, and cation exchange capacity (CEC) due to the low clay content. These soils developed from basic parent material (example basalt), and are in an advanced state of weathering, and leaching is indicative.

10.5.2.2 Clovelly Soil Form

Clovelly soil forms are frequently confused with Hutton soil forms as they share the same characteristics. Clovelly soil forms have a Yellow-brown Apedal B-horizon, whereas Hutton soil has a Red-apedal B-horizon. Both these soil forms have deep, sandy, well-drained characteristics. Yellow-brown Apedal B-horizons are formed from leached Red Apedal B-horizons. Yellow- Brown Apedal B-horizons are thus usually in lower-lying areas, more leached, and has higher drainage than that of the red soils and are poorer in nutrients.

10.5.2.3 Oakleaf

Oakleaf soil forms consist of a neo-cutanic B-horizon which contains traces of calcium, and calcium-magnesium however, not enough to test for in the field with cold 10% hydrochloric acid. These soils have an unconsolidated material and have an aggregation of soil particles, and somewhat structure in the B-horizon. These soils were mainly found in the lower-lying areas in the proximity of the pans. Neo-cutanic B-horizons typically form from alluvial or colluvial processes and are typically found in foot-slope and riverbed landscape areas.

10.5.2.4 Glencoe

Glencoe soil forms within the OC1 Area were predominantly shallow and had a restricting layer at 800 mm. These soils comprise of a Yellow-brown Apedal B-horizon overlying a Hard Plinthic layer containing an accumulation of iron-, and manganese oxides. These soils together with its high clay content and restricted rooting depth prevent free drainage and lower the agricultural potential of the soils.

10.5.2.5 Kroonstad

Kroonstad soil forms were identified within the pans or in the proximity of the pans. These soils are higher in clay content with clear signs of mottles within the first 500 mm of the profile. E-horizons are grey, leached, sandy soils with low structure. They are grey and has a loose consistency. The G horizon has a higher clay content with an accumulation of iron, and manganese oxides, forming mottles. These horizons are saturated for long periods and have noticeable clay accumulation.

10.5.3 Land Capability

The land capability is determined by assessing the combination of soil, terrain and climate features. The dominant land capability class in the Project area was Class V (Grazing – Moderate Grazing - Figure 10-11). The area is not yet disturbed by mining activities but currently used for wildlife and grazing. A detailed breakdown is given below in Table 10-4.

Table 10-4: Land Capability Classification of Dalyshope Mine Area

Land Capability Class	Description	Dominant Limitation Influencing the Physical Suitability for Agricultural Use
V	Grazing – Moderate Grazing	These lands are generally not suitable for cultivation. The soils have little or no erosion hazard but have other limitations. They are impractical to remove thus limiting their use. These areas are generally used for pasture, range, forestland or wildlife for food and cover. The soils in this class have restrictions regarding cultivations which can limit plant growth and prevent normal tillage of cultivated crops lands. Some limitations include that the soils are frequently wet and overflowed by streams, are stony and have climate limitations. These soils are nearly level and created ponding and prevent drainage of cultivated crops. The soils are not feasible to cultivate and mainly suitable for grasses or trees.

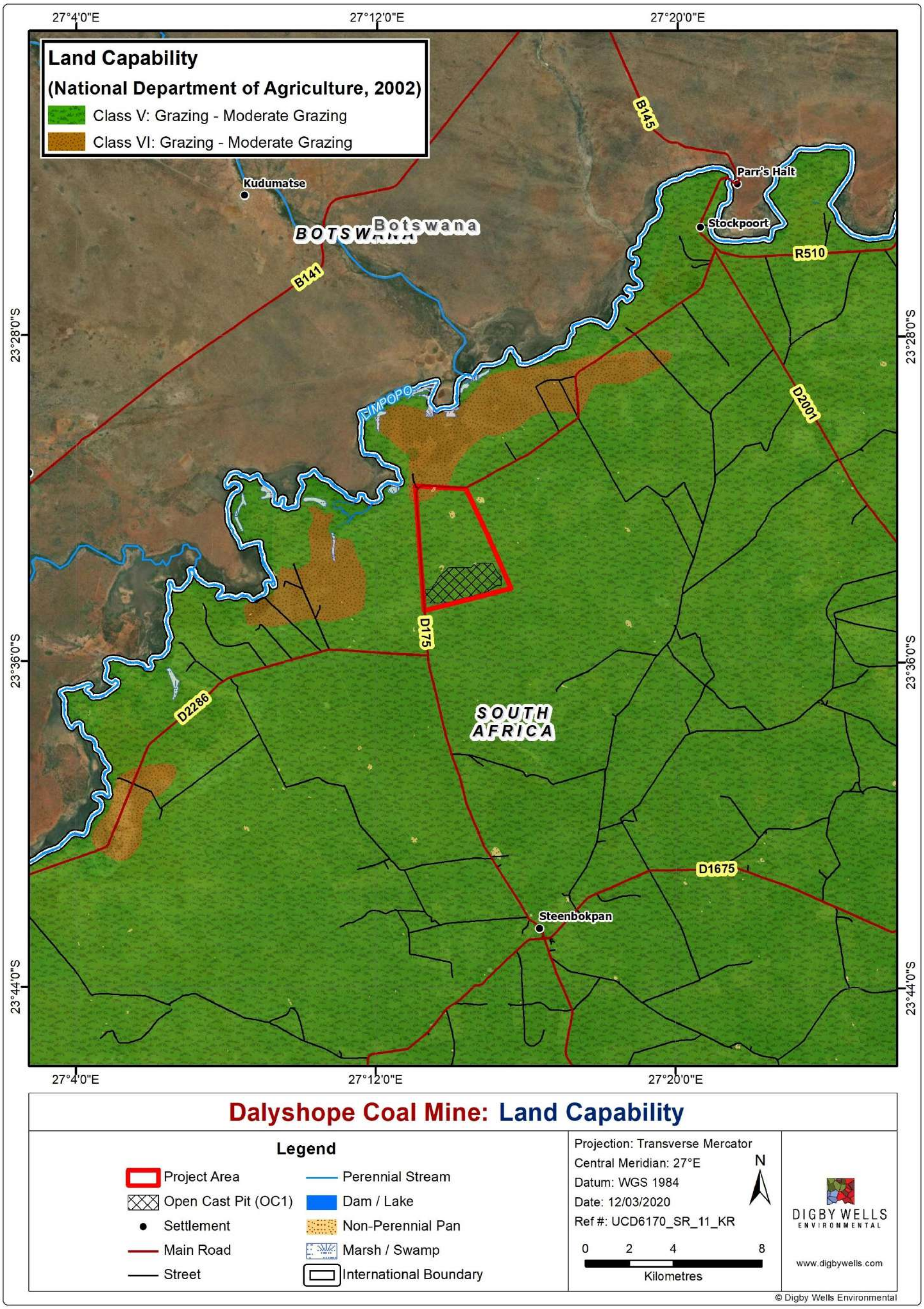


Figure 10-11: Land Capability at Dalyshope Mine

10.5.4 Land Use

The dominant land use in the OC1 Project area is agriculture, dominated by cattle grazing, and game farming (Figure 10-12). This can be attributed to the low agricultural potential of the soils, low rainfall, and high evapotranspiration demand. The site consists of natural open woodland, and grassland, with small seasonal pans, herbaceous wetlands, eroded lands, and sparsely wooded grassland (Figure 10-13) The dominant land use in the Steenbokpan region is game farming, cattle grazing and cultivation.

Figure 10-12: Land Use (Field survey photos, February 2020)

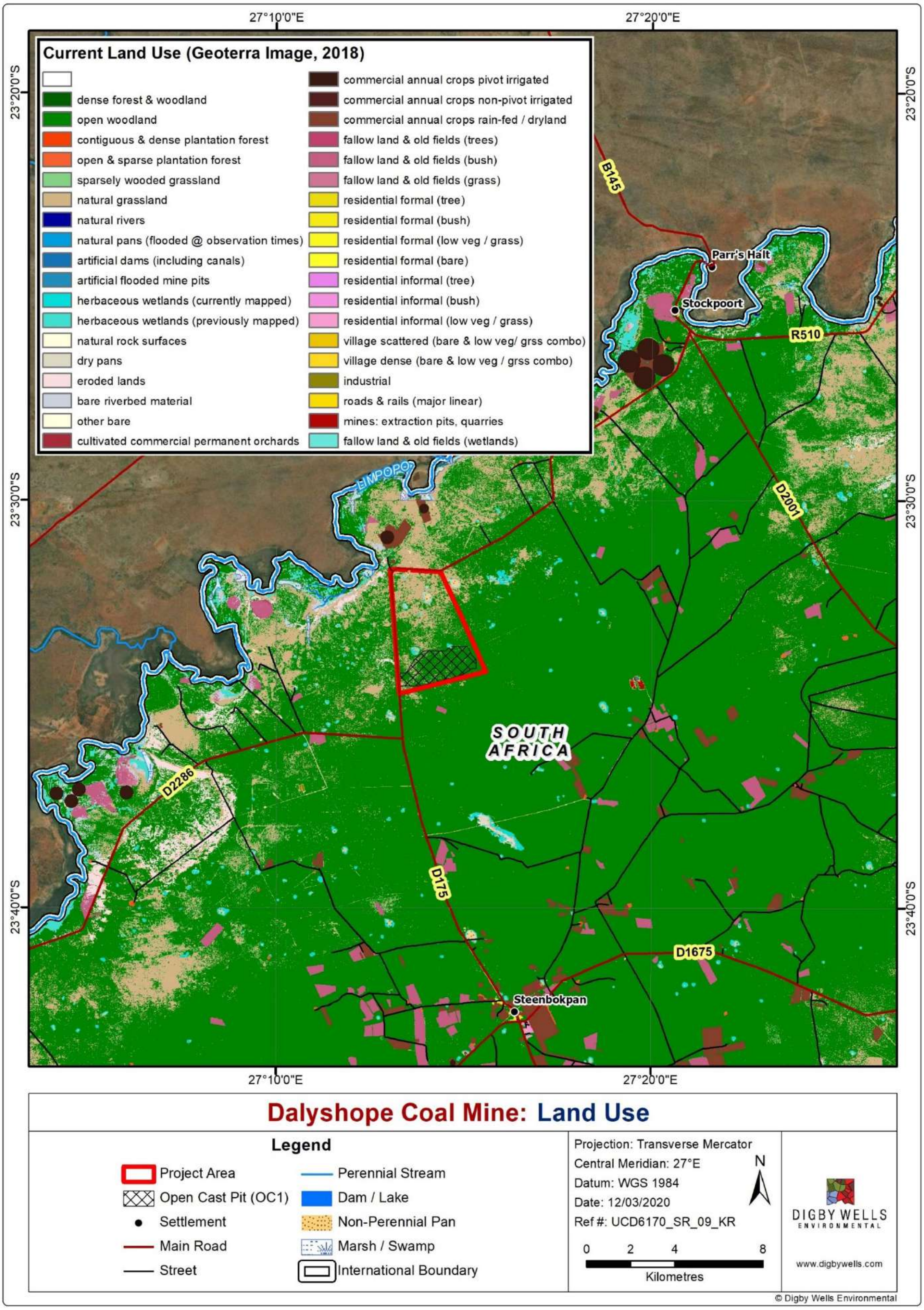


Figure 10-13: Land Use map for Dalyshope Mine

10.6 Hydrology (Surface water)

A Surface Water Assessment was undertaken during the EIA Phase. A site visit was conducted in February 2020 to collect water samples on the surface water bodies within and around the project area. A detailed surface water report is appended to this report (Appendix F).

10.6.1 Hydrological Setting

The proposed Project area falls within primary drainage region A of the Limpopo WMA and the A41E quaternary catchment, Sub-Quaternary Reach (SQR) A41E-00126 (Limpopo River) (Figure 10-14). The A41E catchment has an aerial extent of 1,938 km^2, which contains an endorheic region (an area that does not contribute surface water flow to river systems). Based on the current outputs of the National Freshwater Ecosystem Priority Areas (NFEPA) project (Nel et al., 2011), there are no areas of potential concern within the sub-quaternary catchment associated with the proposed project. Approximately 0.8% of the MAP contributes to surface water runoff in the A41E catchment (Digby Wells, 2014 and Digby Wells, 2020a).

The Matlabas catchment, located within quaternary catchment A41E, is a largely undeveloped catchment with limited water resources and limited water use. The Limpopo River Basin spans over four countries, namely South Africa, Botswana, Mozambique and Zimbabwe. All four of these countries are members of the Southern Africa Development Community (SADC) and as a result, the basin has considerable importance. The management of shared rivers associated within SADC is guided by the SADC protocol on shared water courses; the management of which is under river basin commissions.

The Limpopo River is the focus of this study. The source of the Limpopo River is at the confluence of the Marico and Crocodile Rivers in South Africa and the system then flows through three distinct river reaches, namely the Upper, Middle and Lower Limpopo River before discharging into the Indian Ocean. The main tributaries which are associated with the upper Limpopo River are the Mahalapswe, Lephalala, Lotsane, Mogalakwena, Motloutse and Shashe Rivers, all of which originate in Botswana.

The river-reach relevant for this study is located in the Middle Limpopo River area which comprises all the drainage areas downstream of the Notwane River (tributary of Limpopo River) along the Botswana boundary. Within the South African side, the Limpopo River has a relatively dense network of tributary systems and rivers which are seasonal or have episodic flows.

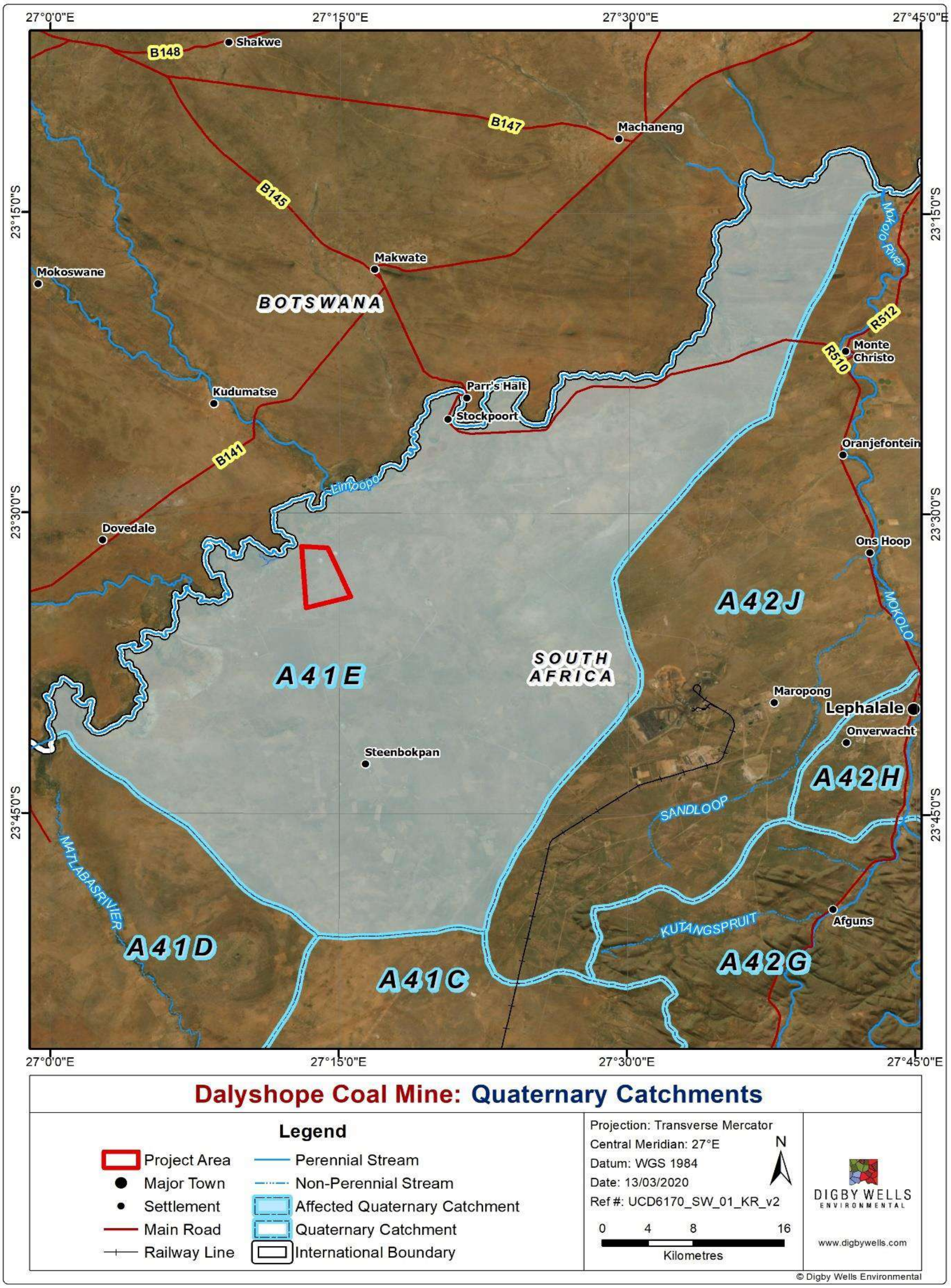


Figure 10-14: Hydrological Setting of Quaternary Catchment A41E

10.6.2 Water Quality Assessment

For the previous water quality study, samples were obtained during the following periods:

- November 2012;
- March 2013;
- July 2013;
- November 2013; and
- February 2014.

The findings of the previous water quality assessment found that the water quality for most parameters was generally acceptable for all the sampled sites until the November sample run, which is associated with the rainy season. It is envisaged that the beginning of the rainy season results in rising groundwater levels, causing an interaction between groundwater and surface water, which in turns results in the observed spike in concentrations as the groundwater quality near the river was poor, with high sodium and chloride concentrations (Digby Wells Environmental, 2014).

A site visit was conducted between the 17th and 19th of February 2020 where five water samples were collected on the streams within and around the Project area. Sampling points which could not be sampled due to access issues or which were dry at the sampling moment have been included on the proposed monitoring programme for the mine to continue monitoring. The sampling points are indicated in Table 10-5 and Figure 10-15 below.

Table 10-5: Location and Description of Surface Water Quality Sampling Points at the proposed Dalyshope Project Area

Monitoring Localities	Description	Coordinates (Decimal Degrees)	
		Latitude	Longitude
SW1	Monitoring point in the Limpopo River upstream of the proposed Dalyshope mining activities	-23.537516°	27.160297°
SW2	Monitoring point mid-stream and parallel to the Dalyshope project area in the Limpopo River	-23.526280°	27.210791°
SW3	Water monitoring point in a tributary draining into the Limpopo River	-23.483000°	27.240835°
SW4	Downstream monitoring point in relation to the Dalyshope project area	-23.477657°	27.254097°
SW5*	Non-perennial pan situated within the proposed Dalyshope MRA boundary	-23.562379°	27.229238°

* - Proposed monitoring point

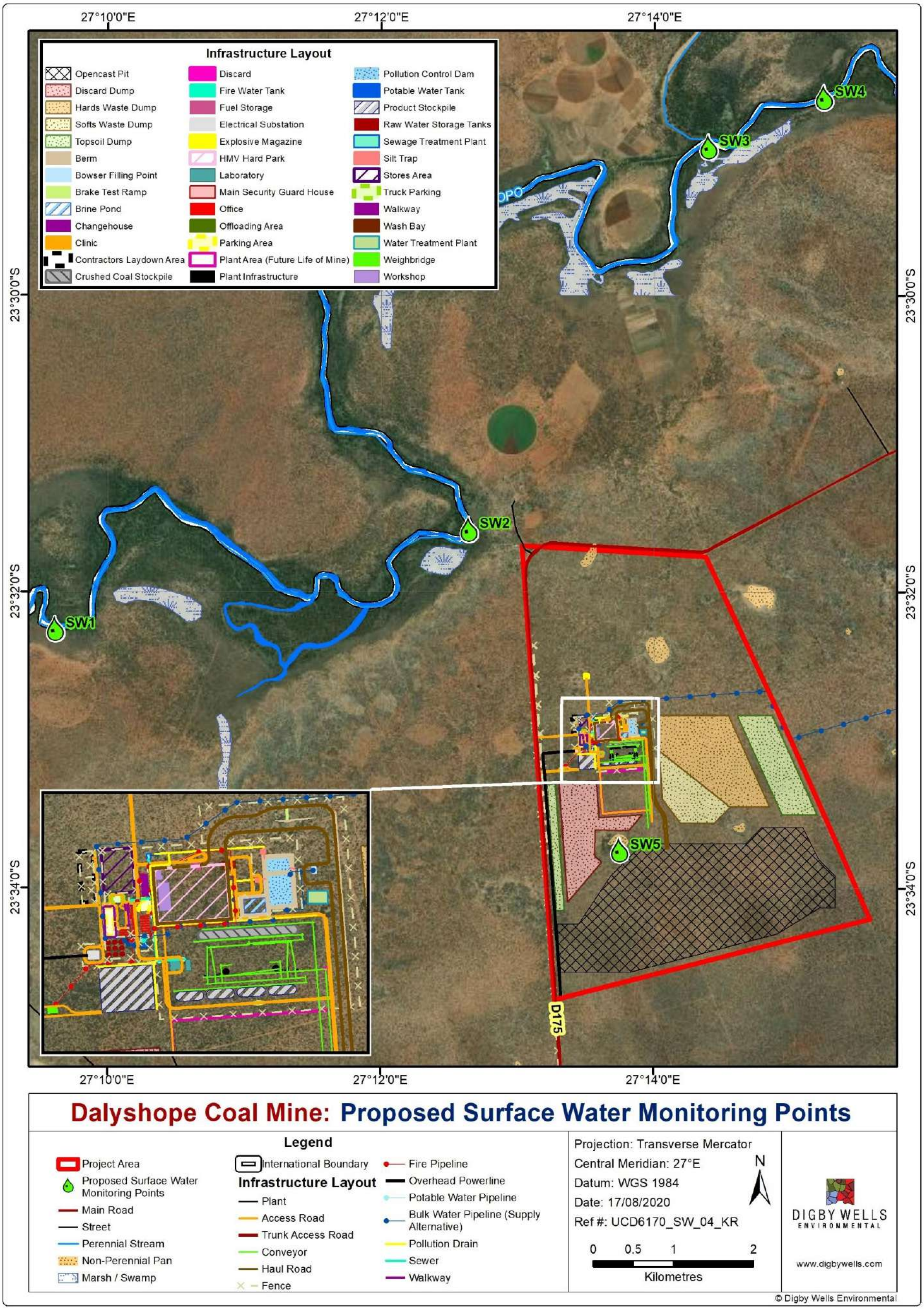


Figure 10-15: Surface Water Monitoring Locations

The water samples collected at the upstream and downstream of the nearby natural water bodies were analysed at a South African National Accreditation System (SANAS) accredited laboratory. The results were analysed and interpreted to provide baseline water quality conditions prior to commencement of mining activities within the Dalyshope Project area.

The Department of Water and Sanitation (DWS) water quality guidelines for Livestock watering, irrigation and aquatic ecosystems (DWA, 1996) were used to benchmark against the water quality results. The water quality data of the selected monitoring points (Figure 10-15) was benchmarked against the target water quality guidelines for domestic use, aquatic ecosystems, livestock watering and irrigation (Table 10-6).

Based on the water quality results, the baseline water quality is generally acceptable and have slight exceedances in relation to the guideline values. An alkaline pH of 8.9 was measured at SW4. Copper was also slightly elevated (0.019 mg/L) at this point (Table 10-6). Suspended solids were also above the irrigation guideline, with a measured concentration of 86 mg/L, which indicates some human influence in the stream, although minimal.

TDS and Aluminium were elevated at SW2 (i.e. 490 and 0.119 mg/L, respectively). Calcium was elevated at SW1 and SW2 (i.e. 37 mg/L at both sites), while the concentration of suspended solids was 217 mg/L at both SW1 and SW2. Both sites 1 and 2 show some human influence on water quality from upstream activities. However, apart from suspended solids, the observed exceedances are not significantly elevated above the target water quality guidelines.

Zinc was elevated for the aquatic ecosystems guideline which stipulates a concentration below 0.002 while concentrations of 0.015, 0.013 and 0.029 mg/L were at SW2, SW3 and SW4, respectively. The exceedances are not significant, and it is therefore not envisaged that this would have significant impacts on aquatic ecosystems within the Limpopo River.

This baseline data should be used as background data against which potential impacts on surface water quality as a result of the proposed mining activities may be assessed. Furthermore, if possible, representative baseline data for the wet and dry season should be obtained as water quality may be seasonally variable. Since sampling was done in February, which is part of the wet season, another sample may be acquired during dry months (i.e. April to September).

Table 10-6: Baseline Surface Water Quality within the Dalyshope Project Area

Parameter	SW1	SW2	SW3	SW4	DWS Domestic Use	DWS Aquatic Ecosystem	DWS Livestock Watering	DWS Irrigation
	(mg/L, unless otherwise stated)							
pH, at 25˚C *(pH meter units)*	8.1	8.1	8.3	8.9	6 - 9	NS	NS	6.5 - 8.4
Electrical Conductivity, *(mS/m)*	57.4	57.2	42.3	31.7	<70	NS	NS	NS
Total Dissolved solids (TDS)	444	490	356	268	<450	NS	<1000	NS
Aluminium	<0.1	0.119	<0.1	<0.1	<0.15	<0.01	<5	<5
Ammonia	0.1	0.1	0.3	2.4	NS	NS	NS	NS
Arsenic	<0.01	<0.01	<0.01	<0.01	≤200	0.01	≤1	0.1
Barium	0.067	0.07	0.114	0.042	NS	NS	NS	NS
Beryllium	<0.01	<0.01	<0.01	<0.01	NS	NS	NS	0.10
Bismuth	<0.01	<0.01	<0.01	<0.01	NS	NS	NS	NS
Boron	0.034	0.034	0.034	0.03	NS	NS	<5	<0.5
Cadmium	<0.01	<0.01	<0.01	<0.01	<0.005	<0.00015	<0.01	<0.01
Calcium	37	37	27	16	<32	NS	<1000	NS
Cerium	<0.01	<0.01	<0.01	<0.01	NS	NS	<5	NS
Caesium	<0.01	<0.01	<0.01	<0.01	NS	NS	<5	NS
Chloride	61	59	36	30	<100	NS	<1500	<100
Chromium	<0.01	<0.01	<0.01	<0.01	<0.05	0.007	<1	<0.1
Cobalt	<0.01	<0.01	<0.01	<0.01	NS	NS	<1	<0.05
Copper	<0.01	<0.01	<0.01	0.019	<1	<0.0003	<0.5	<0.2
Fluoride	0.3	0.3	0.4	0.5	<1	<0.75	<2	<2
Iron	0.039	0.052	0.042	0.025	<0.1	NS	<10	<5
Lead	<0.01	<0.01	<0.01	<0.01	<0.01	<0.0002	<0.1	<0.2
Lithium	<0.01	<0.01	<0.01	<0.01	NS	NS	NS	NS
Magnesium	17	17	14	10	<30	NS	<500	NS
Manganese	<0.025	<0.025	<0.025	<0.025	<0.05	<0.18	<10	<0.02
Mercury	<0.01	<0.01	<0.01	<0.01	<1	0.04	<1	NS
Molybdenum	<0.01	<0.01	<0.01	<0.01	NS	0.04	0.01	0.01
Nickel	<0.01	<0.01	<0.01	<0.01	NS	NS	<1	<0.2
Nitrate	1.8	1.8	0.1	0.2	≤6	NS	<200	100
Total Phosphate, as P	0.6	0.5	<0.2	0.2	NS	NS	NS	NS
Potassium	9.4	9.6	9.3	7.7	<50	NS	NS	NS
Selenium	<0.01	<0.01	<0.01	<0.01	<0.02	<0.002	<0.05	<0.02
Silicon	5.6	5.8	3.4	4.5	NS	NS	NS	NS
Silver	<0.01	<0.01	<0.01	<0.01	NS	NS	NS	NS
Sodium	44	46	36	26	<100	NS	<2000	<70
Strontium	0.062	0.062	0.065	0.065	NS	NS	NS	NS
Sulphate	68	75	42	29	<200	NS	<1000	NS
Suspended Solids at 105º	217	217	38	86	NS	NS	NS	<50
Tin	<0.01	<0.01	<0.01	<0.01	NS	NS	NS	NS
Titanium	0.02	0.023	0.017	<0.01	NS	NS	NS	NS
Uranium	<0.01	<0.01	<0.01	<0.01	0.070 - 0.284	NS	NS	0.01
Vanadium	0.011	0.01	<0.01	0.013	<0.1	NS	<1	<0.1
Zinc	<0.01	0.015	0.013	0.029	<3	<0.002	<20	<1
KEY:								
Exceeds either the DWS standards for domestic, aquatic ecosystem, livestock watering and irrigation water uses								
No Standard								NS

10.6.3 Clean and Dirty Catchments

The dirty areas identified on site are:

- Hards and Softs Waste Dumps;
- Discard Dump;
- Mine Plant;
- Product Stockpile Area;
- Topsoil Dumps;
- HMV Hard Park Area;
- Workshop Area;
- Fuel Storage Area; and
- Sewage Treatment Plant.

The rest on the areas within the project area are classified as clean water areas (please see the Surface Water Assessment - Appendix F). Simulated peak flows and runoff volumes for delineated stormwater sub-catchments are summarised in Table 10-7 for the 1:50-year recurrence interval, 24-hour flood event.

Table 10-7: Simulated Peak Runoff Rates and Volumes at Dalyshope

Name	Description	Area (m2)	Precipitation (mm)	Runoff Volume (ML)	Peak Runoff (m^3/s)
S1	Dirty	286.9	152.4	339.2	199.6
S1_1	Dirty	5.0	152.4	5.2	1.7
S1_2	Dirty	6.4	152.4	6.9	2.4
S2_1	Dirty	1.8	152.4	2.1	1.2
S2_2	Dirty	1.8	152.4	2.1	1.3
S3_1	Dirty	15.7	152.4	15.7	4.6
S3_2	Dirty	15.6	152.4	15.6	4.5
S5	Dirty	245.4	152.4	290.2	171.6
Discard_Dump	Dirty	63.1	152.4	36.3	4.9
Hards_WRD	Dirty	98.4	152.4	57.5	15.6

Softs_WRD	Dirty	41.6	152.4	25.7	7.2

10.7 Groundwater

The Groundwater Assessment undertaken during the EIA Phase is appended to this report as Appendix G. A summary of the baseline conditions is included in the below sections.

10.7.1 Local and Regional Aquifers

The Karoo Supergroup sediments associated with the Ellisras Basin generally have a recharge coefficient of 0.7% of MAP (equating to approximately 3 mm/a). The local geology defines the following aquifers for the Project area (Digby Wells, 2014):

Unconfined alluvial aquifer associated with the Limpopo River: Groundwater is temporarily stored in this aquifer allowing recharge to the underlying fractured rock aquifer. Surface water interactions take place within the unconfined alluvial aquifer. As the Limpopo River is also defined as the border between Botswana and South Africa, contamination and dewatering impacts to this aquifer could have international consequences.

Fractured aquitard (meaning a zone that restricts the flow of groundwater from one aquifer to another) associated with the Grootegeluk Formation lithologies: The aquifer comprises shale and mudstone lithologies. Groundwater flow and storage occurs predominantly along fractures and fissures, which act as preferred pathways for groundwater flow. High yielding fractures and fissures can be intersected in this aquifer but unless this is associated with a high recharge feature (i.e. perennial river) storage volume could be poor and limited.

Permeable aquifer associated with the coal seams: Water associated with this aquifer is generally of poor quality due to the presence of sulphates occurring within the coal seams. Coal seams typically have a slightly higher conductivity rate in comparison to the mudstone lithologies and can therefore yield higher volumes of water.

Deep fractured aquifer associated with the Swartrant Formation lithologies: The aquifer comprises of sandstone lithologies. Groundwater storage is within pore space and yield is defined by the size and interconnectivity of pore spaces, which results in low yielding boreholes.

Dolerite intersections were not identified during the previous hydrogeological drilling programme; however, its presence is mentioned in the project description provided by Universal. Dolerite is associated with very low permeabilities limiting or preventing the flow of groundwater through this lithological unit and are known as aquicludes. Aquicludes are important in controlling the groundwater flow and aquifer characteristics in overlying and underlying aquifers.

10.7.1.1 Previous investigation results

As part of the Dalyshope (Phase 1) Coal Mine and Vedanta IPP hydrogeological assessments, 11 boreholes were drilled and 29 boreholes were aquifer tested (Figure 10-16).

The 11 boreholes intersected mudstone, shale, sandstone and coal lithologies, with eight boreholes measuring water strikes with blow yields estimating between 612 l/hr to 10 404 l/hr. Water strike depths ranged from 8 mbgl to 107 mbgl, with 10 mbgl occurring as the most frequent water strike depth. The shallow water strikes predominantly yielded seepage water. The higher yielding (deeper water strikes) are associated with lithological contacts and potential linear fracture features. No water strikes were identified below a depth of 107 m (where drilling extended to depths of 150 m and 300 m) (Digby Wells, 2014a and 2014b).

Static water levels varied between 8 mbgl to 20 mbgl. Majority of the static water level measurements indicate confined aquifer characteristics are present at the Project area, which are attributed to the presence of aquitards (as a result of thick mudstones sequences, at shallow depths). Only the boreholes which intersect the alluvial aquifer display unconfined aquifer characteristics (Digby Wells, 2014a and 2014b).

The aquifer testing results indicate that the boreholes in the Project area have low borehole yields, with fast drawdown in water levels and slow recoveries. Boreholes which intersect the alluvial aquifer (Limpopo River) attained the highest yields. The average transmissivity values calculated from the recovery data was 0.93 m^2/d (Digby Wells, 2014a and 2014b).

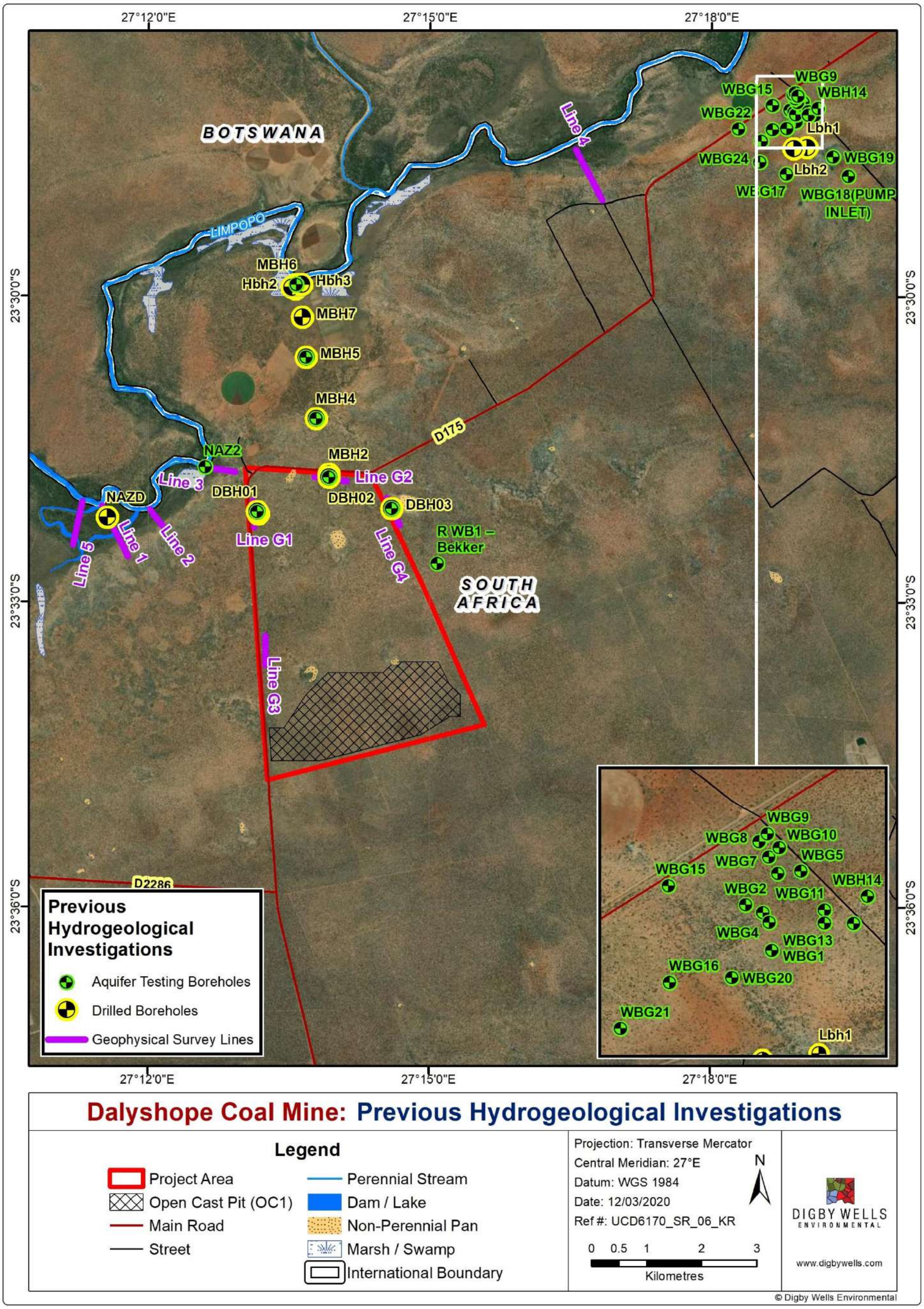


Figure 10-16: Previous Hydrogeological Investigations

10.7.2 Groundwater Usage

The main source of drinking water supply in and around the project area is groundwater through a number of solar energy, windmill pumps and submersible pumps which are mainly used for domestic and livestock watering.

A total of 88 private boreholes were surveyed, of which 10 are within the Mining Right area while 42 are within a 3 km radius of the mining right area. Of the 42 boreholes:

- 8 (9%) boreholes are used for game watering only;
- 20 (23%) are used for livestock watering;
- 11 (13%) are used for human drinking, gardening and livestock watering;
- 13 (15%) are used for groundwater monitoring;
- 12 (14%) are exploration holes (not boreholes) used for monitoring;
- 3 (3%) are not used; and
- The remaining 21 (24%) boreholes are unused.

10.7.3 Groundwater Quality

A total of 48 samples were collected for baseline water quality assessment between 2012 and 2019. The samples were sent for analysis to Aquatico Laboratory (Pty) Ltd and Water Lab; both SANAS accredited laboratories in Pretoria. The boreholes sampled were chosen based on their geographical distribution to best represent the project site.

The groundwater quality results were compared against the South African Water Quality Guidelines (SAWQG) for domestic use as shown in Table 10-8. According to the SAWQG guideline, water quality has two benchmarks: Ideal, Acceptable and Unacceptable:

- Concentrations below the “Ideal” is considered of good quality;
- Concentrations between the “Ideal” and “Unacceptable” is considered as marginal. This is the maximum acceptable concentration if consumed for less than 7 years (depending on the sensitivity of the receptors); and
- Concentrations above the “Unacceptable” limits are unacceptable for human consumption.

As shown in Table 10-8, none of the boreholes are considered of good water quality as they are all above the Class I category. At least one of the tested parameters exceed the recommended limit. The water is generally not recommended for human consumption without treatment due to high Cl, TDS, Ca and other parameters. This is with the exception TCD1 which is in good quality and boreholes DH2, Gruis1, KW1, KW2, KW4, NAZ2A, SSEX1, SSX1, VLV2, W26 and WB5 which are within the acceptable limit and can be used for domestic use.

The elevated element concentrations can be attributed to the natural dissolution of the host rocks. The only external impacts are associated with the elevated nitrate concentrations identified in boreholes CAN1 and KW4 which is associated with fertiliser application and/or animal waste as cattle often live nearby.

The water chemistry is also displayed in the form of a Stiff Diagram in Figure 10-17. The water facies of the region range between Sodium Chloride (Na-Cl) and Calcium/ Magnesium bicarbonate (Ca/Mg-HCO_3) water types. Cl is the dominant anion, although bicarbonate (HCO_3) is also present. The dominant cation is Na, although Ca and Mg are also present.

High Na and Cl values are typical of Karoo aquifers with old stagnant water, with high salt loads. This is indicative of low recharge and long residency time (slow moving groundwater). The Ca/Mg-HCO_3 signature is often associated with recently recharged water. This is an indication of the aquifer heterogeneity whereby although the recharge in the area is low, there are high permeable zones, often associated with fractures, along which recharge takes place. Such chemical signature is unique to the Waterberg Coalfield, as the signature in the Ermelo, Highveld or Witbank Coalfields are characterised with Ca/Hg-HCO_3 type water with no or insignificant Cl in the baseline quality.

Noteworthy is the sulphate levels in these boreholes. The recommended maximum sulphate limit for drinking is 400 mg/L, but the concentration is currently less than 200 mg/L. Sulphate is expected to be an element of concern at Dalyshope Coal Mine based on the experience learned from other coal mines, including at Grootegeluk where it has reached up to 2 700 mg/L in some monitoring boreholes. The low levels of sulphate in all the boreholes suggests that no mine-related contamination has taken place at the project site. Sulphate should be used as an indicator to assess the Dalyshope Coal Mine impact and the values obtained currently should be used as a baseline for future comparisons.

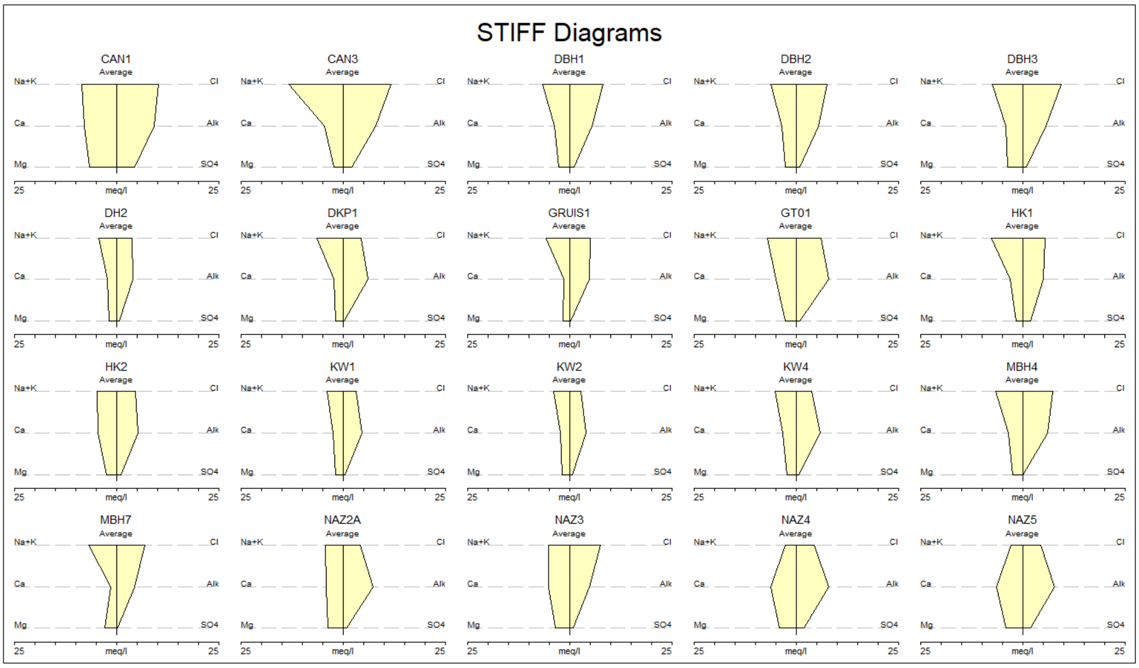


Figure 10-17: Stiff Diagram of the Groundwater Chemistry

Table 10-8: Baseline groundwater quality as classified based on the SAWQG for domestic use

SAWQG for domestic use	pH	TDS mg/L	TALK mg/L	NO3_N mg/L	SO4 mg/L	Ca mg/L	Cl mg/L	F mg/L	Mg mg/L	Na mg/L	K mg/L	Al mg/L	As mg/L	Cd mg/L	Cu mg/L	Cr mg/L	Fe mg/L	Pb mg/L	Mn mg/L	Ni mg/L	Zn mg/L
Ideal	6	450		6	200	32	100	1	30	100	50	0.15	0.01	0.005	1	0.05	0.1	0.01	0.05	0.15	3
Acceptable	6 - 9	450 - 1000	-	6 - 10	200 - 400	32 - 80	100 - 200	1 - 1.5	30 - 50	100 - 200	50 - 100	0.15 - 0.5	0.01 - 0.2	0.005 - 0.01	1 - 3	0.05 - 0.06	0.1 - 0.3	0.01 - 0.02	0.05 - 0.1	0.15 - 0.35	3 - 5
Unacceptable	9	1000		10	400	80	200	1.5	50	200	100	0.5	0.2	0.01	3	0.06	0.3	0.02	0.1	0.35	5
CAN1	7.14	1316	459	12.2	214	158	367	2.12	81.2	182	24.6	<0.003	-	-	-	-	<0.003	-	<0.001	-	-
CAN3	8.71	1202	398	0.264	105	93.1	416	0.839	28.8	295	23.9	<0.003	-	-	-	-	<0.003	-	<0.001	-	-
DBH1	7.77	773	277	0.017	46.1	73.7	288	0.993	34.1	146	15.9	<0.003	-	-	-	-	<0.003	-	<0.001	-	-
DBH2	7.68	721	269	0.017	38.9	69.7	264	1.23	34.1	133	16.2	<0.003	-	-	-	-	<0.003	-	<0.001	-	-
DBH3	8.03	863	284	0.017	39.4	85.3	333	1.28	45.9	163	18.7	<0.003	-	-	-	-	<0.003	-	<0.001	-	-
DH2	6.9	684	204	9.6	<0.2	47.376	136	0.8	23.159	97.847	6.452	< 0.100	< 0.010	< 0.010	< 0.010	< 0.010	< 0.025	< 0.010	< 0.025	< 0.010	0.01
DKP1	7	562	322	0.303	4.97	39.6	158	1.18	22.9	137	3.78	<0.003	-	-	-	-	1.93	-	<0.001	-	-
GRUIS1	6.8	706	240	0.2	<0.2	30.514	176	0.8	19.723	128.813	6.106	< 0.100	< 0.010	< 0.010	< 0.010	< 0.010	0.082	< 0.010	0.081	< 0.010	0.016
GT01	7.3	912	328	0.3	<0.2	96.256	227	0.5	32.005	156.848	20.321	< 0.100	< 0.010	< 0.010	< 0.010	< 0.010	< 0.025	< 0.010	0.097	< 0.010	< 0.010
HK1	7.7	760	240	0.9	<0.2	34.565	129	3.4	10.996	164.603	6.841	< 0.100	< 0.010	< 0.010	< 0.010	< 0.010	< 0.025	< 0.010	< 0.025	< 0.010	0.1
HK1	7.75	726	258	0.979	80.5	72.2	216	2.44	23.4	169	6.89	<0.003	-	-	-	-	<0.003	-	<0.001	-	-
HK1	8.02	795	265	1.89	98.7	78.7	236	2.86	25.6	185	7.71	<0.003	-	-	-	-	<0.003	-	<0.001	-	-
HK2	7.66	584	256	0.017	55.4	88.7	152	0.894	28.3	98.4	7.27	<0.003	-	-	-	-	<0.003	-	0.025	-	-
HK2	7.31	641	272	0.298	52.4	99.2	175	1.15	31.5	110	8.21	<0.003	-	-	-	-	<0.003	-	0.044	-	-
KW1	7	606	240	1.7	0.3	47.017	123	0.7	20.607	86.988	6.903	0.278	< 0.010	< 0.010	< 0.010	< 0.010	0.062	< 0.010	0.075	< 0.010	0.036
KW1	7.3	405	213	7.22	23.7	47.9	88.9	0.558	21.5	83.4	4.17	<0.003	-	-	-	-	<0.003	-	<0.001	-	-
KW1	7.68	458	240	5.73	21	48.8	114	0.713	23.2	94.3	5.45	<0.003	-	-	-	-	<0.003	-	<0.001	-	-
KW1	7.72	447	223	8.84	<0.04	58.9	119	0.765	24.2	95.8	6.61	<0.003	-	-	-	-	<0.003	-	<0.001	-	-
KW2	7.76	409	204	7.12	27.9	45.5	93.2	0.619	21.8	86.3	4.37	<0.003	-	-	-	-	<0.003	-	<0.001	-	-
KW4	7.16	549	290	9.26	36.5	63	116	0.989	26.8	108	14.3	<0.003	-	-	-	-	<0.003	-	<0.001	-	-
KW4	7.77	562	300	10.8	16.5	73.4	118	0.905	27.2	120	14.9	<0.003	-	-	-	-	<0.003	-	<0.001	-	-
KW4	8.12	598	279	6.12	40.5	69.1	162	1	29.6	107	15	<0.003	-	-	-	-	<0.003	-	<0.001	-	-
MBH4	8.03	713	299	0.017	1.43	72.4	258	2.48	30.9	139	23.9	<0.003	-	-	-	-	<0.003	-	<0.001	-	-
MBH7	8.36	624	215	0.024	15	28.2	245	1.44	35.5	147	15.2	<0.003	-	-	-	-	<0.003	-	<0.001	-	-
NAZ2A	7.67	643	330	0.561	60.1	119	146	0.601	49.3	60.5	8.28	<0.003	-	-	-	-	<0.003	-	0.007	-	-
NAZ2A	7.88	655	411	2.15	22.2	47.5	150	0.458	44	126	10.9	<0.003	-	-	-	-	<0.003	-	<0.001	-	-
NAZ3	7	1108	252	3.2	0.2	140.053	288	0.8	39.495	121.673	15.892	< 0.100	< 0.010	< 0.010	< 0.010	< 0.010	< 0.025	< 0.010	< 0.025	< 0.010	0.013
NAZ3	8.12	664	231	2.18	36.4	71.8	253	0.579	45.5	103	12.5	<0.003	-	-	-	-	<0.003	-	<0.001	-	-
NAZ4	7.64	730	396	0.017	93.2	126	156	0.581	50.3	59.9	5.71	<0.003	-	-	-	-	<0.003	-	0.169	-	-
NAZ4/5	7.77	652	330	0.631	61.4	128	146	0.661	49.9	59.2	8.23	<0.003	-	-	-	-	<0.003	-	0.043	-	-
NAZ5	7.73	732	387	0.017	95.5	129	155	0.617	51.8	61.4	5.55	<0.003	-	-	-	-	<0.003	-	<0.001	-	-
PEH1	8.46	1184	239	1.47	68.7	115	547	1.03	49.3	238	20.2	<0.003	-	-	-	-	<0.003	-	<0.001	-	-
PEH1	7.43	1183	246	0.961	94.4	114	532	0.966	57.3	215	22	<0.003	-	-	-	-	<0.003	-	<0.001	-	-
PEH2	7.35	1161	255	0.017	60.3	107	541	0.95	49.6	221	25.8	<0.003	-	-	-	-	<0.003	-	0.014	-	-
SSEX1	7.4	726	248	0.4	<0.2	63.462	108	0.6	33.164	68.27	4.921	< 0.100	< 0.010	< 0.010	< 0.010	< 0.010	< 0.025	< 0.010	< 0.025	< 0.010	< 0.010
SSX1	7.51	469	263	0.042	62.3	64	89.1	0.42	36.4	55.3	2.84	<0.003	-	-	-	-	<0.003	-	0.481	-	-
SSX1	8.02	492	292	0.343	60	70.5	75.1	0.66	41.3	64.8	3.91	<0.003	-	-	-	-	<0.003	-	<0.001	-	-
TCD1	6.2	544	80	0.1	0.2	22.778	181	0.2	20.739	78.153	10.074	< 0.100	< 0.010	< 0.010	< 0.010	< 0.010	10.218	< 0.010	0.263	< 0.010	0.012
VLV1	7.15	779	271	0.017	63.1	75.8	282	0.622	37.6	142	15	<0.003	-	-	-	-	<0.003	-	0.161	-	-
VLV1	7.82	725	262	0.571	56.6	60.3	258	0.688	35.2	144	13.2	<0.003	-	-	-	-	<0.003	-	<0.001	-	-
VLV2	6.8	702	252	2.5	0.2	34.976	158	0.7	22.66	126.286	4.499	< 0.100	< 0.010	< 0.010	< 0.010	< 0.010	0.16	< 0.010	0.047	< 0.010	0.057
VLV3	8.43	587	198	0.017	<0.04	16.3	263	1.59	44.8	134	8.31	<0.003	-	-	-	-	<0.003	-	<0.001	-	-
VLV3	8	678	263	0.305	0.997	34.5	279	2.5	49.9	142	10.2	<0.003	-	-	-	-	<0.003	-	<0.001	-	-
W26	7.2	688	336	0.2	<0.2	76.942	72	1.2	33.22	78.414	15.126	< 0.100	< 0.010	< 0.010	< 0.010	< 0.010	< 0.025	< 0.010	0.045	< 0.010	< 0.010
WB 1	7.86	1497	264	1.53	73.6	92.9	707	0.941	40.8	380	41.8	<0.003	-	-	-	-	<0.003	-	<0.001	-	-
WB 1	7.74	1500	277	1.14	19.9	87.8	745	0.841	41.4	379	59	<0.003	-	-	-	-	<0.003	-	<0.001	-	-
WB 5	7.81	460	251	7.97	35.5	51.6	81.9	0.835	18.3	108	5.3	<0.003	-	-	-	-	<0.003	-	<0.001	-	-
WB 5	7.56	438	257	6.25	37	45.7	74	0.68	17.6	96.7	6.22	<0.003	-	-	-	-	<0.003	-	<0.001	-	-

10.7.4 Groundwater Level and Flow Direction

The groundwater levels within the open pit area varies between 8 m and 20 m below surface, with an average of 15.1 m. There is currently only one water level monitoring borehole (DH2) that is located within the pit area. This is a limitation as the borehole may not be representative of the entire pit footprint. The water depth at the pit area is shown in Figure 10-18.

Under natural condition groundwater flow mimics the topography and regional surface water flow direction is towards the Limpopo River. However, local depression of water table could occur due to abstractions by the local farmers.

The maximum hydraulic head is found in the eastern part of the project site, at an elevation of 829 mamsl. The lowest hydraulic head is found in north-western part of the Project area at an elevation of 824 mamsl. This would mean that the hydraulic gradient along the groundwater flow direction is approximately 0.0025.

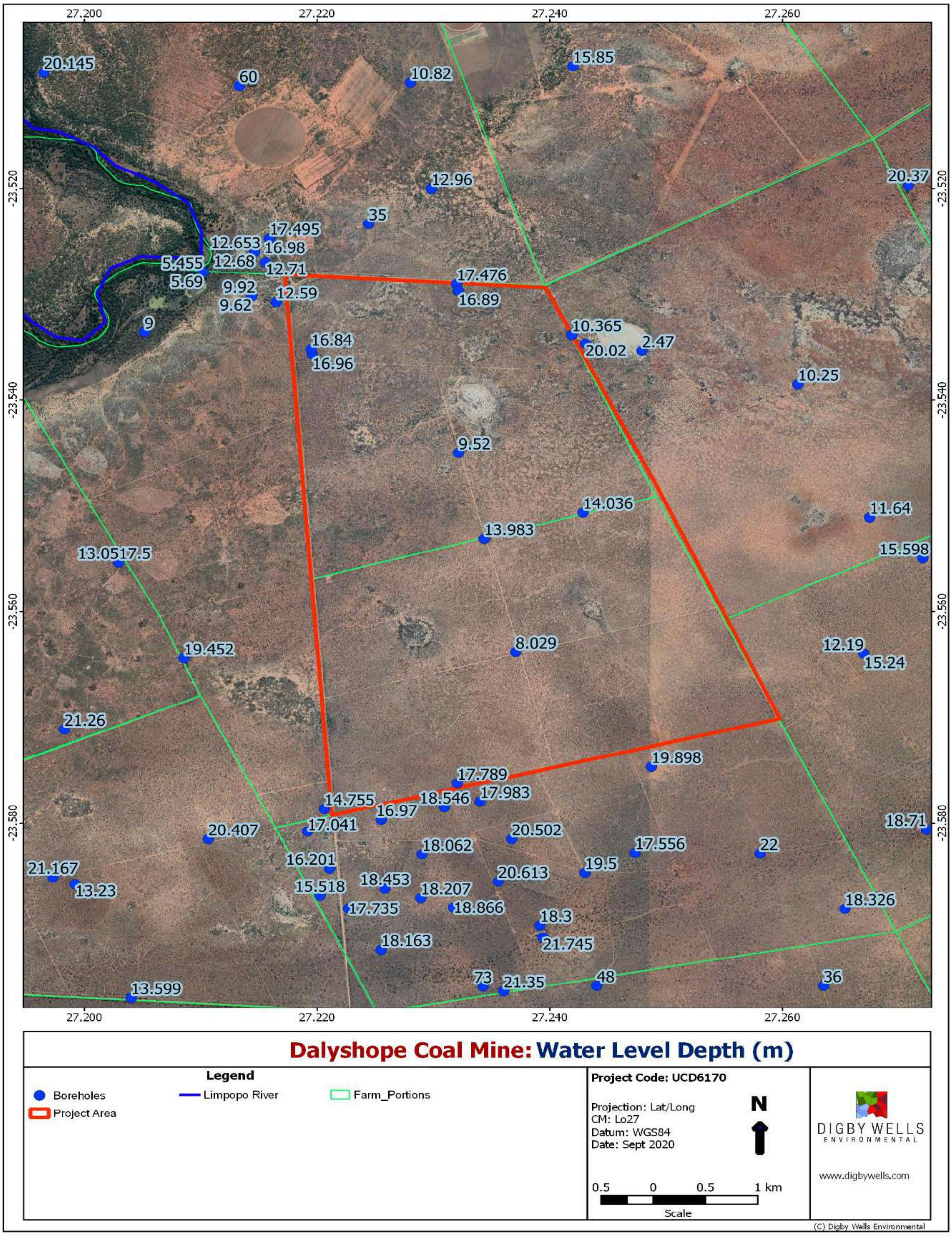


Figure 10-18: Groundwater Depth at the Project Area

10.8 Geochemistry

The information provided in this section was obtained from the 2014 Geochemical Study conducted by Digby Wells (Appendix H). A detailed Geochemistry Study is being undertaken to assess the potential of Acid Mine Drainage post-closure. Eight waste rock samples were collected and sent to an accredited laboratory for analysis. The report and findings of the investigation thereof will be included in the Final EIA report.

10.8.1 Desktop Review

Golder Associates completed a conceptual Acid Rock Drainage (ARD Potential Study for the Dalyshope Project IN 2013. A total of 19 samples including waste and coal materials were analysed for Acid-Base Accounting (ABA) and Net Acid Generation (NAG). The results from the Golder Associates report were incorporated into the August 2014 “Dalyshope Ash backfill and Geochemical Study” undertaken by Digby Wells. The purpose of the Digby Wells study was to evaluate the feasibility of backfilling the proposed open pit at the Dalyshope project with ash material and other waste rock by undertaking geochemical laboratory analysis and detailed groundwater flow and geochemical models where needed.

A total of six waste rock materials were sent for static testing (XRD, X-Ray Fluorescence, ABA, NAG and Distilled/Reagent waste leach test). Additionally, one composite waste rock sample was submitted for kinetic humidity cell tests for 20 weeks with a leachate fluid used was distilled water. The samples from the “Dalyshope Ash backfill and Geochemical Study” with additional sample results taken from the Golder study were used to provide a more statistical distribution of the data.

10.8.2 Sampling of Waste Material

A total of eight core rock samples from exploration boreholes, were available for testing with each sample weighing at least 2 kg. For acid generating potential and waste classification purposes, the provided samples were submitted for the following laboratory test work:

- X-Ray Diffraction (XRD) and X-Ray Fluorescence (XRF) to determine the mineralogical content of the samples;
- Aqua regia digestion to allow an elevation of the total concentration in each sample;
- Acid-Base Accounting (ABA), Net Acid Generation (NAG) and Sulphur speciation to determine the acid mine drainage potential of each sample; and
- Distilled water leachate test to evaluate the leachability of contaminants from the material under operational conditions (neutral pH).

During the sampling of the cores, mineralogy that was observed included siderite, which is one of sulphide minerals that may or may not be responsible for acid generation depending on the pH. The acid forming mineral pyrite together with the acid buffering mineral calcite were observed during the site assessment.

10.9 Flora

The proposed Project area falls within the Least Threatened Limpopo Sweet Bushveld biome (Table 10-9;Figure 10-19) (Mucina & Rutherford, 2006). This vegetation type occurs within the Limpopo Province at an altitude of 700-1000 metres. This vegetation type extends across the border, into Botswana and consists of plains, which are traversed by several tributaries of the Limpopo River. A Critical Biodiversity Area and Protected Area are located within a close proximity to the study area (see Figure 10-20 and Figure 10-21). Majority of the infrastructure layout lies within an identified CBA (SANBI, 2013).

Vegetation consists of short, open woodland. Areas which have been disturbed are dominated by thickets of Blue Thorn (*Senegalia erubescens)*, Black Thorn (*Senegalia mellifera)* and Sickle Bush (*Dichrostachys cinerea*) (Mucina and Rutherford, 2006).

Tall trees include Ankle thorn (*Vachellia robusta)* and Black Monkey Thorn (*Senegalia burkei).* Smaller trees include Blue Thorn (*Senegalia erubescens), Acacia fleckii* (*Senegalia cinerea*), *Vachellia nilotica, Senegalia senegal, Albizia anthelminitica, Boscia albitrunca, Combretum apiculatum,* and *Terminalia sericea.*

A site visit during the wet season was conducted in February 2020 for the Project area and determined that the vegetation was similar to the description provided by Mucina and Rutherford (2006). Sandy soils, high levels of termitaria (termite) activity and evident signs of moderate grazing resulted in the Project area in a relatively good condition.

Dominance of species varied marginally throughout the Project area with an abundance of cosmopolitan species such as *Boscia* spp. and *Grewia* spp. Various portions of the Project area were dominated by smaller trees of *S. erubescens*, *Terminalia cinerea*, *Dichrostachys cinerea*, *Combretum apiculatum* and interspersed with *Commiphora pyracanthoides* and numerous forbs such as *Crotalaria* sp., *Tephrosia multijuga* and *Tribulus terrestris*.

Five major vegetation types were noted within and adjacent to the Project area. Three of these are types of bushveld with different dominant species, and the fourth a very distinctive watercourse (pan vegetation). The five identified vegetation communities are:

- Acacia (Senegalia and Vachellia) woodland;
- Combretum woodland;
- Terminalia woodland;
- Pan vegetation; and
- Riparian vegetation (adjacent to Project area).

Most of the Project area is comprised of bushveld vegetation with a small tree and herbaceous layer indicating a Savanna Woodland.

Table 10-9: Conservation status of the Limpopo Sweet Bushveld (Mucina & Rutherford, 2006)

Name of Vegetation type	Limpopo sweet bushveld
Code as used in the Book - contains space	SVcb 19
Conservation Target (percent of area)	19%
Description of conservation status	Least threatened
Name of the biome	Central Bushveld
Threats and uses	About 5% transformed, mainly by cultivation.

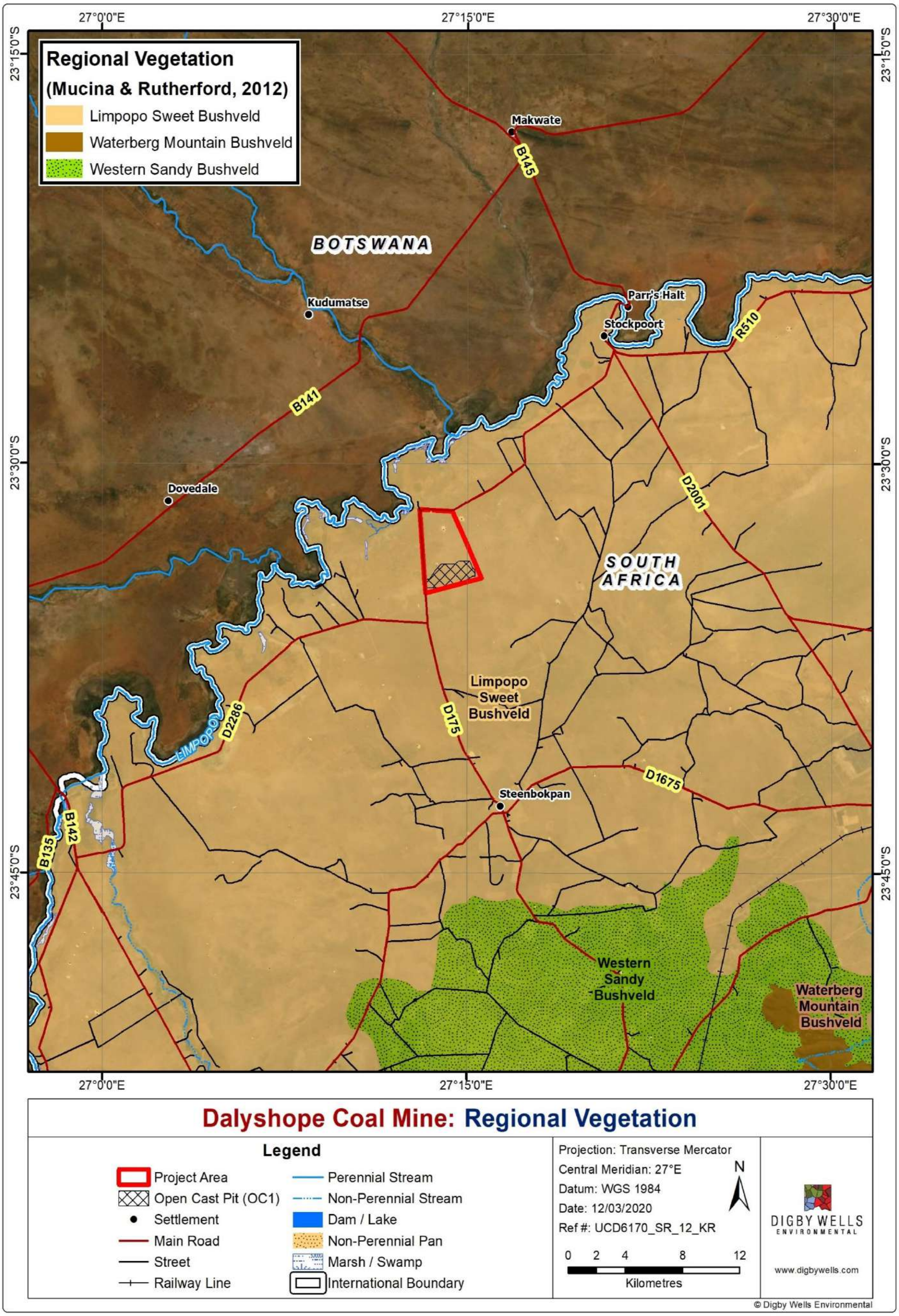


Figure 10-19: Regional Vegetation

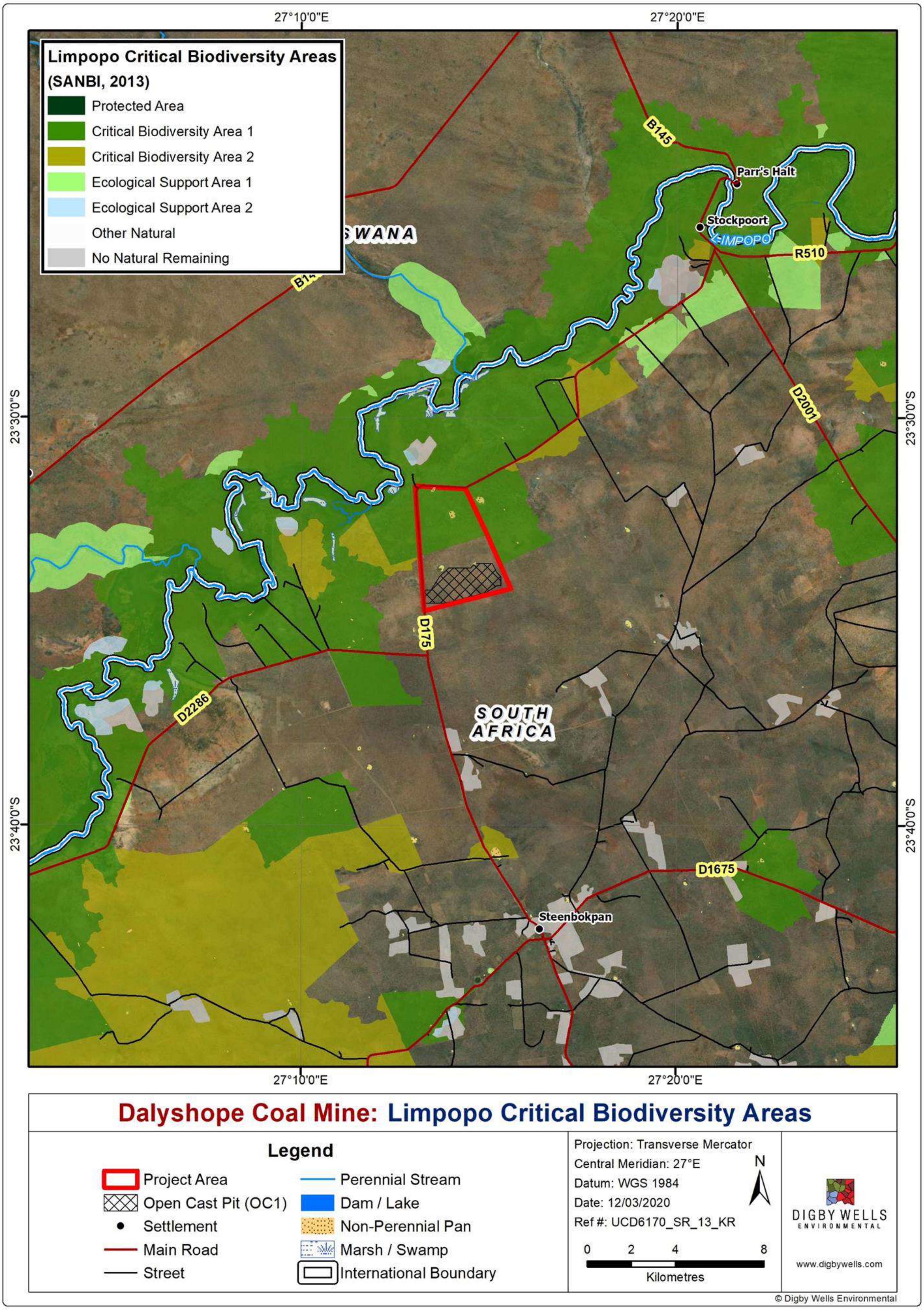


Figure 10-20: Limpopo Critical Biodiversity Areas within Project Area

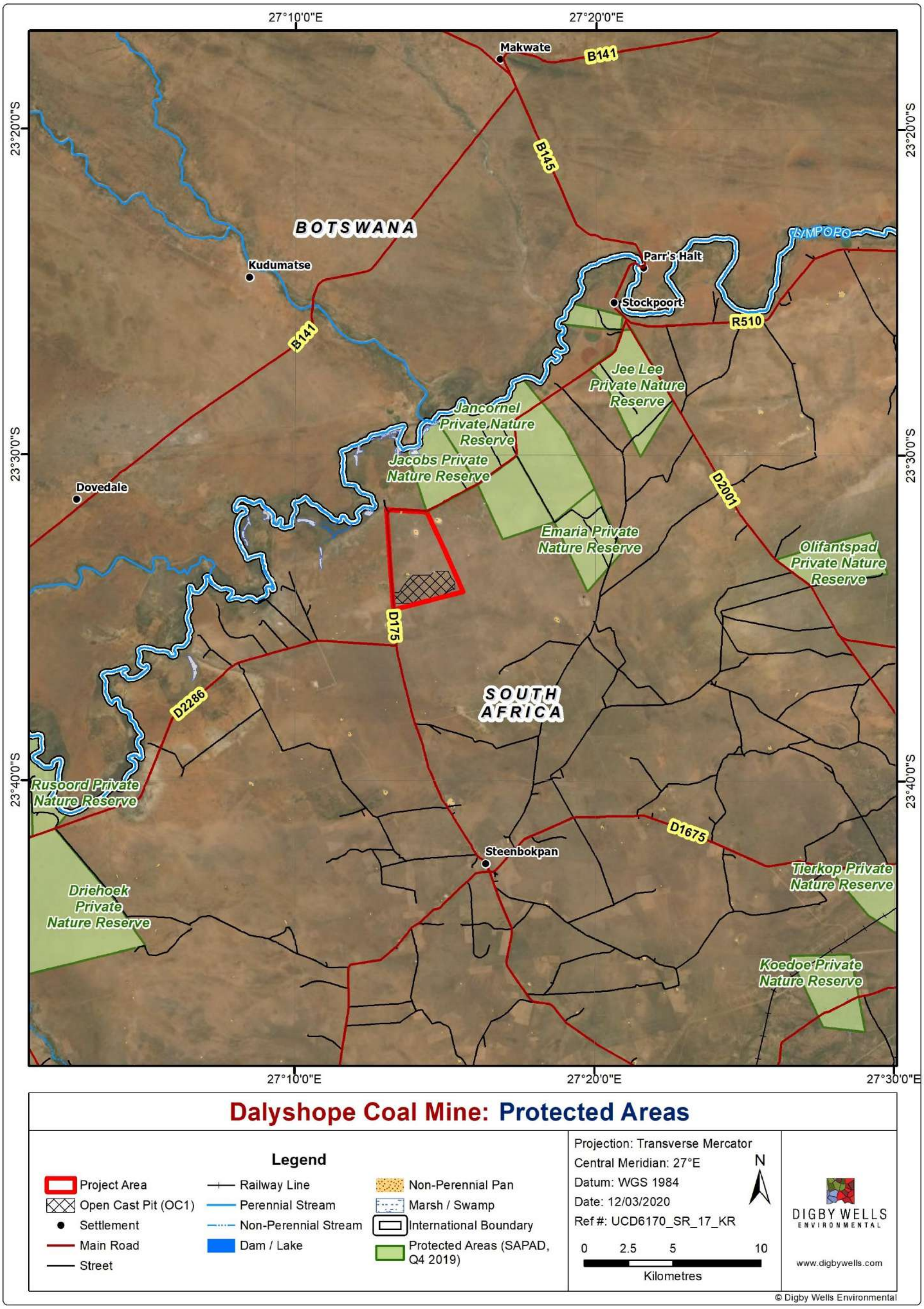


Figure 10-21: Protected Areas in proximity to the Dalyshope Site

10.9.1 Species of Conservation Concern

The proposed Project area lies within two Quarter Degree Squares (QDSs) namely 2327CA and 2327CB. The Pretoria Computerised Information System (PRECIS) (BODATSA-POSA, 2016) database was consulted to establish previously recorded plant species in the locality of the Project area by retrieving data for the relevant QDSs. According to the PRECIS, no Red Data species are expected to be present for the 2327CA and 2327CB QDSs.

10.9.2 Protected Flora

Three Nationally Protected Tree species (according to Schedule A the National Forests Act (Act. 89 of 1998) (NFA)) and one Declining yet Least Concern (IUCN status) species (according to the South African Red Data list) were identified during the field investigations (Table 10-10). In addition, one provincially protected plant species according to Schedule 12 of the Limpopo Environmental Management Act, 2003 (Act No. 7 of 2003) (LEMA), *Grewia rogersii*, was recorded during the field surveys in 2013. It is important to note that this does not necessarily imply that additional Species of Conservation Concern (SCC) do not occur on site.

Table 10-10: Floral SCC identified within the Project area

Family	Scientific name	Common name	Protected status
Capparaceae	*Boscia albitrunca*	Shepherds Bush Tree	Schedule A of NFA
Combretaceae	*Combretum imberbe*	Leadwood	Schedule A of NFA
Fabaceae	*Vachellia erioloba*	Camel Thorn	Schedule A of NFA
Malvaceae	*Grewia rogersii*	Waterberg Raisin	Schedule 12 of LEMA

10.10 Fauna

The field work searched for various animal groups including small mammals, large mammals, birds, reptiles, amphibians and invertebrates (specifically butterflies, scorpions and baboon spiders).

10.10.1 Mammals

The diversity of vegetation types present ensures an ecologically diverse assemblage of plant species which in turn supports a variety of mammal species. Some of the farms surrounding the Dalyshope Project area are involved in the wildlife industry (mostly hunting) and access to some of these farms was restricted. Accordingly, species lists could not be compiled. As a result, the list provided below is restricted to species naturally occurring in the area and does not include introduced or re-introduced species.

Opportunistic sightings during the site survey in February 2020 of mammals included Gemsbok (*Oryx gazella*), Impala (*Aepyceros melampus*), Porcupine (*Hystrix africaeaustralis*), Brwon Hyeana (*Hyaena brunnea*) (Near Threatedned), Warthog (*Phacochoerus africanus*), and a Vlei Rat (*Otomys irroratus*). A Leopard (*Panthera pardus*) was recorded in the Project area during the 2013 surveys. Of the mammals potentially occurring on site, 17 have been assigned a Red Data status. These species are listed in Table 10-11 below.

Table 10-11: Red Data Mammal Species likely to be found in the Project Area

Common Name	Status	IUCN Status
African Elephant	VU	Least Concern
African Weasel	N/A	Lower Risk – least concern
Brown Hyaena	Near Threatened	Lower Risk – near threatened
Bushveld Gerbil	N/A	Least Concern
Darling's Horseshoe Bat	NT	Least Concern
Cheetah	VU	Vulnerable – Decreasing
Forest Shrew	N/A	Least Concern
Leopard	VU	Vulnerable – Decreasing
Geoffroy's Horseshoe Bat	NT	Least Concern
Greater Dwarf Shrew	N/A	
Hippo	VU	Least Concern
Honey Badger	VU	Lower Risk – least concern
Least Dwarf Shrew	N/A	Least Concern
Lesser Dwarf Shrew	N/A	Least Concern
Lesser Grey-browned Musk Shrew	N/A	Least Concern
Lesser Red Musk Shrew	N/A	Least Concern
Reddish-grey Musk Shrew	N/A	Least Concern
Rock Dormouse	N/A	Least Concern
Rusty Bat	NT	Least Concern
Sable Antelope	VU	Lower Risk – conservation dependent
Schreiber's Long-fingered Bat	NT	Near Threatened
Serval	NT	Least Concern
Short-eared Trident Bat	CR	Vulnerable
Short-snouted Elephant-shrew	N/A	Least Concern
Single-striped Mouse	N/A	Least Concern
South African Hedgehog	NT	Lower Risk – Least Concern
Spotted-necked Otter	NT	Least Concern
Sundevall's Leaf-nosed Bat	N/A	Least Concern

Common Name	Status	IUCN Status
Swamp Musk Shrew	N/A	Least Concern
Temminck's Hairy Bat	NT	Least Concern
Tiny Musk Shrew	N/A	Least Concern
Water Rat	NT	Least Concern
Welwitsch's Hairy Bat	NT	Least Concern

EN = Endangered, CR = Critically Endangered, VU = Vulnerable, NT = Near Threatened, LC = Least Concern

10.10.2 Avifauna

According to the South African Bird Atlas Project (SABAP2), almost 300 species of birds have been identified in the area; the majority of these birds are comprised of bushveld species (please see the Fauna and Flora Impact Assessment Report - Appendix I). Of these species, 14 have been assigned a Red Data status and 25 are either endemic or near-endemic to South Africa. These species are listed in the Table 10-12 below. The Endangered Saddle-billed Stork was seen on site.

Table 10-12: Red Data Avifauna Species likely to be found in the Project Area

Common Name	Scientific Name	Status	Endemicity
Babbler, Southern Pied	*Turdoides bicolor*		Endemic
Barbet, Acacia Pied	*Tricholaema leucomelas*		Near-endemic
Bateleur, Bateleur	*Terathopius ecaudatus*	VU	
Bulbul, African Red-eyed	*Pycnonotus nigricans*		Near-endemic
Bustard, Kori	*Ardeotis kori*	VU	
Canary, Yellow	*Crithagra flaviventris*		Near-endemic
Eagle, Martial	*Polemaetus bellicosus*	VU	
Eagle, Tawny	*Aquila rapax*	VU	
Falcon, Lanner	*Falco biarmicus*	NT	
Finch, Scaly-feathered	*Sporopipes squamifrons*		Near-endemic
Flamingo, Greater	*Phoenicopterus ruber*	NT	
Flycatcher, Marico	*Bradornis mariquensis*		Near-endemic
Goshawk, Southern Pale Chanting	*Melierax canorus*		Near-endemic
Hornbill, Southern Yellow-billed	*Tockus leucomelas*		Near-endemic
Korhaan, Red-crested	*Lophotis ruficrista*		Near-endemic
Lark, Sabota	*Calendulauda sabota*		Near-endemic
Oxpecker, Red-billed	*Buphagus erythrorhynchus*	NT	

Common Name	Scientific Name	Status	Endemicity
Painted-snipe, Greater	*Rostratula benghalensis*	NT	
Pratincole, Black-winged	*Glareola nordmanni*	NT	
Prinia, Black-chested	*Prinia flavicans*		Near-endemic
Sandgrouse, Burchell's	*Pterocles burchelli*		Near-endemic
Sandgrouse, Double-banded	*Pterocles bicinctus*		Near-endemic
Scrub-Robin, Kalahari	*Cercotrichas paena*		Near-endemic
Shrike, Crimson-breasted	*Laniarius atrococcineus*		Near-endemic
Shrike, Southern White-crowned	*Eurocephalus anguitimens*		Near-endemic
Sparrow, Cape	*Passer melanurus*		Near-endemic
Sparrow, Great	*Passer motitensis*		Near-endemic
Spurfowl, Natal	*Pternistis natalensis*		Near-endemic
Starling, Burchell's	*Lamprotornis australis*		Near-endemic
Stork, Marabou	*Leptoptilos crumeniferus*	NT	
Stork, Saddle-billed	*Ephippiorhynchus senegalensis*	EN	
Stork, Yellow-billed	*Mycteria ibis*	NT	
Tit, Ashy	*Parus cinerascens*		Near-endemic
Tit-Babbler, Chestnut-vented	*Parisoma subcaeruleum*		Near-endemic
Vulture, Lappet-faced	*Torgos tracheliotus*	VU	
Vulture, White-backed	*Gyps africanus*	VU	
White-eye, Cape	*Zosterops virens*		Endemic
Whydah, Shaft-tailed	*Vidua regia*		Near-endemic
Wren-Warbler, Barred	*Calamonastes fasciolatus*		Near-endemic

EN = Endangered, VU = Vulnerable, NT = Near Threatened

10.10.3 Reptiles

Reptiles are ectothermic (cold-blooded) meaning they are organisms that control body temperature through external means. As a result, reptiles are dependent on environmental heat sources. Due to this, many reptiles regulate their body temperature by basking in the sun or in warmer areas. Substrate is an important factor determining which habitats are suitable for which species of reptile. The presence of few rocky out crops within the Project area could mean few reptile species are present.

Reptiles expected to occur on site are listed in the Fauna and Flora Impact Assessment Report (Appendix I). Of these species, two have been assigned a Red Data status; and these species are listed in Table 10-13 below.

Table 10-13: Red Data Reptile species likely to be found on the Project Area

Common Name	Scientific Name	Status
Aurora House Snake	*Lamprophis aurora*	Rare
Southern African Python	*Python natalensis*	Vulnerable

10.10.4 Amphibians

Amphibians are viewed to be good indicators of change to the whole ecosystem as they are sensitive to changes in the aquatic and terrestrial environments (Waddle, 2006). Most species of amphibians are dependent on the aquatic environment for reproduction. Additionally, amphibians are sensitive to water quality and ultraviolet radiation because of their permeable skin (Gerlanc and Kaufman, 2005).

Within the large grass pan adjacent to the Project area, Golden Leaf-Folding Frog (*Afrixalus aureus*), the Giant African Bullfrog (*Pyxicephalus adspersus*) and the Lesser Bullfrog (*Pyxicephalus adspersus*) were identified. Due to loss of habitat and negatively impacting anthropogenic activities, the Giant African Bullfrog is listed as Near Threatened in South Africa according to the IUCN. According to Yetman (2012), the Giant Bullfrog has been recorded burrowing as far as 1 km around their breeding sites. To determine the extent of the presence of their burrows within the Project area and the infrastructure, further investigations is recommended to locate the burrows.

Red Data amphibians expected to be present within the proposed Project area are listed in Table 10-14 below.

Table 10-14: Red Data Amphibian Species likely to be found in the Project Area

Common Name	Scientific Name	Status
Giant Bullfrog	*Pyxicephalus adspersus*	Near Threatened
Golden Leaf-Folding Frog	*Afrixalus aureus*	Rare
Pickersgill's Reed Frog	*Hyperolius pickersgilli*	Rare

10.10.5 Invertebrates

Butterflies are a good indication of the habitats available in a specific area (Woodhall 2005). Although many species are eurytropes (able to use a wide range of habitats) and are widespread and common, South Africa has many stenotrope (specific habitat requirements with populations concentrated in a small area) species which may be very specialised (Woodhall, 2005). Butterflies are useful indicators as they are relatively easy to locate and catch, and to identify. It is for this reason that Lepidoptera will be used as the primary focus for the vertebrate survey.

Red Data species are listed in Table 10-15. The specific Red Data conservation status was not always known.

Table 10-15: Red Data Lepidoptera (moths and butterflies) Species likely to be found in the Project Area

Scientific Name	Habitat	Status
Acraea (Acreae) machequena	Bushveld	Red Data
Aloeides dentatis maseruna	Grassland	Vulnerable
Andronymus neander neander	Bushveld	Red Data
Gegenes hottentota	Riparian	Vulnerable
Lepidochrysops hypopodia	Grassland	Red Data
Lepidochrysops praeterita	Grassland	Red Data
Metisella meninx	Riparian	Red Data
Neita neita	Bushveld	Red Data
Platylesches dolomitica	Grassland	Vulnerable
Spialia paula	Bushveld	Red Data
Tuxentius melaena griqua	Riparian	Red Data

In addition to the butterflies, Baboon Spiders and scorpions were also identified (Figure 10-22). A number of Baboon Spider (*Augacephalus ezendami*) burrows were found adjacent to a pan on the Klaarwater property and in the central portion of the Project area (see location of burrows on the Sensitivity Map in Figure 10-23).

Currently the Baboon Spider has not formally been assessed for the IUCN Red Data List, but within South Africa it is included on the draft list of Threatened or Protected Species (ToPS). This restriction means that it is illegal to collect, transport, or keep these spiders without a permit. Figure 10-23 shows sensitive areas found within the Project area. No important birding areas have been identified within close proximity to the Project area.

Top row: Scorpion burrow (left), Baboon Spider burrow (right). Middle row: Common Joker (left), Velvet Mite (middle) and Baboon Spider burrow (right). Bottom row: Shield-back Bug (left), Garden Orb (middle) and Dotted Veld Antlion (right).

Figure 10-22: Images of Invertebrates found on Site

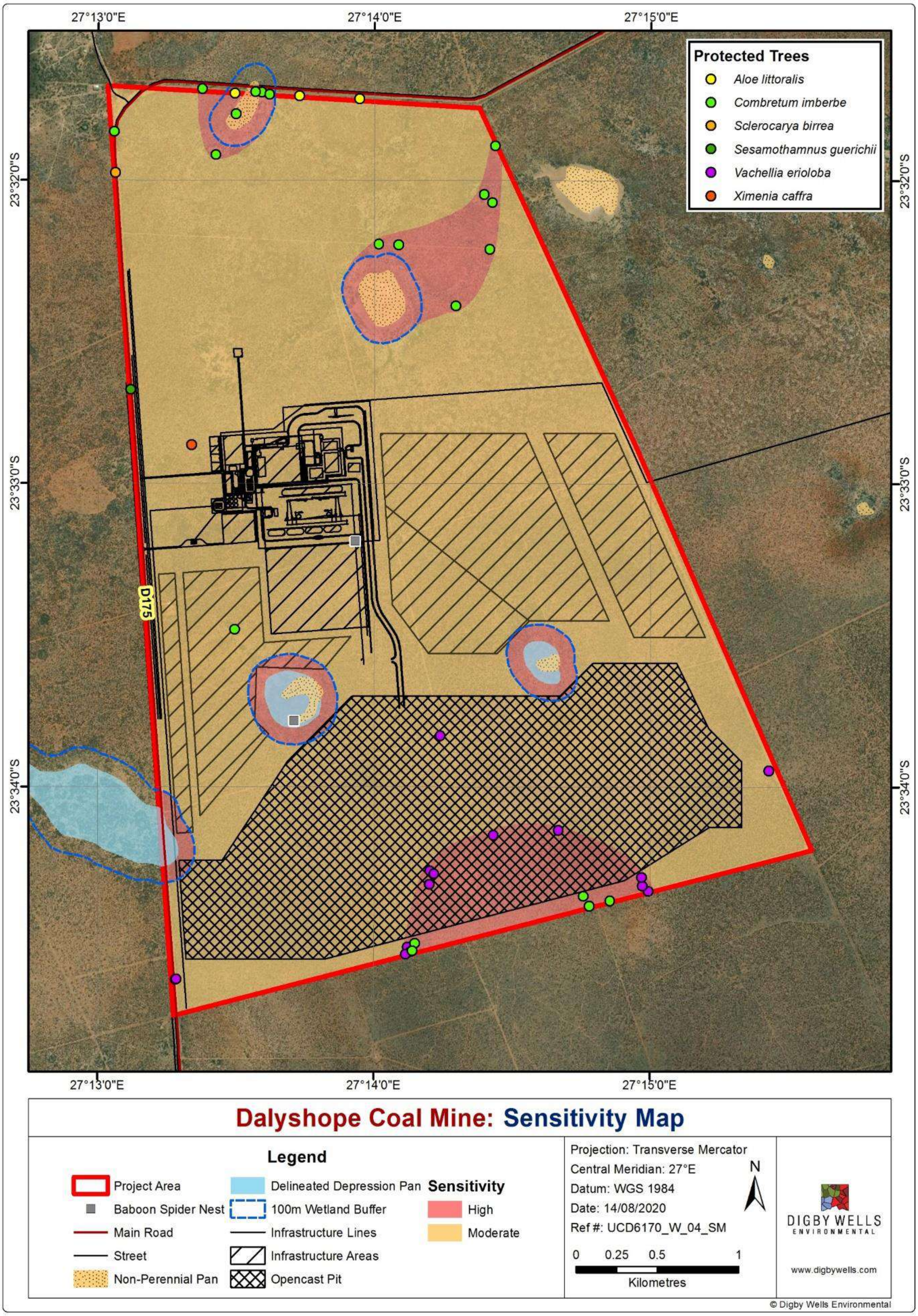


Figure 10-23: Sensitive Areas within the Project Area

10.11 Wetlands

The Wetlands Report is as attached in Appendix J. A site visit was undertaken during February 2020. The aim was to delineate the wetlands within the Project area and determine their Present Ecological Status (PES) and Ecological Importance and Sensitivity (EIS).

10.11.1 Wetland Delineation and Classification

The total Project area comprises approximately 4970 ha, with OC1 only occupying 542 ha. Only small sections of OC1 are occupied by depression pans, which account to 35.41 ha including the calculated buffer zone. Three wetlands were recorded on or directly adjacent to OC1. Some non-perennial pans have been identified within the Farm Nazarov 685 LQ. All three of these wetlands are classified as Non-Perennial Episodic Endorheic Depression Pans (Figure 10-24). This indicates that the depression wetlands only naturally fill with water during high rainfall events where it then remains saturated for only small periods during the year, remaining dry the rest of the year. Pans are generally formed by aeolian deflation on susceptible surfaces (Goudie & Wells, 1995). No other wetlands are located within 500 m of the three depression pan wetlands recorded on the OC1 area.

A buffer zone is defined as a strip of land surrounding a wetland or riparian area in which activities are controlled or restricted (DWAF, 2005). Buffer zones have been shown to perform a wide range of functions and have therefore been widely proposed as a standard measure to protect water resources and their associated biodiversity. The recommended calculated buffer zones applicable to the proposed Project (Based on the activity class 'Mining - Worst Case Scenario) are as follows:

- Construction Phase: 50 m; and
- Operational Phase: 81 m.

Being inward draining systems, pans are vulnerable to pollution in their catchment. Pollutants draining into these pans become concentrated and significantly affect water quality. Thus, the calculated buffer zones may not be suitably large enough for pans unless the direct catchment of the pans are also excluded from any harmful activities.

It should be noted that the buffer calculation tool does not take into account the effects of climate change or cumulative impacts to flood flows resulting from transformed catchments. Therefore, a conservative approach to the application of buffer zones is encouraged. Furthermore, the buffer recommended in this report will be reviewed during the EIA phase to include possible sensitive fauna species.

Figure 10-24 depicts the current layout of OC1 and infrastructure, which shows that the infrastructure placement encroaches within 500 m of DP2, and mining of OC1 will occur within 500 m of all three pans, and DP3 will be mined through. The impacts thereof will be assessed in the Impact Assessment Phase of the Project.

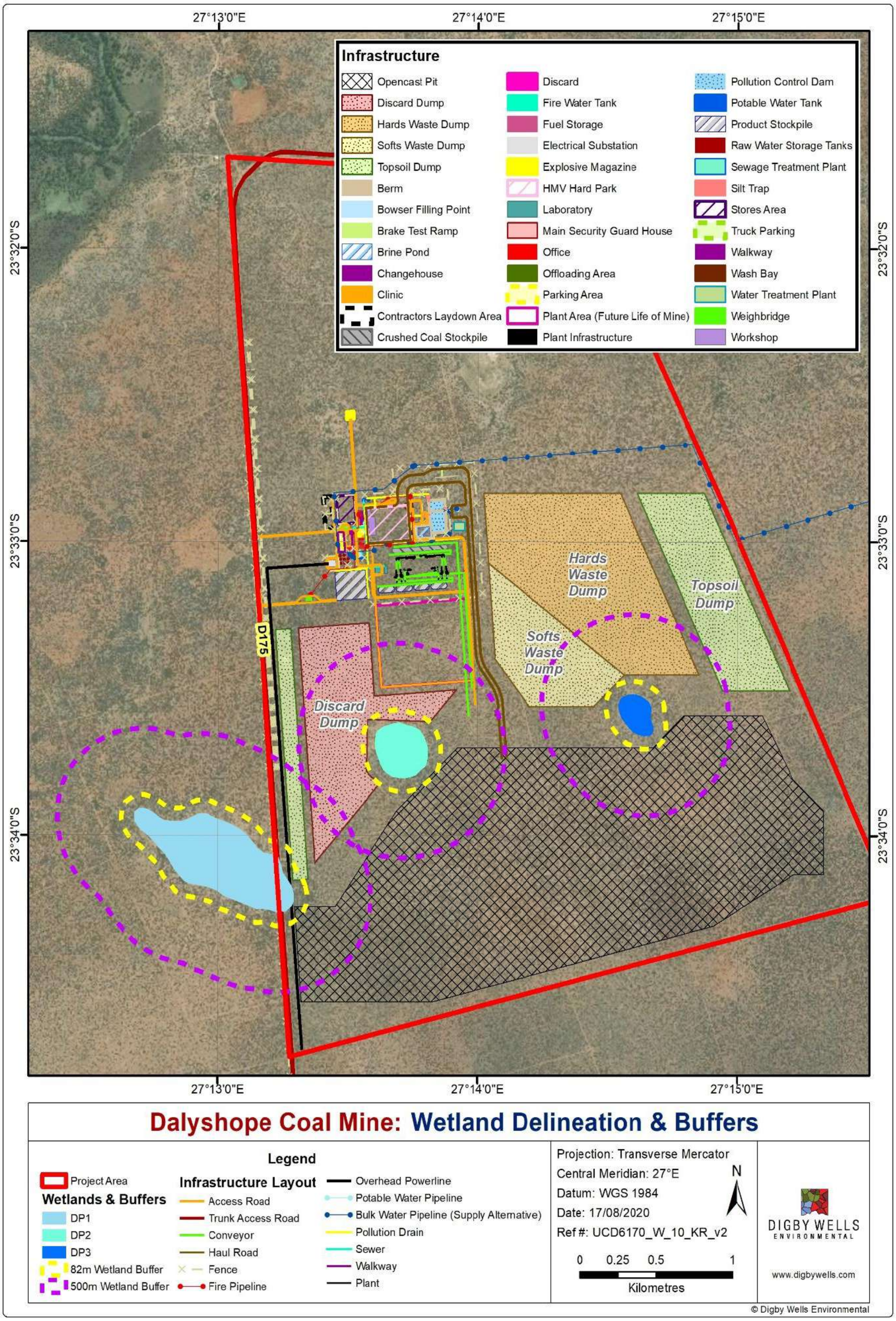


Figure 10-24: Wetland Delineation and Buffers

10.11.2 Soil Indicators and Vegetation Indicators

The depression pans are weakly developed and is unlikely to hold water for large periods of time. The dominant soil of the three pans were identified as Longlands soil. The wetland soils had a high clay content with clear redoximoprhic features such as mottling. The soil samples indicated various redoximorphic features consistent with wetland soils such as mottling and gleying which is easily distinguished from the terrestrial soil forms of the area which consisted of thick red apedal soil of the Hutton form.

The vegetation of the depression pans is characterised by terrestrial woody species similar in composition to the surrounding terrestrial areas but in higher densities and abundance in the pan areas. The dominant woody species of the pan and the pan fringes include: *Vachellia erioloba, Vachellia karroo, Senegalia mellifera, Vachellia tortilis, Boscia albitrunca, Boscia foetida, Carissa bispinosa, Chamaecrista mimosoides, Combretum apiculatum, Combretum hereroense, Combretum* imberbe, *Dichrostachys cinerea, Elephantorrhiza elephantine, Grewia bicolor, Grewia flava, Sclerocarya birrea, Terminalia sericea* and *Ziziphus mucronata.*

Some remnants of pipes and water pumping infrastructure were recorded in two of the pans suggesting that water has been pumped in these areas at least during some periods. In these areas, hydrophytic vegetation was recorded in a higher number than in the rest of the pan area. The hydrophytic plants recorded in the pans include: *Kyllinga alba, Marsilea ephippiocarpa, Fuirena pachyrrhiza, Schoenoplectus muricinux, Pycreus betschuanus* and *Schoenoplectus decipiens.*

Only a small number of exotic/invasive plant species were recorded on the study area and specifically within the pan wetlands. *Sesbania bispinosa* was recorded in dense stands in the pans where water remains longer (possibly pumped). Other species include *Schkuhria pinnata.* The grass species *Chloris virgate,* which is a good indicator of disturbance was also recorded within disturbed areas in the pans. Several other grass species were recorded such as: *Cynodon dactylon, Digitaria eriantha, Enneapogon cenchroides, Eragrostis pallens, Eragrostis rotifer, Melinis repens subsp. repens, Panicum repens, Setaria incrassate* and *Urochloa mosambicensis.*

Other species recorded include: *Cucumis sp., Harpagophytum procumbens, Hibiscus physaloides, Hibiscus trionum, Ipomoea hackeliana, Momordica balsamina, Pupalia lappacea, Ruellia patula, Sansevieria aethiopica* and *Sarcostemma viminale.*

10.11.3 Wetland Functional Assessment

10.11.3.1 Present Ecological State

The Project area in general including the depression pans have undergone few major changes since 1955. The main concern related to wetland functionality is the area where water naturally, and possibly artificially by means of pumped-water, pools within the pans. These pools function as watering areas for the cattle and wildlife located on the farm. This leads to some degree of trampling, which leads to an increase in sedimentation.

DP2 and DP3 scored a Present Ecological State (PES) of B - Largely Natural with few modifications (Table 10-16). A slight change in ecosystem processes is discernible and a small loss of natural habitats and biota may have taken place. DP1 is more impacted with a regional road bisecting the pan along with fencing on both sides and subsequently scored a PES of C - Moderately modified. A moderate change in ecosystem processes and loss of natural habitats has taken place but the natural habitat remains predominantly intact.

Table 10-16: Summary of hydrology, geomorphology and vegetation health assessment for the depression pans wetlands found on site (Macfarlane *et al*, 2009).

Wetland Unit	Hydrology		Geomorphology		Vegetation		Overall Score	
	Impact Score	Change Score	Impact Score	Change Score	Impact Score	Change Score	Impact Score	Change Score
DP1	2.6	0	1.5	0	1.6	-1	2.0	0
PES Category and Projected Trajectory	**C**	→	**B**	→	**B**	↓	**C**	→
DP2 & DP3	1.1	0	0.8	0	1.2	-1	1.0	0
PES Category and Projected Trajectory	**B**	→	**A**	→	**B**	↓	**B**	→

10.11.3.2 Ecological Importance and Sensitivity

The Ecological Importance and Sensitivity (EIS) score of 1.8 for the wetlands fall into a category characterised as **moderate** ecological importance and sensitivity. Wetlands that fall into this category are ecologically important and sensitive on a provincial or local scale. The biodiversity of these wetlands is not usually sensitive to flow and habitat modifications. They play a small role in moderating the quantity and quality of water in major rivers (DWAF, 1999). Table 10-17 shows the ecosystem services provided by the wetlands found within the Project area. Table 10-18 provides a summary of the results recorded for each wetland unit potentially affected by the proposed development.

Table 10-17: Results and brief discussion of the Ecosystem Services provided by the wetlands delineated on site.

Function	Score	Significance
Cultural significance	0.3	Very Low
Water supply for human use	0.4	Very Low
Natural resources	0.4	Very Low
Cultivated foods	0.4	Very Low

Function	Score	Significance
Streamflow regulation	0.7	Very Low
Education and research	0.8	Very Low
Threats	1.0	Low
Opportunities	1.0	Low
Carbon storage	1.3	Low
Tourism and recreation	1.6	Low
Nitrate removal	2.1	Moderate
Toxicant removal	2.1	Moderate
Sediment trapping	2.2	Moderate
Maintenance of biodiversity	2.3	Moderate
Phosphate trapping	2.4	Moderate
Erosion control	2.4	Moderate
Flood attenuation	2.9	Moderate

Table 10-18: Sensitivity results for wetlands within the proposed Project area

Classification (SANBI, 2013)	PES (Macfarlane *et al*, 2007)	EIS (DWAF, 1999)	WetEcoServices (3 most prominent scores)	Scientific Buffer (Macfarlane *et al.*, 2015)		REC
				Construction	Operational	
DP1	2.0 C	1.8 - Moderate	Phosphate trapping - 2.4 Erosion control - 2.4 Flood attenuation- 2.9	82 m	82 m	B
DP2 & DP3	1.0 B					

10.12 Aquatic Ecology

The Aquatic Ecology Assessment undertaken during the EIA Phase is appended to this report as Appendix K.

Details pertaining to the aquatic sampling points selected for assessment are provided in Table 10-19, along with a brief description of the characteristics observed at each of the assessment sites.

Table 10-19: Location and description of the aquatic sampling sites assessed

Site	Coordinates	Description
DAL 1 (Same as 2013 study)	23°31'24.58"S 27° 8'12.73"E	Located on the upper Limpopo River reach, below the confluence with the Bonwapitse River. Site lies upstream of the proposed project area.
DAL 2 (Added in present study)	23°29'40.10"S 27°12'9.45"E	Located on the middle Limpopo River reach, upstream of the confluence with the Mhalatswe River. Site lies adjacent to the project area.
DAL 3 (Same as **DAL 2** from 2013 study)	23°28'30.73"S 27°16'27.04"E	Located on the middle Limpopo River reach, below the confluence with the Mhalatswe River. Site lies downstream of the project area.
DAL 4 (Added in present study)	23°24'9.95"S 27°21'24.86"E	Located on the lower Limpopo River reach, at a river crossing of the South Africa – Botswana border, downstream of a non-perennial tributary of the Limpopo River. Site lies downstream of the project area.

10.12.1 *In-Situ* Water Quality

The water quality results of the 2020 wet season survey for the Limpopo River are presented in Table 10-20. Results comparing the current survey to the 2014 wet season survey are shown in Table 10-21. It should be noted that the in-situ results are not deemed to represent the typical wet season characteristics due to the occurrence of floods at the time of the survey.

Table 10-20: *In-situ* water quality results obtained along the Limpopo River system

Monitoring Site	DAL 1	DAL 2	DAL 3	DAL 4	Guideline
Time	9h30	10h30	13h40	16h20	-
Temperature (°C)	26.2	27.1	27.4	29.1	-
pH	7.67	7.69	7.57	7.55	6-8
Conductivity (µS/cm)	62	59	64	64	≤500
Dissolved oxygen (mg/l)	6.31	6.47	5.43	5.87	>5
Dissolved oxygen (Saturation %)	74.3	89.9	66.5	71.6	80-120
***Red values indicate constituents exceeding recommended guideline values**					

Table 10-21: *In-situ* water quality results between the current survey and the 2014 wet season survey

Monitoring Site	DAL 1		DAL 3		Guideline
Year	**2014**	**2020**	**2014**	**2020**	-
Temperature (°C)	26	26.2	25	27.4	-
pH	7.7	7.67	7.8	7.57	6-8
Conductivity (µS/cm)	447	62	400	64	≤500
Dissolved oxygen (mg/l)	7.29	6.31	6.48	5.43	>5
Dissolved oxygen (Saturation %)	114	74.3	94	66.5	80-120
Exceedances in Target Water Quality Range (TWQR; Department of Water Affairs and Forestry, 1996; Government notice 562, 2019) are indicated in red					

Amongst the water quality results obtained between the current survey and the 2014 wet season survey, only conductivity was observed to differ significantly. In the 2014 survey, high conductivity levels – seven and six times higher than the current survey at sites DAL 1 and DAL 3 – were recorded. The river was reported to be in flood during the 2014 survey. Unlike the 2020 survey, the DWE (2014) report does not report on inaccessibility to sample instream despite the flooded state. It is, therefore, assumed that the relatively higher conductivity and dissolved oxygen levels were a result of increased turbidity and aeration caused by the flows.

10.12.2 Index for Habitat Integrity

The Index for Habitat Integrity (IHI) was completed on a desktop level for each aquatic ecosystem considered in the study and populated with observations recorded during the field survey. IHI scores from the previous survey are included. Both low and high-flow 2013 surveys were considered in determining the scores (Table 10-22).

Table 10-22: Index for Habitat for the Project area during the current survey and 2013 surveys

Habitat Component	IHI Score	Ecological Category
2020 survey		
Instream	69	**C**
Riparian	80	**B**
2013 survey		
Instream	62	**C**
Riparian	92	**A**

The findings from the IHI assessments conducted during the current survey indicate that the habitat integrity was moderately modified (Ecological Category C) for the instream component and largely natural (Ecological Category B) for the riparian component throughout the study area. In comparison to the 2013 surveys, the IHI score for the instream component remained as moderately modified, whilst the Ecological Category moved from A (natural) to B (largely natural) for the riparian component which is probably attributed to an increase in alien vegetation encroachment over the years.

The main modifications to the assessed Limpopo reach were observed to be associated with game reserves and agricultural land uses such as water abstraction; small dams; overgrazing and trampling; vegetation removal; sedimentation; irrigation as well as inundation.

10.12.3 Aquatic Macroinvertebrate Assessment

The following sections provides insights into the available habitat that was sampled at each respective monitoring sites at the time of the current survey, as well as the South African Scoring System (SASS, Version 5) metrics obtained and the subsequent determination of the ecological condition of the observed assemblages in relation to reference conditions.

10.12.3.1 Invertebrate Habitat Assessment System

The results of the Integrated Habitat Assessment System (IHAS) scores at the sites assessed during the current survey and the 2014 wet-season survey are presented in Table 10-23.

Table 10-23: IHAS values obtained throughout the Project area

Site	2020		2014	
	IHAS Score (%)	Interpretation	IHAS Score (%)	Interpretation
DAL 1	43.6	Poor	37	Poor
DAL 2	29.1	Poor	N/A	
DAL 3	32.7	Poor	39	Poor
DAL 4	36.4	Poor	N/A	
*N/A not assessed				

Due to the flood conditions within the study area during the current survey, accessibility of representative aquatic macroinvertebrate biotopes was largely limited, and sampling of aquatic macroinvertebrates was limited to the inundated marginal and riparian zones, as such, the stones biotope was largely absent. The system was dominated by shallow to deep, still and/or slow-flowing water at the banks. Consequently, each of the assessed sampling sites exhibited largely poor habitat availability with varying degrees of fringing vegetation, sand and mud being the dominant biotopes. By comparison, the dominant feature amongst invertebrate habitat was reported to be sandy substrate with the stones and vegetation biotopes lacking (DWE, 2014).

10.12.3.2 South African Scoring System Version 5 - Benthic Communities and Composition

Table 10-24 presents the South African Scoring System, version 5 (SASS5) results for the assessed monitoring sites within the Limpopo River system. Comparisons in SASS5 results between the current survey and the 2014 wet-season survey are presented in Table 10-25.

Table 10-24: SASS5 data obtained for the 2020 high-flow assessment

Monitoring Site	DAL 1	DAL 2	DAL 3	DAL 4
SASS5 Score	19	15	7	22
Taxa	6	5	3	4
ASPT	3.2	3.0	2.3	5.5

A total of only 10 families (out of the expected 41) were collected along the Limpopo River reach during the present study. Ranging from three at Site DAL 3 to six at Site DAL 1. Five of the taxa are generally regarded as having a high preference for very slow-flowing water, whilst the rest are regarded as having preference for either slow or moderate-flowing water. These thus took refuge at the marginal areas of the floodplain where flows were slower.

Site DAL 4 recorded the highest SASS score, as well as the highest Average Score Per Taxon (ASPT) value, whilst Site DAL 3 recorded the lowest SASS score and ASPT. The highest number of taxa was collected at Site DAL 1 (site in the upper reaches of the Limpopo River) whilst the lowest number of taxa was collected at Site DAL 3 (site in the middle reaches of the Limpopo River). Only macroinvertebrate families highly tolerant to water quality impairment were collected at all sites. The high ASPT at Site DAL 4 is a result of collecting taxa with relatively high sensitivity scores (i.e., 5 and 6) which skewed the results.

Table 10-25: SASS5 data for the 2020 vs 2014 high-flow assessments

Survey	2014	2020	2014	2020
Monitoring Site	**DAL 1**		**DAL 3**	
SASS5 Score	25	19	36	15
Taxa	7	6	10	5
ASPT	3.4	3.2	3.6	3

Similar SASS5 results were obtained for the two surveys, which were both conducted during periods of floods along the Limpopo River. The low number of invertebrate families collected is therefore attributed to the state of floods which limited sampling accessibility and limited the availability of aquatic macroinvertebrate biotopes.

10.12.3.3 Ecological Condition of the Aquatic Macroinvertebrate Assemblages

The aim of the Macro-Invertebrate Response Assessment Index (MIRAI) is to provide a habitat-based cause-and-effect foundation to interpret the deviation of the aquatic macroinvertebrate community (assemblage) from the reference condition (Thirion, 2008). Results for the MIRAI at the Limpopo River reach are shown in Table 10-26. The PES was determined on a reach-basis for purposes of comparing to the 2013 survey.

Table 10-26: MIRAI at the Limpopo River monitoring sites during baseline aquatic assessment

Component	2020	2013
MIRAI (%)	52.85	50.31
EC: MIRAI	D	D
Category	Largely modified	Largely modified

The macroinvertebrate assemblages along the sampled Limpopo River reach exhibited largely modified conditions (Ecological Category D) for both the current and previous 2013 surveys. These findings are, however; of low confidence and not regarded to represent the 'natural' state of macroinvertebrate assemblage at the Limpopo River reach as the sampling was conducted during periods of floods which are known to cause disturbances in aquatic invertebrate communities (Hughes *et al*., 2008). All the aquatic macroinvertebrate samples collected are believed to have been flushed onto the riverbanks or carried along with substrates.

10.12.4 Fish Communities – Catch Record

A total of 11 fish species were collected (or observed), one of which was regarded as alien invasive species (*Gambusia affinis* or Mosquitofish). Among the species of conservation concern, only O. mossambicus was collected. The number of fish collected per site sampled is shown in Table 10-27.

Table 10-27: Fish collected (or observed) within the reaches of the Limpopo River

Scientific Name	DAL 1	DAL 2	DAL 3	DAL 4
Brycinus imberi	2	-	-	1
Enteromius paludinosus	1		-	-
Enteromius trimaculatus	-	2	-	-
*Gambusia affinis**	-	-	(1)	-
Labeo cylindricus	1	-	-	-
Labeo ruddi	-	-	-	2
Labeo molybdinus	1	-	-	-
Labeo rosae	2	3	-	-

Scientific Name	DAL 1	DAL 2	DAL 3	DAL 4
Engraulicypris brevianalis	6	-	-	-
Oreochromis mossambicus	1	4	-	-
Pseudocrenilabrus philander	-	2	-	-
Number of Species	7	4	1	2
Total Catch	13	11	1	3
Catch per Unit Effort (per minute/throw)	1.6	1.1	-	0.3
*** Alien species. Values in parenthesis indicated observed specimens.**				

A single individual of the alien Mosquitofish was observed at Site DAL 3. The Mosquitofish – introduced in South Africa as a mosquito control agent and forage for bass – has proved to be an aggressive invader species capable of restricting other fish populations by preying on fish larvae (Skelton, 2001).

The highest number of species were collected at the upper reaches (Site DAL 1 and DAL 2; nine species in total) whilst only one and two species were collected at the lower reaches (DAL 3 and DAL 4 respectively). *Labeo rosae* (Rednose Labeo) and *Oreochromis mossambicus* (Mozambique Tilapia) were the only species collected at more than one site. The Rednose Labeo prefers sandy stretches of larger perennial and intermittent rivers whilst the Mozambique Tilapia prefers waters (Skelton, 2001). Both these species prefer slow deep waters and are moderately tolerant and tolerant (respectively) to water quality modifications (DWS, 2016). Dominance of these species during the current survey is therefore suspected to be a result of the above-mentioned biological traits, i.e. individuals were spending more time along the banks where the flow velocity was slower and the water was clearer as sediments were allowed to settle making it easier to feed.

10.12.4.1 Ecological Condition of the Fish Assemblages

The assemblage of fish in the current study featured both tolerant (*Enteromius paludinosus* for example) and intolerant species (*Brycinus imberi* for example) to water quality modifications. Fish Response Assessment Index (FRAI) results are presented in Table 10-28. A reach-based FRAI was implemented for purposes of comparing to the 2014 results.

Table 10-28: FRAI results for the baseline aquatic assessment

Survey	FRAI Score (%)	Ecological Category	Description
2020	32.2	**E**	Seriously modified
2014	83.1	**B/C**	Largely natural/moderately modified

Based on the results obtained, the fish assemblage collected within the assessed portion of the Limpopo River was representative of seriously modified conditions (Ecological Category E). The determined ecological condition is suspected to be attributed to the high-water levels and floods experienced at the time of survey which limited the ability to sample in a diversity of potential fish habitat and across the water column. The collected assemblage was dominated by species that have a high preference for *slow-deep* and *slow-shallow* habitat (where sampling was mostly limited to). In terms of preferences to modified water quality, fish tolerances ranged from moderately intolerant to tolerant.

In the DWE (2014) report, FRAI results were determined based on 2013 and 2014 surveys wherein a total of 15 of the expected 19 species were captured, resulting in PES of largely natural conditions (Ecological Category B; with a FRAI % score of 83.1). At the time of the surveys, the water levels allowed for sampling over a wider variety of fish habitat thereby capturing ten species which were not collected in the present survey. Only *Brycinus imberi* and the alien *Gambusia affinis* were captured in the present study and not in the previous studies. *B. imberi* is moderately intolerant to no flow conditions and water quality modifications (DWS, 2014).

10.12.5 Integrated EcoStatus Determination

The EcoStatus is defined as: "*The totality of the features and characteristics of the river and its riparian areas that bear upon its ability to support an appropriate natural flora and fauna and its capacity to provide a variety of goods and services*" (Iversen *et al*., 2000). In essence, the EcoStatus represents an integrated ecological state representing the drivers (hydrology, geomorphology, physico-chemical) and responses (fish, aquatic invertebrates and riparian vegetation; Kleynhans & Louw, 2008). The Instream Biological Integrity, as well as the integrated EcoStatus, for the sampled river reaches within the Project area were determined (Table 10-29).

Table 10-29: The PES of the reaches under study at the time of the February 2020 field survey using the ECOSTATUS4 (Version 1.02; Kleynhans & Louw, 2008)

Survey	Response Indices					
	Aquatic Macroinvertebrate EC (MIRAI)	Fish EC (FRAI)	INSTREAM EC	Riparian Vegetation EC (IHI)	ECOSTATUS	
					Score (%)	Category
2020	D	E	D	C/B	61.35	C/D

Following integration of the defined ecological conditions obtained for the instream biological integrity (i.e. combination of MIRAI from aquatic invertebrates and FRAI from fish) and the riparian component (i.e. IHI from riparian vegetation assessment), it was determined that the sampled Limpopo River represented an integrated EcoStatus of close to moderately modified (Ecological Category C/D). It is important to note that a low confidence rating was given to the scoring of instream and riparian vegetation ecological categories due to inaccessibility to sample a wide range of aquatic biota as a result of the flood at the time of the survey.

An integrated EcoStatus of largely modified conditions (Ecological Category D) was attained during the 2013 survey. The water quality was largely natural across the sampled sites whilst the habitat integrity and aquatic macroinvertebrates were seriously modified and largely modified respectively. The fish community assemblage was in a natural condition.

10.13 Air Quality

The Air Quality Impact Assessment (AQIA) undertaken during the EIA Phase is appended to this report as Appendix L.

10.13.1 Receiving Environment

Figure 10-25 shows the MRA boundary. In Google Earth® Imagery, isolated homesteads are noticeably scattered around the landscape, and used as dust monitoring locations. These were considered as sensitive receptors, in accordance with the USEPA (2016). The latter described sensitive receptors amongst other things as *“an area where the occupants are more susceptible to pollutants”.*

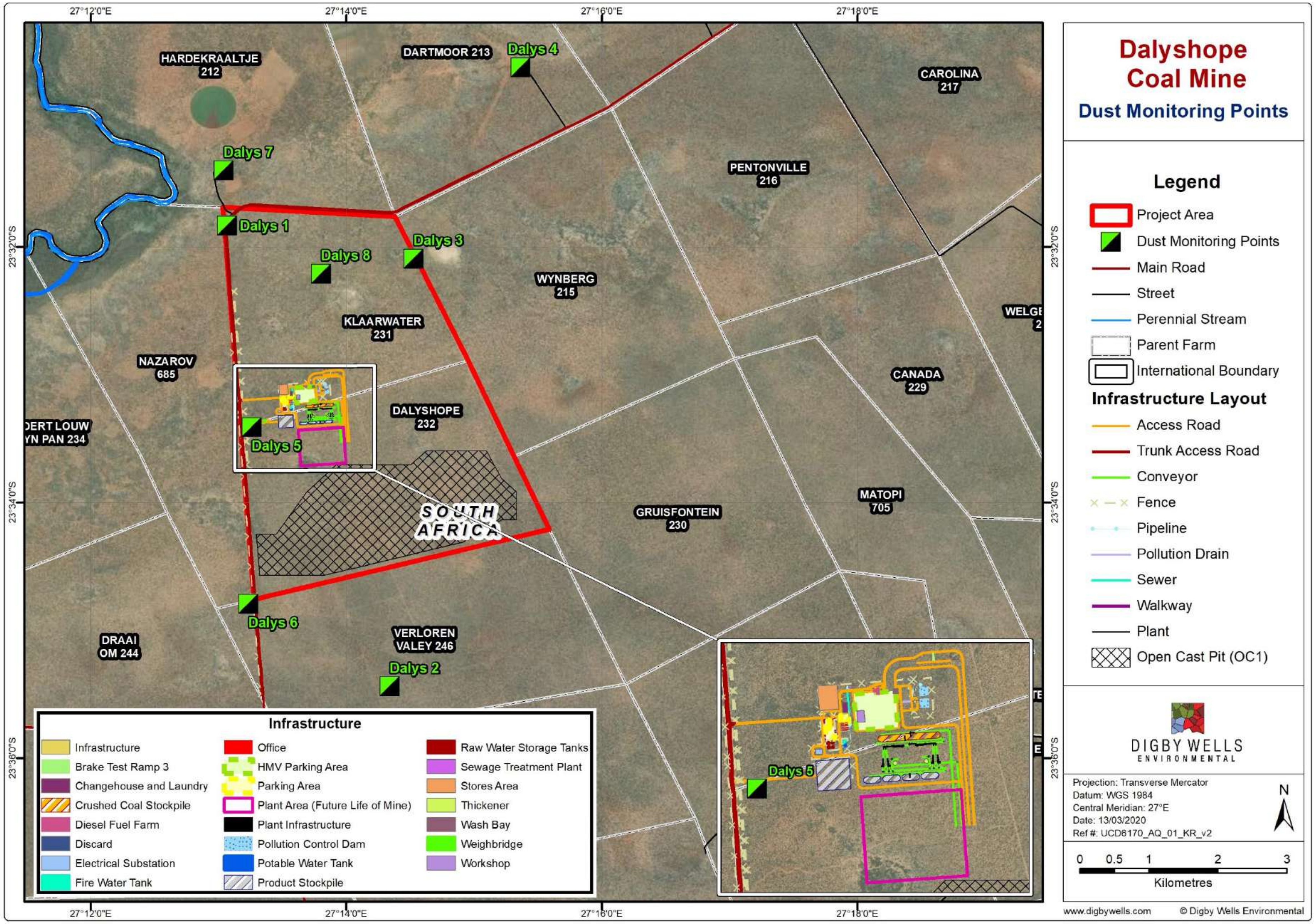


Figure 10-25: Project Boundary Showing Surrounding Receptors and Monitoring Sites

10.13.2 Wind Speed

Hourly meteorological data was analysed and used to understand the prevailing wind patterns at the MRA. Data was used to assess the wind speed and wind direction regime on site.

The wind rose is depicted in Figure 10-26. The prevailing winds are from the northeast (25%) and east-northeast (25%) respectively. The wind directions for the different seasons, and during the day were relatively constant to the annual wind rose pattern, with winds from the northeast and east-northeast dominating. Secondary winds were observed from the east (10%) and north-northeast (8%) respectively.

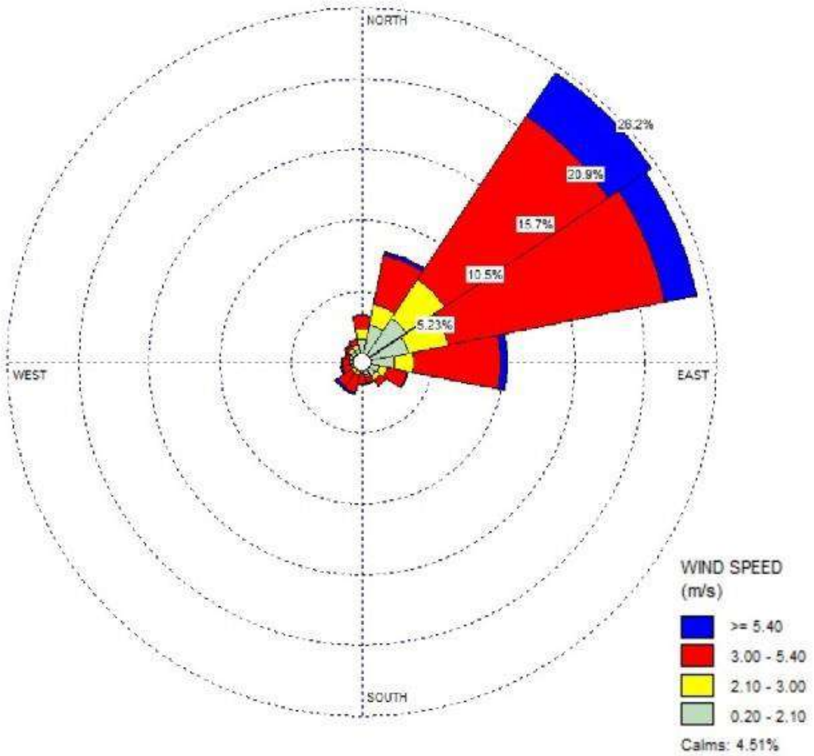


Figure 10-26: Surface Wind Rose

(Source: Lakes Environmental)

The average wind speed at the MRA is 3.1 m/s and calm conditions (<0.5 m/s) occurred for some 5.4% of the time. Wind speed capable of causing wind erosion i.e. ≥5.4 m/s occurred for about 7.3% of the time (Figure 10-27). This equates to about 27 days in a year.

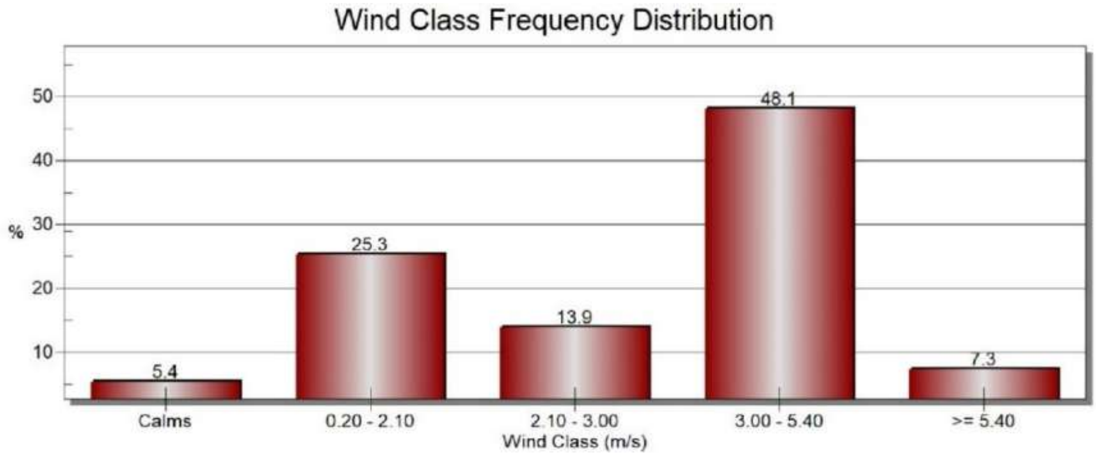


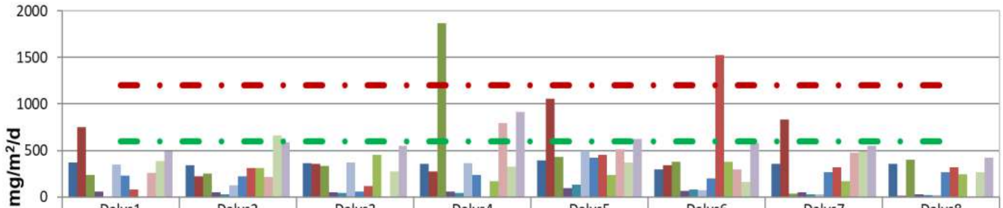
Figure 10-27: Wind Class Frequency

10.13.3 Assessment of Existing Air Quality

10.13.3.1 Total Suspended Particulate

Historical dustfall records collected using the American Standard Test Method (ASTM) D1739 were used to assess background Total Suspended Particulate (TSP) scenarios in the MRA. One years' worth of dustfall data from eight sites (designated as Dalys 1 to Dalys 8) were used. The graph showing the results is depicted below (Figure 10-28). Since mining has not commenced, the monitoring sites were categorised as residential. Once mining commences, the sites will be reclassified as non-residential. The dustfall results were compared with the dust standards (GN 827 of 2013). For a site where exceedance of the residential limit was observed, the reasons for the exceedance are provided after an investigation was conducted in sequential order:

- Dalys 1: exceedance was observed in April 2013 (751 mg/m^{2}d);
- Dalys 2: exceedance was observed in January 2014 (661 mg/m^{2}d);
- Dalys 4: exceedances were observed in May 2013 (1871 mg/m^{2}d), October 2013 (8,441 mg/m^2/d), December 2013 (792 mg/m^{2}d), and February 2014 (915 mg/m^{2}d). The October result was omitted, as this was considered sabotage. These are exceedances above the residential and non-residential limit values. Investigation of these sites found that cattle were being transferred from one area to another. This localised activity resulted in particulates being airborne, deposited, and re-suspended. This lead to the high dustfall rates measured at these sites;
- Dalys 5: exceedances were observed in April 2013 (1055 mg/m^{2}d), and February (627 mg/m^{2}d);
- Dalys 6: exceedance was observed in October 2013 (1524 mg/m^{2}d); and
- Dalys 7: exceedance was observed in April 2013 (829 mg/m^{2}d).



	Dalys1	Dalys2	Dalys3	Dalys4	Dalys5	Dalys6	Dalys7	Dalys8
Mar-13	369	343	360	356	396	295	358	355
Apr-13	751	218	353	275	1055	338	829	14
May-13	235	253	336	1871	429	381	35	397
Jun-13	59	49	47	56	91	67	50	26
Jul-13	6	29	44	44	128	80	31	20
Aug-13	345	122	371	363	497	75	31	20
Sep-13	231	219	54	236	422	201	263	263
Oct-13	78	312	120		449	1524	321	316
Nov-13		311	449	168	237	377	169	246
Dec-13	255	217		792	513	298	471	
Jan-14	382	661	272	322	368	163	489	265
Feb-14	492	588	552	915	627	576	551	420
Residential Limit	600	600	600	600	600	600	600	600
Non-Residential Limit	1200	1200	1200	1200	1200	1200	1200	1200

Figure 10-28: Dalyshope Dustfall Data

10.13.3.2 Particulate Matter and Gases

The real-time air quality monitor was installed at a secure location in the MRA to collect data for one month. A picture of the real-time continuous monitor and the range of pollutants measured is depicted in Figure 10-29. Criteria air pollutants retrieved from the real-time sampler include PM_{10}, NO_2, SO_2, and CO. The data is recorded in the comma-separated values (CSV) format that can be directly imported into Microsoft® Excel for statistical analysis and interpretation.

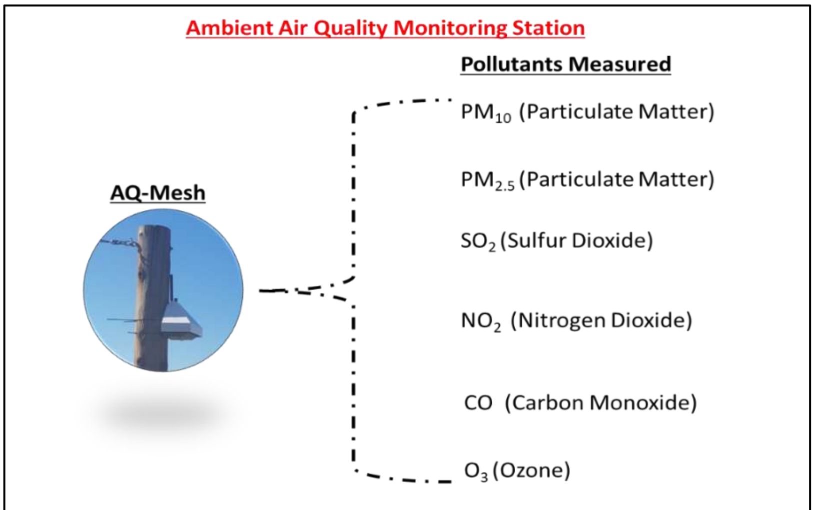


Figure 10-29: Schematic of the Pollutants Measured

10.13.3.3 Fine Particulate Matter

The monitoring of these pollutants ensures background levels are established before the commencement of mining. The background levels of PM_{10} and $PM_{2.5}$ measured were very low. For PM_{10}, the highest daily concentration measured during the sampling period was 4.5 µg/m^3. This value is approximately 6% of the South African standard (75 µg/m^3). For $PM_{2.5}$, the highest daily concentration measured was 3.1 µg/m^3. This value is approximately 8% of the South African standard (40 µg/m^3). The graphs showing the plot of the data compared with the standards are depicted in Figure 10-30 and Figure 10-31 below.

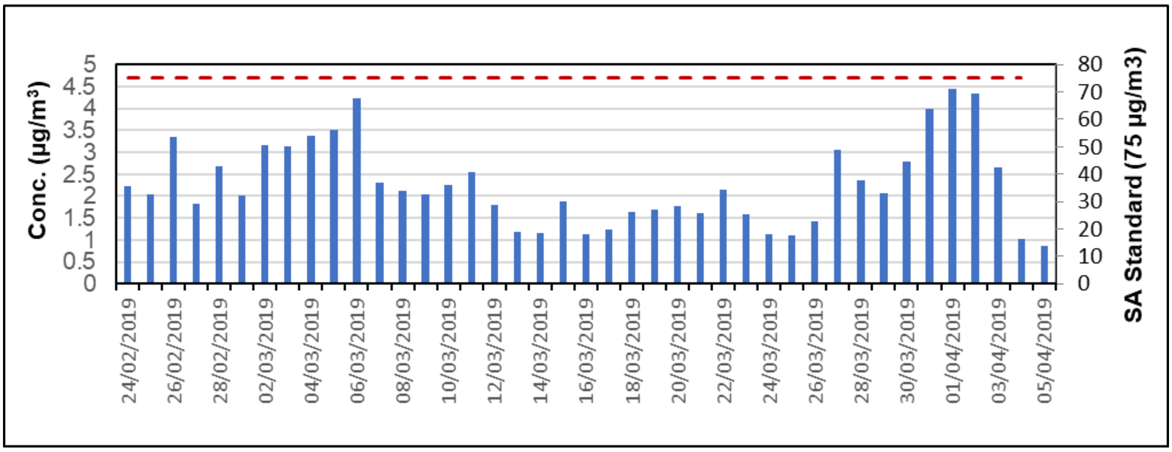


Figure 10-30: Ambient Daily PM_{10} Levels in the MRA

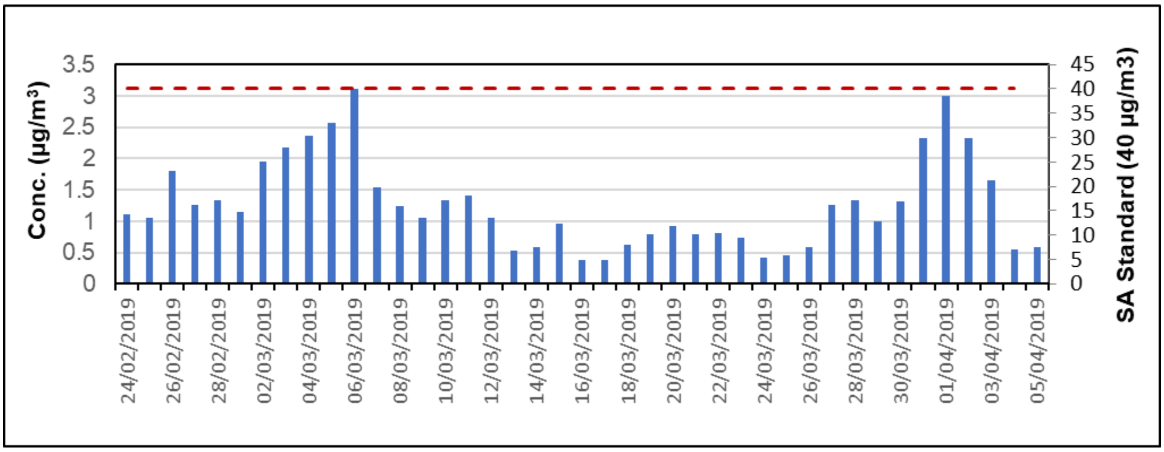


Figure 10-31: Ambient Daily PM2.5 Levels in the MRA

10.13.3.4 Gaseous Pollutants

The ambient concentrations of SO_2, NO_2, and CO are displayed graphically in Figure 10-32, Figure 10-33, and Figure 10-34, respectively. For SO_2, the highest daily concentration measured was 4.5 µg/m^3. This value is 4% of the South African standard (125 µg/m^3). For NO_2, the highest hourly concentration measured was 76 µg/m^3. This value is 38% of the South African standard (200 µg/m^3). For CO, the highest hourly concentration measured was 313 µg/m^3. This value is approximately 1% of the South African standard (30,000 µg/m^3). The monitoring of these pollutants before the commencement of mining is invaluable as this will represent a reference point to which future perturbations can be compared.

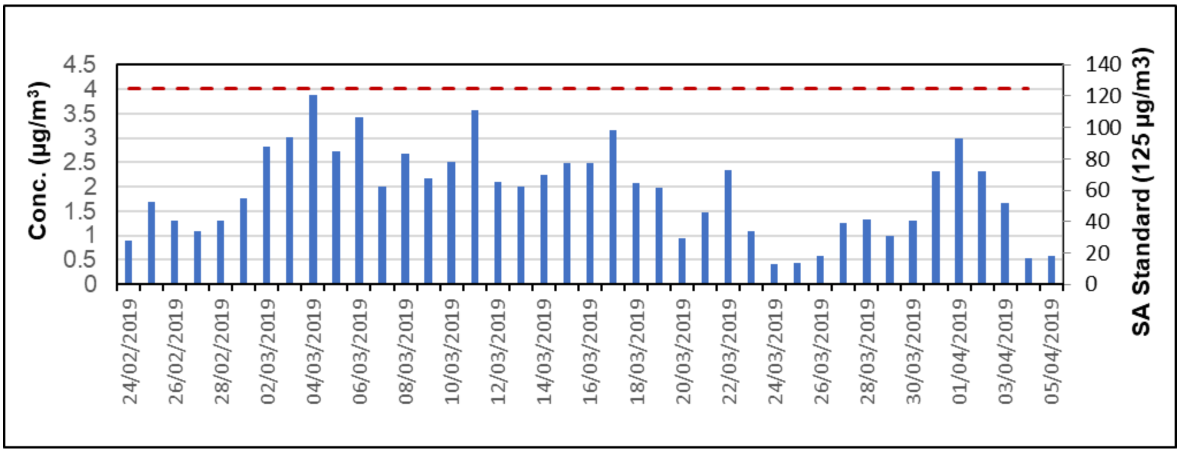


Figure 10-32: Ambient Daily SO_2 Levels in the MRA

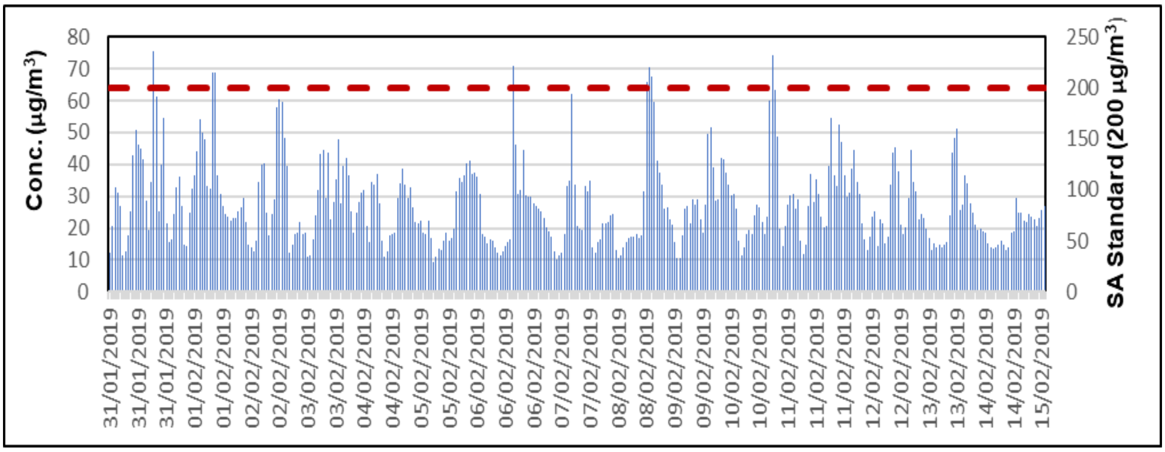


Figure 10-33: Ambient Hourly NO_2 Levels in the MRA

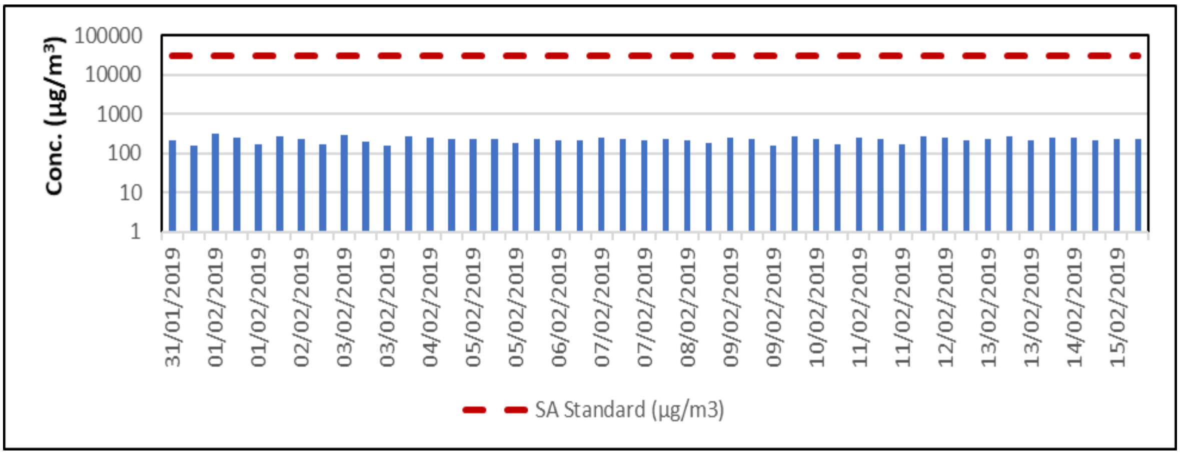


Figure 10-34: Ambient 8-Hourly CO Levels in the MRA

10.14 Noise

The Noise Impact Assessment report is attached in Appendix M. The soundscape of the proposed Project area is characterised by measurements taken at selected receptors in the area likely to be impacted. Data encompasses both daytime and night-time measurements.

Residential areas and potential noise-sensitive developments/receptors/communities were identified using tools such as Google Earth®, considering a focus area up to 2000 m from potential (noise-generating) infrastructure areas. These receptors are highlighted in Figure 10-35.

Figure 10-35 also shows generalized 500 m, 1000 m and 2000 m buffer zones. Normally, noises from mining activities:

- are limited to a distance of less than 500 m from active mining access roads, though this would normally be less than 200 m with low traffic volumes and speeds associated with such roads. This can be increased to a distance of 1,000 m, normally associated with very busy roads (such as a busy national road where average speeds exceed 100 km/h);
- are significant, and receptors staying within 500 m from active mining activities normally are subject to noises at a sufficient level to be considered disturbing;
- are normally limited to a distance of approximately 1,000 m from the active mining areas. Ambient sound levels are increased due to noises from mining activities, with the potential noise impact measurable;
- audible up to a distance of 2000 m at night, and may be audible up to 4,000 m during very quiet periods at night with certain meteorological conditions. Noise levels from mining activities are generally less than 45 dBA further than 1,000 m from the mining activities; and
- of a low concern at distances greater than 2000 m from activities at night (though it may be audible up to 4,000 m during very quiet periods).

These buffer distances may not be valid with very large mining or industrial operations, or in areas with very low ambient sound levels.

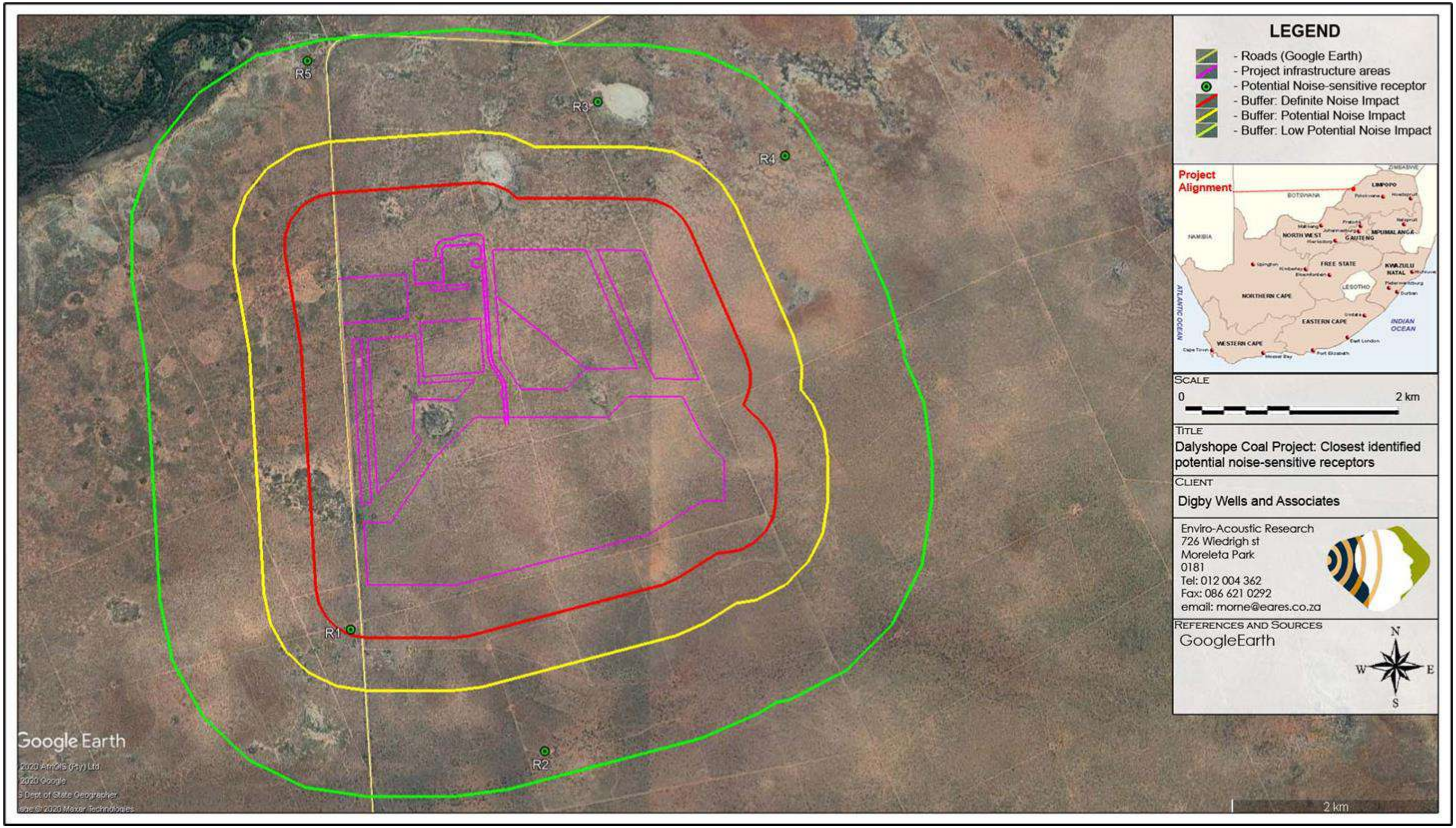


Figure 10-35: Study Area and Potential Noise-sensitive Receptors Close to the Proposed Mine Infrastructure

10.14.1 Sound Measurements - Procedure

Ambient (background) noise levels were measured during January 2019 and September 2020 in accordance with the South African National Standard SANS 10103:2008 "***The measurement and rating of environmental noise with respect to land use, health, annoyance and to speech communication***", also considering the protocols defined in GG 43110.

During these site visits, ambient sound levels were measured over at least one full night-time period at two locations using class-1 Sound Level Meters (SLMs) with the measurement localities presented in Figure 10-36 as blue squares. The SLMs would measure "average" sound levels over 10-minute periods, save the data and start with a new 10-minute measurement till the instrument was stopped. The SLMs were referenced at 1000 Hz directly before and after the measurements were taken. In all cases drift was less than 1.0 dBA. This data was augmented by a number of short-term measurements done during January 2019.

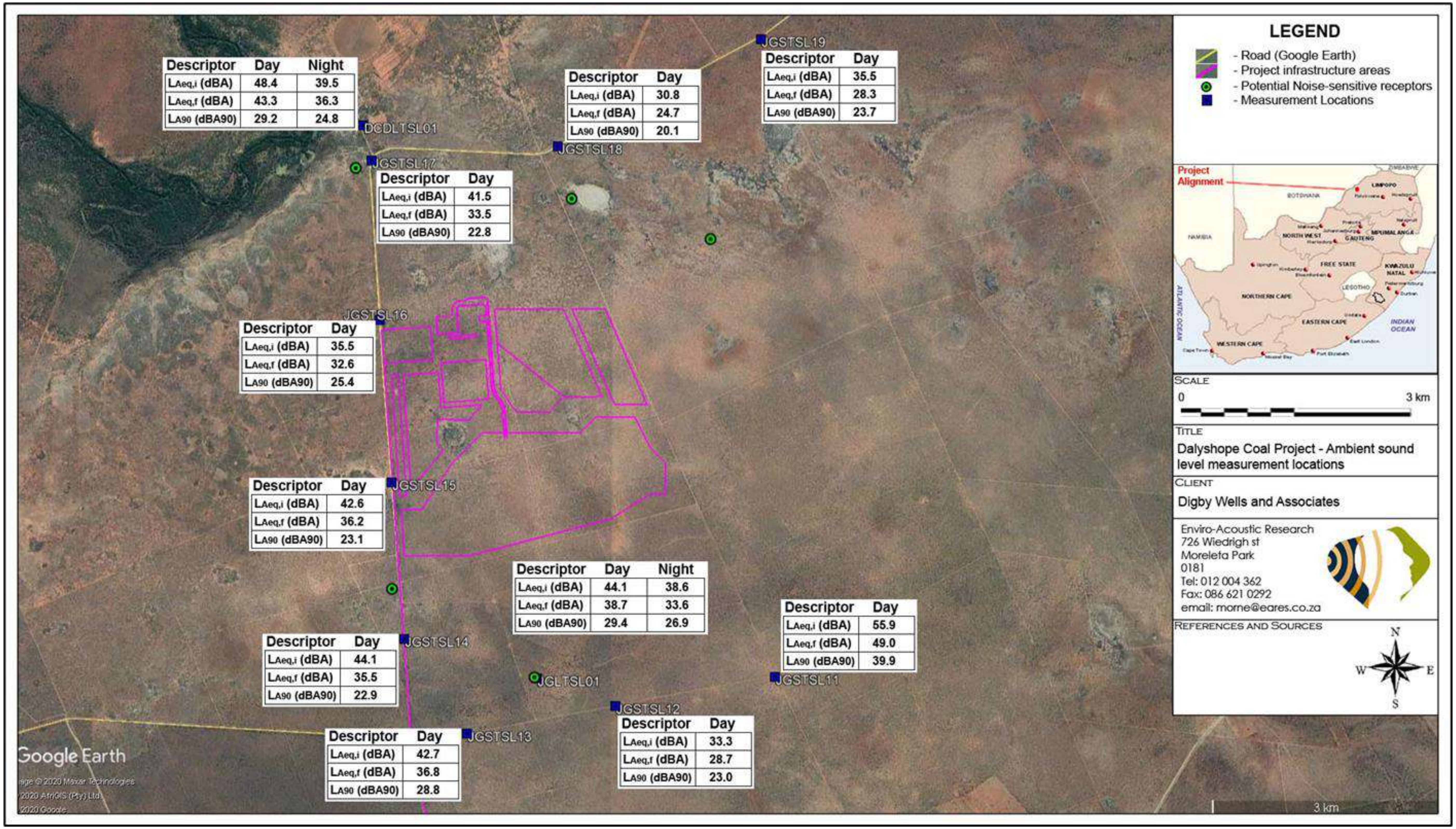


Figure 10-36: Localities where Ambient Sound Levels were Measured

10.14.2 Long-term Measurement Location DCDLTSL01

Ambient (background) sound levels were measured over a one night-time period from 21 to 22 January 2019, augmented with a number of short, 10-minute measurements.

The measurement location was selected to be indicative of potential ambient sound levels in the vicinity of the Project site. Table 10-30hights sounds heard during equipment deployment and collection.

Table 10-30: Noises/sounds heard during site visits at DCDLTSL01

Noises/sounds heard during onsite investigations		
Magnitude Scale Code: • **Barely Audible** • **Audible** • **Dominating**	**During equipment deployment**	
	Faunal and Natural	Birds clearly audible and dominant. Wind-induced noises audible and significant at times.
	Residential	-
	Industrial & transportation	Eskom transformers audible during quiet periods.
	During equipment collection	
	Faunal and Natural	Birds dominant. Wind induced noise quite significant at times.
	Residential	-
	Industrial & transportation	Mining sounds just audible. Reverse alarms in distance.

10.14.2.1 Summary of Ambient Sound Levels measured

Impulse time-weighted equivalent sound levels $L_{AIeq,10min}$ and fast time-weighted equivalent sound levels $L_{AFeq,10min}$ are presented in Table 10-31 below. The L_{A90} level is presented in this report to define the "background ambient sound level", or the sound level that can be expected if there were little single events (loud transient noises) that impacts on average sound level. The L_{A90} level is elevated, indicating the presence of constant noises in the area that raises the noise levels.

Maximum noise level exceeded 65 dBA only a few times at night. If maximum noise levels exceed 65 dBA more than 10 times at night, it may increase the probability where a receptor may be awakened at night, ultimately impacting on the quality of sleep[2].

(2) World Health Organization, 2009, '*Night Noise Guidelines for Europe.*

Table 10-31: Sound levels considering various sound level descriptors at DCDLTSL01

	$L_{Amax,i}$ (dBA)	$L_{Aeq,i}$ (dBA)	$L_{Aeq,f}$ (dBA)	$L_{A90,f}$ (dBA90)	$L_{Amin,f}$ (dBA)
Day arithmetic average	-	48.4	43.3	29.2	-
Night arithmetic average	-	39.5	36.3	24.8	-
Day minimum	-	29.7	26.2	-	20.4
Day maximum	87.1	63.0	57.9	-	-
Night minimum	-	20.9	20.5	-	18.9
Night maximum	67.4	49.4	47.1	-	-
Day 1 equivalent	-	45.6	41.3	-	-
Night 1 Equivalent	-	42.7	40.4	-	-
Day 2 equivalent	-	45.7	41.7	-	-
Night 2 Equivalent	-	31.4	27.7	-	-
Day 3 equivalent	-	44.2	37.5	-	-
Night 3 Equivalent	-	38.3	30.3	-	-
Day 4 equivalent	-	48.8	43.4	-	-

10.14.3 Long-Term Measurement Location JGSTSL01

The measurement location was selected to be reflective of ambient sound levels in the area. Refer to Table 10-32 highlighting sounds heard during equipment deployment and collection.

Table 10-32: Noises/sounds heard during site visits at JGSTSL01

Noises/sounds heard during onsite investigations		
Magnitude – Colour Code Used Barely Audible Audible Dominating	**During equipment deployment**	
	Faunal and Natural	Bird sounds dominant. Insects at times. Wind-induced noises at times.
	Residential	-
	Industrial & transportation	-
	During equipment collection	
	Faunal and Natural	Bird sounds dominant. Insects at times.
	Residential	-
	Industrial & transportation	-

10.14.3.1 Summary of Ambient Sound Levels measured

Impulse time-weighted equivalent sound levels $L_{AIeq,10min}$ and fast time-weighted equivalent sound levels $L_{AFeq,10min}$ are presented in Table 10-33 below. Most of the daytime measurements fall within the rural noise district rating level, with most of the night-time measurements in the rural-sub-urban noise district rating level. Maximum noise level exceeded 65 dBA only a few times at night.

Table 10-33: Sound level descriptors as measured at JGSTSL01

	$L_{Amax,i}$ (dBA)	$L_{Aeq,i}$ (dBA)	$L_{Aeq,f}$ (dBA)	$L_{A90,f}$ (dBA90)	$L_{Amin,f}$ (dBA)
Day arithmetic average	-	44	39	29	-
Night arithmetic average	-	39	34	27	-
Day minimum	-	32	29	-	24
Day maximum	71	59	55	-	-
Night minimum	-	31	27	-	23
Night maximum	73	54	49	-	-
Day 1 equivalent	-	44	38	-	-
Night 1 Equivalent	-	44	38	-	-
Day 2 equivalent	-	51	43	-	-

10.15 Heritage

The Heritage Impact Assessment (HIA) undertaken during the EIA Phase is appended to this report as Appendix N.

10.15.1 Site-Specific Cultural Heritage Baseline

Digby Wells undertook an extensive pre-disturbance survey of the Project area between 12 and 19 November 2012 and 5 to 7 August 2013 as part of a prior HRM process[3]. Digby Wells surveyed the farms Klaarwater and Dalyshope, as well as neighbouring farms which are not applicable to the current Project and the results of the surveys on these farms are not considered in this report.

Table 10-34 presents a summary of the heritage resources identified in the pre-disturbance survey.

[3] The HRM process was conducted as part of an EIA process in support of the proposed Dalyshope Phase 1 Coal Mine Project. Anglo appointed Digby Wells as the Environmental Assessment Practitioner (EAP) but closed the Project before the final EIA was submitted to the authorities.

Table 10-34: Summary of Heritage Resources Identified in Pre-Disturbance Survey

Site Name	Description
S.35-001	Isolated Farming Community Period Occurrence. One undiagnostic potsherd found near an animal burrow.
S.35-002	Isolated Farming Community Period Occurrence. One undiagnostic potsherd found near an animal burrow.
S.35-003	Isolated Stone Age Occurrence. One MSA quartzite flake found near an animal burrow.
S.35-004	Isolated Farming Community Period Occurrence. One undiagnostic potsherd found near an animal burrow.
S.35-005	Isolated Stone Age Occurrence. One MSA quartzite flake found near a drill area.
S.35-006	Isolated Stone Age Occurrence. Two MSA quartzite flakes found near an animal burrow.
S.35-007	Isolated Stone Age Occurrence. One MSA quartzite flake found on the surface.
S.35-008	Isolated Stone Age Occurrence. Two MSA quartzite flakes found on the surface.
S.35-009	Isolated Stone Age Occurrence. One MSA quartzite flake found on the surface
S.35-010	Isolated Stone Age Occurrence. Three MSA quartzite flakes found on the surface.
S.35-011	Isolated Stone Age Occurrence. Three MSA quartzite flakes found on the surface near an animal burrow.
S.35-012	Isolated Stone Age Occurrence. One MSA quartzite flake found on the surface
S.35-013	Isolated Stone Age Occurrence. One MSA quartzite artefact found on the surface
S.35-014	Isolated Stone Age Occurrence. One MSA quartzite flake found on the surface
S.35-015	Isolated Stone Age Occurrence. Two MSA quartzite flakes found on the surface.
S.35-016	Isolated Farming Community Period Occurrence. Isolated decorated (*Mambo* facies) undiagnostic potsherd found on the surface at the edge of a floodplain.
S.35-017	Isolated Farming Community Period Occurrence. Isolated undiagnostic potsherd found on the surface at the edge of a floodplain.
S.35-018	Isolated Stone Age Occurrence. One quartzite hammerstone found on the surface.
S.35-020	Isolated Stone Age Occurrence. One MSA quartzite flake found on the surface.
S.35-024	Farming Community Period Open Scatter. Undiagnostic and diagnostic potsherds with associated iron slag fragment identified in a clearing.
S.35-025	Isolated Farming Community Period Occurrence. Two undiagnostic potsherds found near an animal burrow.
S.35-026	Isolated Farming Community Period Occurrence. One undiagnostic potsherd found near an animal burrow
S.35-027	Isolated Stone Age Occurrence. One MSA quartzite flake found on the surface.

Site Name	Description
S.35-034	Isolated Stone Age Occurrence. One MSA quartzite flake found on the surface
S.35-043	Isolated Stone Age Occurrence. One MSA quartzite flake found on the surface.
S.35-044	Isolated Farming Community Period Occurrence. One undiagnostic potsherd found near an animal burrow.
S.35-045	Isolated Stone Age Occurrence. One MSA quartzite flake found on the surface.
S.35-050	Isolated Stone Age Occurrence. One MSA shale flake found on the surface
S.35-051	Isolated Stone Age Occurrence. One MSA shale flake found near an animal burrow.
S.35-052	Isolated Stone Age Occurrence. One MSA quartzite flake found on the surface.

10.15.2 Results from the Verification Survey

Shannon Hardwick undertook a non-intrusive vehicular and pedestrian verification survey of the affected infrastructure footprints on 11 to 13 February 2020. The survey was recorded as GPS tracks and identified heritage resources were marked as waypoints. Identified heritage resources were also recorded through written notes and photographs.

10.15.2.1 Existing Environment

Table 10-35 presents a summary description of the natural environment within which the Project is situated. The environment at the time of the verification survey was disturbed through anthropogenic and animal activities. Anthropogenic disturbances included the establishment of informal roads, fences and other farm infrastructure including dams and windmills. Cattle and game are kept on the property. Other animal disturbance includes burrows. These were inspected for archaeological material. Figure 10-37 presents an overview of the environment at the time of the verification survey.

Table 10-35: Summary of the Vegetation Setting of the Project

Biome	Bio-region	Vegetation Type
Savanna	Central Bushveld	Limpopo Sweet Bushveld (SVcb 19) Vegetation consists of short, open woodland which occurs in plains (which may be undulating or irregular) traversed by several tributaries of the Limpopo River. Where disturbed, thickets of woodland may become impenetrable. This vegetation occurs on a range of geological formations including: • The gneisses, metasediments and metavolcanics of the Malala Drift Group (within the Beit Bridge Complex of the Swazian Erathem) in the northern half of the region; • The basalts of the Letaba Formation (from the Lebombo Group of the Karoo Supergroup) in the northeast; • The sandstone, siltstone and mudstone comprising the Clarens Formation of the Karoo Supergroup to the south and west; and • The lithologies of the Matlabas Subgroup of the Mokolian Waterberg Group, also in the south and west portions of the region covered by this vegetation unit. This vegetation type is considered 'least threatened'. A small portion of the vegetation has been transformed, mostly through cultivation. Erosion within this vegetation unit ranges from low to high.

Adapted from Mucina & Rutherford (2010)

10.15.2.2 Newly Identified Heritage Resources

A preliminary assessment of the Genealogical Society of South Africa (2011) database did not indicate additional burial grounds are known to exist within the Project area. Table 10-36 provides a description of newly identified heritage resources during the verification survey. Figure 10-38 presents photographs of these heritage resources.

Table 10-36: Heritage Resources Identified Through the Pre-Disturbance Survey

Site Name	Description
S.35-069	Isolated Stone Age Occurrence. Heavily-weathered lithic found on edge of pan.

Figure 10-37: Results of the Verification Survey showing the Existing Environment

Individual lithic identified in the Infrastructure Area (S35.-069)

Figure 10-38: Results of the Verification Survey showing newly-identified Heritage Resources

10.16 Socio-Economic

The Social Impact Assessment (SIA) undertaken during the EIA Phase is appended to this report (Appendix O). The baseline profile of the receiving socio-economic environment is presented in this section.

In defining the study areas, the manner in which publicly-available socio-economic data is aggregated was taken into account. The study areas were thus defined to correspond to existing administrative boundaries. The study areas for the SIA are:

- ***The regional study area*** – Induced areas of impact which are areas likely to experience Project impacts regardless of their geographical proximity to the Project area; for example, increased spending in the economy thus decreased demand for goods and services; therefore some industries needing to employ more people in order to meet the demand for services and goods. This area encompasses the entire Limpopo Province;
- ***The secondary study area*** – an area likely to experience some Project impacts including economic pull exerted by the Project. It is comprised of Waterberg District Municipality (WDM); Lephalale Local Municipality (LLM) and broader Ward 3; and
- The ***primary study area*** – an area likely to experience the most Project effects (positive and negative) due to their proximity to the Project footprint. This area encompasses farms adjacent to the Project area (Farms Dalyshope and Klaarwater) and the community of Lesedi within Ward 3.

10.16.1 Regional and Secondary Study Areas

10.16.1.1 Population demographics

The 2011 Census reported the population of the Province at 5,404,868 people (10% of the total population of South Africa). Within the Province, the Vhembe District Municipality comprised of the largest district municipality (in terms of land area) and population size (with 1,294,722 people). In turn, the WDM was the least populated of the Provincial district municipalities with a population of 679,336 people (or 13% of the total provincial population). Within WDM, LLM had the second largest population (118,865 people or 18% of the total WDM population).

Ward 3 covers an extensive area and is mostly rural in nature which includes the Medupi Power Station, a portion of the Grootegeluk Coal Mine and several airstrips. There are no major towns within this ward. This notwithstanding, the ward had a relatively large population (10,836 people) compared to the other wards in the LLM. A summary of the population characteristics for the study areas are depicted in Table 10-37. According to the WDM IDP, the LLM experienced significant population decreases between 2005 and 2007; this was attributed to out-migration of people in search of economic opportunities within the Province and elsewhere in the country. However, an inverse situation was observed between 2011 and 2016 whereby the population of LLM grew significantly from 3% to 18%. The increase in the population was due to the growth of the energy and mining sectors.

Table 10-37: Population Characteristics

Study Area:	Regional	Secondary		
Statistics (2011)	**Limpopo**	**WDM**	**LLM**	**Ward 3**
Population	5 404 868	679 336	118 865	10 836
Land Area *(km^2)*	125 806.1	45 315.6	13 826.1	4 509.0
Population density *(person/km^2)*	43	15	9	2
Population growth rate	1%	1.2%	3.1%	-

10.16.1.1.1 Age groups

Table 10-38 provides an overview of the population the age ranges of the population. The most predominant age groups across the study areas are people of economically active groups (i.e., between 18 and 64 years of age). This provides an indication of the expected portion of the population that are of economically working age that might be available to take up employment opportunities within the study areas when measured against the study areas' employment rate and education levels. Of the study areas, Ward 3 was reported to have the largest proportion of people of economically active ages compared to the provincial, district and local municipal levels. Furthermore, Ward 3 and LLM comprised of lower numbers of elderly people compared to the district and provincial levels. This may be attributed to increase in-migration of people into the area in search of economic opportunities associated with the energy and mining sectors at the time of census data collection.

Table 10-38: Population by Age Range

Age Range	Limpopo		WDM		LLM		Ward 3	
	No.	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**
Under 18	2 216 457	41	242472	36	37 531	32	2 328	21
18 to 64	2 849 994	53	397 331	58	76 544	64	8 090	75
65 and over	338 417	6	39 534	6	4 789	4	417	4

10.16.1.1.2 Population groups

The majority of the population is Black African, followed by White (Figure 10-39). While the percentage component of Indian/Asian and Coloured varies across the study areas, the Coloured population is generally larger than the Indian/Asian. The "Other" population groups constituted of the smallest portion of the population.

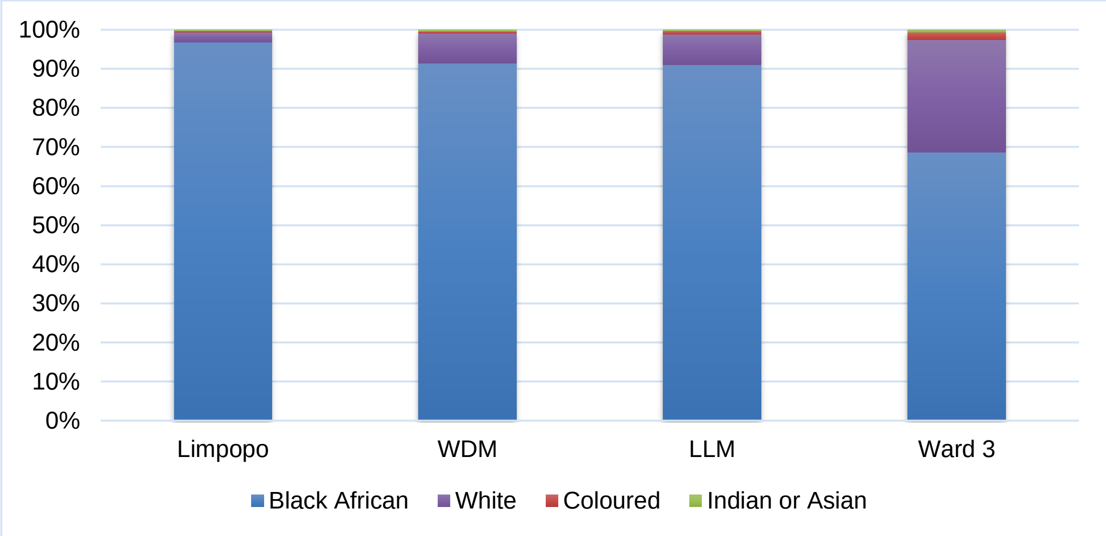


Figure 10-39: Racial Distribution of the Population in Percentages

10.16.1.1.3 Gender

Gender is divided fairly equally across the study areas, with females comprising slightly larger portions of the population. This may be attributed to out-migration of males leaving women to care for the household. In the Limpopo Province, however, there are more males than females (53% of the population is male). Figure 10-40 presents the distribution with respect to gender within the population of the study areas.

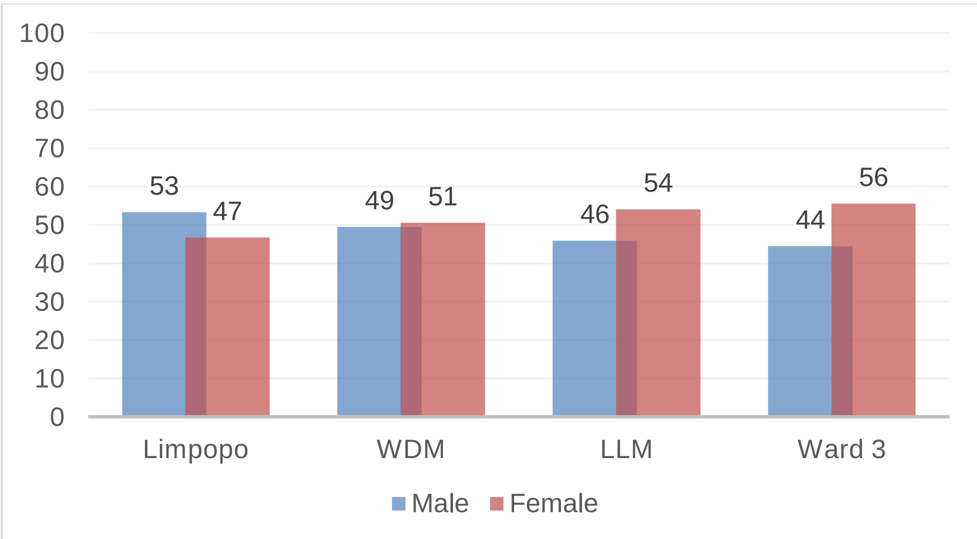


Figure 10-40: Gender Distribution in Percentages

10.16.1.1.4 Languages

Figure 10-41 provides an overview of the most and least commonly spoken languages in the study area, which will in future inform stakeholder communication protocols for the Mine. From the provincial to the local municipality, Sepedi was the most spoken language within the broader study areas. The exception is observed within Ward 3 whereby Afrikaans was the most spoken due to the area being dominated by White Afrikaans speakers. Across the study areas English is amongst the least spoken languages. Other predominant languages include Xitsonga and Setswana which are dominant in the LLM and Ward 3.

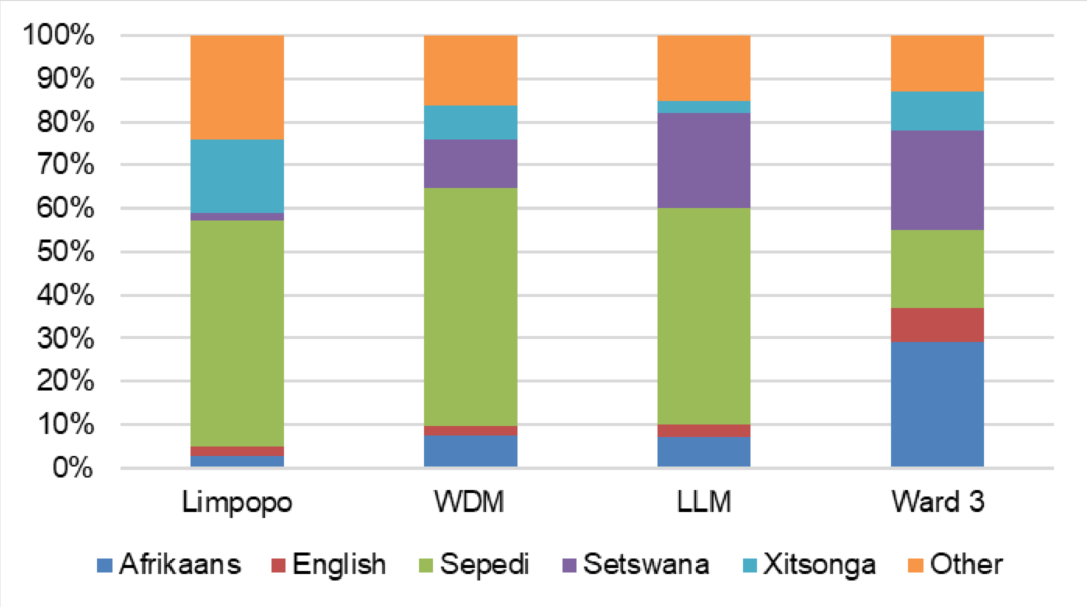


Figure 10-41: Predominant Spoken Languages

10.16.1.1.5 Education

An average of 12% of the population of the study areas have not attained any level of education, with the majority (17%) of illiterate persons found at a provincial level, followed by people at the WDM (12%). The LLM reported the highest proportion of the population with higher education, followed by LLM and Ward 3 population as indicated in Figure 10-42.

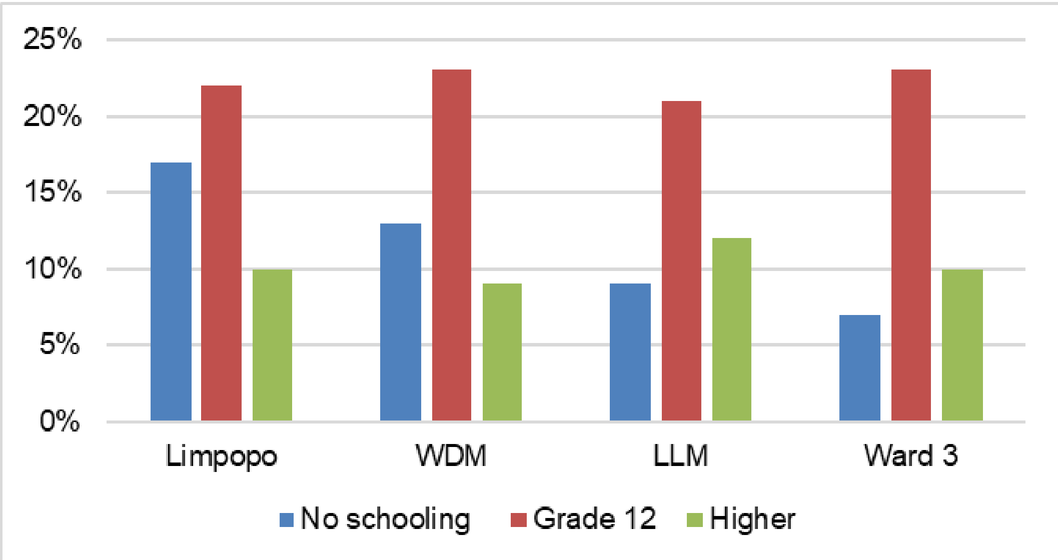


Figure 10-42: Level of Education of the Population <20 yrs

10.16.1.2 Economics and livelihood activities

The key sectors contributing to the Provincial economy include mining, agriculture, and tourism as highlighted in Table 10-39.

Table 10-39: Main Economic Sectors within the Regional and Secondary Study Areas

Mining	Agriculture	Tourism
• Beneficiation; • Mining Tourism; • Platinum Corridor; and • Mining logistics hub.	• Game farming; • Agro-processing; • Meat and horticulture Cluster; and • Agro-tourism.	• Tourism transport operators; • Tour operators; • Business tourism; and • Theme parks and recreational facilities.

10.16.1.2.1 Labour force and employment

Based on the readily available data, Ward 3 had the highest employment rate (65%) compared to the province, district and local municipality's population. Table 10-40 below shows the employment and unemployment rates of the population. Since the data used is outdated, it is assumed that the data reflect the employment conditions around the construction of Medupi Power Station. During the same period, the province had nearly half of its population as "discouraged job-seekers" and others who were not actively seeking work.

Table 10-40: Employment Statistics

	Limpopo	WDM	LLM	Ward 3
Employment rate	27%	38%	44%	65%
Unemployment rate	17%	15%	13%	6%
Other /NEA	49%	43%	42%	28%

10.16.1.2.2 Individual income levels

Figure 10-43 summarises the annual income for employed individuals. These figures are as per the 2011 census and have not been updated to consider inflation. An average of five percent (or 5%) of individuals are without income across the study area. An average of 21% across the study areas earn an income between R9 6001 and R 38 400. A family of four with a monthly household income of R 1 600.00 or less would be considered to live in poverty, as this income would leave the family unable to meet their food needs with no money left for non-food items.

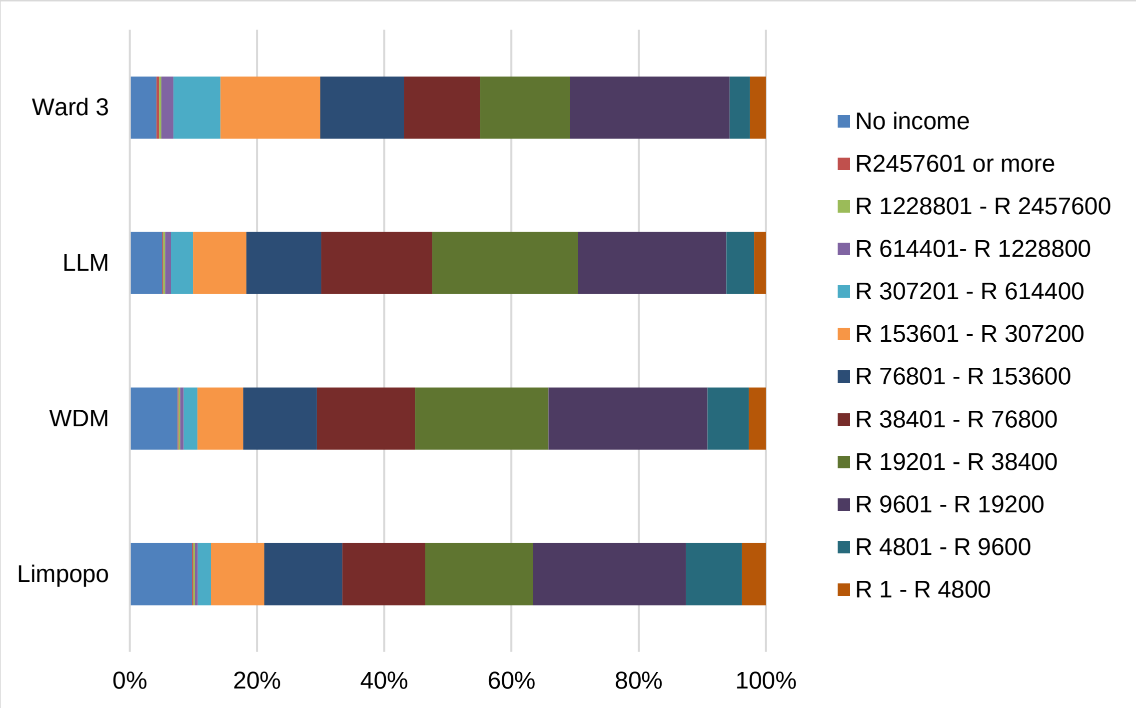


Figure 10-43: Annual Income for Employed Individuals within the Broader Study Area

10.16.1.3 Household characteristics

A summary of the households' characteristics within the primary study area is provided in Table 10-41. On average, households in the study areas comprise of four members. Half of the households at a provincial level are headed by females whilst an average of 1% of households are headed by children. The average household incomes are lowest at the provincial level and in Ward 3, depicting a monthly income of R4 800 or less.

Table 10-41: Summary of Household Characteristics

Study Area:	Regional	Secondary		
Statistics (2011)	**Limpopo**	**WDM**	**LLM**	**Ward 3**
Number of households	1 447 658	191 214	33 599	3 762
Average household size	4	4	4	3
Dependency ratio	67	55	44	-
Number of female headed households	50%	43%	39%	-
Average household income per annum	R 56 841	R 72 421	R 98 055	R57 500

10.16.1.3.1 Land tenure

LLM includes three types of land tenure (LLM, 2019). Table 10-42 below presents an overview of these types of land tenure as well as the areas in which they generally apply.

Table 10-42: Types of Land Tenure in the LLM

Tenure Type	Description	Applicability
Private Ownership	The most prevalent form of ownership in the LLM.	Lephalale town, most local service points and all farms
Communal Land Ownership	Ownership of land is vested in the national government, but the land is used by local residents.	All population concentration points and scattered villages
Deed of Grant	A deed of grant refers to a proclamation that has since become obsolete and grants less than full ownership. Since 1994, some of these deeds of grant have been converted to full ownership through the Extended Benefit Scheme.	Marapong

10.16.1.3.2 Housing

Table 10-43 below presents a snapshot of the most and least common types of dwellings in the study areas.

Table 10-43: Most and Least Common Dwelling Types

Dwelling type	Limpopo	WDM	LLM	Ward 3
Most common	Separate stand	Separate stand	Separate stand	Separate stand
Second-most common	Traditional Dwelling	Informal, other	Informal, other	Informal, other
Third-most common	Informal, other	Informal, in backyard	Informal, in backyard	Flat or apartment
Least common	Caravan / Tent	Caravan / Tent	Semi-detached	Cluster house

10.16.1.4 Household access to public services and infrastructure

This section presents the households access to various basic services including electricity; water supply; sanitation and toilet facilities; waste management; health care; as well as public transport and associated infrastructure.

10.16.1.4.1 Electricity

Figure 10-44 presents an overview of the sources of energy for domestic activities (i.e. cooking, heating and lighting) in the LLM. The percentages in the graph show the proportions of households that have access to resources for the various activities – several households did not report access to resources, or these were not captured in the WDM or LLM IDPs. The IDPs also reports that 3,429 households are provided with electricity for free in LLM.

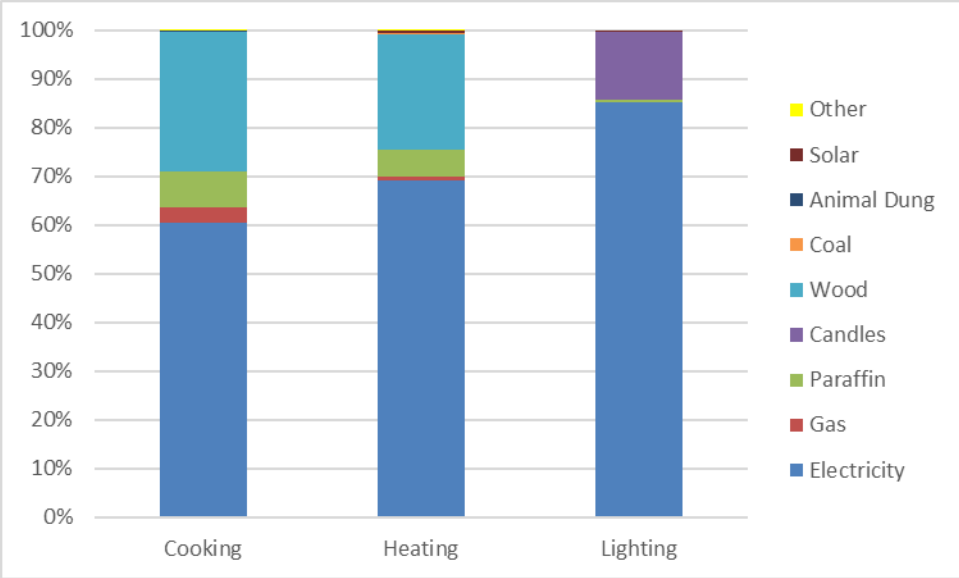


Figure 10-44: Sources of Energy for Domestic Activities

10.16.1.4.2 Water supply

The Blue Drop report shows that water quality within the WDM, and the LLM, ranges from bad to excellent, depending on the source of the water. However, it appears there is much data missing for the Blue and Green Drop reports (WDM, 2019). Figure 10-45 presents the various sources of domestic water for households within the study areas. In this figure, the regional/local water scheme refers to a scheme that is operated by the municipality or other water services provider. Stagnant water includes pools of water that gathered after, for example, rainfall.

The Moloko Dam supplies all urban areas within the LLM, and the rural areas are currently divided into four different water services schemes (LLM, 2019). In Ward 3, approximately 75% of households have access to water inside their dwellings. Those that do not have access to water inside their homes make use of a tap on the property (20%) or community standpipes (5%).

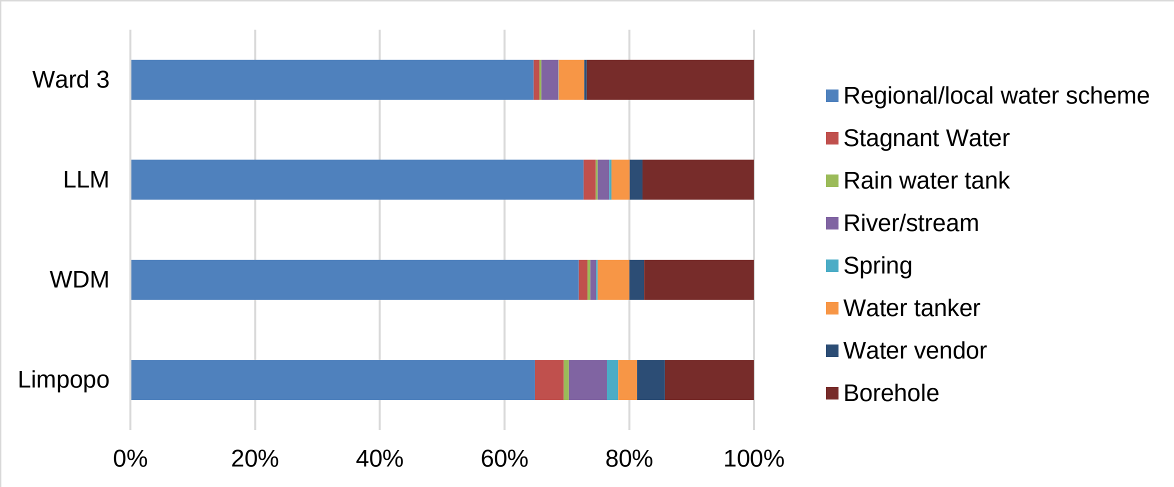


Figure 10-45: Sources of Water for Households in the Broader Study Area

10.16.1.4.3 Sanitation and toilet facilities

Figure 10-46 illustrates the access to toilet facilities, which includes pit toilets with and without ventilation and flush toilets connected to septic tanks or the sewerage system. Overall, there has been an increase in access to sanitation facilities in both the LLM and WDM. Notably, even though Ward 3 is highly rural and somewhat underdeveloped, the majority of its households (73%) have access to flush toilets, while only 6% of the households were reported to have no access to toilet facilities.

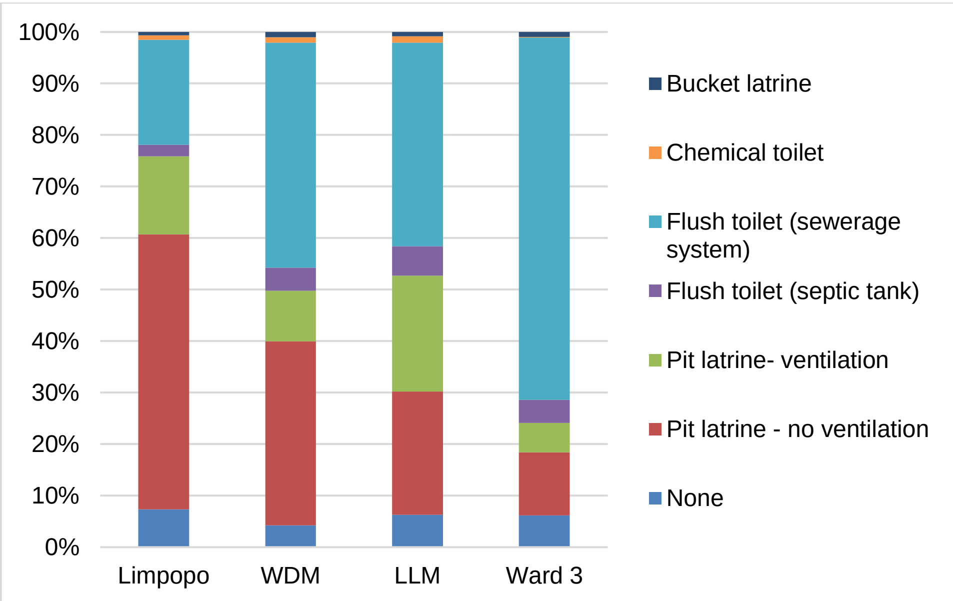


Figure 10-46: Household Access to Toilet Facilities within the Study Areas

10.16.2 Primary Study Area

The primary study area (or Ward 3) is comprised of commercial farmers engaged in livestock, and crop farming and ecotourism and the community of Lesedi. These are described below.

10.16.2.1 Commercial farmers

Due to the COVID-19 hard lock down, the Specialist could only consult with two farmers from the area, including the farmer currently leasing Farms Dalyshope and Klaarwater. The farmer currently leasing the Project affected farms, co-owns one farm portion in the area. The main land uses of the farmland include cattle breeding and keeping, and hunting. The farmer has five families currently working on the farms and one of these resides full-time on the farm. Water on the farms is sourced from boreholes, and energy source is mainly grid electricity. In general, the roads are unpaved and become impassable during the rainy season. The farmers and their employees use the clinic in Lesedi for health care services or consult private doctors in town. The farmer indicated that the loss of access to the leased farm portions will not affect his farming activities within the study area. However, he is reluctant to continue operating ecotourism due to the proposed mine next door.

10.16.2.2 Steenbokpan/ Lesedi Community

The Lesedi Community is located approximately 17 km from the proposed Project area and 46 km from Lephalale. The community was established in 2008 and are informal occupiers of vacant land owned by the South African Government (the Department of Education). The majority of the community relocated onto this land after the tenure of farmland they were living on was uncertain. Other community members have relocated here from the Lephalale area. There is a High Court Moratorium preventing the establishment of any permanent infrastructure within the community and there are no plans to convert the present settlement to a permanent settlement. The Municipality plans to relocate the community outside this area.

The community is said to comprise of 1,500 residents; spread across an estimated 300 households. According to the interviewees, approximately 70% of the population are females. The majority of the households in the area are headed by women. An estimated 25% of the total population were reportedly as being youths, and the remaining population is comprised of a combination of middle-aged and elderly people. Approximately 15% of the community have completed Grade 12. Most of the population is unemployed and are reliant on government social grants; and piece jobs, while formal employment is comprised of farm work in neighbouring commercial farms as general workers. Furthermore, most of the people of economic active ages have general skills which they acquired through working on the farms and being taught artisanry skills by others.

In terms of access to infrastructure and services, the community of Lesedi reported the following:

- The community has access to a day-clinic; however, it is not open every day. It is not equipped to handle emergencies but provides referrals to the facilities in Lephalale.

- The community has a single primary school. Secondary/ high schools are found in Lephalale and they are provided transportation by the Department of Education in a form of a school bus. Some of the key schooling challenges of the households include:
  - A shortage of educators which has led to the employment of untrained educators at the local school.
  - There are inadequate classrooms at the primary school and some locally based mining companies have donated temporary structures which are used as classrooms. This is due to the local government restrictions on construction of permanent structure in the community.
- There is a high drop-out rate amongst primary and high school scholars.
- Some households in the area have access to grid electricity – however, only those who can afford to buy electricity. Other households use wood as a source of fuel for cook and heating.
- The main water sources in the area are boreholes which pump into communal taps and taps inside some houses.
- Sanitation facilities are comprised of pit latrines within the yard. For households without sanitation facilities, they share facilities with other shared households.

10.17 Blasting and Vibration

A Blast and Vibration Report (Appendix P) compiled by Blast Management & Consulting (dated 15 November 2020) considers blasting operations for the proposed Project.

10.17.1 Structure Profile

To establish the baseline, all possible structures within a 3,500 m radius of the proposed different opencast boundaries were identified. These were classified and mapped to produce a model which depicts the foreseeable blasting impact within the radius. The list of infrastructures identified, referred to as Points of Interests (POIs), is shown in Table 10-44. This assists in determining the allowable ground vibration limits and air blast limits necessary for the Project.

Figure 10-47 shows the aerial view of the pit area and surroundings with POIs. The type of POIs identified is grouped into different classes. These classes are indicated as “Classification” in Table 10-44.

During the site visit, 83 structures were observed, and the initial POI list was verified and finalised on site. Structures ranged from well-built structures, mining structures to informal building styles.

Table 10-44: POI classification used

Class	Description
1	Rural Building and structures of poor construction
2	Private Houses and people sensitive areas
3	Office and High-rise buildings
4	Ruins
5	Animal related installations and animal sensitive areas
6	Industrial buildings and installations
7	Earth like structures – no surface structure
8	Heritage sites (buildings, infrastructure, activity, graves)
9	Graves
10	Water Borehole
11	Water Resources Surface
12	Pipelines Buried
13	Powerlines / Telephone Lines / Towers

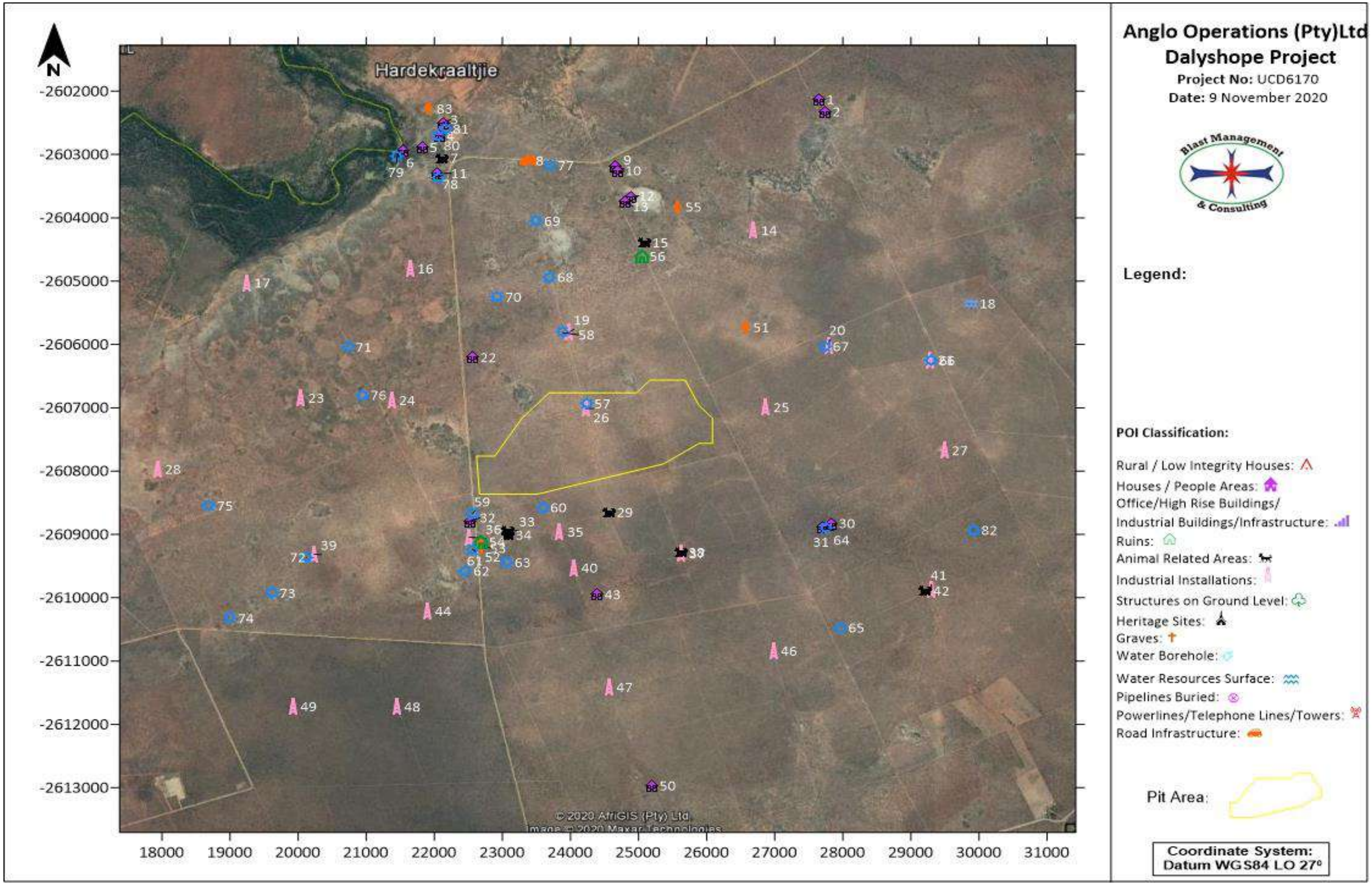


Figure 10-47: Aerial view and surface plan of the proposed Opencast mining area with points of interest identified

10.17.2 Blasting Operations

Blast design forms the basis of all calculations done for impact assessment. The current planned designs as supplied was applied for impact evaluation. Table 10-45 below provides a technical information summary of the blast designs provided.

Table 10-45: Blast Design Technical Information

Blast Geometry	
Type of Rock Blasted:	Shale
Formation of Blast:	Half Chevron
Hole diameter:	171mm
Burden:	5.0m
Spacing:	5.8m
Stemming length:	5.1m
Charge Column length:	14.9m
Hole depth:	20m
Sub-drill:	0m
Block Dimensions:	20m High, 50m Wide, 100-200m in length
Charge mass/delay expected:	17ms spacing delay with a 42ms burden delay
Target Powder Factor:	0.65 kg/m^3
Explosive type:	ANFO (Example: Innovex 207)
Charge mass/metre:	25.3 kg/m
Effective charge diameter:	171mm
Average in-hole density:	1.1 g/cm^3

The above information is applied for predicting ground vibration and air blast. Evaluation of the blasting operations considered a minimum charge and a maximum charge. The minimum charge was derived from the 171 mm diameter single blast hole and the maximum charge was extracted from the blast simulation in JKSimblast. The maximum charge relates to the total number of blast holes that detonates simultaneously based on a blast layout, initiation and timing of the blast. In this case a shock tube type initiation system is considered and expected to have at least four blastholes detonating simultaneously yielding the maximum mass of explosives detonating at once. The minimum charge relates to 316 kg and the maximum charge relates to 1506 kg. These values were applied in all predictions for ground vibration and air blast.

10.17.2.1 Ground vibrations

Based on the designs presented on expected drilling and charging design, Table 10-46 shows expected ground vibration levels (PPV) for various distances calculated at the two different charge masses. The charge masses are 316 kg and 1506 kg for the opencast area.

Table 10-46: Expected Ground Vibration at Various Distances from Charges Applied in this Study

No.	Distance (m)	Expected PPV (mm/s) for 316 kg Charge	Expected PPV (mm/s) for 1506 kg Charge
1	50.0	207.5	752.3
2	100.0	106.3	385.3
3	150.0	33.9	122.8
4	200.0	21.1	76.4
5	250.0	14.6	52.9
6	300.0	10.8	39.1
7	400.0	6.7	24.3
8	500.0	4.6	16.8
9	600.0	3.4	12.5
10	700.0	2.7	9.7
11	800.0	2.1	7.8
12	900.0	1.8	6.4
13	1000.0	1.5	5.4
14	1250.0	1.0	3.7
15	1500.0	0.8	2.7
16	1750.0	0.6	2.1
17	2000.0	0.5	1.7
18	2500.0	0.3	1.2
19	3000.0	0.2	0.9
20	3500.0	0.2	0.7

10.17.2.2 Air blast

The prediction of air blast as a pre-operational effect is difficult to define exactly. There are many variables that have influence on the outcome of air blast. Air blast is the direct result from the blast process, although influenced by meteorological conditions, wind strength and direction, the final blast layout, timing, stemming, accessories used, covered or not covered etc. all has an influence on the outcome of the result. Air blast is also an aspect that can be controlled to a great degree by applying basic rules.

In most cases mainly an indication of typical levels can be obtained. The indication of levels or the prediction of air blast in this report is used to predefine possible indicators of concern.

10.18 Traffic

The Traffic Impact Assessment (TIA) was conducted by EDL Engineers (Pty) Ltd and is attached to this report as Appendix Q. The study was undertaken to investigate the passing and new traffic that will be generated by the colliery, and to quantify, as well as evaluate its impact on the existing road network.

10.18.1 Surrounding Road Network

The following roads and streets are relevant to the study area:

- **Steenbokpan Road (D1675):** This road, which serves as the only direct route from Lephalale to Sandbult, and subsequently, the Project area, functions as a minor arterial for the area of and surrounding Sandbult, as per the criteria in Chapter 4.5.5. in the South African Road Classification and Access Management Manual (TRH26), despite almost only providing access to neighbouring farms. It runs in an east / west direction about 15km south of the southern boundary of the study site with a several large radius curves over its length, travelling towards Lephalale. It should, however, be mentioned that this road is in a bad condition, resulting in unsafe driving conditions considering the vast number of potholes and unsurfaced patches along its length. This road intersects the D175 by means of a 2-Way "Stop" with the D1675 having the R.O.W. The average speed on the D1675, according to data obtained by EDL Engineers (Pty) Ltd is 80km/h.

  Traffic counts indicate that this road carries traffic volumes of between 10 vehicle per hour (vph) and 50vph per direction during the Weekday morning (AM) and afternoon (PM) peak hours.

- **D175:** This road, which serves mainly as an access route for the farms situated near the Project area, runs along the western boundary of the proposed colliery. This road links the town of Sandbult, to the south, with the R510, just south of the Stockpoort border post. This road is an unsurfaced (gravel) single carriageway road with no median and space for two vehicles per direction. This road has a 2-Way "Stop" intersection with the Steenbokpan Road (D1675) with the last mentioned having the R.O.W.

  Traffic counts indicate that this road carries traffic volumes between 20vph and 60vph per direction during the Weekday morning (AM) and afternoon (PM) peak hours.

10.18.2 Future Road Network

There are no new roads planned which will have an impact on the proposed colliery situated across the Farms of Klaarwater 231 LQ and Dalyshope 232 LQ. Upgrades are, however; proposed for both the D1675 as well as the D175.

10.18.3 Proposed Site Access

The proposed Dalyshope coal mining project, is proposed to be accessed by a full access with an access road from the D175 situated about 18.5km north of the intersection of the D1675 and the D175.

10.18.4 Existing Traffic Flows

The study area was defined to include two key intersections as required by COTO TMH 16. Weekday Traffic Count data were supplied to EDL Engineers (Pty) Ltd which were carried out during June of 2020 during the Weekday AM and PM commuter peak periods, at the following identified intersections:

- Key Intersections: Steenbokpan Road (D1675) & the D175; and
- D175 & Access to the proposed Colliery.

EDL Engineers (Pty) Ltd acknowledges the fact that traffic patterns have been altered as a result of the Covid-19 outbreak (and lockdown) and has therefore adjusted the traffic count figures according to the proposals discussed by various municipalities during the Zoom meeting with the South African Institute of Civil Engineers (SAICE) early in June. It was estimated that, at the abovementioned key intersections, a correction factor of 3 for the Existing weekday AM and PM Peak Hour is to be applied. The existing Weekday AM, and PM peak hour traffic volumes are summarised in Figure 10-48.

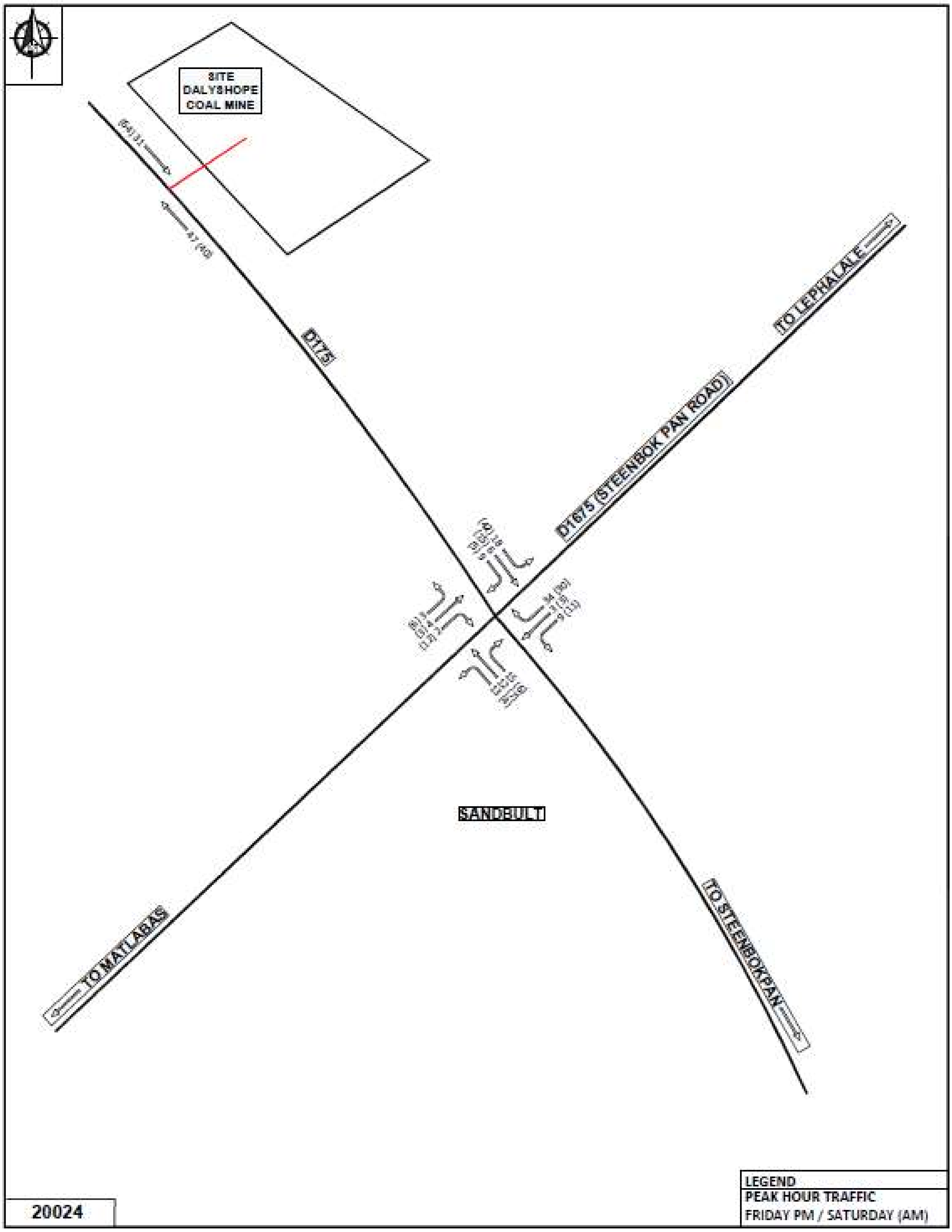


Figure 10-48: Existing 2020 Background Peak Hour Traffic

11 Item 3(j): Impacts and Risks Identified Including the Nature, Significance, Consequence, Extent, Duration and Probability of the Impacts

This section aims to rate the significance of the identified potential impacts pre-mitigation and post-mitigation. The potential impacts identified in this section are a result of both the environment in which the Project activity takes place, as well as the activity itself. The identification of potential impacts is performed by determining the potential source, possible pathways and receptors. In essence, the potential for any change to a resource or receptor (i.e. environmental aspect) brought about by the presence of a Project component or by a Project-related activity has been identified as a potential impact.

The potential impacts are discussed per environmental feature/ aspect and according to each phase of the Project i.e. the Construction, Operational and Decommissioning/ Post Closure Phases. The significance, probability and duration of these potential impacts have been assessed based on the detailed specialist studies undertaken on the sensitivity of the receiving environment. The main Project activities to take place during the construction, operational and decommissioning phases may pose potential impacts on the receiving environment and are described in Table 5-1 above.

11.1 Impacts and Mitigations per Project Phase

The potential impacts that were identified for the construction, operational and decommissioning phases, are discussed in Table 11-2. The impact matrix abbreviations used in Table 11-2 are provided in Table 11-1 below.

Table 11-1: Impact Matrix Abbreviations

Abbreviation	Definition
D	Duration
E	Extent
I	Intensity
P	Probability
S	Significance

Table 11-2: Impact Assessment associated with the Construction, Operational and Decommissioning Phases

Phase	Activity	Aspect	Impacts	D	E	I	P	S	Rating (Pre-Mitigation)	Mitigation Measures	D	E	I	P	S	Rating (Post Mitigation)
Construction	Movement of vehicles, and heavy machinery	Soil, Land Use and Land Capability	• Soil compaction; • Increased erosion, and consequently sedimentation of water bodies potential; and • Impacting agricultural activities in short, medium and long term (which may lead to lowering of land use and land capability).	5	3	4	5	60	Minor (negative)	• Keep site clearing to a minimal, and restrict vehicle movement outside of dedicated areas, specifically close to wetlands (pans); • Keep site clearing and impacts to the Dalyshope MRA; • Make use of existing roads to encourage minimal impacts/footprint to the OC1 Project area; and • Runoff must be controlled and managed by the use of proper stormwater management measures.	4	2	2	4	32	Negligible (negative)
Construction	Site clearing, and preparation by the removal of vegetation, and topsoil, leading to the exposure of soils	Soil, Land Use and Land Capability	• Soil loss by wind and water erosion from cleared land surfaces; • Soil compaction; • Increased wind, and water erosion, and consequently sedimentation potential; • Removal of vegetation, basal cover, and thus increasing the potential of loss of topsoil, organic material, and increased erosion potential; and • Compaction, ponding, and landscaping of the area.	5	4	5	6	82	Moderate (negative)	• Keep site clearing to a minimum; • After topsoil is stockpiled, it should be revegetated to limit erosion and loss of organic material; • Topsoil stockpile height should not exceed three meters; • Establishment of effective vegetation around constructed infrastructure for adequate soil protection from wind and water erosion; • If any erosion occurs, corrective actions must be taken to minimise any further erosion from taking place at regular intervals or after high rainfall events; and • Runoff must be controlled and managed by the use of proper stormwater management measures.	4	2	2	4	30	Negligible (negative)
Construction	Construction of infrastructure, including, workshop, PCD's, offices, stores, water distribution, diesel farm, brake-test ramp, heavy, and light vehicle access roads, truck access roads, and provincial road upgrade from Steenbokpan to the mining site.	Soil, Land Use and Land Capability	• Increased vehicle movement in the area, increasing soil compaction, and runoff potential; • Increased hardened surfaces resulting in increased hydrological functioning; • Potential spillage of hydrocarbons such as oils, fuels, and grease, thus contamination of the soils; • Impacting agricultural activities in short, medium and long term (which may lead to lowering of land use and land capability);	5	4	5	6	82	Moderate (negative)	• Keep site clearing to a minimal and within the Dalyshope MRA; • After topsoil is stockpiled, it should be revegetated to limit erosion and loss of organic material; • Establishment of effective vegetation around constructed infrastructure for adequate soil protection from wind, and water erosion; • If any erosion occurs, corrective actions must be taken to minimise any further erosion from taking place at regular intervals or after high rainfall events; and • Runoff must be controlled and managed by the use of proper stormwater management measures.	4	2	2	4	30	Negligible (negative)

Phase	Activity	Aspect	Impacts	D	E	I	P	S	Rating (Pre-Mitigation)	Mitigation Measures	D	E	I	P	S	Rating (Post Mitigation)
			• Increased dust, erosion, and sedimentation; and • Removal of natural vegetation, and loss of basal cover.													
Construction	Waste management activities, including handling of hydrocarbon chemicals, hauling, transportation of waste material, transportation of product coal, and disposal of waste material.	Soil, Land Use and Land Capability	• Soil Contamination from hydrocarbon waste (lubricants, explosives, and fuels); and • Soil compaction resulting from the movement of heavy machinery.	5	3	3	6	64	Minor (negative)	• Runoff must be controlled, and managed by use of proper stormwater management measures; • Vehicles should be serviced in accordance with the maintenance plans and checked that soils are not exposed to oil spills and other contaminants; • Re-fuelling must take place on bunded impervious surfaces to prevent seepage of hydrocarbons into the soil; • All vehicles and machines must be parked within hard park areas, and must be checked daily for fluid leaks; and • Fuel, grease, and oil spills should be remediated using a commercially available emergency clean up kits. However, for major spills (>5L), if soils are contaminated, they must be stripped and disposed of at a licensed waste disposal site.	4	2	1	4	29	Negligible (negative)
Construction	Temporary PCD	Soil, Land Use and Land Capability	• Soil Contamination from PCD spillage or leakages	5	3	3	6	64	Minor (negative)	• Ensure proper lining of the temporary PCD as per the engineering design and maintenance to prevent spillage, and leakages into the soils and water resources; and • Spills should be remediated using a commercially available emergency clean up kits. However, for major spills (>5L), if soils are contaminated, they must be stripped and disposed of at a licensed waste disposal site.	4	2	1	4	29	Negligible (negative)
Construction	Site preparation including vegetation clearance and excavations, leading to exposure of soils	Surface Water	• Sedimentation and siltation of nearby watercourses/ bodies	5	4	3	6	72	Minor (negative)	• Clearing of vegetation must be limited to the development footprint, and the use of any existing access roads must be prioritised to minimise creation of new ones and a stormwater management plan should be established and maintained; • If possible, construction activities must be prioritised to the dry months of the year (May to September) to limit mobilisation of sediments, dust	2	2	2	3	18	Negligible (negative)
Construction	Handling of hydrocarbons and other chemicals; Loading, hauling and transportation of product coal.	Surface Water	• Surface water contamination leading to deterioration of water quality	5	4	3	5	60	Minor (negative)		5	2	2	2	18	Negligible (negative)

Phase	Activity	Aspect	Impacts	D	E	I	P	S	Rating (Pre-Mitigation)	Mitigation Measures	D	E	I	P	S	Rating (Post Mitigation)
										generation and mobilisation hazardous substances from construction vehicles used during construction phase; • Dust suppression on the haul roads and other cleared areas must be undertaken on regular basis to prevent or limit dust generation; • Hydrocarbon and hazardous waste storage facilities must be appropriately bunded to ensure that leakages can be contained. Spill kits should be in place and construction workers should be trained in the use of spill kits, to contain and immediately clean up any leakages or spills; • Vehicles should regularly be maintained as per the developed maintenance program. This should also be inspected daily before use to ensure there are no leakages underneath; • Drip trays must be used to capture any oil leakages. Servicing of vehicles and machinery should be undertaken at designated hard park areas. Any used oil should be disposed of by accredited contractors; and • Implementation of the proposed stormwater management plan including installation of drains, berms and water containment facilities.						
Construction	Site clearing for the development of surface infrastructure through the removal of the topsoil and weathered rocks	Groundwater	• Lowering of the water table	2	1	-1	1	4	Negligible (negative)	• Avoid constructing below the water table as far as possible; • In the unlikely scenario where the foundation of structures is to be installed below the water level, dewatering of the aquifer to locally lower the water table can be considered. The abstracted water can be utilised for dust suppression, vegetation or discharged to the pollution control dams; and • Install long term monitoring boreholes.	1	1	-1	1	3	Negligible (negative)
Construction	Site/vegetation clearance	Fauna and Flora	• Loss of plant communities including floral SCC; • Loss of biodiversity; • Increased erosion; • Potential for AIP proliferation;	6	3	6	7	133	Major (negative)	• Keep site clearing to a minimal, and restrict vehicle movement outside of dedicated areas, specifically close to wetlands (pans); • Alien plant management strategy should be implemented;	6	3	3	7	77	Moderate (negative)

Phase	Activity	Aspect	Impacts	D	E	I	P	S	Rating (Pre-Mitigation)	Mitigation Measures	D	E	I	P	S	Rating (Post Mitigation)
			• Loss of faunal habitat including faunal SCC; and • Loss of vegetation types including Woodland and Pan vegetation.							• Make use of existing roads to encourage minimal impacts/footprint to the OC1 Area; • Relocation of the Baboon Spider's is recommended (See location on Sensitivity Map); • The footprint of the mine should be as compact as possible from a design point of view; • Avoid Combretum imberbe and Vachellia erioloba stands in sensitive areas; • Adhere to 100 m protective buffers around pans; • Ensure the replacement of removed protected trees, discussed in detail in the fauna and flora report (Appendix I).						
Construction	Access and haul roads construction	Fauna and Flora	• Removal of vegetation and basal layer; • Increased proliferation of AIPs • Increased faunal casualties; and • Increased dust pollution.	6	3	4	6	91	Moderate (negative)	• Keep site clearing to a minimum; • If any erosion occurs, corrective actions must be taken to minimise any further erosion from taking place at regular intervals or after high rainfall events; • Staff of the mine must adhere to policies within the operation of the mine, such as adhering to designated speed limits; • Restoration and rehabilitation of removed vegetation and SCC during rehab phase; • Construction must be kept within the infrastructure footprint area, to reduce as much fragmentation as possible; and • AIPs should be continuously monitored and controlled throughout the life of the mine and thereafter.	5	3	3	6	54	Minor (negative)
Construction	Rock blasting and operation of open pit workings	Fauna and Flora	• Heavy machinery utilised increasing vehicle movement in the area, increasing soil compaction, habitat disturbances and vegetation removal; • Blasting will increase loss of habitat, faunal casualties, loss of ecosystem functioning and encourage habitat fragmentation;	6	4	5	7	105	Moderate (negative)	• Restoration and rehabilitation of removed vegetation and SCC during rehab phase; • Construction must be kept within the infrastructure footprint area, to reduce as much fragmentation as possible; • Alien invasive plants should be continuously monitored and controlled throughout the life of the mine and thereafter; • An alien invasive management plan to be put in place; and	4	3	3	6	60	Minor (negative)

Phase	Activity	Aspect	Impacts	D	E	I	P	S	Rating (Pre-Mitigation)	Mitigation Measures	D	E	I	P	S	Rating (Post Mitigation)
			• Natural vegetation will be removed for the Open Pit working promoting edge effects and AIP proliferation; and • Increased dust pollution and erosion.							• Corridors (infrastructure and ecological) set aside within the mine area would mitigate fragmentation substantially, especially if this could be managed with the community over an extended period of time.						
Construction	Vegetation removal and surface water redirection	Wetlands	• The sources of this impact include the compaction of soil, the removal of vegetation and surface water redirection. Opencast mining through pan wetlands or upslope from pan wetlands will irrevocably alter their water flow characteristics. This impact cannot be mitigated where wetlands are lost through opencast mining.	3	3	-5	7	77	Moderate (negative)	• A temporary fence or demarcation must be erected around No-Go Areas outside the proposed works area prior to any construction taking place as part of the contractor planning phase when compiling work method statements to prevent access to the adjacent portions of the watercourse; • Effective stormwater management should be a priority during both construction and operational phases. This should be monitored as part of the EMP; • High energy stormwater input into the watercourses should be prevented at all cost. Changes to natural flow of water (surface water as well as water flowing within the soil profile) should be taken into account during the design phase and mitigated effectively; • External monitoring should commence from prior to the Construction Phase to ensure baseline information regarding soils and vegetation and to monitor any changes thereof; and • Throughout the Construction Phase, external monitoring should be done annually for soils and vegetation, preferable right after the rainy season (March to May).	3	3	-4	6	60	Minor (negative)
Construction	Construction activities	Wetlands	• Changes in sediment entering and exiting the system.	3	3	-4	7	70	Minor (negative)	• Water may seep into trenching and earthworks. It is likely that water will be contaminated within these earthworks and should thus be cleaned or dissipated into a structure that allows for additional sediment input and slows down the velocity of the water thus reducing the risk of erosion. Effective sediment traps should be installed; • Remove only the vegetation where essential for construction and do not	3	3	-3	6	54	Minor (negative)

Phase	Activity	Aspect	Impacts	D	E	I	P	S	Rating (Pre-Mitigation)	Mitigation Measures	D	E	I	P	S	Rating (Post Mitigation)
										allow any disturbance to the adjoining natural vegetation cover; • Rehabilitation plans must be submitted and approved for rehabilitation of damage during construction and that plan must be implemented immediately upon completion of construction; • Cordon off areas that are under rehabilitation as no-go areas using danger tape and steel droppers. If necessary, these areas should be fenced off to prevent vehicular, pedestrian and livestock access; • Protect all areas susceptible to erosion and ensure that there is no undue soil erosion resultant from activities within and adjacent to the construction camp and work areas. • Runoff from the mining area must be managed to avoid erosion and pollution problems; • Implementation of best management practices; • Implement source-directed controls; • Implement buffer zones to trap sediments; and • Monitoring should be done to ensure that sediment pollution is timeously dressed.						
Construction	Vegetation removal	Wetlands	• Introduction and spread of alien vegetation.	3	3	-4	6	60	Minor (negative)	• AIPs should be continuously monitored and controlled throughout the life of the mine and thereafter; • Retain vegetation and soil in position for as long as possible, removing it immediately ahead of construction / earthworks in that area and returning it where possible afterwards; • Monitor the establishment of alien invasive species within the areas affected by the construction and maintenance and take immediate corrective action where invasive species are observed to establish; and • Rehabilitate or revegetate disturbed areas.	2	3	-3	4	32	Negligible (negative)
Construction	Construction activities	Wetlands	• Loss and disturbance of watercourse habitat and fringe vegetation.	3	3	-5	7	77	Moderate (negative)	• Drying out of wetlands and loss of hydrological zonation (loss of	6	3	-4	6	78	Moderate (negative)

Phase	Activity	Aspect	Impacts	D	E	I	P	S	Rating (Pre-Mitigation)	Mitigation Measures	D	E	I	P	S	Rating (Post Mitigation)
										catchment) should be monitored and addressed through an offset program.						
Construction	Construction activities	Wetlands	• Changes in water quality due to pollution	4	3	-3	6	60	Minor (negative)	• Provision of adequate sanitation facilities located outside of the watercourse or its associated buffer zone; • Implementation of appropriate stormwater management around the excavation to prevent the ingress of run-off into the excavation and to prevent contaminated runoff into the watercourse; • The development footprint must be fenced off from the watercourses and no related impacts may be allowed into the watercourse e.g. water runoff from cleaning of equipment, vehicle access etc.; • Maintenance of vehicles / equipment should not take place within the watercourse or watercourse buffer; • Maintenance of buffer zones to trap sediments with associated toxins; • Ensure that no operational activities impact on the watercourse or buffer area. This includes edge effects; • Control of waste discharges and do not allow dirty water from operational activities to enter the watercourse; • Control of waste discharges and do not allow dirty water from operational activities to enter the watercourse; • Regular independent water quality monitoring should form part of operational procedures in order to identify pollution; and • Treatment of pollution identified should be prioritized according to best practice guidelines.	2	3	-2	4	28	Negligible (negative)
Construction	Site clearance and construction of proposed infrastructure	Aquatics	• Land and vegetation manipulation/clearing for infrastructure in proximity to the watercourses potentially draining into the Limpopo River via diffuse overland flow.	5	1	-2	3	24	Negligible (negative)	• Limit vegetation removal to the infrastructure footprint area only. Where removed or damaged, vegetation areas (riparian or aquatic related) should be revegetated as soon as possible; • Bare land surfaces downstream of construction activities must be vegetated to limit erosion from the	5	1	-1	2	14	Negligible (negative)

Phase	Activity	Aspect	Impacts	D	E	I	P	S	Rating (Pre-Mitigation)	Mitigation Measures	D	E	I	P	S	Rating (Post Mitigation)
										expected increase in surface runoff from infrastructure; • Environmentally friendly barrier systems, such as silt nets or, in severe cases, use trenches downstream from construction sites to limit erosion and possibly trap contaminated runoff from construction; • Storm water must be diverted from construction activities and managed in such a manner to disperse runoff and prevent the concentration of storm water flow; • Water used at construction sites should be utilised in such a manner that it is kept on site and not allowed to run freely into nearby watercourses (i.e. use of a PCD); • Construction chemicals, such as paints and hydrocarbons, should be used in an environmentally safe manner with correct storage as per each chemical's specific storage descriptions; • All vehicles must be frequently inspected for leaks; • No material may be dumped or stockpiled within any rivers, drainage lines in the vicinity of the proposed Coal Mine; • All waste must be removed and transported to appropriate waste facilities; • High rainfall periods (usually November to March) should be avoided during construction, where possible, to possibly avoid increased surface runoff in attempt to limit erosion and the entering of external material (i.e. contaminants and/or dissolved solids) into associated aquatic systems; and • Monitoring of the associated Limpopo River reach should be implemented upon commissioning of the construction phase.						
Construction	Site Clearing, Construction of Surface Infrastructure and Topsoil Stockpiling	Air Quality	• Reduction in ambient air quality	1	2	2	6	30	Negligible (negative)	• Application of a dust suppressant on the haul roads and exposed areas;	1	1	1	4	12	Negligible (negative)

Phase	Activity	Aspect	Impacts	D	E	I	P	S	Rating (Pre-Mitigation)	Mitigation Measures	D	E	I	P	S	Rating (Post Mitigation)
										• Limit activity to non-windy days (wind speed less than 5.4 m/s), where possible; • Set maximum speed limits on haul roads and have these limits enforced; • The area of disturbance must be kept to a minimum at all times and no unnecessary clearing, digging or scraping must occur, especially on windy days; • The drop heights when loading onto trucks and at tipping points should be minimised; • The enclosure of crushers; • Application of fogging system at the crusher or dust suppression system (such as sprays); and • The implementation of an air quality management plan.						
Construction	Diesel Storage	Air Quality	• Release of Volatiles Resulting in Poor Air Quality	1	2	2	4	20	Negligible (negative)	• Internal floating roofs and seal to minimize vapourisation is recommended; • Spill prevention control and countermeasure plan in place; • Maintenance of large spill kit at the diesel storage facility for incidental spill and drip; and • Secondary containment provided for all storage tanks for leaks in accordance with good engineering practices.	1	1	1	3	9	Low (negative)
Construction	Construction activities during the day	Noise	• Noise disturbance- NSD R1	2	2	10	5	70	High	• Due to NSD R1 located within 100m from the main access road, projected noise levels would be higher than the recommended zone rating level, or the noise limit as recommended for residential use (WHO and IFC guideline). Due to the proximity to the mining area mitigation will be difficult, with the most viable option being the relocation of NSD R1.	2	2	2	1	6	Low
Construction	Construction activities during the day	Noise	• Noise disturbance- Other NSD	2	2	2	1	6	Low							
Construction	Construction activities at night	Noise	• Noise disturbance- NSD R1	2	3	10	5	75	High	• Due to NSD R1 located within 100m from the main access road, projected noise levels would be higher than the recommended zone rating level, or the noise limit as recommended for residential use (WHO and IFC guideline). Due to the proximity to the mining area mitigation will be difficult,	2	3	2	1	14 - 18	Low
Construction	Construction activities at night	Noise	• Noise disturbance- NSD R3	2	3	6	3	33	Low							
Construction	Construction activities at night	Noise	• Noise disturbance- Other NSD	2	3	4	2	14 - 18								

Phase	Activity	Aspect	Impacts	D	E	I	P	S	Rating (Pre-Mitigation)	Mitigation Measures	D	E	I	P	S	Rating (Post Mitigation)
										with the most viable option being the relocation of NSD R1. Other measures that would reduce the night-time noise levels at other NSD include: • the construction of berms using sub-soil or hard burden between active and future mining areas (including the plant infrastructure) and the identified NSD. The berms should be as high as possible and should ideally break the line of sight between the mining activities and the NSD. The berms should ideally be constructed during the daytime period with the dumping of material taking place behind these berms at night; • the mine should consider the recommendations defined in Section 13 of the Noise Study (Appendix M); • the mine should implement a noise monitoring programme. Recommendations regarding a potential monitoring programme is defined in Section 14 of the Noise Study (Appendix M); • it is recommended that the mine development team minimize night-time (22:00 – 06:00) traffic that may pass within 200 m from residential areas, such as Sandbult.						
Construction	Site / Vegetation Clearance	Visual	• Site / vegetation clearance will reduce the screening properties that the natural vegetation has on the environment making the project more visible to receptors.	5	2	-4	7	77	Moderate (negative)	• Only remove vegetation within the infrastructure footprint areas; and • Limit the footprint area of surface infrastructure where possible.	5	1	-3	7	63	Minor (negative)
Construction	Infrastructure Construction	Visual	• The surface infrastructure will change the sense of place of the Project area. This change in landscape and land use will draw attention to the project area.	5	4	4	7	91	Moderate (negative)	• Ensure that the surface infrastructure does not exceed the proposed heights; • Limit the footprint area of surface infrastructure where possible; • Only remove vegetation within the infrastructure footprint areas; • Plant trees and plants along the fence line to assist in screening the surface infrastructure; and • Revegetate after construction phase to assist in screening the surface infrastructure.	5	4	-2	7	77	Moderate (negative)

Phase	Activity	Aspect	Impacts	D	E	I	P	S	Rating (Pre-Mitigation)	Mitigation Measures	D	E	I	P	S	Rating (Post Mitigation)
Construction	Topsoil Stockpiling	Visual	• Negative visual impact due to the proposed height and footprint size.	5	4	-5	7	98	Moderate (negative)	• Limit the footprint area of topsoil stockpiles where possible; • Limit the height of topsoil stockpiles to 3 m to prevent negative visual impacts, if possible; • Topsoil stockpiles must be shaped and contoured to prevent ponding and to prevent erosion and slope failure; • Vegetate the topsoil stockpiles as soon as possible to blend into the surrounding landscape and reduce dust generation; and • Apply dust suppression techniques to limit dust generated from topsoil stockpiles.	5	3	-3	7	77	Moderate (negative)
Construction	All Construction Activities	Socio-economic	• Creation of Employment Opportunities	2	4	2	5	40	Minor (positive)	• Set targets for local employment regardless of the size the work program. Targets must include employment of youths and women from historically disadvantaged backgrounds; and continuously monitored; • Establish a Local Employment Office to facilitate access to employment opportunities for local candidates with appropriate skill sets. • Develop and implement a Work Readiness and Vocational Training Plan in consultation with local stakeholders, including women's groups; • Develop and maintain a database of people looking for work within the study area; Widely advertise all Project employment opportunities in local community newspapers and placed in public places in local languages; • Comply with minimum wage requirements for unskilled labour and all other requirements, including gender equity, of the Employment Equity Act to ensure maximum benefits accrue to workers; and • Ensure that no employment take place at the entrance to the site (to avoid people congregating at the work site). Only formal channels for employment will be used.	4	4	-4	5	60	Minor (positive)

Phase	Activity	Aspect	Impacts	D	E	I	P	S	Rating (Pre-Mitigation)	Mitigation Measures	D	E	I	P	S	Rating (Post Mitigation)
Construction	• Site/vegetation clearance'; • Temporary PCD; • Contractors laydown yard; • Access and haul road construction; • Infrastructure construction; • Diesel storage and explosives magazine; • Septic tanks; and • Topsoil stockpiling	Socio-economic	• Opportunities and Capabilities within the Supply Chain	5	4	2	4	44	Minor (positive)	• Carry out an audit of local businesses and their capacity to meet Project needs, including those businesses in the study area, and maintain a database of local business information. • Establish local procurement and business development office in central and accessible location to enhance accessibility of information about contract and training opportunities and promote opportunities through trade forums and other events. • Establish relevant training and capacity building initiatives to support businesses' ability to meet the Project requirements, based on audit results and needs assessments. • Develop and implement a local Procurement Policy or Plan. The policy/ plan shall provision for the following: • Setting of targets the numbers of local businesses used by the Project at all levels will be tracked. • Adaptation of Project procurement documents to suit local businesses as far as possible within the standards required of the Project. • Provision of incentives for Project contractors to purchase locally and partner with local businesses, including tender requirements regarding local procurement. • Creation of an SME electronic portal to facilitate communication of contract opportunities and management training materials to SMEs. • Considerations for unbundling of contracts into small work programs to ensure that small and locally based businesses are able to benefit. • Promotion of joint ventures between large and small Contractors to ensure equitable sharing of economic benefits and skills development. • Procedure for dissemination of procurement opportunities as early as possible, with clearly defined requirements for the goods or service to manage expectations.	5	5	6	6	96	Moderate (positive)

Phase	Activity	Aspect	Impacts	D	E	I	P	S	Rating (Pre-Mitigation)	Mitigation Measures	D	E	I	P	S	Rating (Post Mitigation)
										• Partner with relevant organisations where available and appropriate (e.g., government agencies, civil society and NGOs) to provide access for local businesses to finance and advisory services in order to develop their capacity to competitively supply to the Project. • Implementation of the grievance procedures.						
Construction	All project related activities associated with construction and operations	Socio-economic	• Change to the Sense of Place	6	2	-5	6	78	Moderate (negative)	• Implement induction programmes for all employees and contractors to increase sensitivity to local norms and customs. • Contract shall implement a 'no fraternization' policy at the worker's camp to minimise relations with prostitutes and unsafe sexual interaction with local residents. • Implement traffic safety measures, particularly speed control and driver awareness training for all drivers. • Minimise the construction footprint in forested areas in particular and ensure that disturbed areas are rehabilitated with indigenous trees and other plants. • Adequate plan for rehabilitation. • Offset negative experience of altered sense of place by maximising local employment/ economic benefits. • Implementation of the grievance procedures.	4	3	-3	5	50	Minor (negative)
Construction	All project related activities associated with construction and operation	Socio-economic	• Impacts associated with Population Influx such as increased competition for residential land and other natural resources as well as an increased strain in accessing government services	5	3	-7	6	90	Moderate (negative)	• Develop an In-Migration Plan that addresses how the Project will seek to minimise Project-induced in-migration as far as possible. Implement mitigation measures to address the adverse environmental and social consequences, and maximise the benefits, of in-migration. The management plan should be developed together with other industry role players and government. • To discourage influx of job-seekers, consider prioritisation of employment of unemployed members of local communities. • Liaise with Local Government to ensure that expected population influx	5	3	4	6	72	Minor (negative)

Phase	Activity	Aspect	Impacts	D	E	I	P	S	Rating (Pre-Mitigation)	Mitigation Measures	D	E	I	P	S	Rating (Post Mitigation)
										is considered in infrastructure development and spatial development planning. • Create synergies with Community Development Plan (CDP) to ensure that infrastructure development initiatives can off-set increased pressure on local services. • Identify if recorded criminal activities involved members of the Project's workforce. • Engage with government authorities on issues, risks, and opportunities regarding in-migration. • Engage with local communities to understand their concerns, raise awareness of risks and opportunities, and identify solutions to issues relating to in-migration. • Develop and implement a targeted communications plan in areas known to be potential sources of in-migration and, using migrant networks, inform potential in-migrants of the scale and nature of opportunities, manage their expectations, and where appropriate discourage them from moving to the study area. • Maintain a clear security zone around all Project land to avoid informal settlement around the perimeter of Project activities. • Operate employee bus services from local settlements to discourage people from moving from their village to locations closer to Project sites in search of jobs and improve existing roads and build new roads to facilitate access from larger centres to Project sites. • Focusing Project-workforce housing and vocational training and business support services in larger towns with the most capacity to accommodate new residents. • Working with and assisting local authorities and relevant partners to achieve the following: • Monitoring changes in land cover and land use outside the Project site to						

Phase	Activity	Aspect	Impacts	D	E	I	P	S	Rating (Pre-Mitigation)	Mitigation Measures	D	E	I	P	S	Rating (Post Mitigation)
										identify loss of areas of importance for biodiversity and cultural heritage. • Discourage informal settlements along Project roads to minimise loss of habitat of value for biodiversity. • Where available and appropriate to design and implement an information and awareness programme regarding sustainable harvesting and conversation of natural resources. • Supporting community-based and inter-settlement youth programmes for sport, arts, and culture						
Construction	All project related activities associated with construction and operation	Socio-economic	• Community unrest due to perceived lack of economic opportunities and unfulfilled promises.	5	4	-5	6	84	Moderate (negative)	• Implement enhancement measures associated with all positive impacts in order to minimise or avoid protest and unrests. • Undertake ongoing consultation with local communities (including local authorities and traditional leadership) and clearly communicate Project needs and schedule. • Encourage stakeholders to utilise the grievance procedure to communicate their issues and ensure timeous response to all lodged complaints and grievances. • Utilise existing procurement and employment plans that promote transparent and fair recruitment and procurement. • Implement the grievance procedures.	4	4	-3	5	55	Minor (negative)
Operational	Vehicle, and heavy machinery movement	Soil, land use and land capability	• Soil compaction; • Increased runoff potential; • Increased erosion, and consequently sedimentation potential; and • Impacting agricultural activities in short, medium and long term.	5	3	4	5	60	Minor (negative)	• Keep site clearing to a minimal, and restrict vehicle movement outside of dedicated areas, specifically close to wetlands (pans); • Make use of existing roads to encourage minimal impacts/footprint to the OC1 Project area; and • Topsoil should be stockpiled separate from the subsoil to enhance the rehabilitation process.	2	1	3	2	32	Negligible (negative)
Operational	OC1 establishment	Soil, land use and land capability	• Removal of soil, and decreased soil depth; • Increased erosion, and sedimentation potential; and • Soil compaction, and increased surface runoff.	7	5	7	7	133	Major (negative)	• Keep site clearing to a minimal, and restrict vehicle movement outside of dedicated areas, specifically close to wetlands (pans); • All areas not proposed to be mined of high land capability, should be demarcated as "No-Go" areas, and	6	3	4	5	65	Minor (negative)

Phase	Activity	Aspect	Impacts	D	E	I	P	S	Rating (Pre-Mitigation)	Mitigation Measures	D	E	I	P	S	Rating (Post Mitigation)
										avoided as far as possible (including vehicle movement, infrastructure, roads and mining related activities • Ensure proper soil stripping, and stockpiling for optimum rehabilitation; and • Vegetate stockpiles to prevent soil loss, organic material loss, erosion, and sedimentation.						
Operational	Blasting (only when dikes and other geological features are encountered)	Soil, land use and land capability	• Movement of the soil strata; and • Changes to the landscape, causing ponding, and undulating topographies.					133	Major (negative)	• Monitoring must be carried out during the operational phase to ensure no unnecessary impact to the soil resources present, and if so that a remedy is put in place as soon as possible; and • The disturbance must be minimised, and suitably rehabilitated.	6	3	4	5	65	Minor (negative)
Operational	Stockpiling (rock dumps, soils, ROM, discard dump) establishment, and operation.	Soil, land use and land capability	• Removal of topsoil, stockpiling, and exposed soil which may lead to unexpected changes in the depth and the nature of the soil. • Increased vehicle movement in the area, increasing soil compaction, runoff, and erosion potential; • Potential spillage of hydrocarbons such as oils, fuels, and grease, thus contamination of the soils; and • Unexpected changes in the depth, and the nature of the soil.	5	4	4	5	65	Minor (negative)	• A Topsoil Management Plan (TMP) must be prepared to demonstrate how topsoil will be preserved in a condition as near as possible to its pre-mining condition to allow successful mine rehabilitation (Statham, 2014); • Long term stockpiles should be revegetated to minimise loss of soil quality. This will minimise AIPs, maintain soil organic matter levels, maintain soil structure, and microbial activity; • Topsoil stripping should be scheduled for the dry season, where possible; and • All long-term topsoil material stockpiles should be located outside the active mine path, and away from drainage lines.	4	2	2	4	32	Negligible (negative)
Operational	Waste management activities	Soil, land use and land capability	• Soil contamination from hydrocarbon waste (lubricants, explosives, and fuels); • Soil contamination from sewage; and • Impacting agricultural activities in short, medium and long term (soil and water contamination).	5	3	3	6	66	Minor (negative)	• Soil pollution monitoring should be conducted at selected locations on the Project site to detect any extreme levels of pollutants; and • Any spillages of sewage effluent from the treatment plant or ablution facilities should be cleaned up immediately, and the removed contaminated soils should be disposed of at accredited disposal sites.	4	2	1	4	28	Negligible (negative)
Operational	Diesel storage, explosives magazine, and handling, and	Soil, land use and land capability	• Soil contamination; • Soil contamination from hydrocarbon waste/spills	5	4	4	5	65	Minor (negative)	• Chemicals, such as paints, and hydrocarbons, should be used in an environmentally safe manner with	4	2	2	4	32	Negligible (negative)

Phase	Activity	Aspect	Impacts	D	E	I	P	S	Rating (Pre-Mitigation)	Mitigation Measures	D	E	I	P	S	Rating (Post Mitigation)
	treatment of hazardous products (including fuel, explosives, and oil)		(lubricants, oil, explosives, and fuels); • Soil contamination from sewage, and wastewater; and • Impacting agricultural activities in short, medium and long term.							correct storage as per each chemical's specific storage descriptions; • All spills should be immediately cleaned up, and treated accordingly; and • Re-fuelling must take place on a sealed surface area away from wetlands to prevent the ingress of hydrocarbons into the topsoil.						
Operational	Operating crush, and screen, and coal washing plant.	Soil, land use and land capability	• Soil contamination from wastewater, and spillages; and • Impacting agricultural activities in short, medium and long term (Soil and water contamination).	7	5	7	7	133	Major (negative)	• Stormwater must be diverted from construction activities and managed in such a manner to disperse runoff and prevent the concentration of stormwater flow; • Water used at construction sites should be utilised in such a manner that it is kept on-site, and not allowed to run freely into nearby watercourses (i.e. installation of clean, and dirty water separation systems); and • A Storm Water Management Plan (SWMP) should already be implemented. This should consider all high land capability area, high potential erosion areas, wetlands, and other watercourses associated with the new developments/infrastructure which should divert stormwater away from the surface infrastructure, and back into natural watercourses to maintain catchment yield as far as possible. The SWMP should also convey stormwater to silt traps to limit erosion and the subsequent increase of suspended solids in downstream watercourses.	6	3	4	5	32	Negligible (negative)
Operational	• Open pit establishment and operation; and • Stockpiling (Runoff from the dirty water areas or catchments (coal stockpile areas, mine processing plant, workshops etc.)	Surface water	• Surface water contamination and deterioration of water quality on the natural water resources	3	5	4	5	60	Moderate (negative)	• Runoff from dirty areas should be directed to the storm water management infrastructure (drains and PCDs) and should not be allowed to flow into the natural environment, unless DWS discharge authorisation and compliance with relevant discharge standards as stipulated in the NWA is obtained; • The PCDs and dirty water channels should be lined either by concrete or High-Density Polyethylene (HDPE) in order to prevent contamination of groundwater through seepage;	2	2	2	2	18	Negligible (negative)
Operational	• Storage, handling and treatment of hazardous products	Surface water	• Surface water Contamination from	5	4	3	6	72	Minor (negative)		5	2	2	2	18	Negligible (negative)

Phase	Activity	Aspect	Impacts	D	E	I	P	S	Rating (Pre-Mitigation)	Mitigation Measures	D	E	I	P	S	Rating (Post Mitigation)
	(including fuel, explosives and oil) and waste; and • Movement of vehicles and mine machinery		hydrocarbon and chemical spillages and leakages							• The water quality monitoring program provided in this report should be adhered to for monitoring water resources within and in close proximity to the study area to allow detection of any contamination arising from operational activities; • The management of general and other forms of waste must ensure collection and disposal into clearly marked skip bins that can be collected by approved contractors for disposal to appropriate disposal sites; • The overall housekeeping and storm water system management (including the maintenance of berms, de-silting of dams and conveyance channels and clean-up of leaks) must be maintained throughout the LOM; • The hydrocarbon and chemical storage areas and facilities must be located on hard-standing area (paved or concrete surface that is impermeable), roofed and bunded in accordance with SANS1200 specifications. This will prevent mobilisation of leaked hazardous substances; • Training of mine personnel and contractors in proper hydrocarbon and chemical waste handling procedures is recommended; • Vehicles must only be serviced within designated service bays; and • Wash bay and workshop runoff should flow through an oil separator as indicated on the infrastructure plan prior to discharge into the PCD.						
Operational	Operation of PCD	Surface water	• Reduction of catchment runoff yield	5	3	3	7	72	Minor (negative)	Although there are no mitigation measures to completely prevent this kind of impact. The following management measures can be applied to ensure that the impact is limited to the site and its immediate surrounding: • Infrastructure development must be limited to the demarcated footprint to minimize the dirty runoff generating catchments within the study area;	No mitigation possible.					

Phase	Activity	Aspect	Impacts	D	E	I	P	S	Rating (Pre-Mitigation)	Mitigation Measures	D	E	I	P	S	Rating (Post Mitigation)
										• As per the recommended storm water management plan, clean water runoff from the upstream catchment of the mine should be diverted around the site into the natural environment, this will minimize the runoff that will potentially be contaminated by mine waste; and • All the runoff captured on the PCD and RWD should be re-used in the mine processes as currently proposed as this will avoid sourcing raw water from external sources.						
Operational	Mine dewatering and creation of cone of dewatering	Groundwater	• Lowering of the water table	6	2	-4	4	48	Minor (negative)	• Store the dewatered water in pollution control dams and ensure that the dams will have sufficient storage volume; • Compensation of farmers with impacted groundwater levels, if impact is confirmed through monitoring; • Monitoring of groundwater water levels and pit inflow rates; • Minimise the impact associated with the lowering of the water table. Always keep the dewatering level close to the pit floor and not too far (more than 2 m) below; and • Update numerical model as aquifer information becomes available.	6	2	-3	4	44	Minor (negative)
Operational	Pit mining, pit backfilling, seepage from the PCD and waste stockpiling	Groundwater	• Groundwater contamination (Solute transport in the groundwater)	6	3	-3	4	42	Minor (negative)	• Compensation of farmers with impacted groundwater or mine purchase land (if impact is proved to be from the mine). • Nitrate-based explosives should be avoided to minimise groundwater contamination. • Contain the contamination plume to within the pit area, by dewatering the pit. • Overburden stockpiles should be managed to minimise infiltration of contaminants to the groundwater. The stockpiling of carbonaceous contaminated with the topsoil stockpiles should be prevented and managed accordingly. Mitigation methods that should be considered include:	6	2	2	4	40	Minor (negative)

Phase	Activity	Aspect	Impacts	D	E	I	P	S	Rating (Pre-Mitigation)	Mitigation Measures	D	E	I	P	S	Rating (Post Mitigation)
										• Management of the stockpile shape to control the ease with which water can run off. • The vegetation of the stockpile and covering them with soil to minimise rainfall infiltration and mobilisation of dissolved metals. • The following management activities can be implemented to minimise contamination that originates from the pollution control dam: • Implementation of adequate storm water management to contain all waste water and/or volatile organic compounds, for treatment and recycling. • Pollution control dams should be lined to pro-actively prevent infiltration of contaminated seepage water.						
Operational	• Coal transportation; and • Vehicle and heavy machinery movement	Fauna and Flora	• Habitat destruction by removal of vegetation; • Increase in dust production; • AIP spread; • Increased compaction, erosion, and consequently sedimentation potential; and • Increased faunal casualties.	5	3	4	6	72	Minor (negative)	• The footprint of the mine should be kept as small as possible with only necessary areas being cleared; • Existing roads should be used with no new roads constructed, if new roads need to be constructed, these should be done outside of the identified vegetation communities and as close as possible to the existing roads; • Adhere to a protective 100 m buffer around the pans; • Further investigation is recommended to determine the extent of the presence of burrows of the *Pyxicephalus adspersus* in relation to the infrastructure of the Project area; • Access should be restricted to already impacted areas (haul roads, open pits and dumps) by rehabilitating these areas as soon as possible by removal of infrastructure and planting; • To minimise loss of Faunal SCC, awareness campaigns with activated anti-poaching units incorporated during the mine life cycle. Security patrols to prevent snaring. Create a sanctuary for faunal species identified within the Project area during the operational phase;	5	3	2	4	40	Negligible (negative)

Phase	Activity	Aspect	Impacts	D	E	I	P	S	Rating (Pre-Mitigation)	Mitigation Measures	D	E	I	P	S	Rating (Post Mitigation)
										• Alien invasive plants should be continuously monitored and controlled throughout the life of the mine and thereafter. It is recommended that AIP programme be established to control the spread; and • Monitoring of the vegetation communities present must be completed every two years to document to impacts of the edge effect and fragmentation.						
Operational	Open-pit establishment, stockpiles, rock blasting and dumping	Fauna and Flora	• Removal of vegetation, habitats and increased soil erosion and compaction; • Loss of faunal SCC; • Destruction of and changes to the habitats; • Increased dust pollution due to erosion and vehicular activity; and • Risk of AIP proliferation.	6	3	4	7	91	Moderate (negative)	• Monitoring of alien invasive sprawl during the operation is recommended as the surrounding vegetation is relatively intact and free from alien invasive plants; • Ensure no loss of faunal SCC by activating anti-poaching units that will be incorporated during the mine life cycle; • Monitor dust pollution; • Keep sight clearing to a minimal, and restrict vehicle movement outside of dedicated areas, specifically close to wetlands (pans); and • Vegetate stockpiles to prevent soil loss, organic material loss, erosion, and sedimentation.	4	3	3	4	40	Minor (negative)
Operational	Diesel storage, and fuelling of diesel on site	Fauna and Flora	• Contamination of soil, water and surrounding areas / habitats (pan vegetation) from Hydrocarbon waste/spills (lubricants, oil, explosives, and fuels).	5	3	5	6	84	Minor (negative)	• All spills should be immediately cleaned up, and treated accordingly; and • Re-fuelling must take place on a sealed surface area away from sensitive habitats such as the pan vegetation to prevent the ingress of hydrocarbons into the topsoil.	5	3	2	3	30	Negligible (negative)
Operational	Operational activities	Wetlands	• Changes in water flow regime.	4	3	-5	6	72	Minor (negative)	• A temporary fence or demarcation must be erected around No-Go Areas outside the proposed works area prior to any construction taking place as part of the contractor planning phase when compiling work method statements to prevent access to the adjacent portions of the watercourse; • Effective stormwater management should be a priority during both construction and operational phase. This should be monitored as part of the EMP; and	3	3	-3	6	54	Minor (negative)

Phase	Activity	Aspect	Impacts	D	E	I	P	S	Rating (Pre-Mitigation)	Mitigation Measures	D	E	I	P	S	Rating (Post Mitigation)
										• High energy stormwater input into the watercourses should be prevented. Changes to natural flow of water (surface water as well as water flowing within the soil profile) should be taken into account during the design phase and mitigated effectively.						
Operational	Operational activities	Wetlands	• Changes in sediment entering and exiting the system.	3	4	-5	6	60	Minor (negative)	• Surface water dissipation structures and effective sediment traps should be installed; • Remove only the vegetation where essential and do not allow any disturbance to the adjoining natural vegetation cover; • Rehabilitation plans must be submitted and approved for rehabilitation of damage and that plan must be implemented immediately upon completion of construction; • Restrict vehicular and human movement in no-goes areas and clearly indicate these areas with signs; • Cordon off areas that are under rehabilitation as no-go areas using steel droppers. • Protect all areas susceptible to erosion and ensure that there is no undue soil erosion resultant from activities within and adjacent to the work areas; • Runoff from the mining area must be managed to avoid erosion and pollution problems; • Implementation of best management practices; and • Monitoring should be done to ensure that sediment pollution is timeously dressed.	3	2	-4	4	36	Minor (negative)
Operational	Operational activities	Wetlands	• Introduction and spread of alien vegetation.	3	3	-3	4	36	Minor (negative)	• AIPs should be continuously monitored and controlled throughout the life of the mine and thereafter; • Retain vegetation and soil in position for as long as possible, removing it immediately ahead of construction / earthworks in that area and returning it where possible afterwards; • Monitor the establishment of alien invasive species within the areas affected by the construction and maintenance and take immediate	3	2	-2	2	28	Negligible (negative)

Phase	Activity	Aspect	Impacts	D	E	I	P	S	Rating (Pre-Mitigation)	Mitigation Measures	D	E	I	P	S	Rating (Post Mitigation)
										corrective action where invasive species are observed to establish; and • Rehabilitate or revegetate disturbed areas.						
Operational	Operational activities	Wetlands	• Loss and disturbance of watercourse habitat and fringe vegetation.	4	3	-4	3	33	Negligible (negative)	• Drying out of wetlands and loss of hydrological zonation (loss of catchment) should be monitored and addressed through an offset program; and • Throughout the Operational and Decommissioning Phases, bi-annual (twice a year) external monitoring of soils and vegetation, preferable one survey after the rainy season (March to May) and one after the dry season (July to September) should be undertaken.	3	2	-3	4	32	Negligible (negative)
Operational	Operational activities	Wetlands	• Changes in water quality due to pollution.	4	3	-5	3	33	Minor (negative)	• Provision of adequate sanitation facilities located outside of the watercourse or its associated buffer zone; • Implementation of appropriate stormwater management around the mining areas to prevent the ingress of run-off into the excavation and to prevent contaminated runoff into the watercourse; • The development footprint must be fenced off from the watercourses and no related impacts may be allowed into the watercourse e.g. water runoff from cleaning of equipment, vehicle access etc; • Maintenance of vehicles / equipment should not take place within the watercourse or watercourse buffer; • Control of waste discharges; • Maintenance of buffer zones to trap sediments with associated toxins; • Ensure that no operational activities impact on the watercourse or buffer area. This includes edge effects; • Control of waste discharges and do not allow dirty water from operational activities to enter the watercourse; • Control of waste discharges and do not allow dirty water from operational activities to enter the watercourse;	3	2	-4	5	45	Minor (negative)

Phase	Activity	Aspect	Impacts	D	E	I	P	S	Rating (Pre-Mitigation)	Mitigation Measures	D	E	I	P	S	Rating (Post Mitigation)
										• Regular independent water quality monitoring should form part of operational procedures in order to identify pollution; and • Treatment of pollution identified should be prioritized according to best practice guidelines.						
Operational	Operational aspects of proposed Coal Mine	Aquatics	• Water quality and habitat deterioration of watercourses receiving unnatural/contaminated runoff	5	2	-2	4	36	Minor (negative)	• Runoff from dirty areas should be directed to the storm water management infrastructure (drains and PCDs) and should not be allowed to flow into the surrounding pans, unless DWS discharge authorisation and compliance with relevant discharge standards as stipulated in the NWA is obtained as suggested in DWE Surface Water Impact Assessment Report (2020); • Channelled water should not be dispersed in a concentrated manner. Baffles should be incorporated into artificial drainage lines/channels around the surface infrastructure to decrease the kinetic energy of water as it flows into the natural environment; • Bare surfaces downstream from the developments where silt traps are not an option should be vegetated in order to attempt to limit erosion and runoff that might be carrying contaminants; • Careful monitoring of the areas where dust suppression is proposed should be undertaken regularly. Areas concentrating water runoff should be addressed and not allowed to flow freely into associated watercourses; and • Monitoring of the associated Limpopo River reach should be done by an aquatic specialist in order to determine potential impacts where after new mitigation actions should be implemented as per the specialist's recommendations including the following: • Toxicity testing should be implemented due to the 'unusual' nature of the low-flow cycles within the Limpopo River; Diatom assemblage assessments	5	1	-1	3	21	Negligible (negative)

Phase	Activity	Aspect	Impacts	D	E	I	P	S	Rating (Pre-Mitigation)	Mitigation Measures	D	E	I	P	S	Rating (Post Mitigation)
										should be undertaken to further investigate potential drivers of change; and • The Aquatic Biomonitoring Programme must be adopted on an annual basis after commencement of the construction phase.						
Operational	Establishment of Open Pit, Removal of Material, Stockpiling, Operation of the Plant and Construction of Surface Infrastructure	Air quality	• Dust generation and reduction in ambient air quality	5	3	5	6	78	Major (negative)	• Application of a dust suppressant on the haul roads and exposed areas; • Limit activity to non-windy days (wind speed less than 5.4 m/s), where possible; • Set maximum speed limits on haul roads and have these limits enforced; • The area of disturbance must be kept to a minimum at all times and no unnecessary clearing, digging or scraping must occur, especially on windy days; and • The drop heights when loading onto trucks and at tipping points should be minimised.	5	2	2	4	36	Negligible (negative)
Operational	Diesel Storage	Air Quality	• Release of Volatiles Resulting in Poor Air Quality	5	2	2	4	36	Negligible (negative)	• Strict adherence to products and waste management plan; • Handle, store, and dispose of hazardous substances in accordance with the local regulations; • Store hazardous substances in clearly labelled containers; • Deal with emergencies promptly i.e. spills; and • Make provision of secondary containment for fuel storage.	5	1	1	3	21	Negligible (negative)
Operational	Operational activities during the day	Noise	• Noise disturbance	4	2	2	1	8	Low	• No Mitigation is required due to low significance of the impact.	4	2	2	1	8	Low
Operational	Operational activities at night	Noise	• Noise disturbance	4	3	6	4	33	Medium	• Other measures that would reduce the night-time noise levels at other NSD include: • the mine should consider the recommendations defined in Section 13 of the Noise Study (Appendix M); • the mine should implement a noise monitoring programme. Recommendations regarding potential a monitoring programme is defined in Section 14 of the Noise Study (Appendix M);	4	3	6	3 to 2	52 & 33	Medium (noise levels above 38 dBA)

Phase	Activity	Aspect	Impacts	D	E	I	P	S	Rating (Pre-Mitigation)	Mitigation Measures	D	E	I	P	S	Rating (Post Mitigation)
										• it is recommended that the mine development team minimize night-time (22:00 – 06:00) traffic that may pass within 200m from residential areas, such as Sandbult, with no hauling at night.						
Operational	Opencast pit Establishment	Visual	• Blasting to remove rock will result in noise and dust thereby attracting attention to the Project area; and • The opencast pit will dramatically contrast with the surrounding area as it will result in a scar on the landscape.	7	1	7	7	10	Moderate (negative)	• Apply dust suppression techniques to limit the dust generated from the blasting; • Construct a berm along the perimeter of the open pit; • Ensure that the open pit is completely backfilled with material from the overburden stockpiles; • Rehabilitate all disturbed areas; • Ensure that the rehabilitated area is re-contoured and profiled to create a free-draining topography; • Spread topsoil over the rehabilitated area; • Revegetate the rehabilitated areas with grasses; and • Ensure all the mitigation/management actions outlined in the Closure and Rehabilitation reports are conducted.	5	1	-4	7	70	Minor (negative)
Operational	Establishment and Operation of Stockpiling Infrastructure	Visual	• The overburden, product and discard stockpile will have a negative visual impact due to their proposed height and footprint size; and • Dust from the stockpiles will also affect receptors.	5	4	-5	7	98	Moderate (negative)	• Limit the footprint area of stockpiles where possible; • Limit the height of the stockpiles to not exceed the proposed heights; • Stockpiles must be shaped and contoured to facilitate drainage of surface water to prevent ponding and to prevent erosion and slope failure; and • Apply dust suppression techniques to limit dust generated from the stockpiles.	5	3	-4	7	84	Moderate (negative)
Operational	Backfilling and Concurrent Rehabilitation	Visual	• The potential impact is a neutral visual impact as it assists to reduce the negative visual impact of mining on the receiving environment	4	3	-1	5	30	Negligible (negative)	• Backfill void with overburden stockpiles; • Ensure that the open pit is completely backfilled with material from the overburden stockpiles; • Ensure that the rehabilitated area is re-contoured and profiled to create a free-draining topography; • Spread sub-soil and topsoil over the backfilled and rehabilitated area; • Revegetate the backfilled and rehabilitated areas with grasses; and	4	2	1	5	25	Negligible (negative)

Phase	Activity	Aspect	Impacts	D	E	I	P	S	Rating (Pre-Mitigation)	Mitigation Measures	D	E	I	P	S	Rating (Post Mitigation)
										• Ensure all the mitigation/management actions outlined in the Closure and Rehabilitation reports are conducted.						
Operational	Coal Transportation	Visual	• Dust and heavy traffic in the area will change the visual character of the area.	5	4	5	7	98	Moderate (negative)	• Apply dust suppression techniques to limit dust generated from the trucks; and • Minimise heavy traffic by reducing the frequency of coal transportation schedule and avoid night time use where possible.	4	4	-3	7	77	Moderate (negative)
Operational	• All project related activities associated with construction and operation	Socio-economic	• Creation of employment, work skills development and experience	5	6	2	4	52	Minor (positive)	• Develop and continuously update (throughout the LoM) an Employment Plan with the objective of increasing local employment and transferring operational positions from migrant workers to people from within the study areas; • Maintain a Local Employment Office to facilitate access to employment opportunities for local candidates with appropriate skill sets; • Develop and implement a Work Readiness and Vocational Training Plan in consultation with local stakeholders, including women's groups. The Plan will: • Identify the skill needs of the Project and skills gaps in the local community; • Provide training for local people to meet Project needs; and • Identify and focus on the particular needs of women and youth and design trainings to encourage their participation. • Ensure the implementation of the Social and labour Plan to support the promotion of education and skills uplift among local communities within the study areas, including the implementation of on-the-job training and scholarship programme. • Develop and implement a grievance procedure which local communities can utilise reporting their issues and concerns related to the Project; and • Implementation of the SLP workforce programs.	5	5	3	6	78	Moderate (positive)

Phase	Activity	Aspect	Impacts	D	E	I	P	S	Rating (Pre-Mitigation)	Mitigation Measures	D	E	I	P	S	Rating (Post Mitigation)
Operation	All project related activities associated with construction and operation	Socio-economic	• Opportunities and Capabilities within the Supply Chain	5	4	2	4	44	Minor (positive)	• Carry out an audit of local businesses and their capacity to meet Project needs, including those businesses in the study area, and maintain a database of local business information; • Establish local procurement and business development office in central and accessible location to enhance accessibility of information about contract and training opportunities and promote opportunities through trade forums and other events; • Establish relevant training and capacity building initiatives to support businesses' ability to meet the Project requirements, based on audit results and needs assessments; • Develop and implement a local Procurement Policy or Plan. The policy/ plan shall provision for the following: • Setting of targets the numbers of local businesses used by the Project at all levels will be tracked. • Adaptation of Project procurement documents to suit local businesses as far as possible within the standards required of the Project. • Provision of incentives for Project contractors to purchase locally and partner with local businesses, including tender requirements regarding local procurement. • Creation of an SME electronic portal to facilitate communication of contract opportunities and management training materials to SMEs. • Considerations for unbundling of contracts into small work programs to ensure that small and locally based businesses are able to benefit. • Promotion of joint ventures between large and small Contractors to ensure equitable sharing of economic benefits and skills development. • Procedure for dissemination of procurement opportunities as early as possible, with clearly defined requirements for the goods or service to manage expectations.	5	5	6	6	96	Moderate (positive)

Phase	Activity	Aspect	Impacts	D	E	I	P	S	Rating (Pre-Mitigation)	Mitigation Measures	D	E	I	P	S	Rating (Post Mitigation)
										• Partner with relevant organisations where available and appropriate (e.g., government agencies, civil society and NGOs) to provide access for local businesses to finance and advisory services in order to develop their capacity to competitively supply to the Project; and • Implementation of the grievance procedures.						
Operational	All project related activities associated with construction and operation	Socio-economic	• Multiplier effects on the local and regional economy	5	5	2	5	60	Minor (positive)	• Implement enhancement measures linked to employment creation and opportunities associated with the supply chain; • Implement the SLP related interventions; • Compliance with SLP commitments to make maximum use of local SMMEs and BBBEE companies; and • Implement the grievance procedure.	5	5	3	6	78	Moderate (positive)
Operational	Water use and storage on-site – during the operation water will be required for various domestic and industrial uses.	Socio-economic	• Increased competition for water resources	6	3	-7	7	112	Major (negative)	• Implement mitigation from the underground and surface water Specialist studies; • Develop and Implement a Project grievance procedure; and • Consult with municipality regarding the provision of additional water in case of underground water resources disruptions due to the Project.	5	3	-6	6	84	Moderate (negative)
Operational	• Open pit establishment; • Removal of rock (blasting); and • Stockpiling (rock dumps, soft dumps, soils, ROM, product, discard dump) establishment and operation.	Socio-economic	Potential economic impacts on eco-tourism operators and establishments	6	2	-7	7	105	Moderate (negative)	• Commission a stand-alone Tourism Impact Assessment Study with economic modelling in order to develop a baseline and set-out monitoring indicators; • Implement the recommendations and mitigation measures of the Tourism Impact Assessment Study; and • Implementation of the grievance procedures.	6	2	-5	6	78	Moderate (negative)
Operational	Blasting	Socio-economic	• Impacts associated with blasting on neighbouring landowners such as dust, noise, vibrations from blasting activities, road closures, etc.	5	2	-6	7	91	Moderate (negative)	• Implement mitigation measures outlined in the Blasting and Vibrations Specialist Study. • Maintain a grievance procedure established during the construction phase.	3	2	-4	5	45	Minor (negative)

Phase	Activity	Aspect	Impacts	D	E	I	P	S	Rating (Pre-Mitigation)	Mitigation Measures	D	E	I	P	S	Rating (Post Mitigation)
										• Widely publicise the daily blasting schedule to neighbouring communities.						
Operational	All project related activities associated with construction and operation	Socio-economic	• Occupational health and safety risks to mine workers such as dust-induced occupational lung diseases and noise induced hearing loss	6	5	-4	5	75	Moderate (negative)	• Project staff including third party Contractors to be subject to health and safety standards and policies. It recommended that the Project develops and implements a detailed Occupational Health and Safety Management Plan and System; • The Occupational Health and Safety (OHS) management plan should include but not be limited to: • Hazard identification and risk assessment procedure. • A 'fitness for work' programme to ensure that all employees are physically able to undertake their work without impact to their health. • Mandatory OHS training programmes provided to all employees, including contractors to ensure staff are aware of the health and safety guidelines. • Specific OHS training programmes provided for workers assigned to tasks associated with particular H&S risks. • All workers should be provided with Personal Protective Equipment (PPE) and be mandated to use it; • Placement of visual warning signs in place, including those for the electrical and mechanical equipment safety warning, and chemical hazard warning; • Toolbox talks or health and safety meeting on a daily basis to ensure that procedures are being adhered to, and to discuss any incidents that have occurred; and • Develop and implement a workforce grievance procedure where they can raise issues and concerns relating to OHS.	6	5	-3	4	56	Minor (negative)
Operational	All project related activities associated with construction and operation	Socio-economic	• Social Development as part of the SLP	6	3	5	5	70	Minor (positive)	• Consultation with Project beneficiaries regarding proposed community development needs and associated initiatives; • Early identification of community members for enrolment in ABET and	7	3	6	6	96	Moderate (positive)

Phase	Activity	Aspect	Impacts	D	E	I	P	S	Rating (Pre-Mitigation)	Mitigation Measures	D	E	I	P	S	Rating (Post Mitigation)
										portable skills training to improve likelihood of employment on the mine; • Conduct baseline socio-economic survey of households located within primary study area prior to commencement of community development initiatives to enable accurate identification of eligible Local Economic Development (LED) project and skills training beneficiaries and measure impacts of development initiatives on households; • Collaboration with other developmental role players during implementation; • Establishing an external monitoring programme to monitor and evaluate community development initiatives as well as HRDP and procurement policy implemented by the mine and its contractors; • Expanding skills development and capacity building programmes to non-employees; and • Maintaining a record of training courses completed per individual and community. Where training is offered to non-employees, their contact information and qualifications can be shared with other industries.						
Operation	All project related activities associated with construction and operation	Socio-economic	• Impacts associated with decreased community health, safety, and security	6	4	-6	6	96	Moderate (negative)	• In partnership with government authorities the Project to support improvements to existing health services to handle the increase in population numbers and changes to the existing health profile of the area. This may include facilities, quality of medical personnel, diagnostic capacity and treatment, etc; • Develop and implement an Emergency Prevention, Preparedness and Response Plan; • Develop information, education and communication campaigns around diseases and health practices including communicable diseases such as HIV/AIDS, TB and COVID-19; etc; • Regularly review and update as necessary its existing communicable diseases management strategy;	6	4	-5	5	75	Moderate (negative)

Phase	Activity	Aspect	Impacts	D	E	I	P	S	Rating (Pre-Mitigation)	Mitigation Measures	D	E	I	P	S	Rating (Post Mitigation)
										• Provide awareness, counselling and testing (ACT) for all Project personnel, including voluntary testing for STIs and HIV/AIDS in pre-employment and on-going health screening. (Workers will not be denied employment or discriminated against in any way based on their HIV status); • Survey all households in the primary study area to record the location, extent, and quality of water sources the size of the population reliant on water and its usage patterns, particularly with regard to seasonality, and differences in water use or access by vulnerable populations, including women; • Develop a programme in consultation with local communities to improve access to good quality potable water and determine preferred water infrastructure; • Develop and implement a Traffic Management Plan covering vehicle safety, driver and passenger behaviour, use of drugs and alcohol, hours of operation, rest periods and accident reporting and investigations; • Strictly enforce drug and alcohol policies in relation to Project drivers and undertake regular and random testing of drivers and in response to suspicious behaviour; • Require Project drivers to be trained in defensive driving and provided regular refresher courses; • Propose road bypasses where there is a significant risk to public safety from road accidents; • Establish preparedness and response capabilities to deal with any road traffic or other accidents that may occur including multiple casualty events; and • In partnership with local authorities and the police, educate communities on road traffic laws and road safety.						
Operational	Blasting operations	Blasting	Ground vibration impact on: • Farmstead; • Ruins (inside pit);	4	3	4	7	77	Moderate (negative)	• Specific blast design to be done, shorter blast holes, smaller diameter blast hole, using electronic initiation	4	3	2	3	27	Negligible (negative)

Phase	Activity	Aspect	Impacts	D	E	I	P	S	Rating (Pre-Mitigation)	Mitigation Measures	D	E	I	P	S	Rating (Post Mitigation)
			• Borehole (DH2) (inside pit); • Cement Dam; and • Borehole (LD04).							instead of shock tube systems to obtain single hole firing; • Monitor ground vibration and air blast from blasting operations; • Purchase of nearest Farmstead; and • Protection of sensitive heritage sites with blast design mitigations.						
Operational	Blasting operations	Blasting	Air blast impact on: • Farmstead; • Borehole (DH2) (inside pit); • Borehole (GT02); and • Borehole.	4	3	4	7	77	Moderate (negative)	• Specific blast design to be done, shorter blast holes, smaller diameter blast hole, use of specific stemming materials to manage air blast, increased stemming lengths to reduce air blast effect. Used of specific stemming to manage fly rock - crushed aggregate of specific size. Re-design with increased stemming lengths; and • Monitor ground vibration and air blast from blasting operations.	4	3	2	3	27	Negligible (negative)
Operational	Blasting operations	Blasting	• Fly rock impact on Borehole (DH2).	4	3	4	7	77	Moderate (negative)	• Specific blast design to be done, shorter blast holes, smaller diameter blast hole, use of specific stemming materials to manage air blast, increased stemming lengths to reduce air blast effect; and • Monitor fly rock situation using video camera, when blasting near receptors in the zone the zone of influence.	4	3	2	3	27	Negligible (negative)
Decommissioning	Movement of vehicles, and heavy machinery removing infrastructure	Soil, Land Use and Land Capability	• Soil compaction, and increased hardened surfaces, excess waste material; • Compaction of soil; • Increased runoff potential; • Increased waste material, and potential hard waste material; and • Increased erosion, and consequently sedimentation potential.	3	3	4	5	55	Minor (negative)	• Continue with concurrent rehabilitation, and implement land rehabilitation measures; • Address compacted areas by deep ripping to loosen the soil, and revegetate the area as soon as possible; • Ensure proper stormwater management designs are in place to ensure no run-off or pooling occurs; • Only designated access routes are to be used to reduce any unnecessary compaction; • The backfilled, reprofiled landscape should be top soiled and revegetated to allow free drainage close to the pre-mining conditions; • Inventory of hazardous waste materials stored on-site should be compiled, and arrange complete removal; and	4	2	2	4	32	Negligible (negative)
Decommissioning	Demolition of infrastructure, and rehabilitation of affected areas	Soil, Land Use and Land Capability	• Disturbance of soils, and subsequent erosion by wind, and water; • Increased vehicle movement in the area, increasing soil compaction, and runoff potential; • Potential spillage of hydrocarbons such as oils,	6	3	4	5	65	Minor (negative)		2	2	2	4	24	Negligible (negative)

Phase	Activity	Aspect	Impacts	D	E	I	P	S	Rating (Pre-Mitigation)	Mitigation Measures	D	E	I	P	S	Rating (Post Mitigation)
			fuels, and grease, thus contamination of the soils; • Unexpected changes in the depth, and the nature of the soil; and • Ponding of water, and creation of drainage channels.							• Rehabilitation, and Monitoring Plan.						
Decommissioning	Rehabilitation mainly consisting of spreading, and landscaping of the preserved subsoil, and topsoil, profiling of the land, and re-vegetation	Soil, Land Use and Land Capability	• Exposure of soils, and subsequent compaction, erosion, and sedimentation; • Soil compaction, and increased runoff potential due to vehicle movement during rehabilitation programs; • Loss of organic material, and vegetation cover; and • Potential spillage of hydrocarbons such as oils, fuels, and grease, thus contamination of soil.	4	4	5	5	56	Minor (negative)		2	2	2	4	24	Negligible (negative)
Decommissioning	Post-closure monitoring, and rehabilitation.	Soil, Land Use and Land Capability	• Minimal negative impacts on the environment; and • Soil Monitoring Plan.	5	4	2	5	55	Minor (negative)		6	4	7	7	119	Major (Positive)
Decommissioning	• Demolition and removal of infrastructure; and • Rehabilitation and closure.	Surface water	• Sedimentation and siltation of nearby watercourses and deterioration of water quality.	2	4	3	7	63	Minor (negative)	• Restore the topography to pre-mining conditions as much as is practically possible by backfilling, removing stockpiles and restore the slope gradient and angle of the site; • Immediate revegetation of cleared areas; • Where practical, decommissioning activities should be prioritized during dry months of the year (May to September); • Movement of demolition machinery and vehicles should be restricted to designated access roads to minimise the extent of soil disturbance; • Use of accredited contractors for removal or demolition of infrastructure during decommissioning is recommended; this will reduce the risk of waste generation and accidental spillages;	2	2	2	2	12	Negligible (negative)
Decommissioning		Surface water	• Restoration of pre-mining streamflow regime in nearby watercourses	7	4	5	7	112	Major (positive)		No mitigation required.					
Decommissioning		Surface water	• Water contamination from Acid Mine Drainage (AMD) decant into surface water resources	7	5	4	6	96	Moderate (negative)		6	2	2	4	40	Minor (negative)

Phase	Activity	Aspect	Impacts	D	E	I	P	S	Rating (Pre-Mitigation)	Mitigation Measures	D	E	I	P	S	Rating (Post Mitigation)
										• Ensure that the infrastructure (pipelines, fuel storage areas, pumps) are first emptied of all residual material before decommissioning; and • If decant occurs, the decant needs to be captured, contained and treated to acceptable or prescribed water quality standards prior to discharge into the natural water resources.						
Decommissioning	Pit backfilling and groundwater recovering	Groundwater	• Groundwater contamination - Solute transport in the groundwater	6	3	-4	4	52	Minor (negative)	• The water table in the pit area should be lowered as part of the contaminant management plan whereby evaporation from the pit lake will keep the water level below the regional groundwater depth; • The hydraulic head in the pit should be less than the regional head to make it a hydraulic sink so that no water (and solute transport) flows away from the project site; • Compensation of farmers with impacted groundwater or mine purchase land; • Monitoring of groundwater water levels and pit inflow rates; and • Update numerical model and decant rates as aquifer information becomes available.	6	2	2	3	30	Negligible (negative)
Decommissioning	Movement of vehicles and heavy machinery	Fauna & Flora	• Compaction of soil; • Potential faunal casualties; • Increased runoff potential; and • Increased erosion and decline in revegetation potential.	3	3	4	5	55	Minor (negative)	• Rehabilitate the compacted, eroded areas by deep ripping to loosen the soil and revegetate the area as soon as possible; • Ensure proper stormwater management designs are in place to ensure no run-off or pooling occurs; • Adhere to health and safety protocols within the operations of the mine and adhere to speed limits to minimise faunal casualties; • Only designated access routes are to be used to reduce any unnecessary compaction; • Continue with concurrent rehabilitation, begin with stockpiles, open pits and dumps, implement rehabilitation measures; • Address eroded and compacted areas by deep ripping to loosen the soil, and	4	2	2	4	32	Negligible (negative)
Decommissioning	Demolition of infrastructure and preparation for rehabilitation of affected areas	Fauna & Flora	• Disturbance of soils, and subsequent erosion by wind, and water; • Increased vehicle movement in the area, increasing soil erosion and habitat destruction; • Potential spillage of hydrocarbons such as oils, fuels, and grease, thus contamination of the surrounding grounds; • AIP proliferation; and	6	3	4	5	65	Minor (negative)		2	2	2	4	24	Negligible (negative)

Phase	Activity	Aspect	Impacts	D	E	I	P	S	Rating (Pre-Mitigation)	Mitigation Measures	D	E	I	P	S	Rating (Post Mitigation)
			• Unexpected changes in topography and landscape.							revegetate the area as soon as possible to prevent AIP sprawl; and • Inventory of hazardous waste materials stored on-site should be compiled and complete removal arranged.						
Decommissioning	Re-vegetation and profiling of the land	Fauna & Flora	• Exposure of soils, and subsequent compaction, erosion, and sedimentation; • Soil compaction, and increased runoff potential due to vehicle movement during rehabilitation programs; • AIP proliferation; • Loss of organic material, basal layer and vegetation cover; and • Potential spillage of hydrocarbons such as oils, fuels, and grease, thus contamination of soil.	4	4	5	5	56	Minor (negative)	• During the decommissioning phase, rehabilitation must start as soon as possible and preferably in the growing season to ensure adequate plant recruitment; • Address eroded and compacted areas by deep ripping to loosen the soil, and revegetate the area as soon as possible; • Inventory of hazardous waste materials stored on-site should be compiled and complete removal arranged; • Only designated access routes are to be used to reduce any unnecessary compaction.	6	3	2	6	66	Positive Impact
Decommissioning	Post-closure monitoring and rehabilitation	Fauna & Flora	• Minimal negative impacts on the environment.	7	1	4	5	30	Negligible (negative)	• During the decommissioning phase, rehabilitation must start as soon as possible and preferably in the growing season to ensure adequate plant recruitment; • Stockpiles, open pits and dumps are to be rehabilitated; • Ensure sufficient irrigation (i.e. using watercart) and fertilizing of newly planted vegetation to facilitate a rapid establishment; and • Replant with species identified within each vegetation community.	6	3	2	6	66	Positive Impact
Decommissioning	Physical removal of surface infrastructure and rehabilitation activities near and within drainage lines	Aquatics	• Water quality and habitat deterioration of watercourses in contact with heavy machinery and receiving runoff from surface workings	3	2	-2	4	28	Minor (negative)	• High rainfall periods should be avoided where possible during decommissioning; • Removed or damaged vegetation areas should be revegetated; • Storm water must be diverted from decommissioning activities; • Water used during decommissioning should be kept onsite and not be allowed to freely flow into nearby watercourses; • Stored mine-affected water should be treated before decommissioning of any	3	1	-1	3	15	Negligible (negative)

Phase	Activity	Aspect	Impacts	D	E	I	P	S	Rating (Pre-Mitigation)	Mitigation Measures	D	E	I	P	S	Rating (Post Mitigation)
										mine-related water retention areas, such as PCDs; • Land reprofiling should be done during the dry season to allow for attempts to restore the morphology of the endorheic pans prior to rainfall/flow events; and • Ensure the revegetation activities use appropriate indigenous plant species.						
Decommissioning	Demolition and Removal of Infrastructure and Rehabilitation	Air quality	• Dust generation and reduction in ambient air quality	3	2	2	6	42	Major (negative)	• Application of dust suppressant on the haul roads and exposed areas; • Limit activity to non-windy days (wind speed less than 5.4 m/s), where possible; • Set maximum speed limits on haul roads and have these limits enforced; • The area of disturbance must be kept to a minimum at all times and no unnecessary clearing, digging or scraping must occur, especially on windy days; • The drop heights when loading onto trucks and at tipping points should be minimised; and • Proper rehabilitation of disturbed areas to allow for vegetation establishment.	3	1	1	4	20	Negligible (negative)
Decommissioning	Demolition and Removal of Infrastructure	Visual	• The potential impact is a neutral visual impact as it assists to restore the landscape to its pre-development state.	3	3	-2	7	56	Minor (negative)	• Apply dust suppression techniques to limit the dust from the demolition area; • Ensure all infrastructure is demolished and removed from the site; • Ensure all rubble is removed from site; and • Rehabilitate all disturbed areas as detailed in the Closure and Rehabilitation Plan.	3	2	-1	6	36	Minor (negative)
Decommissioning	Rehabilitation	Visual	• The potential impact is a neutral visual impact as it assists to restore the landscape to its pre-development state.	3	3	-4	7	70	Minor (negative)	• Ensure that the open pit is backfilled with material from the overburden stockpiles; • Rehabilitate all disturbed areas; • Ensure that the rehabilitated area is re-contoured and profiled to create a free-draining topography; • Spread topsoil over the rehabilitated area; • Revegetate the rehabilitated areas with grasses; and • Ensure all the mitigation/management actions outlined in the Closure and Rehabilitation reports are conducted.	3	2	3	7	56	Minor (negative)

Phase	Activity	Aspect	Impacts	D	E	I	P	S	Rating (Pre-Mitigation)	Mitigation Measures	D	E	I	P	S	Rating (Post Mitigation)
Decommissioning	Decommissioning	Socio-economic	• Economic boom-bust after the construction and operation phases	3	5	-5	6	78	Moderate (negative)	• Develop and implement an integrated Mine Closure Plan; and • Proactively assess and manage the social and economic impacts on individuals, regions and economies where retrenchment and/or closure of the Project are certain.	3	5	-3	6	66	Minor (negative)

11.2 Cumulative Impacts

The importance of identifying and assessing cumulative impacts is that the whole is often greater than the sum of its parts. This implies that the total effect of multiple stressors or change processes acting simultaneously on a system may be greater than the sum of their effects when acting in isolation. The cumulative impacts considered by the relevant specialists are discussed per environmental aspect, below.

11.2.1 Soil, Land Use and Land Capability

Cumulative impacts on soil resources were viewed in the light of similar mining or related operations within the catchment that contribute similar or related pollutants to soil resources within or downstream of the Project area.

Mining and associated activities impacting the soil resources include changes to the physicochemical properties of the soil. The cumulative impacts may, therefore, have a significant effect on the soil resources, and therefore impacting the land use, and land capability. The effect of mining in the region will result in a loss of cattle and game farming land which will result in economical agricultural and hunting income losses. Contaminated soil will directly impact the water quality, and quantity as well as the vegetation and land capability of the area.

11.2.2 Surface Water

Mining and associated activities require a significant amount of water, and this may pose a threat to water availability for the available water resources in the area. Coal mining and processing, using water for dust suppression and in processing plants, are relatively water intensive activities. Although mines recycle water extensively, a significant amount of additional (make-up) water is required for such activities. Furthermore, contaminated (acidic/high sulphate) decant water from the mined areas often finds its way to surface streams, reducing the quality of water in these streams.

The Limpopo quaternary catchment has severe water shortages due to a large proportion of the quaternary catchment being covered by endoreic areas, low MAP and high evaporation rates. Furthermore, the Limpopo River is an international river, from which abstractions have been fully allocated and is currently over-subscribed (Semane, 2014).

Therefore, the biggest consideration that needs to be made with regards to this Project is the alternative sources of water, which is currently being investigated by Digby Wells. Although the water storage within the mine area will reduce the amount of runoff reporting to the Limpopo River, this is not envisaged to impose significant impacts on the reduction of flow as runoff accounts for a small fraction of rainfall (i.e. 0.8% of MAP) and the study area is dominated by endoreic areas which implies minimal contribution of surface water from the study area even prior to any mining activities.

With regards to water quality, the baseline water quality data shows some parameters are above the guideline values when benchmarked with the South African Target Water Quality

Guidelines. Therefore, implementation of the proposed mitigation measures will ensure that the proposed Dalyshope project has a minimal cumulative impact on the Limpopo River.

11.2.3 Groundwater

The only active mine in the proximity of the Dalyshope Mine is Exxaro's Grootegeluk mine. Grootegeluk is, however, at about 25 km from Dalyshope Coal Mine and no direct hydraulic interaction is expected between them, therefore no cumulative impact is foreseen.

There are several mines that are planned to be operational in the Waterberg Coalfield. Those that are currently known in the vicinity of the Dalyshope Coal Project include:

- Temo Coal Mine which is approximately 130 m to the south;
- Boikarabelo Mine which is approximately 5 km to the west; and
- Mafutha Mine which his approximately 4.4 km to the southeast.

The proximity of these mines means that the impact of the dewatering activities at Dalyshope Coal Mine may potentially affect these neighbouring mines. It is also likely that the cones of dewatering and solute transport from the nearby mines may affect the Dalyshope Coal Mine and have a cumulative impact on the water level.

During this study, a preliminary large-scale model has been run to simulate the cumulative impact on the water level. Since there is no comprehensive information on the sizes, depths, life of mines, waste disposal areas and mining methods of the nearby mines, a number of assumptions have been made such as:

- All of the mines will be approximately 81 m deep; and
- All of the mines will be operational for 24 years and will operate at the same time.

The cumulative impact on the water table is illustrated in Figure 11-1 and shows that the radius of influence could be significant with a potential impact on the Limpopo River. Integrated inter-mine hydrogeological studies of the entire Waterberg Coalfield are required to quantify the cumulative impacts and to strategize a large-scale management plan during operation and after closure.

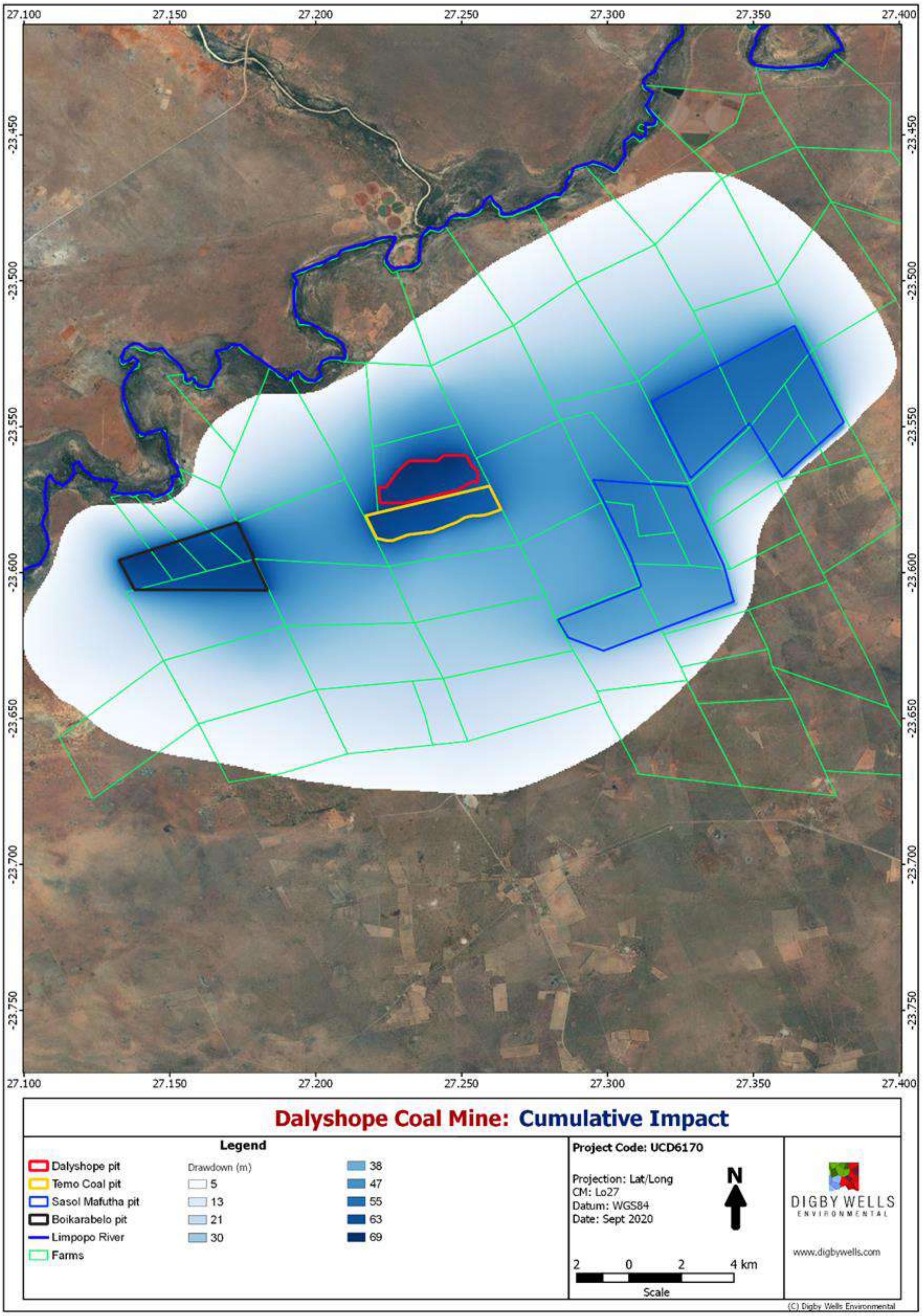


Figure 11-1: Cumulative Impact Considering the Mines Nearby Dalyshope

11.2.4 Fauna and Flora

It is necessary to consider the impacts that the future development will have from a wide-ranging perspective, by considering land-use and transformation of the natural habitat in surrounding areas. Cumulative impacts are assessed by considering past, present and anticipated changes to the biodiversity.

Although the Limpopo Sweet Bushveld vegetation type is assigned a Least Concern conservation status, large portions of this vegetation type are under threat due to expanding mining operations. The cumulative loss of the vegetation type as well as the SCC within it should be considered proactively.

The further removal of habitat/vegetation types to allow construction will bring about a reduction of natural areas, and the increase of the edge effect. The impacts on the ecology of the area will be significant. It is expected that there will be great losses of vegetation and flora along with associated faunal habitat. The primary impacts will be fragmentation and edge effects with a reduction in movement of remaining naturally occurring wildlife (not confined to game farms for example: Kudu, Leopard, Cheetah) and isolation of pockets of vegetation.

Secondary cumulative impacts will include increased accessibility to the site and the resulting increase in development and resource dependence. Ideally, a strategic environmental plan for the area should be developed and adhered to. This should include the conservation of important areas as well as the provision of corridors for faunal movement.

11.2.5 Aquatics

Most of the Limpopo River basin sub-catchments are either Stressed or Very Stressed with low Mean Annual Precipitation (MAP) and high evaporation rates, consequently, water supply surpasses demand (Figure 11-2). Presently, the main cumulative impact identified for the aquatic ecosystems within the Limpopo River basin appears to be the influence of several game farming and to a lesser extent agricultural fields and mining operations (including the Grootgeluk, Biokarabelo, Temo and other mines in the area). The former are known to abstract water for animal consumption and for irrigation (Ginster *et al.*, 2010) whilst the latter uses significant amounts of water for mineral processing, dust suppression, slurry transport and domestic uses. The establishment of the Dalyshope Coal Mine might result in other economic activities being established such as residential, retail and other mining developments in the area which will further add on to the water demand pressures.

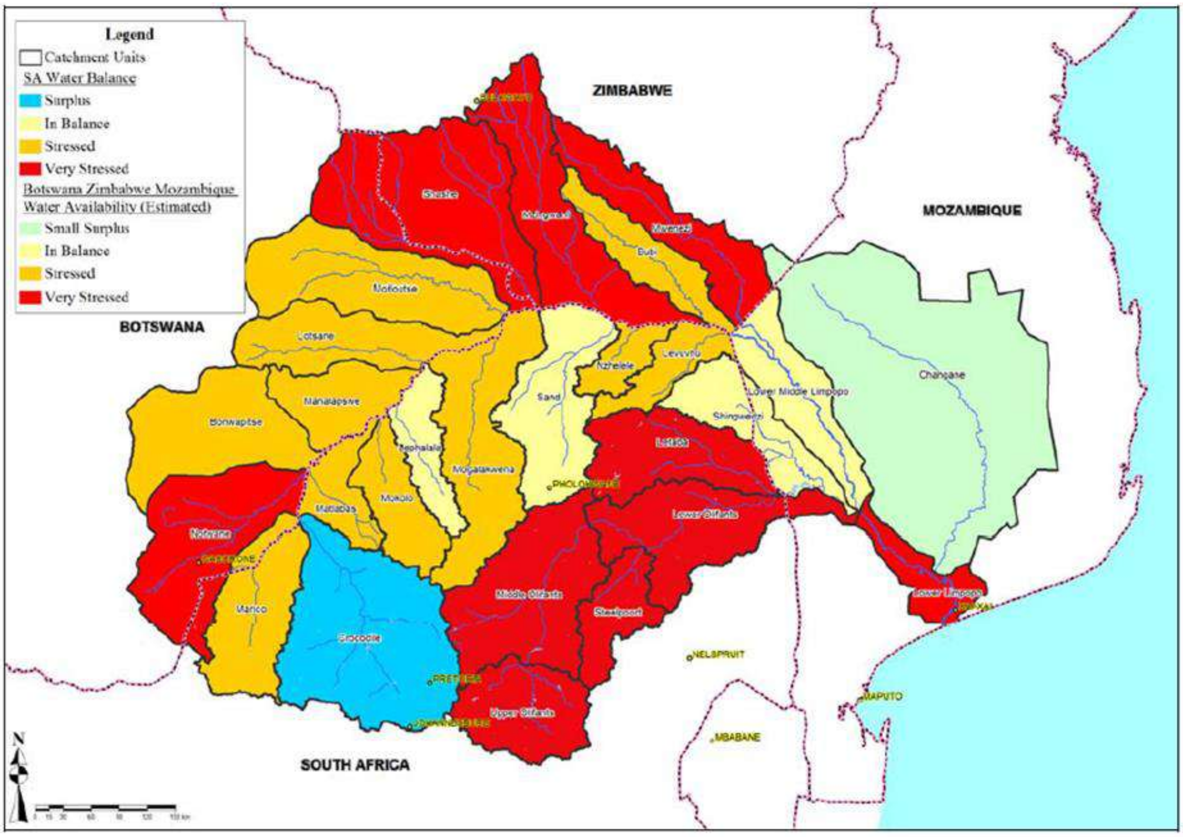


Figure 11-2: General Water Balances in the Limpopo River basin illustrated as the Ratio Between Natural Runoff and Water Use Per Sub-catchment (LBPTC, 2010)

11.2.6 Air Quality

Historical dustfall data for the MRA at sites Dalys2 and Dalys4, coupled with one month's record of daily PM_{10}, $PM_{2.5}$, SO_2 levels, and hourly NO_2 concentrations were used to evaluate cumulative impacts. For the dustfall, the averages over 12 months at Dalys2 (277 mg/m^2/d) and Dalys4 (491 mg/m^2/d) were taken as the baseline to which the model predicted GLC for the same locations were added (model prediction + the background). For the fine particulates and gases, the 90th percentile values were chosen as the background for each of the pollutants. The values for pollutants were calculated at 3.5 µg/m^3 (PM_{10}), 2.3 µg/m^3 ($PM_{2.5}$), 3.4 µg/m^3 (SO_2), and (45 µg/m^3) for NO_2. The final cumulative values were then compared with the standards for compliance. The final cumulative concentrations for the different pollutants were below the limit values (Table 11-3). These values are summarised in Table 11-3 below.

Table 11-3: Comparison of Modelled to Baseline Data

Pollutants	Averaging Period	Location	Regulatory Limit	Dust Deposition Rates ($mg/m^2/d$)		
				Model	Background	Total
$PM_{2.5}$	24-hrs	SR1	40 µg/m^3	17	2.3	19.3
		SR2		1.5		3.8
PM_{10}	24-hrs	SR1	75 µg/m^3	145	3.5	149
		SR2		10		14
SO_2	24-hrs	SR1	125 µg/m^3	0.9	3.4	4.3
		SR2		0.3		3.7
NO_2	1-hr	SR1	200 µg/m^3	61	45	106
		SR2		43		88
Dust deposition	Monthly	Dalys2	600 mg/m^2/d 1 200 mg/m^2/d	70	277	347
		Dalys4		26	491	517

11.2.7 Visual

The Waterberg Coalfield area is largely undeveloped and is characterised by undisturbed Bushveld vegetation, game farming, hunting, tourism and agriculture. A number of operational mines and power stations are present in the area. These include the Boikarabelo and Grootegeluk Coal Mines situated 10 km southwest and 50 km southeast of the project area respectively. The Medupi and Matimba Power Stations are situated 50 km southeast and 60 km southeast of the project area respectively. These developments have altered the original Bushveld character which has resulted in a loss of scenic quality and sense of place.

It is expected that the numerous future developments, including that of the proposed Dalyshope Project will contribute to the loss of scenic quality and sense of place. However, the mitigation measures proposed for the project will reduce the cumulative impact.

11.2.8 Cultural Heritage

This Project in conjunction with other planned developments in line with the strategic development plans for the Limpopo Province requires consideration to identify the possible in-combination effects of various impacts to known heritage resources. The development and operation of the proposed Project will add to the existing and proposed infrastructure in the area and will contribute to the degradation of the sense-of-place of the cultural landscape.

Considering the greater development landscape, the effects from the various proposed developments will interact to produce a total greater effect on the cultural landscape and degradation thereof.

11.2.9 Social

Potential cumulative impacts associated with the Project and the potential of more mines being established in the study area are outlined in Table 11-4.

Table 11-4: Potential Cumulative Impacts Related to Proposed Project

Risks	Mitigation Measures
• Compounded effects of lighting, noise, traffic, water pollution, dust emission, groundwater abstraction and physical reduction in habitat impacts community health and safety.	• Implement all mitigation measures recommended by the associated Specialist Studies in collaboration with other active mines in the study area.
• Economic dependency on surrounding mines will negatively impact local, regional and national economies with decommissioning and mine closure.	• Collaborate with government, agencies and civil society to identify alternative economic activities in the study area.
The presence of multiple mines in the study area is likely to result in the influx of business and job seekers attracted by the economic activities. The increased in-migration of people may result in: • Urban sprawl, housing backlog and / or growth of informal settlements; • Increased social capital associated with an increase in number of highly educated and skilled people searching for economic opportunities associated with the mines. • Increased the pressure on water resources for local communities. • Increased population, demand for goods and services, and constraints on supply as a result of pressure on resources, will all contribute to inflation in local prices and increased economic vulnerability of local people, in particular those who are already vulnerable. • Increased anti-social behaviours will adversely affect the lives of the local population.	• Develop and implement an In-migration Plan in collaboration with government, civil society and other active mines in the study area.
• Increased risks associated with road traffic accidents between humans, livestock, game and mining vehicles. In some cases, this will lead to fatalities.	• Make financial provisions to be used in case of reported and proven incidences of health, safety and security issues.
• The increase in the number of mines in the area may result in a decreased ambient air quality due to the increase in carbon dioxide emissions associated with increased vehicle movement, machinery and equipment on mine sites as well as blasting activities. This may, in	• Implement recommendations and mitigation measures as per the air quality specialist study as well comply with the national and international standard procedures and protocols for active opencast mining.

Risks	Mitigation Measures
turn, result in poor health outcomes to those exposed to it.	• Development and implementation of a grievance procedure. • Make financial provisions to be used in case of reported and proven incidences of health, safety and security issues.
• The presence of multiple active mines in the area has a potential to cause structural damage through blasting and the movement of heavy-duty vehicles; thus, causing health and safety risks to those dwelling in such structures.	• Implement mitigation measures outlined in the blasting, vibrations and traffic specialist studies. • Collaborate with other mines in the area to develop and implement long-term health and safety procedures and protocols to minimise and avoid the impacts. • Development and implementation of a grievance procedure. • Make financial provisions to be used in case of reported and proven incidences of health, safety and security issues.

12 Item 3(k): Methodology used in Determining and Ranking the Nature, Significance, Consequence, Extent, Duration and Probability of Potential Environmental Impacts and Risks

Details of the impact assessment methodology used to determine the significance of physical, bio-physical and socio-economic impacts are provided below.

The significance rating process follows the established impact/risk assessment formula:

Significance = CONSEQUENCE X PROBABILITY X NATURE

Where

Consequence = intensity + extent + duration

And

Probability = likelihood of an impact occurring

And

Nature = positive (+1) or negative (-1) impact

The matrix calculates the rating out of 147, whereby intensity, extent, duration and probability are each rated out of seven as indicated in Table 12-3. The weight assigned to the various parameters is then multiplied by +1 for positive and -1 for negative impacts.

Impacts are rated prior to mitigation and again after consideration of the mitigation measure proposed in this EIA report. The significance of an impact is then determined and categorised into one of eight categories, as indicated in Table 12-2, extracted from Table 12-1. The descriptions of the significance ratings are presented in Table 12-3.

It is important to note that the pre-mitigation rating takes into consideration the activity as proposed, (i.e., there may already be some mitigation included in the engineering design). If the specialist determines the potential impact is still too high, additional mitigation measures are proposed.

Table 12-1: Impact Assessment Parameter Ratings

Rating	Intensity		Extent	Duration/Reversibility	Probability
	Negative Impacts (Nature = -1)	**Positive Impacts (Nature = +1)**			
7	Irreplaceable loss or damage to biological or physical resources or **highly** sensitive environments. Irreplaceable damage to **highly sensitive** cultural/social resources.	Noticeable, on-going natural and / or social benefits which have improved the overall conditions of the baseline.	International The effect will occur across international borders.	Permanent: The impact is irreversible, even with management, and will remain after the life of the Project.	Definite: There are sound scientific reasons to expect that the impact will occur. >80% probability.
6	Irreplaceable loss or damage to biological or physical resources or **moderate to highly** sensitive environments. Irreplaceable damage to cultural/social resources of **moderate to highly** sensitivity.	Great improvement to the overall conditions of a large percentage of the baseline.	National Will affect the entire country.	Beyond Project life: The impact will remain for some time after the life of the Project and is potentially irreversible even with management.	Almost certain / Highly probable: It is most likely that the impact will occur. <80% probability.

Rating	Intensity		Extent	Duration/Reversibility	Probability
	Negative Impacts (Nature = -1)	**Positive Impacts (Nature = +1)**			
5	Serious loss and/or damage to physical or biological resources or **highly** sensitive environments, limiting ecosystem function. Very serious widespread social impacts. Irreparable damage to highly valued items.	On-going and widespread benefits to local communities and natural features of the landscape.	Province/ Region Will affect the entire province or region.	Project Life (>15 years): The impact will cease after the operational life span of the Project and can be reversed with sufficient management.	Likely: The impact may occur. <65% probability.
4	Serious loss and/or damage to physical or biological resources or **moderately** sensitive environments, limiting ecosystem function. On-going serious social issues. Significant damage to structures / items of cultural significance.	Average to intense natural and / or social benefits to some elements of the baseline.	Municipal Area Will affect the whole municipal area.	Long term: 6-15 years and impact can be reversed with management.	Probable: Has occurred here or elsewhere and could therefore occur. <50% probability.

Rating	Intensity		Extent	Duration/Reversibility	Probability
	Negative Impacts (Nature = -1)	**Positive Impacts (Nature = +1)**			
3	Moderate loss and/or damage to biological or physical resources of **low to moderately** sensitive environments and, limiting ecosystem function. On-going social issues. Damage to items of cultural significance.	Average, on-going positive benefits, not widespread but felt by some elements of the baseline.	<u>Local</u> Local extending only as far as the development site area.	Medium term: 1-5 years and impact can be reversed with minimal management.	Unlikely: Has not happened yet but could happen once in the lifetime of the Project, therefore there is a possibility that the impact will occur. <25% probability.
2	**Minor loss and/or effects** to biological or physical resources or low sensitive environments, not affecting ecosystem functioning. Minor medium-term social impacts on local population. Mostly repairable. Cultural functions and processes not affected.	Low positive impacts experience by a small percentage of the baseline.	<u>Limited</u> Limited to the site and its immediate surroundings.	Short term: Less than 1 year and is reversible.	Rare / improbable: Conceivable, but only in extreme circumstances. The possibility of the impact materialising is very low because of design, historic experience or implementation of adequate mitigation measures. <10% probability.

Rating	Intensity		Extent	Duration/Reversibility	Probability
	Negative Impacts (Nature = -1)	Positive Impacts (Nature = +1)			
1	**Minimal to no loss** and/or effect to biological or physical resources, not affecting ecosystem functioning. Minimal social impacts, low-level repairable damage to commonplace structures.	Some low-level natural and / or social benefits felt by a very small percentage of the baseline.	Very limited/Isolated Limited to specific isolated parts of the site.	Immediate: Less than 1 month and is completely reversible without management.	Highly unlikely / None: Expected never to happen. <1% probability.

Table 12-2: Probability/ Consequence Matrix

Probability	Significance																																					
7	-147	-140	-133	-126	-119	-112	-105	-98	-91	-84	-77	-70	-63	-56	-49	-42	-35	-28	-21	21	28	35	42	49	56	63	70	77	84	91	98	105	112	119	126	133	140	147
6	-126	-120	-114	-108	-102	-96	-90	-84	-78	-72	-66	-60	-54	-48	-42	-36	-30	-24	-18	18	24	30	36	42	48	54	60	66	72	78	84	90	96	102	108	114	120	126
5	-105	-100	-95	-90	-85	-80	-75	-70	-65	-60	-55	-50	-45	-40	-35	-30	-25	-20	-15	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100	105
4	-84	-80	-76	-72	-68	-64	-60	-56	-52	-48	-44	-40	-36	-32	-28	-24	-20	-16	-12	12	16	20	24	28	32	36	40	44	48	52	56	60	64	68	72	76	80	84
3	-63	-60	-57	-54	-51	-48	-45	-42	-39	-36	-33	-30	-27	-24	-21	-18	-15	-12	-9	9	12	15	18	21	24	27	30	33	36	39	42	45	48	51	54	57	60	63
2	-42	-40	-38	-36	-34	-32	-30	-28	-26	-24	-22	-20	-18	-16	-14	-12	-10	-8	-6	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40	42
1	-21	-20	-19	-18	-17	-16	-15	-14	-13	-12	-11	-10	-9	-8	-7	-6	-5	-4	-3	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
	-21	-20	-19	-18	-17	-16	-15	-14	-13	-12	-11	-10	-9	-8	-7	-6	-5	-4	-3	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21

Consequence

Table 12-3: Significance Rating Description

Score	Description	Rating
109 to 147	A very beneficial impact that may be sufficient by itself to justify implementation of the Project. The impact may result in permanent positive change	Major (positive) (+)
73 to 108	A beneficial impact which may help to justify the implementation of the Project. These impacts would be considered by society as constituting a major and usually a long-term positive change to the (natural and / or social) environment	Moderate (positive) (+)
36 to 72	A positive impact. These impacts will usually result in positive medium to long-term effect on the natural and / or social environment	Minor (positive) (+)
3 to 35	A small positive impact. The impact will result in medium to short term effects on the natural and / or social environment	Negligible (positive) (+)
-3 to -35	An acceptable negative impact for which mitigation is desirable. The impact by itself is insufficient even in combination with other low impacts to prevent the development being approved. These impacts will result in negative medium to short term effects on the natural and / or social environment	Negligible (negative) (-)
-36 to -72	A minor negative impact requires mitigation. The impact is insufficient by itself to prevent the implementation of the Project but which in conjunction with other impacts may prevent its implementation. These impacts will usually result in negative medium to long-term effect on the natural and / or social environment	Minor (negative) (-)
-73 to -108	A moderate negative impact may prevent the implementation of the Project. These impacts would be considered as constituting a major and usually a long-term change to the (natural and / or social) environment and result in severe changes.	Moderate (negative) (-)
-109 to -147	A major negative impact may be sufficient by itself to prevent implementation of the Project. The impact may result in permanent change. Very often these impacts are immitigable and usually result in very severe effects. The impacts are likely to be irreversible and/or irreplaceable.	Major (negative) (-)

12.1 Item 3(k)(i): The Positive and Negative Impacts that the Proposed Activity and Alternatives will have on the Environment and the Community that may be affected

Section 9.1 above provides an explanation of the site layout, alternatives and aspects that were considered during the finalisation of the layout. The Impact Assessment detailed in Section 11 describes all identified potential impacts associated with the preferred site layout and planned Project activities.

12.2 Item 3(k)(ii): The Possible Mitigation Measures that Could be Applied and the Level of Risk

Mitigation measures for each identified impact have been proposed and are presented with the impact ratings in Section 11.1 above.

12.3 Item 3(k)(iii): Motivation where no Alternative Sites were Considered

In terms of mining, alternative sites (i.e. locations) could not be considered since the location of the mineral resource determines the location of the mining operations. Since mining and extraction can only occur at the location of an ore body, it is not feasible to consider alternative locations. The proposed property has indicated the presence of coal.

The alternatives considered for the new proposed activities have been detailed in Section 9 above.

12.4 Item 3(k)(iv): Statement Motivating the Alternative Development Location within the Overall Site

The preferred overall site is based on the location of the identified coal seam, however, the proposed infrastructure layout for the Dalyshope Project area was informed by various specialist investigations. The mine layout was amended to avoid sensitive areas and to ensure that structures are situated away from sensitive pans and terrestrial ecology areas, as far as possible. The layout was therefore designed and revised to reduce associated impacts to the environment. The Fauna and Flora study has confirmed the presence of protected tree species and two Baboon Spider nests within the development footprint, which will need to be removed and relocated elsewhere.

The preferred mining method for Dalyshope is opencast mining as it suits shallow coal seams in a consistent, flat lying orientation. This method is deemed most economically viable for the proposed Project.

The no-mining option will mean that all potential negative impacts associated with the proposed mine and its associated infrastructure would not occur. However, the potential benefits (i.e. the proposed community upliftment projects associated with the SLP, etc.) associated with the Project would also not occur. A more detailed description of the alternatives is provided in Section 9.

13 Item 3(l): Full Description of the Process Undertaken to Identify, Assess and Rank the Impacts and Risks the Activity will Impose on the Preferred Site (In respect of the final site layout plan) Through the Life of the Activity

The identification of potential impacts associated with the proposed Dalyshope Project were informed by the environmental and technical specialist investigations undertaken.

Following the identification of potential impacts and detailed baseline environment, the impacts were assessed utilising the Digby Wells methodology which assesses the nature of the impact, duration and extent, intensity and the probability of the impact occurring (Section 12). Following the assessment of the potential impacts, mitigation measures are provided, and the potential impacts are assessed post-mitigation. The significance of the pre-mitigation impacts, the proposed mitigation measures and the post-mitigation significance ratings are detailed per environmental aspect per phase of the Project in Section 11.1, Table 11-2.

The determined site sensitivities were also considered in the selection of the preferred project site for proposed activities at Dalyshope Project. The identified impacts associated with the activities are presented in Table 14-1 below.

14 Item 3(m): Assessment of each Identified Potentially Significant Impact and Risk

Table 14-1 presents the potential impacts assessed per project activity and per phase as well as their proposed mitigation / enhancement measures for the proposed activities subject to the EIA Phase.

Table 14-1: Assessment of each identified Potentially Significant Impact

Phase	Activity	Aspect	Impacts	Rating (Pre-Mitigation)	Mitigation Measures	Rating (Post Mitigation)
Construction	Movement of vehicles, and heavy machinery.	Soil, Land Use and Land Capability	• Soil compaction; • Increased erosion, and consequently sedimentation of water bodies; and • Impacting agricultural activities in short, medium and long term.	Minor (negative)	• Keep site clearing to a minimal, and restrict vehicle movement outside of dedicated areas, specifically close to wetlands (pans); • Keep site clearing and impacts to the Dalyshope MRA; • Make use of existing roads to encourage minimal impacts/footprint to the OC1 Project area; and • Runoff must be controlled and managed by the use of proper stormwater management measures.	Negligible (negative)
Construction	Site clearing, and preparation by the removal of vegetation, and topsoil, leading to the exposure of soils.	Soil, Land Use and Land Capability	• Soil loss by wind and water erosion from cleared land surfaces; • Soil compaction; • Increased wind, and water erosion, and consequently sedimentation potential; • Removal of vegetation, basal cover, and thus increasing the potential of loss of topsoil, organic material, and increased erosion potential; and • Compaction, ponding, and landscaping of the area.	Moderate (negative)	• Keep site clearing to a minimum; • After topsoil is stockpiled, it should be revegetated to limit erosion and loss of organic material; • Topsoil stockpile height should not exceed three meters; • Establishment of effective vegetation around constructed infrastructure for adequate soil protection from wind and water erosion; • If any erosion occurs, corrective actions must be taken to minimise any further erosion from taking place at regular intervals or after high rainfall events; and • Runoff must be controlled and managed by the use of proper stormwater management measures.	Negligible (negative)
Construction	Construction of infrastructure, including, workshop, PCD's, offices, stores, water distribution, diesel farm, brake-test ramp, heavy, and light vehicle access roads, truck access roads, and provincial road upgrade from Steenbokpan to the mining site.	Soil, Land Use and Land Capability	• Increased vehicle movement in the area, increasing soil compaction, and runoff potential; • Increased hardened surfaces resulting in increased hydrological functioning; • Potential spillage of hydrocarbons such as oils, fuels, and grease, thus contamination of the soils; • Impacting agricultural activities in short, medium and long term; • Increased dust, erosion, and sedimentation; and • Removal of natural vegetation, and loss of basal cover.	Moderate (negative)	• Keep site clearing to a minimal and within the Dalyshope MRA; • After topsoil is stockpiled, it should be revegetated to limit erosion and loss of organic material; • Topsoil stockpile height should not exceed three meters; • Establishment of effective vegetation around constructed infrastructure for adequate soil protection from wind, and water erosion; • If any erosion occurs, corrective actions must be taken to minimise any further erosion from taking place at regular intervals or after high rainfall events; and • Runoff must be controlled and managed by the use of proper stormwater management measures.	Negligible (negative)
Construction	Waste management activities, including handling of hydrocarbon chemicals, hauling, transportation of waste material, transportation of product coal, and	Soil, Land Use and Land Capability	• Soil Contamination from hydrocarbon waste (lubricants, explosives, and fuels); and • Soil compaction resulting from the movement of heavy machinery.	Minor (negative)	• Runoff must be controlled, and managed by use of proper stormwater management measures; • Vehicles should be serviced in accordance with the maintenance plans and checked that soils are not exposed to oil spills and other contaminants; • Re-fuelling must take place on bunded impervious surfaces to prevent seepage of hydrocarbons into the soil; • All vehicles and machines must be parked within hard park areas, and must be checked daily for fluid leaks; and	Negligible (negative)

Phase	Activity	Aspect	Impacts	Rating (Pre-Mitigation)	Mitigation Measures	Rating (Post Mitigation)
	disposal of waste material.				• Fuel, grease, and oil spills should be remediated using a commercially available emergency clean up kits. However, for major spills (>5L), if soils are contaminated, they must be stripped and disposed of at a licensed waste disposal site.	
Construction	Temporary PCD	Soil, Land Use and Land Capability	• Soil Contamination from PCD spillage or leakages.	Minor (negative)	• Ensure proper lining of the temporary PCD as per the engineering design and maintenance to prevent spillage, and leakages into the soils and water resources; and • Spills should be remediated using a commercially available emergency clean up kits. However, for major spills (>5L), if soils are contaminated, they must be stripped and disposed of at a licensed waste disposal site.	Negligible (negative)
Construction	Site preparation including vegetation clearance and excavations, leading to exposure of soils.	Surface Water	• Sedimentation and siltation of nearby watercourses/ bodies.	Minor (negative)	• Clearing of vegetation must be limited to the development footprint, and the use of any existing access roads must be prioritised to minimise creation of new ones and a stormwater management plan should be established and maintained; • If possible, construction activities must be prioritised to the dry months of the year (May to September) to limit mobilisation of sediments, dust generation and mobilisation hazardous substances from construction vehicles used during construction phase; • Dust suppression on the haul roads and other cleared areas must be undertaken on regular basis to prevent or limit dust generation; • Hydrocarbon and hazardous waste storage facilities must be appropriately bunded to ensure that leakages can be contained. Spill kits should be in place and construction workers should be trained in the use of spill kits, to contain and immediately clean up any leakages or spills; • Vehicles should regularly be maintained as per the developed maintenance program. This should also be inspected daily before use to ensure there are no leakages underneath; • Drip trays must be used to capture any oil leakages. Servicing of vehicles and machinery should be undertaken at designated hard park areas. Any used oil should be disposed of by accredited contractors; and • Implementation of the proposed stormwater management plan including installation of drains, berms and water containment facilities.	Negligible (negative)
Construction	Handling of hydrocarbons and other chemicals; Loading, hauling and transportation of product coal.	Surface Water	• Surface water contamination leading to deterioration of water quality.	Minor (negative)		Negligible (negative)
Construction	Site clearing for the development of surface infrastructure through the removal of the topsoil and weathered rocks.	Groundwater	• Lowering of the water table.	Negligible (negative)	• Avoid constructing below the water table as far as possible; • In the unlikely scenario where the foundation of structures is to be installed below the water level, dewatering of the aquifer to locally lower the water table can be considered. The abstracted water can be utilised for dust suppression, vegetation or discharged to the pollution control dams; and • Install long term monitoring boreholes.	Negligible (negative)
Construction	Site/vegetation clearance.	Fauna and Flora	• Loss of plant communities including floral SCC; • Loss of biodiversity; • Increased erosion; • Potential for AIP proliferation; • Loss of faunal habitat including faunal SCC; and • Loss of vegetation types including Woodland and Pan vegetation.	Major (negative)	• Keep site clearing to a minimal, and restrict vehicle movement outside of dedicated areas, specifically close to wetlands (pans); • Keep site clearing and impacts to the Dalyshope MRA; • Alien plant management strategy should be implemented; • Make use of existing roads to encourage minimal impacts/footprint to the OC1 Area; • Relocation of the Baboon Spider's is recommended (See location on Sensitivity Map);	Moderate (negative)

Phase	Activity	Aspect	Impacts	Rating (Pre-Mitigation)	Mitigation Measures	Rating (Post Mitigation)
					• The footprint of the mine should be as compact as possible from a design point of view; • Avoid Combretum imberbe and Vachellia erioloba stands in sensitive areas; • Adhere to 100 m protective buffers around pans; and • Replacement of removed protected trees.	
Construction	Access and haul roads construction.	Fauna and Flora	• Removal of vegetation and basal layer; • Increased proliferation of AIPs • Increased faunal casualties; and • Increased dust pollution.	Moderate (negative)	• Keep site clearing to a minimum; • If any erosion occurs, corrective actions must be taken to minimise any further erosion from taking place at regular intervals or after high rainfall events; • Staff of the mine must adhere to policies within the operation of the mine, such as adhering to designated speed limits; • Restoration and rehabilitation of removed vegetation and SCC during rehab phase; • Construction must be kept within the infrastructure footprint area, to reduce as much fragmentation as possible; and • AIPs should be continuously monitored and controlled throughout the life of the mine and thereafter.	Minor (negative)
Construction	Rock blasting and operation of open pit workings.	Fauna and Flora	• Heavy machinery utilised increasing vehicle movement in the area, increasing soil compaction, habitat disturbances and vegetation removal; • Blasting will increase loss of habitat, faunal casualties, loss of ecosystem functioning and encourage habitat fragmentation; • Natural vegetation will be removed for the open pit working promoting edge effects and AIP proliferation; and • Increased dust pollution and erosion.	Moderate (negative)	• Restoration and rehabilitation of removed vegetation and SCC during rehab phase; • Construction must be kept within the infrastructure footprint area, to reduce as much fragmentation as possible; • Alien invasive plants should be continuously monitored and controlled throughout the life of the mine and thereafter. It is recommended that AIP management plan be established to control the spread; and • Corridors (infrastructure and ecological) set aside within the mine area would mitigate fragmentation substantially, especially if this could be managed with the community over an extended period of time.	Minor (negative)
Construction	Vegetation removal and surface water redirection	Wetlands	• The sources of this impact includes the compaction of soil, the removal of vegetation and surface water redirection. Opencast mining through pan wetlands or upslope from pan wetlands will irrevocably alter their water flow characteristics. This impact cannot be mitigated where wetlands are lost through opencast mining.	Moderate (negative)	• A temporary fence or demarcation must be erected around No-Go Areas outside the proposed works area prior to any construction taking place as part of the contractor planning phase when compiling work method statements to prevent access to the adjacent portions of the watercourse; • Effective stormwater management should be a priority during both construction and operational phases. This should be monitored as part of the EMP; • High energy stormwater input into the watercourses should be prevented at all cost. Changes to natural flow of water (surface water as well as water flowing within the soil profile) should be taken into account during the design phase and mitigated effectively; • External monitoring should commence from prior to the Construction Phase to ensure baseline information regarding soils and vegetation and to monitor any changes thereof; and • Throughout the Construction Phase, external monitoring should be done annually for soils and vegetation, preferable right after the rainy season (March to May).	Minor (negative)
Construction	Construction activities	Wetlands	• Changes in sediment entering and exiting the system.	Minor (negative)	• Water may seep into trenching and earthworks. It is likely that water will be contaminated within these earthworks and should thus be cleaned or dissipated into a structure that allows for additional sediment input and slows	Minor (negative)

Phase	Activity	Aspect	Impacts	Rating (Pre-Mitigation)	Mitigation Measures	Rating (Post Mitigation)
					down the velocity of the water thus reducing the risk of erosion. Effective sediment traps should be installed; • Remove only the vegetation where essential and do not allow any disturbance to the adjoining natural vegetation cover; • Rehabilitation plans must be submitted and approved for rehabilitation of damage and that plan must be implemented immediately upon completion of construction; • Protect all areas susceptible to erosion and ensure that there is no undue soil erosion resultant from activities within and adjacent to the work areas. • Runoff from the mining area must be managed to avoid erosion and pollution problems; • Implementation of best management practices; • Implement buffer zones to trap sediments; and • Monitoring should be done to ensure that sediment pollution is timeously dressed.	
Construction	Vegetation removal	Wetlands	• Introduction and spread of alien vegetation.	Minor (negative)	• AIPs should be continuously monitored and controlled throughout the life of the mine and thereafter; • Retain vegetation and soil in position for as long as possible, removing it immediately ahead of construction / earthworks in that area and returning it where possible afterwards; • Monitor the establishment of alien invasive species within the areas affected by the construction and maintenance and take immediate corrective action where invasive species are observed to establish; and • Rehabilitate or revegetate disturbed areas.	Negligible (negative)
Construction	Construction activities	Wetlands	• Loss and disturbance of watercourse habitat and fringe vegetation.	Moderate (negative)	• Drying out of wetlands and loss of hydrological zonation (loss of catchment) should be monitored and addressed through an offset program.	Moderate (negative)
Construction	Construction activities	Wetlands	• Changes in water quality due to pollution.	Minor (negative)	• Provision of adequate sanitation facilities located outside of the watercourse or its associated buffer zone; • Implementation of appropriate stormwater management around the mining area to prevent the ingress of run-off into the excavation and to prevent contaminated runoff into the watercourse; • The development footprint must be fenced off from the watercourses and no related impacts may be allowed into the watercourse e.g. water runoff from cleaning of equipment, vehicle access etc; • Maintenance of vehicles / equipment should not take place within the watercourse or watercourse buffer; • Control of waste discharges; • Maintenance of buffer zones to trap sediments with associated toxins; • Ensure that no operational activities impact on the watercourse or buffer area. This includes edge effects; • Control of waste discharges and do not allow dirty water from operational activities to enter the watercourse; • Control of waste discharges and do not allow dirty water from operational activities to enter the watercourse; • Regular independent water quality monitoring should form part of operational procedures in order to identify pollution; and	Negligible (negative)

Phase	Activity	Aspect	Impacts	Rating (Pre-Mitigation)	Mitigation Measures	Rating (Post Mitigation)
					• Treatment of pollution identified should be prioritized according to best practice guidelines.	
Construction	Site clearance and construction of proposed infrastructure.	Aquatics	• Land and vegetation manipulation/clearing for infrastructure in proximity to the watercourses potentially draining into the Limpopo River via diffuse overland flow.	Negligible (negative)	• Limit vegetation removal to the infrastructure footprint area only. Where removed or damaged, vegetation areas (riparian or aquatic related) should be revegetated as soon as possible; • Bare land surfaces downstream of construction activities must be vegetated to limit erosion from the expected increase in surface runoff from infrastructure; • Environmentally friendly barrier systems, such as silt nets or, in severe cases, use trenches downstream from construction sites to limit erosion and possibly trap contaminated runoff from construction; • Storm water must be diverted from construction activities and managed in such a manner to disperse runoff and prevent the concentration of storm water flow; • Water used at construction sites should be utilised in such a manner that it is kept on site and not allowed to run freely into nearby watercourses (i.e. use of a PCD); • Construction chemicals, such as paints and hydrocarbons, should be used in an environmentally safe manner with correct storage as per each chemical's specific storage descriptions; • All vehicles must be frequently inspected for leaks; • No material may be dumped or stockpiled within any rivers, drainage lines in the vicinity of the proposed Coal Mine; • All waste must be removed and transported to appropriate waste facilities; • High rainfall periods (usually November to March) should be avoided during construction, where possible, to possibly avoid increased surface runoff in attempt to limit erosion and the entering of external material (i.e. contaminants and/or dissolved solids) into associated aquatic systems; and • Monitoring of the associated Limpopo River reach should be implemented upon commissioning of the construction phase.	Negligible (negative)
Construction	Site Clearing, Construction of Surface Infrastructure and Topsoil Stockpiling.	Air Quality	• Reduction in ambient air quality.	Negligible (negative)	• Application of a dust suppressant on the haul roads and exposed areas; • Limit activity to non-windy days (wind speed less than 5.4 m/s), where possible; • Set maximum speed limits on haul roads and have these limits enforced; • The area of disturbance must be kept to a minimum at all times and no unnecessary clearing, digging or scraping must occur, especially on windy days; • The drop heights when loading onto trucks and at tipping points should be minimised; • The enclosure of crushers; • Application of fogging system at the crusher or dust suppression system (such as sprays); and • The implementation of an air quality management plan.	Negligible (negative)
Construction	Diesel Storage	Air Quality	• Release of Volatiles Resulting in Poor Air Quality.	Negligible (negative)	• Internal floating roofs and seal to minimize vapourisation is recommended; • Spill prevention control and countermeasure plan in place; • Maintenance of large spill kit at the diesel storage facility for incidental spill and drip; and	Low (negative)

Phase	Activity	Aspect	Impacts	Rating (Pre-Mitigation)	Mitigation Measures	Rating (Post Mitigation)
					• Secondary containment must be provided for all storage tanks for leaks in accordance with good engineering practices.	
Construction	Construction activities during the day	Noise	• Noise disturbance- NSD R1	High	• Due to NSD R1 located within 100m from the main access road, projected noise levels would be higher than the recommended zone rating level, or the noise limit as recommended for residential use (WHO and IFC guideline). Due to the proximity to the mining area mitigation will be difficult, with the most viable option being the relocation of NSD R1.	Low
Construction	Construction activities during the day	Noise	• Noise disturbance- Other NSD	Low		
Construction	Construction activities at night	Noise	• Noise disturbance- NSD R1	High	• Due to NSD R1 located within 100m from the main access road, projected noise levels would be higher than the recommended zone rating level, or the noise limit as recommended for residential use (WHO and IFC guideline). Due to the proximity to the mining area mitigation will be difficult, with the most viable option being the relocation of NSD R1. Other measures that would reduce the night-time noise levels at other NSD include: • the construction of berms using sub-soil or hard burden between active and future mining areas (including the plant infrastructure) and the identified NSD. The berms should be as high as possible and should ideally break the line of sight between the mining activities and the NSD. The berms should ideally be constructed during the daytime period with the dumping of material taking place behind these berms at night; • the mine should consider the recommendations defined in Section 13 of the Noise Study (Appendix M); • the mine should implement a noise monitoring programme. Recommendations regarding a potential monitoring programme is defined in Section 14 of the Noise Study (Appendix M); and • it is recommended that the mine development team minimize night-time (22:00 – 06:00) traffic that may pass within 200 m from residential areas, such as Sandbult.	Low
Construction	Construction activities at night	Noise	• Noise disturbance- NSD R3	Low		
Construction	Construction activities at night	Noise	• Noise disturbance- Other NSD	Low		
Construction	Site / Vegetation Clearance	Visual	• Site / vegetation clearance will reduce the screening properties that the natural vegetation has on the environment making the project more visible to receptors.	Moderate (negative)	• Only remove vegetation within the infrastructure footprint areas; and • Limit the footprint area of surface infrastructure where possible.	Minor (negative)
Construction	Infrastructure Construction	Visual	• The surface infrastructure will change the sense of place of the Project area. This change in landscape and land use will draw attention to the project area.	Moderate (negative)	• Ensure that the surface infrastructure does not exceed the proposed heights; • Limit the footprint area of surface infrastructure where possible; • Only remove vegetation within the infrastructure footprint areas; • Plant trees and plants along the fence line to assist in screening the surface infrastructure; and • Revegetate after construction phase to assist in screening the surface infrastructure.	Moderate (negative)
Construction	Topsoil Stockpiling	Visual	• Negative visual impact due to the proposed height and footprint size.	Moderate (negative)	• Limit the footprint area of topsoil stockpiles where possible; • Limit the height of topsoil stockpiles to 20 m to prevent negative visual impacts, if possible; • Topsoil stockpiles must be shaped and contoured to prevent ponding and to prevent erosion and slope failure; • Vegetate the topsoil stockpiles as soon as possible to blend into the surrounding landscape and reduce dust generation; and	Moderate (negative)

Phase	Activity	Aspect	Impacts	Rating (Pre-Mitigation)	Mitigation Measures	Rating (Post Mitigation)
					• Apply dust suppression techniques to limit dust generated from topsoil stockpiles.	
Construction	All Construction Activities	Socio-economic	• Creation of Employment Opportunities	Minor (positive)	• Set targets for local employment regardless of the size the work program. Targets must include employment of youths and women from historically disadvantaged backgrounds; and continuously monitored; • Establish a Local Employment Office to facilitate access to employment opportunities for local candidates with appropriate skill sets; • Develop and implement a Work Readiness and Vocational Training Plan in consultation with local stakeholders, including women's groups; • Develop and maintain a database of people looking for work within the study area; Widely advertise all Project employment opportunities in local community newspapers and placed in public places in local languages; • Comply with minimum wage requirements for unskilled labour and all other requirements, including gender equity, of the Employment Equity Act to ensure maximum benefits accrue to workers; and • Ensure that no employment take place at the entrance to the site (to avoid people congregating at the work site). Only formal channels for employment will be used.	Minor (positive)

Construction	• Site/vegetation clearance';
	• Temporary PCD;
	• Contractors laydown yard;
	• Access and haul road construction;
	• Infrastructure construction;
	• Diesel storage and explosives magazine;
	• Septic tanks; and
	• Topsoil stockpiling.
		Socio-economic	• Opportunities and Capabilities within the Supply Chain	Minor (positive)	• Carry out an audit of local businesses and their capacity to meet Project needs, including those businesses in the study area, and maintain a database of local business information;
					• Establish local procurement and business development office in central and accessible location to enhance accessibility of information about contract and training opportunities and promote opportunities through trade forums and other events;
					• Establish relevant training and capacity building initiatives to support businesses' ability to meet the Project requirements, based on audit results and needs assessments;
					• Develop and implement a local Procurement Policy or Plan. The policy/ plan shall provision for the following:
					    ◦ Setting of targets the numbers of local businesses used by the Project at all levels will be tracked.
					    ◦ Adaptation of Project procurement documents to suit local businesses as far as possible within the standards required of the Project.
					    ◦ Provision of incentives for Project contractors to purchase locally and partner with local businesses, including tender requirements regarding local procurement.
					    ◦ Creation of an SME electronic portal to facilitate communication of contract opportunities and management training materials to SMEs.
					    ◦ Considerations for unbundling of contracts into small work programs to ensure that small and locally based businesses are able to benefit.
					    ◦ Promotion of joint ventures between large and small Contractors to ensure equitable sharing of economic benefits and skills development.
					    ◦ Procedure for dissemination of procurement opportunities as early as possible, with clearly defined requirements for the goods or service to manage expectations.
					• Partner with relevant organisations where available and appropriate (e.g., government agencies, civil society and NGOs) to provide access for local
						Moderate (positive)

Phase	Activity	Aspect	Impacts	Rating (Pre-Mitigation)	Mitigation Measures	Rating (Post Mitigation)
					businesses to finance and advisory services in order to develop their capacity to competitively supply to the Project; and • Implementation of the grievance procedures.	
Construction	All project related activities associated with construction and operations.	Socio-economic	• Change to the Sense of Place	Moderate (negative)	• Implement induction programmes for all employees and contractors to increase sensitivity to local norms and customs; • Contract shall implement a 'no fraternization' policy at the worker's camp to minimise relations with prostitutes and unsafe sexual interaction with local residents; • Implement traffic safety measures, particularly speed control and driver awareness training for all drivers; • Minimise the construction footprint in forested areas in particular and ensure that disturbed areas are rehabilitated with indigenous trees and other plants; • Adequate plan for rehabilitation; • Offset negative experience of altered sense of place by maximising local employment/ economic benefits; and • Implementation of the grievance procedures.	Minor (negative)
Construction	All project related activities associated with construction and operation.	Socio-economic	• Impacts associated with Population Influx such as increased competition for residential land and other natural resources as well as an increased strain in accessing government services	Moderate (negative)	• Develop an In-Migration Plan that addresses how the Project will seek to minimise Project-induced in-migration as far as possible. Implement mitigation measures to address the adverse environmental and social consequences, and maximise the benefits, of in-migration. The management plan should be developed together with other industry role players and government; • To discourage influx of job-seekers, consider prioritisation of employment of unemployed members of local communities; • Liaise with Local Government to ensure that expected population influx is considered in infrastructure development and spatial development planning; • Create synergies with CDP to ensure that infrastructure development initiatives can off-set increased pressure on local services; • Identify if recorded criminal activities involved members of the Project's workforce.; • Engage with government authorities on issues, risks, and opportunities regarding in-migration; • Engage with local communities to understand their concerns, raise awareness of risks and opportunities, and identify solutions to issues relating to in-migration; • Develop and implement a targeted communications plan in areas known to be potential sources of in-migration and, using migrant networks, inform potential in-migrants of the scale and nature of opportunities, manage their expectations, and where appropriate discourage them from moving to the study area; • Maintain a clear security zone around all Project land to avoid informal settlement around the perimeter of Project activities; • Operate employee bus services from local settlements to discourage people from moving from their village to locations closer to Project sites in search of jobs and improve existing roads and build new roads to facilitate access from larger centres to Project sites; • Focusing Project-workforce housing and vocational training and business support services in larger towns with the most capacity to accommodate new residents; and	Minor (negative)

Phase	Activity	Aspect	Impacts	Rating (Pre-Mitigation)	Mitigation Measures	Rating (Post Mitigation)
					• Working with and assisting local authorities and relevant partners to achieve the following: • Monitoring changes in land cover and land use outside the Project site to identify loss of areas of importance for biodiversity and cultural heritage. • Discourage informal settlements along Project roads to minimise loss of habitat of value for biodiversity. • Where available and appropriate to design and implement an information and awareness programme regarding sustainable harvesting and conversation of natural resources. • Supporting community-based and inter-settlement youth programmes for sport, arts, and culture.	
Construction	All project related activities associated with construction and operation	Socio-economic	• Community unrest due to perceived lack of economic opportunities and unfulfilled promises.	Moderate (negative)	• Implement enhancement measures associated with all positive impacts in order to minimise or avoid protest and unrests; • Undertake ongoing consultation with local communities (including local authorities and traditional leadership) and clearly communicate Project needs and schedule; • Encourage stakeholders to utilise the grievance procedure to communicate their issues and ensure timeous response to all lodged complaints and grievances; • Utilise existing procurement and employment plans that promote transparent and fair recruitment and procurement; and • Implement the grievance procedures.	Minor (negative)
Operational	Vehicle, and heavy machinery movement	Soil, land use and land capability	• Soil compaction; • Increased runoff potential; • Increased erosion, and consequently sedimentation potential; and • Impacting agricultural activities in short, medium and long term.	Minor (negative)	• Keep site clearing to a minimal, and restrict vehicle movement outside of dedicated areas, specifically close to wetlands (pans); • Make use of existing roads to encourage minimal impacts/footprint to the OC1 Project area; and • Topsoil should be stockpiled separate from the subsoil to enhance the rehabilitation process.	Negligible (negative)
Operational	OC1 establishment	Soil, land use and land capability	• Removal of soil, and decreased soil depth; • Increased erosion, and sedimentation potential; and • Soil compaction, and increased surface runoff.	Major (negative)	• Keep site clearing to a minimal, and restrict vehicle movement outside of dedicated areas, specifically close to wetlands (pans); • All areas not proposed to be mined of high land capability, should be demarcated as “No-Go” areas, and avoided as far as possible (including vehicle movement, infrastructure, roads and mining related activities; • Ensure proper soil stripping, and stockpiling for optimum rehabilitation; and • Vegetate stockpiles to prevent soil loss, organic material loss, erosion, and sedimentation.	Minor (negative)
Operational	Blasting (only when dikes and other geological features are encountered).	Soil, land use and land capability	• Movement of the soil strata; and • Changes to the landscape, causing ponding, and undulating topographies.	Major (negative)	• Monitoring must be carried out during the Operational Phase to ensure no unnecessary impact to the soil resources present, and if so that a remedy is put in place as soon as possible; and • The disturbance must be minimised, and suitably rehabilitated.	Minor (negative)
Operational	Stockpiling (rock dumps, soils, ROM, discard dump) establishment, and operation.	Soil, land use and land capability	• Removal of topsoil, stockpiling, and exposed soil which may lead to unexpected changes in the depth and the nature of the soil.	Minor (negative)	• A Topsoil Management Plan (TMP) must be prepared to demonstrate how topsoil will be preserved in a condition as near as possible to its pre-mining condition to allow successful mine rehabilitation (Statham, 2014); • Long term stockpiles should be revegetated to minimise loss of soil quality. This will minimise AIPs, maintain soil organic matter levels, maintain soil structure, and microbial activity;	Negligible (negative)

Phase	Activity	Aspect	Impacts	Rating (Pre-Mitigation)	Mitigation Measures	Rating (Post Mitigation)
			• Increased vehicle movement in the area, increasing soil compaction, runoff, and erosion potential; • Potential spillage of hydrocarbons such as oils, fuels, and grease, thus contamination of the soils; and • Unexpected changes in the depth, and the nature of the soil.		• Topsoil stripping should be scheduled for the dry season, where possible; and • All long-term topsoil material stockpiles should be located outside the active mine path, and away from drainage lines.	
Operational	Waste management activities	Soil, land use and land capability	• Soil contamination from hydrocarbon waste (lubricants, explosives, and fuels); • Soil contamination from sewage; and • Impacting agricultural activities in short, medium and long term (soil and water contamination).	Minor (negative)	• Soil pollution monitoring should be conducted at selected locations on the Project site to detect any extreme levels of pollutants; and • Any spillages of sewage effluent from the treatment plant or ablution facilities should be cleaned up immediately, and the removed contaminated soils should be disposed of at accredited disposal sites.	Negligible (negative)
Operational	Diesel storage, explosives magazine, and handling, and treatment of hazardous products (including fuel, explosives, and oil).	Soil, land use and land capability	• Soil contamination; • Soil contamination from hydrocarbon waste/spills (lubricants, oil, explosives, and fuels); • Soil contamination from sewage, and wastewater; and • Impacting agricultural activities in short, medium and long term.	Minor (negative)	• Chemicals, such as paints, and hydrocarbons, should be used in an environmentally safe manner with correct storage as per each chemical's specific storage descriptions; • All spills should be immediately cleaned up, and treated accordingly; and • Re-fuelling must take place on a sealed surface area away from wetlands to prevent the ingress of hydrocarbons into the topsoil.	Negligible (negative)
Operational	Operating crush, and screen, and coal washing plant.	Soil, land use and land capability	• Soil contamination from wastewater, and spillages; and • Impacting agricultural activities in short, medium and long term (Soil and water contamination).	Major (negative)	• Stormwater must be diverted from construction activities and managed in such a manner to disperse runoff and prevent the concentration of stormwater flow; • Water used at construction sites should be utilised in such a manner that it is kept on-site, and not allowed to run freely into nearby watercourses (i.e. installation of clean, and dirty water separation systems); and • A Storm Water Management Plan (SWMP) should already be implemented. This should consider all high land capability area, high potential erosion areas, wetlands, and other watercourses associated with the new developments/infrastructure which should divert stormwater away from the surface infrastructure, and back into natural watercourses to maintain catchment yield as far as possible. The SWMP should also convey stormwater to silt traps to limit erosion and the subsequent increase of suspended solids in downstream watercourses.	Negligible (negative)
Operational	• Open pit establishment and operation; and • Stockpiling (Runoff from the dirty water areas or catchments (coal stockpile areas, mine processing plant, workshops etc.)	Surface water	• Surface water contamination and deterioration of water quality on the natural water resources	Moderate (negative)	• Runoff from dirty areas should be directed to the storm water management infrastructure (drains and PCDs) and should not be allowed to flow into the natural environment, unless DWS discharge authorisation and compliance with relevant discharge standards as stipulated in the NWA is obtained; • The PCDs and dirty water channels should be lined either by concrete or High-Density Polyethylene (HDPE) in order to prevent contamination of groundwater through seepage; • The water quality monitoring program provided in this report should be adhered to for monitoring water resources within and in close proximity to the study area to allow detection of any contamination arising from operational activities;	Negligible (negative)

Phase	Activity	Aspect	Impacts	Rating (Pre-Mitigation)	Mitigation Measures	Rating (Post Mitigation)
Operational	• Storage, handling and treatment of hazardous products (including fuel, explosives and oil) and waste; and • Movement of vehicles and mine machinery.	Surface water	• Surface water Contamination from hydrocarbon and chemical spillages and leakages.	Minor (negative)	• The management of general and other forms of waste must ensure collection and disposal into clearly marked skip bins that can be collected by approved contractors for disposal to appropriate disposal sites; • The overall housekeeping and storm water system management (including the maintenance of berms, de-silting of dams and conveyance channels and clean-up of leaks) must be maintained throughout the LOM; • The hydrocarbon and chemical storage areas and facilities must be located on hard-standing area (paved or concrete surface that is impermeable), roofed and bunded in accordance with SANS1200 specifications. This will prevent mobilisation of leaked hazardous substances; • Training of mine personnel and contractors in proper hydrocarbon and chemical waste handling procedures is recommended; • Vehicles must only be serviced within designated service bays; and • Wash bay and workshop runoff should flow through an oil separator as indicated on the infrastructure plan prior to discharge into the PCD.	Negligible (negative)
Operational	• Operation of PCD	Surface water	• Reduction of catchment runoff yield	Minor (negative)	Although there are no mitigation measures to completely prevent this kind of impact. The following management measures can be applied to ensure that the impact is limited to the site and its immediate surrounding: • Infrastructure development must be limited to the demarcated footprint to minimize the dirty runoff generating catchments within the study area; • As per the recommended storm water management plan, clean water runoff from the upstream catchment of the mine should be diverted around the site into the natural environment, this will minimize the runoff that will potentially be contaminated by mine waste; and • All the runoff captured on the PCD and RWD should be re-used in the mine processes as currently proposed as this will avoid sourcing raw water from external sources.	
Operational	Mine dewatering and creation of cone of dewatering.	Groundwater	• Lowering of the water table	Minor (negative)	• Store the dewatered water in pollution control dams and ensure that the dams will have sufficient storage volume; • Compensation of farmers with impacted groundwater levels, if impact is confirmed through monitoring; • Monitoring of groundwater water levels and pit inflow rates; • Minimise the impact associated with the lowering of the water table. Always keep the dewatering level close to the pit floor and not too far (more than 2 m) below; and • Update numerical model as aquifer information becomes available.	Minor (negative)

Operational	Pit mining, pit backfilling, seepage from the PCD and waste stockpiling.	Groundwater	• Groundwater contamination (Solute transport in the groundwater).	Minor (negative)	• Compensation of farmers with impacted groundwater or mine purchase land;
					• Nitrate-based explosives should be avoided to minimise groundwater contamination;
					• Contain the contamination plume to within the pit area, by dewatering the pit;
					• Overburden stockpiles should be managed to minimise infiltration of contaminants to the groundwater. The stockpiling of carbonaceous contaminated with the topsoil stockpiles should be prevented and managed accordingly. Mitigation methods that should be considered include:
					  • Management of the stockpile shape to control the ease with which water can run off.
					  • The vegetation of the stockpile and covering them with soil to minimise rainfall infiltration and mobilisation of dissolved metals.
						Minor (negative)

Phase	Activity	Aspect	Impacts	Rating (Pre-Mitigation)	Mitigation Measures	Rating (Post Mitigation)

					• The following management activities can be implemented to minimise contamination that originates from the pollution control dam:
					  ◦ Implementation of adequate storm water management to contain all waste water and/or volatile organic compounds, for treatment and recycling.
					  ◦ Pollution control dams should be lined to pro-actively prevent infiltration of contaminated seepage water.	

Operational	• Coal transportation; and • Vehicle and heavy machinery movement.	Fauna and Flora	• Habitat destruction by removal of vegetation; • Increase in dust production; • AIP spread; • Increased compaction, erosion, and consequently sedimentation potential; and • Increased faunal casualties.	Minor (negative)	• The footprint of the mine should be kept as small as possible with only necessary areas being cleared; • Existing roads should be used with no new roads constructed, if new roads need to be constructed, these should be done outside of the identified vegetation communities and as close as possible to the existing roads; • Adhere to a protective 100 m buffer around the pans; • Further investigation is recommended to determine the extent of the presence of burrows of the *Pyxicephalus adspersus* in relation to the infrastructure of the Project area; • Access should be restricted to already impacted areas (haul roads, open pits and dumps) by rehabilitating these areas as soon as possible by removal of infrastructure and planting; • To minimise loss of Faunal SCC, awareness campaigns with activated anti-poaching units incorporated during the mine life cycle. Security patrols to prevent snaring. Create a sanctuary for faunal species identified within the Project area during the operational phase; • Alien invasive plants should be continuously monitored and controlled throughout the life of the mine and thereafter. It is recommended that AIP programme be established to control the spread; and • Monitoring of the vegetation communities present must be completed every two years to document to impacts of the edge effect and fragmentation.	Negligible (negative)
Operational	Open-pit establishment, stockpiles, rock blasting and dumping.	Fauna and Flora	• Removal of vegetation, habitats and increased soil erosion and compaction; • Loss of faunal SCC; • Destruction of and changes to the habitats; • Increased dust pollution due to erosion and vehicular activity; and • Risk of AIP proliferation.	Moderate (negative)	• Monitoring of alien invasive sprawl during the operation is recommended as the surrounding vegetation is relatively intact and free from alien invasive p; • Ensure no loss of faunal SCC by activating anti-poaching units that will be incorporated during the mine life cycle; • Monitor dust pollution; • Keep sight clearing to a minimal, and restrict vehicle movement outside of dedicated areas, specifically close to wetlands (pans); and • Vegetate stockpiles to prevent soil loss, organic material loss, erosion, and sedimentation.	(Minor negative)
Operational	Diesel storage, and fuelling of diesel on site.	Fauna and Flora	• Contamination of soil, water and surrounding areas / habitats (pan vegetation) from Hydrocarbon waste/spills (lubricants, oil, explosives, and fuels).	Minor (negative)	• All spills should be immediately cleaned up, and treated accordingly; and • Re-fuelling must take place on a sealed surface area away from sensitive habitats such as the pan vegetation to prevent the ingress of hydrocarbons into the topsoil.	Negligible (negative)
Operational	Operational activities.	Wetlands	• The sources of this impact includes the compaction of soil, the removal of vegetation and surface water redirection. Opencast mining through pan wetlands or upslope from pan wetlands will irrevocably alter their water flow characteristics. This	Minor (negative)	• A temporary fence or demarcation must be erected around No-Go Areas outside the proposed works area prior to any construction taking place as part of the contractor planning phase when compiling work method statements to prevent access to the adjacent portions of the watercourse;	Minor (negative)

Phase	Activity	Aspect	Impacts	Rating (Pre-Mitigation)	Mitigation Measures	Rating (Post Mitigation)
			impact cannot be mitigated where wetlands are lost through opencast mining.		• Effective stormwater management should be a priority during both construction and operational phase. This should be monitored as part of the EMP; and • High energy stormwater input into the watercourses should be prevented. Changes to natural flow of water (surface water as well as water flowing within the soil profile) should be taken into account during the design phase and mitigated effectively.	
Operational	Operational activities.	Wetlands	• Changes in sediment entering and exiting the system.	Minor (negative)	• Surface water dissipation structures and Effective sediment traps should be installed; • Remove only the vegetation where essential and do not allow any disturbance to the adjoining natural vegetation cover; • Rehabilitation plans must be submitted and approved for rehabilitation of damage and that plan must be implemented immediately upon completion of construction; • Restrict vehicular and human movement in no-goes areas and clearly indicate these areas with signs; • Protect all areas susceptible to erosion and ensure that there is no undue soil erosion resultant from activities within and adjacent to the work areas; • Runoff from the mining area must be managed to avoid erosion and pollution problems; • Implementation of best management practices; and • Monitoring should be done to ensure that sediment pollution is timeously dressed.	Minor (negative)
Operational	Operational activities.	Wetlands	• Introduction and spread of alien vegetation.	Minor (negative)	• AIPs should be continuously monitored and controlled throughout the life of the mine and thereafter; • Retain vegetation and soil in position for as long as possible, removing it immediately ahead of construction / earthworks in that area and returning it where possible afterwards; • Monitor the establishment of alien invasive species within the areas affected by the construction and maintenance and take immediate corrective action where invasive species are observed to establish; and • Rehabilitate or revegetate disturbed areas.	Negligible (negative)
Operational	Operational activities.	Wetlands	• Loss and disturbance of watercourse habitat and fringe vegetation.	Negligible (negative)	• Drying out of wetlands and loss of hydrological zonation (loss of catchment) should be monitored and addressed through an offset program; and • Throughout the Operational and Decommissioning Phases, bi-annual (twice a year) external monitoring of soils and vegetation, preferable one survey after the rainy season (March to May) and one after the dry season (July to September) should be undertaken.	Negligible (negative)
Operational	Operational activities.	Wetlands	• Changes in water quality due to pollution.	Minor (negative)	• Provision of adequate sanitation facilities located outside of the watercourse or its associated buffer zone; • Implementation of appropriate stormwater management around the mining area to prevent the ingress of run-off into the excavation and to prevent contaminated runoff into the watercourse; • The development footprint must be fenced off from the watercourses and no related impacts may be allowed into the watercourse e.g. water runoff from cleaning of equipment, vehicle access etc;	Minor (negative)

Phase	Activity	Aspect	Impacts	Rating (Pre-Mitigation)	Mitigation Measures	Rating (Post Mitigation)
					• Maintenance of vehicles / equipment should not take place within the watercourse or watercourse buffer; • Control of waste discharges; • Maintenance of buffer zones to trap sediments with associated toxins; • Ensure that no operational activities impact on the watercourse or buffer area. This includes edge effects; • Control of waste discharges and do not allow dirty water from operational activities to enter the watercourse; • Control of waste discharges and do not allow dirty water from operational activities to enter the watercourse; • Regular independent water quality monitoring should form part of operational procedures in order to identify pollution; and • Treatment of pollution identified should be prioritized according to best practice guidelines.	
Operational	Operational aspects of proposed Coal Mine.	Aquatics	• Water quality and habitat deterioration of watercourses receiving unnatural/contaminated runoff.	Minor (negative)	• Runoff from dirty areas should be directed to the storm water management infrastructure (drains and PCDs) and should not be allowed to flow into the surrounding pans, unless DWS discharge authorisation and compliance with relevant discharge standards as stipulated in the NWA is obtained as suggested in DWE Surface Water Impact Assessment Report (2020); • Channelled water should not be dispersed in a concentrated manner. Baffles should be incorporated into artificial drainage lines/channels around the surface infrastructure to decrease the kinetic energy of water as it flows into the natural environment; • Bare surfaces downstream from the developments where silt traps are not an option should be vegetated in order to attempt to limit erosion and runoff that might be carrying contaminants; • Careful monitoring of the areas where dust suppression is proposed should be undertaken regularly. Areas concentrating water runoff should be addressed and not allowed to flow freely into associated watercourses; and • Monitoring of the associated Limpopo River reach should be done by an aquatic specialist in order to determine potential impacts where after new mitigation actions should be implemented as per the specialist's recommendations including the following: • Toxicity testing should be implemented due to the 'unusual' nature of the low-flow cycles within the Limpopo River; Diatom assemblage assessments should be undertaken to further investigate potential drivers of change; and • The Aquatic Biomonitoring Programme must be adopted on an annual basis after commencement of the construction phase.	Negligible (negative)
Operational	Establishment of Open Pit, Removal of Material, Stockpiling, Operation of the Plant and Construction of Surface Infrastructure.	Air quality	• Dust generation and reduction in ambient air quality.	Major (negative)	• Application of a dust suppressant on the haul roads and exposed areas; • Limit activity to non-windy days (wind speed less than 5.4 m/s), where possible; • Set maximum speed limits on haul roads and have these limits enforced; • The area of disturbance must be kept to a minimum at all times and no unnecessary clearing, digging or scraping must occur, especially on windy days; and • The drop heights when loading onto trucks and at tipping points should be minimised.	Negligible (negative)

Phase	Activity	Aspect	Impacts	Rating (Pre-Mitigation)	Mitigation Measures	Rating (Post Mitigation)
Operational	Diesel Storage.	Air Quality	• Release of Volatiles Resulting in Poor Air Quality.	Minor (negative)	• Strict adherence to products and waste management plan; • Handle, store, and dispose of hazardous substances in accordance with the local regulations; • Store hazardous substances in clearly labelled containers; • Deal with emergencies promptly i.e. spills; and • Make provision of secondary containment for fuel storage.	Negligible (negative)
Operational	Operational activities during the day.	Noise	• Noise disturbance.	Low	• No Mitigation is required due to low significance of the impact.	Low
Operational	Operational activities at night.	Noise	• Noise disturbance.	Medium	• Other measures that would reduce the night-time noise levels at other NSD include: • the mine should consider the recommendations defined in Section 13 of the Noise Study (Appendix M); • the mine should implement a noise monitoring programme. Recommendations regarding potential a monitoring programme is defined in Section 14 of the Noise Study (Appendix M); • it is recommended that the mine development team minimize night-time (22:00 – 06:00) traffic that may pass within 200m from residential areas, such as Sandbult, with no hauling at night.	Medium
Operational	Opencast pit Establishment.	Visual	• Blasting to remove rock will result in noise and dust thereby attracting attention to the Project area; and • The opencast pit will dramatically contrast with the surrounding area as it will result in a scar on the landscape.	Moderate (negative)	• Apply dust suppression techniques to limit the dust generated from the blasting; • Construct a berm along the perimeter of the open pit; • Ensure that the open pit is completely backfilled with material from the overburden stockpiles; • Rehabilitate all disturbed areas; • Ensure that the rehabilitated area is re-contoured and profiled to create a free-draining topography; • Spread topsoil over the rehabilitated area; • Revegetate the rehabilitated areas with grasses; and • Ensure all the mitigation/management actions outlined in the Closure and Rehabilitation reports are conducted.	Minor (negative)
Operational	Establishment and Operation of Stockpiling Infrastructure	Visual	• The overburden, product and discard stockpile will have a negative visual impact due to their proposed height and footprint size; and • Dust from the stockpiles will also affect receptors.	Moderate (negative)	• Limit the footprint area of stockpiles where possible; • Limit the height of the stockpiles to not exceed the proposed heights; • Stockpiles must be shaped and contoured to facilitate drainage of surface water to prevent ponding and to prevent erosion and slope failure; and • Apply dust suppression techniques to limit dust generated from the stockpiles.	Moderate (negative)
Operational	Backfilling and Concurrent Rehabilitation	Visual	• The potential impact is a neutral visual impact as it assists to reduce the negative visual impact of mining on the receiving environment.	Negligible (negative)	• Backfill void with overburden stockpiles; • Ensure that the open pit is completely backfilled with material from the overburden stockpiles; • Ensure that the rehabilitated area is re-contoured and profiled to create a free-draining topography; • Spread sub-soil and topsoil over the backfilled and rehabilitated area; • Revegetate the backfilled and rehabilitated areas with grasses; and • Ensure all the mitigation/management actions outlined in the Closure and Rehabilitation reports are conducted.	Negligible (negative)

Phase	Activity	Aspect	Impacts	Rating (Pre-Mitigation)	Mitigation Measures	Rating (Post Mitigation)
Operational	Coal Transportation	Visual	• Dust and heavy traffic in the area will change the visual character of the area.	Moderate (negative)	• Apply dust suppression techniques to limit dust generated from the trucks; and • Minimise heavy traffic by reducing the frequency of coal transportation schedule and avoid night time use where possible.	Moderate (negative)

Operational	• All project related activities associated with construction and operation	Socio-economic	• Creation of employment, work skills development and experience.	Minor (positive)	• Develop and continuously update (throughout the LoM) an Employment Plan with the objective of increasing local employment and transferring operational positions from migrant workers to people from within the study areas;
					• Establish a Local Employment Office to facilitate access to employment opportunities for local candidates with appropriate skill sets;
					• Develop and implement a Work Readiness and Vocational Training Plan in consultation with local stakeholders, including women's groups. The Plan will:
					  • Identify the skill needs of the Project and skills gaps in the local community;
					  • Provide training for local people to meet Project needs; and
					  • Identify and focus on the particular needs of women and youth and design trainings to encourage their participation.
					• Ensure the implementation of the Social and labour Plan to support the promotion of education and skills uplift among local communities within the study areas, including the implementation of on-the-job training and scholarship programme;
					• Develop and implement a grievance procedure which local communities can utilise reporting their issues and concerns related to the Project; and
					• Implementation of the SLP workforce programs.
						Moderate (positive)

Operation	All project related activities associated with construction and operation.	Socio-economic	• Opportunities and Capabilities within the Supply Chain.	Minor (positive)	• Carry out an audit of local businesses and their capacity to meet Project needs, including those businesses in the study area, and maintain a database of local business information; • Establish local procurement and business development office in central and accessible location to enhance accessibility of information about contract and training opportunities and promote opportunities through trade forums and other events; • Establish relevant training and capacity building initiatives to support businesses' ability to meet the Project requirements, based on audit results and needs assessments; • Develop and implement a local Procurement Policy or Plan. The policy/ plan shall provision for the following: • Setting of targets the numbers of local businesses used by the Project at all levels will be tracked. • Adaptation of Project procurement documents to suit local businesses as far as possible within the standards required of the Project. • Provision of incentives for Project contractors to purchase locally and partner with local businesses, including tender requirements regarding local procurement. • Creation of an SME electronic portal to facilitate communication of contract opportunities and management training materials to SMEs. • Considerations for unbundling of contracts into small work programs to ensure that small and locally based businesses are able to benefit. • Promotion of joint ventures between large and small Contractors to ensure equitable sharing of economic benefits and skills development.	Moderate (positive)

Phase	Activity	Aspect	Impacts	Rating (Pre-Mitigation)	Mitigation Measures	Rating (Post Mitigation)
					• Procedure for dissemination of procurement opportunities as early as possible, with clearly defined requirements for the goods or service to manage expectations. • Partner with relevant organisations where available and appropriate (e.g., government agencies, civil society and NGOs) to provide access for local businesses to finance and advisory services in order to develop their capacity to competitively supply to the Project; and • Implementation of the grievance procedures.	
Operational	All project related activities associated with construction and operation.	Socio-economic	• Multiplier effects on the local and regional economy.	Minor (positive)	• Implement enhancement measures linked to employment creation and opportunities associated with the supply chain; • Implement the SLP related interventions; • Compliance with SLP commitments to make maximum use of local SMMEs and BBBEE companies; and • Implement the grievance procedure.	Moderate (positive)
Operational	Water use and storage on-site – during the operation water will be required for various domestic and industrial uses.	Socio-economic	• Increased competition for water resources.	Major (negative)	• Implement mitigation from the underground and surface water Specialist studies; • Develop and Implement a Project grievance procedure; and • Consult with municipality regarding the provision of additional water in case of underground water resources disruptions due to the Project.	Moderate (negative)
Operational	• Open pit establishment; • Removal of rock (blasting); and • Stockpiling (rock dumps, soft dumps, soils, ROM, product, discard dump) establishment and operation.	Socio-economic	• Potential economic impacts on eco-tourism operators and establishments.	Moderate (negative)	• Commission a stand-alone Tourism Impact Assessment Study with economic modelling in order to develop a baseline and set-out monitoring indicators; • Implement the recommendations and mitigation measures of the Tourism Impact Assessment Study; • Implementation of the grievance procedures.	Moderate (negative)
Operational	Blasting	Socio-economic	• Impacts associated with blasting on neighbouring landowners such as dust, noise, vibrations from blasting activities, road closures, etc.	Moderate (negative)	• Implement mitigation measures outlined in the Blasting and Vibrations Specialist Study. • Maintain a grievance procedure established during the construction phase. • Widely publicise the daily blasting schedule to neighbouring communities.	Minor (negative)

Operational	All project related activities associated with construction and operation.	Socio-economic	• Occupational health and safety risks to mine workers such as dust-induced occupational lung diseases and noise induced hearing loss	Moderate (negative)	• Project staff including third party Contractors to be subject to health and safety standards and policies. It recommended that the Project develops and implements a detailed Occupational Health and Safety Management Plan and System;
					• The Occupational Health and Safety (OHS) management plan should include but not be limited to:
					  • Hazard identification and risk assessment procedure.
					  • A 'fitness for work' programme to ensure that all employees are physically able to undertake their work without impact to their health.
						Minor (negative)

Phase	Activity	Aspect	Impacts	Rating (Pre-Mitigation)	Mitigation Measures	Rating (Post Mitigation)
					• Mandatory OHS training programmes provided to all employees, including contractors to ensure staff are aware of the health and safety guidelines. • Specific OHS training programmes provided for workers assigned to tasks associated with particular H&S risks. • All workers should be provided with Personal Protective Equipment (PPE) and be mandated to use it; • Placement of visual warning signs in place, including those for the electrical and mechanical equipment safety warning, and chemical hazard warning; • Toolbox talks or health and safety meeting on a daily basis to ensure that procedures are being adhered to, and to discuss any incidents that have occurred; and • Develop and implement a workforce grievance procedure where they can raise issues and concerns relating to OHS.	
Operational	All project related activities associated with construction and operation.	Socio-economic	• Social Development as part of the SLP.	Minor – (positive)	• Consultation with Project beneficiaries regarding proposed community development needs and associated initiatives; • Early identification of community members for enrolment in ABET and portable skills training to improve likelihood of employment on the mine; • Conduct baseline socio-economic survey of households located within primary study area prior to commencement of community development initiatives to enable accurate identification of eligible Local Economic Development (LED) project and skills training beneficiaries and measure impacts of development initiatives on households; • Collaboration with other developmental role players during implementation; • Establishing an external monitoring programme to monitor and evaluate community development initiatives as well as HRDP and procurement policy implemented by the mine and its contractors; • Expanding skills development and capacity building programmes to non-employees; and • Maintaining a record of training courses completed per individual and community. Where training is offered to non-employees, their contact information and qualifications can be shared with other industries.	Moderate (positive)
Operation	All project related activities associated with construction and operation.	Socio-economic	• Impacts associated with decreased community health, safety, and security	Moderate (negative)	• In partnership with government authorities the Project to support improvements to existing health services to handle the increase in population numbers and changes to the existing health profile of the area. This may include facilities, quality of medical personnel, diagnostic capacity and treatment, etc; • Develop and implement an Emergency Prevention, Preparedness and Response Plan; • Develop information, education and communication campaigns around diseases and health practices including communicable diseases such as HIV/AIDS, TB and COVID-19; etc; • Regularly review and update as necessary its existing communicable diseases management strategy; • Provide awareness, counselling and testing (ACT) for all Project personnel, including voluntary testing for STIs and HIV/AIDS in pre-employment and on-going health screening. (Workers will not be denied employment or discriminated against in any way based on their HIV status);	Moderate (negative)

Phase	Activity	Aspect	Impacts	Rating (Pre-Mitigation)	Mitigation Measures	Rating (Post Mitigation)
					• Survey all households in the primary study area to record the location, extent, and quality of water sources the size of the population reliant on water and its usage patterns, particularly with regard to seasonality, and differences in water use or access by vulnerable populations, including women; • Develop a programme in consultation with local communities to improve access to good quality potable water and determine preferred water infrastructure; • Develop and implement a Traffic Management Plan covering vehicle safety, driver and passenger behaviour, use of drugs and alcohol, hours of operation, rest periods and accident reporting and investigations; • Strictly enforce drug and alcohol policies in relation to Project drivers and undertake regular and random testing of drivers and in response to suspicious behaviour; • Require Project drivers to be trained in defensive driving and provided regular refresher courses; • Propose road bypasses where there is a significant risk to public safety from road accidents; • Establish preparedness and response capabilities to deal with any road traffic or other accidents that may occur including multiple casualty events; and • In partnership with local authorities and the police, educate communities on road traffic laws and road safety.	
Operational	Blasting operations	Blasting	Ground vibration impact on: • Farmstead; • Ruins (inside pit); • Borehole (DH2) (inside pit); • Cement Dam; and • Borehole (LD04).	Moderate (negative)	• Specific blast design to be done, shorter blast holes, smaller diameter blast hole, using electronic initiation instead of shock tube systems to obtain single hole firing; • Monitor ground vibration and air blast from blasting operations; • Purchase of nearest Farmstead; and • Protection of sensitive heritage sites with blast design mitigations.	Negligible (negative)
Operational	Blasting operations	Blasting	Air blast impact on: • Farmstead; • Borehole (DH2) (inside pit); • Borehole (GT02); and • Borehole.	Moderate (negative)	• Specific blast design to be done, shorter blast holes, smaller diameter blast hole, use of specific stemming materials to manage air blast, increased stemming lengths to reduce air blast effect. Used of specific stemming to manage fly rock - crushed aggregate of specific size. Re-design with increased stemming lengths; and • Monitor ground vibration and air blast from blasting operations.	Negligible (negative)
Operational	Blasting operations	Blasting	• Fly rock impact on Borehole (DH2).	Moderate (negative)	• Specific blast design to be done, shorter blast holes, smaller diameter blast hole, use of specific stemming materials to manage air blast, increased stemming lengths to reduce air blast effect; • Monitor fly rock situation using video camera, when blasting near receptors in the zone the zone of influence.	Negligible (negative)
Decommissioning	Movement of vehicles, and heavy machinery removing infrastructure.	Soil, Land Use and Land Capability	• Soil compaction, and increased hardened surfaces, excess waste material; • Compaction of soil; • Increased runoff potential; • Increased waste material, and potential hard waste material; and • Increased erosion, and consequently sedimentation potential.	Minor (negative)	• Continue with concurrent rehabilitation, and implement land rehabilitation measures; • Address compacted areas by deep ripping to loosen the soil, and revegetate the area as soon as possible; • Ensure proper stormwater management designs are in place to ensure no run-off or pooling occurs; • Only designated access routes are to be used to reduce any unnecessary compaction;	Negligible (negative)

Phase	Activity	Aspect	Impacts	Rating (Pre-Mitigation)	Mitigation Measures	Rating (Post Mitigation)
Decommissioning	Demolition of infrastructure, and rehabilitation of affected areas.	Soil, Land Use and Land Capability	• Disturbance of soils, and subsequent erosion by wind, and water; • Increased vehicle movement in the area, increasing soil compaction, and runoff potential; • Potential spillage of hydrocarbons such as oils, fuels, and grease, thus contamination of the soils; • Unexpected changes in the depth, and the nature of the soil; and • Ponding of water, and creation of drainage channels.	Minor (negative)	• The backfilled, reprofiled landscape should be top soiled and revegetated to allow free drainage close to the pre-mining conditions; • Inventory of hazardous waste materials stored on-site should be compiled, and arrange complete removal; and • Rehabilitation, and Monitoring Plan.	Negligible (negative)
Decommissioning	Rehabilitation mainly consisting of spreading, and landscaping of the preserved subsoil, and topsoil, profiling of the land, and re-vegetation.	Soil, Land Use and Land Capability	• Exposure of soils, and subsequent compaction, erosion, and sedimentation; • Soil compaction, and increased runoff potential due to vehicle movement during rehabilitation programs; • Loss of organic material, and vegetation cover; and • Potential spillage of hydrocarbons such as oils, fuels, and grease, thus contamination of soil.	Minor (negative)		Negligible (negative)
Decommissioning	Post-closure monitoring, and rehabilitation.	Soil, Land Use and Land Capability	• Minimal negative impacts on the environment; and • Soil Monitoring Plan.	Minor (negative)		Major (Positive)
Decommissioning	• Demolition and removal of infrastructure; and • Rehabilitation and closure.	Surface water	• Sedimentation and siltation of nearby watercourses and deterioration of water quality.	Minor (negative)	• Restore the topography to pre-mining conditions as much as is practically possible by backfilling, removing stockpiles and restore the slope gradient and angle of the site; • Immediate revegetation of cleared areas; • Where practical, decommissioning activities should be prioritized during dry months of the year (May to September); • Movement of demolition machinery and vehicles should be restricted to designated access roads to minimise the extent of soil disturbance; • Use of accredited contractors for removal or demolition of infrastructure during decommissioning is recommended; this will reduce the risk of waste generation and accidental spillages; • Ensure that the infrastructure (pipelines, fuel storage areas, pumps) are first emptied of all residual material before decommissioning; and • If decant occurs, the decant needs to be captured, contained and treated to acceptable or prescribed water quality standards prior to discharge into the natural water resources.	Negligible (negative)
Decommissioning		Surface water	• Restoration of pre-mining streamflow regime in nearby watercourses	Major (positive)		
Decommissioning		Surface water	• Water contamination from AMD decant into surface water resources	Moderate (negative)		Minor (negative)
Decommissioning	Pit backfilling and groundwater recovering.	Groundwater	• Groundwater contamination - Solute transport in the groundwater	Minor (negative)	• The water table in the pit area should be lowered as part of the contaminant management plan whereby evaporation from the pit lake will keep the water level below the regional groundwater depth; • The hydraulic head in the pit should be less than the regional head to make it a hydraulic sink so that no water (and solute transport) flows away from the project site;	Negligible (negative)

Phase	Activity	Aspect	Impacts	Rating (Pre-Mitigation)	Mitigation Measures	Rating (Post Mitigation)
					• Compensation of farmers with impacted groundwater or mine purchase land; • Monitoring of groundwater water levels and pit inflow rates; and • Update numerical model and decant rates as aquifer information becomes available.	
Decommissioning	Movement of vehicles and heavy machinery.	Fauna & Flora	• Compaction of soil; • Potential faunal casualties; • Increased runoff potential; and • Increased erosion and decline in revegetation potential.	Minor (negative)	• Rehabilitate the compacted, eroded areas by deep ripping to loosen the soil and revegetate the area as soon as possible; • Ensure proper stormwater management designs are in place to ensure no run-off or pooling occurs; • Adhere to health and safety protocols within the operations of the mine and adhere to speed limits to minimise faunal casualties; • Only designated access routes are to be used to reduce any unnecessary compaction.; • Continue with concurrent rehabilitation, begin with stockpiles, open pits and dumps, implement rehabilitation measures; • Address eroded and compacted areas by deep ripping to loosen the soil, and revegetate the area as soon as possible to prevent AIP sprawl; and • Inventory of hazardous waste materials stored on-site should be compiled and complete removal arranged.	Negligible (negative)
Decommissioning	Demolition of infrastructure and preparation for rehabilitation of affected areas	Fauna & Flora	• Disturbance of soils, and subsequent erosion by wind, and water; • Increased vehicle movement in the area, increasing soil erosion and habitat destruction; • Potential spillage of hydrocarbons such as oils, fuels, and grease, thus contamination of the surrounding grounds; • AIP proliferation; and • Unexpected changes in topography and landscape.	Minor (negative)		Negligible (negative)
Decommissioning	Re-vegetation and profiling of the land.	Fauna & Flora	• Exposure of soils, and subsequent compaction, erosion, and sedimentation; • Soil compaction, and increased runoff potential due to vehicle movement during rehabilitation programs; • AIP proliferation; • Loss of organic material, basal layer and vegetation cover; and • Potential spillage of hydrocarbons such as oils, fuels, and grease, thus contamination of soil.	Minor (negative)	• During the decommissioning phase, rehabilitation must start as soon as possible and preferably in the growing season to ensure adequate plant recruitment; • Address eroded and compacted areas by deep ripping to loosen the soil, and revegetate the area as soon as possible; • Inventory of hazardous waste materials stored on-site should be compiled and complete removal arranged; and • Only designated access routes are to be used to reduce any unnecessary compaction.	Positive Impact
Decommissioning	Post-closure monitoring and rehabilitation.	Fauna & Flora	• Minimal negative impacts on the environment.	Negligible (negative)	• During the decommissioning phase, rehabilitation must start as soon as possible and preferably in the growing season to ensure adequate plant recruitment; • Stockpiles, open pits and dumps are to be rehabilitated; • Ensure sufficient irrigation (i.e. using watercart) and fertilizing of newly planted vegetation to facilitate a rapid establishment; and • Replant with species identified within each vegetation community.	Positive Impact
Decommissioning	Physical removal of surface infrastructure and rehabilitation activities near and within drainage lines.	Aquatics	• Water quality and habitat deterioration of watercourses in contact with heavy machinery and receiving runoff from surface workings	Minor (negative)	• High rainfall periods should be avoided where possible during decommissioning; • Removed or damaged vegetation areas should be revegetated; • Storm water must be diverted from decommissioning activities; • Water used during decommissioning should be kept onsite and not be allowed to freely flow into nearby watercourses; • Stored mine-affected water should be treated before decommissioning of any mine-related water retention areas, such as PCDs;	Negligible (negative)

Phase	Activity	Aspect	Impacts	Rating (Pre-Mitigation)	Mitigation Measures	Rating (Post Mitigation)
					• Land reprofiling should be done during the dry season to allow for attempts to restore the morphology of the endorheic pans prior to rainfall/flow events; and • Ensure the revegetation activities use appropriate indigenous plant species.	
Decommissioning	Demolition and Removal of Infrastructure and Rehabilitation.	Air quality	• Dust generation and reduction in ambient air quality	Major (negative)	• Application of dust suppressant on the haul roads and exposed areas; • Limit activity to non-windy days (wind speed less than 5.4 m/s), where possible; • Set maximum speed limits on haul roads and have these limits enforced; • The area of disturbance must be kept to a minimum at all times and no unnecessary clearing, digging or scraping must occur, especially on windy days; • The drop heights when loading onto trucks and at tipping points should be minimised; and • Proper rehabilitation of disturbed areas to allow for vegetation establishment.	Negligible (negative)
Decommissioning	Demolition and Removal of Infrastructure	Visual	• The potential impact is a neutral visual impact as it assists to restore the landscape to its pre-development state.	Minor (negative)	• Apply dust suppression techniques to limit the dust from the demolition area; • Ensure all infrastructure is demolished and removed from the site; • Ensure all rubble is removed from site; and • Rehabilitate all disturbed areas as detailed in the Closure and Rehabilitation Plan.	Minor (negative)
Decommissioning	Rehabilitation	Visual	• The potential impact is a neutral visual impact as it assists to restore the landscape to its pre-development state.	Major (negative)	• Ensure that the open pit is backfilled with material from the overburden stockpiles; • Rehabilitate all disturbed areas; • Ensure that the rehabilitated area is re-contoured and profiled to create a free-draining topography; • Spread topsoil over the rehabilitated area; • Revegetate the rehabilitated areas with grasses; and • Ensure all the mitigation/management actions outlined in the Closure and Rehabilitation reports are conducted.	Minor (negative)
Decommissioning	Decommissioning	Socio-economic	• Economic boom-bust after the construction and operation phases.	Moderate (negative)	• Develop and implement an integrated Mine Closure Plan; and • Proactively assess and manage the social and economic impacts on individuals, regions and economies where retrenchment and/or closure of the Project are certain.	Minor (negative)

15 Item 3(n): Summary of Specialist Reports

Numerous specialist impact assessments were undertaken for the proposed Project, as set out in Table 15-1. Separate specialist reports were compiled and have been attached as appendices to this report. The specialist input included the baseline environment, potential impacts and the recommended mitigation measures. Table 15-1provides a summary of the key recommendations of the studies.

Table 15-1: Specialist Studies Undertaken for the Dalyshope Project

List of studies undertaken	Recommendations of specialist reports	Specialist Recommendations that have been included in the EIA report	Reference to applicable section of report where specialist recommendations have been included
Visual	• It is recommended that the mitigation/management actions in this report are implemented to reduce the impact that the project will have on the topography and visual character of the receiving environment. • During the decommissioning and closure phase, all surface infrastructure must be demolished and removed from the site. The opencast pit must be backfilled with material from the overburden stockpiles. • The Project area must be re-contoured and profiled to create a free-draining topography to reduce the negative visual impact of mining on the receiving environment. The topsoil stockpiles must be spread over the disturbed areas and these areas must be vegetated to complete the rehabilitation process.	X - All recommendations have been considered and included in this report.	Appendix D
Soils, Land Use and Land Capability	• If any erosion occurs, corrective actions must be taken to minimise any further erosion from taking place at regular intervals or after high rainfall events. • The area must be fenced, and animals should be kept off the area until the vegetation is self-sustaining to avoid loss of the soil resource due to the wind and water erosion of unprotected soils. Also, runoff must be controlled and managed using proper stormwater management measures. • It is recommended that vehicle movement over sensitive areas should be restricted to reduce compaction. • If soil is polluted, treat the soil using in-situ bioremediation. If in-situ treatment is not possible then the polluted soil must be classified according to the Minimum Requirements for the Handling, Classification, and Disposal of Hazardous Material, and disposed at an appropriate, permitted, or licensed disposal facility. • All vehicles and machines must be parked within hard park areas and must be checked daily for fluid leaks to avoid soil contamination due to hydrocarbons spillage. Also, re-fuelling must take place on a sealed surface area away from soils to prevent seepage of hydrocarbons into the soil. • Place drip trays where vehicles or machinery leaks are occurring. • Fuel, grease, and oil spills should be remediated using a commercially available emergency clean up kits. • Any contractors on site must ensure that all employees are aware of the procedure for dealing with spills, and leaks, and undergo training on-site. • Soil pollution monitoring should be conducted at selected locations on the Project site to detect any extreme levels of pollutants. • Establishment of effective soil cover such as lawn grass around constructed infrastructure for adequate protection from wind, and water erosion. • Minimise unnecessary removal of the natural vegetation cover outside the development footprint. • It is highly recommended that concurrent rehabilitation, management, and mitigation measures are correctly implemented to minimise potential impacts on soils (as set out in Section 8) to maintain the land capability for future land use.	X - All recommendations have been considered and included in this report.	Appendix E
Surface water	• Ongoing water quality monitoring of surface water monitoring is imperative during all phases of the project life and post closure to allow for early detection of potential contaminants that may cause unforeseen negative impacts on the receiving environment; • Frequent maintenance of stormwater channels and berms is recommended; • Dirty channels should be HDPE lined to prevent seepage of contaminated water into underground aquifers or the natural environment, if possible. Alternatively, dirty channels can be concreted and the concrete maintained to ensure that no cracks occur over time;	X - All recommendations have been considered and included in this report.	Appendix F

List of studies undertaken	Recommendations of specialist reports	Specialist Recommendations that have been included in the EIA report	Reference to applicable section of report where specialist recommendations have been included
	• Topsoil stockpiles should have perimeter berms around them to prevent mobility of sediments or silt into nearby watercourses; • If possible, representative baseline data for the wet and dry season should be obtained as water quality may be seasonally variable. Since sampling was done in February, which is part of the wet season, another sample may be acquired during dry months (i.e. April to September); • Water flow measurements within the mine water reticulation system are recommended to better manage mine water by accounting for actual water uses and identifying the processes in which water losses occur, thereby improving the estimate of the water balance; • It is anticipated that the pit will start decanting post-closure and the Applicant has made provision for a water treatment plant (WTP). Any water that decants from the rehabilitated mine will be treated in the WTP prior to discharge into the natural watercourse. The water and salt balance should be updated annually to ensure that adequate capacity is available for the required treatment; and • The feasibility of the Dalyshope Project depends on the outcome of the water supply investigation which is currently being undertaken by Digby Wells. The study area is located in a catchment with scarce water resources and water availability exacerbated by low MAP, high evaporation and endoreic areas within the catchment. Therefore, the findings of the water supply investigation should be incorporated into this study to ensure that the required external water supply is secured.		

Groundwater	The following recommendations are made following the hydrogeological study:
	• The evaporation rate is approximately four times higher than precipitation and most of the rainfall collected in the pit during the rainfall events could potentially evaporate during the dry periods, unless it is managed properly. This water is recommended to be contained immediately and used to reduce borehole water usage during the rainy periods.
	• The Limpopo River is not at risk from mining at the Dalyshope Coal Mine. However, water level and quality monitoring of the boreholes between the mine and the river are recommended to detect any potential impacts on the Limpopo River. If in the unlikely event that an impact on the Limpopo River is confirmed through monitoring, the mine should actively intervene to reduce or avoid the impact. This can be done through the following two mechanisms:
	  • The interception of the contaminated water before reaching the Limpopo River through interception boreholes; or
	  • The treatment of the contaminated water to an acceptable quality and discharge to the Limpopo River or use it at the mine.
	• A few private boreholes are expected to fall within the radius of the dewatering influence. The following is recommended as part of the management plan:
	  • The mine should supply equal or better-quality water to affected parties that rely on groundwater, if proven that there is an impact.
	  • Monitoring of the groundwater quality and water levels in the private boreholes is recommended.
	  • The numerical model should be refined every 2 years in the first 4 years and thereafter every five years based on groundwater monitoring results.
	• To enable safe and efficient mining conditions, the water inflowing to the pit should be managed through pumping from sumps. This water should be used in the mining operation and therefore is considered to be being used efficiently. Mine dewatering can be conducted from a sump, or dewatering boreholes or a combination of both. Considering the relatively low aquifer yield, it is proposed to be conducted from a sump(s) in the lowest working area of the pit floor. This is also in line with the various coal mines in South Africa, including the Grootegeluk Mine. Dewatering from boreholes has the advantage of intercepting the groundwater before it is potentially contaminated at the pit. However, no high yielding fractures were intersected during this study and installation of dewatering wellfield is likely to be more expensive than seepage management using sumps. If dewatering is to be conducted from boreholes, new boreholes will have to be drilled as mining progresses since mining will be conducted progressively and this is likely to increase the cost. Water collected at the sump should be incorporated with the process water system considering the water shortage in the Waterberg area.
		X - All recommendations have been considered and included in this report.	Appendix G

List of studies undertaken	Recommendations of specialist reports	Specialist Recommendations that have been included in the EIA report	Reference to applicable section of report where specialist recommendations have been included
Fauna and Flora	• Further investigation is recommended to determine the extent of the presence of burrows of the *Pyxicephalus adspersus* in relation to the infrastructure of the Project area. • All identified faunal SCC must be located and relocated, if possible, before the construction phase. • Tree Removal Permit applications will be required for the removal of identified protected tree species within the development footprint, so it is strictly advised to keep development and removal within the footprint. • All floral SCC must be identified and located. Regional relocation of protected tree species within development footprint must be instilled to offset the overall loss of floral SCC within the Project area. As recommended in Section 9, replanting of suitable saplings, small trees and indigenous flora during the rehabilitation phase as a means to re-vegetate the area after decommissioning the mine • Restriction of vehicle movement over sensitive areas to reduce degradation of untouched areas. • Minimise unnecessary removal of the natural vegetation cover outside the development footprint. • After rehabilitation, the area must be fenced, and animals should be kept off the area until the vegetation is self-sustaining and established. • It is also highly recommended that water courses (wetlands and pans) be avoided and not impacted with at least 100 m zones of regulation buffers to any infrastructure and construction activities.	X - All recommendations have been considered and included in this report.	Appendix I
Wetlands	• No mining/development should occur within the wetland areas or the associated 100 m buffer zones. • Proposed excavations should be signed off by a hydro-pedologist. This is to advise on the impact of moisture displacement the proposed activities may have on the sustainability of infrastructure development and the environment. • Development should include measures to ensure that the flow paths and storage mechanisms in the soil should be disturbed as little as possible, to sustain hydrological and biogeochemical connectivity. Note should be taken of the soil characteristics including their erodibility and recharge properties. Permanent changes to regional hydrology should be quantified.; • Control of alien invasive plants should form part of the maintenance plan. • The likelihood of reestablishment of wetland function after mining, through rehabilitation should be investigated in a multidisciplinary team and should be based on relevant case studies where this has been achieved in the past. • External monitoring should commence from prior to the Construction Phase to ensure baseline information regarding soils and vegetation and to monitor any changes thereof. • Throughout the Construction Phase, external monitoring should be done annually for soils and vegetation, preferable right after the rainy season (March to May). • Throughout the Operational and Decommissioning Phases, bi-annual (twice a year) external monitoring of soils and vegetation, preferable one survey after the rainy season (March to May) and one after the dry season (July to September) (Please see Aquatic Impact Assessment Report) should be undertaken. See the monitoring plan in Section 8.1.5, Part B.	X - All recommendations have been considered and included in this report.	Appendix J
Aquatics	Based on the results of the current study, the following actions have been recommended to allow for commencement of the proposed Project: • The 'unusual' nature of the high and low-flow cycles within the Limpopo River presents challenges in employing the preferred REMP indices, therefore toxicity testing (screening-level) should be implemented for a minimum of three biological groups (i.e. algae, invertebrates, and fish) at a quarterly basis during the construction phase and biannually during the operational phase of the project. • Diatom assemblage assessments should be undertaken to further investigate the potential drivers of change and provide an indication of the Present Ecological State during periods of low flow where there is connectivity along the Limpopo River. • The developed Aquatic Biomonitoring Programme must be adopted on an annual basis after commencement of the Construction Phase of the Project. This programme should continue for the life of the Project and for at least three years post the Decommissioning Phase.	X - All recommendations have been considered and included in this report.	Appendix K

List of studies undertaken	Recommendations of specialist reports	Specialist Recommendations that have been included in the EIA report	Reference to applicable section of report where specialist recommendations have been included
Air Quality	Based on the results presented in this report, the following recommendations should be applied once operation commences: • Revive the dustfall monitoring network and maintain for the LOM. • Set up a continuous air quality monitoring station to measure criteria particulate and gaseous pollutants. • Designate a qualified person to act as the Environmental Officer to oversee implementation of mitigation measures and assess efficiency regularly. • Ensure air quality information is incorporated into the environmental management information system and submit annual reports to the South African Atmospheric Emission Licensing & Inventory Portal (SAAELIP), as required by law. • Establish codes of practice for good housekeeping concerning dust management and mitigation, including regular cleaning of spillages, spraying of stockpiles, open areas and roads, appropriate restrictions on vehicle movements and speeds. • Housing of crushers and screens to contain emissions. • Monitor the air quality management measures and information to ensure that adopted mitigation measures are sufficient to achieve current air quality standards at the MRA boundary and the closest receptors. • Implement an air quality management plan.	X - All recommendations have been considered and included in this report.	Appendix L
Noise	• Mitigation is required, identified and recommended to ensure that the noise levels can be managed to minimize the significance of the noise impact. Mitigation would include active noise monitoring for both the construction and operational phases; • While the proposed activities could have a significant noise impact on the surrounding NSD, the implementation of appropriate mitigation measures could reduce the significance of the noise impact to low. It will be required to relocate NSD R1 as recommended in the report. Therefore, with the appropriate implementation of mitigation measures, it is recommended that the proposed activities at Dalyshope be authorized (from a noise impact perspective); • Active noise monitoring is recommended to take place on a six-monthly basis as proposed in the Noise Study.	X - All recommendations have been considered and included in this report.	Appendix M
Cultural Heritage	• All heritage resources identified within the Project area are of negligible cultural significance. As per the SAHRA Minimum Standards, their inclusion into the HIA report is considered sufficient in terms of mitigation and no further actions are required. • At the time of the verification survey and the compilation of this report, the water supply, electricity supply and the coal transportation requirements and infrastructure layout were still under consideration. No design options or layouts were considered in this report. Anglo and/or Universal must appoint a suitably qualified heritage specialist to undertake a walk-down of the proposed infrastructure layout, when finalised, and assess the impacts posed to any heritage resources identified in that process. • To minimise unplanned direct impacts to unidentified heritage resources, Anglo and/or Universal must develop a project-specific Chance Finds Protocol (CFP), which must be approved by the Heritage Resources Authorities (HRAs) and which must be implemented prior to the commencement of the Project.	X - All recommendations have been considered and included in this report.	Appendix N

Social	• The mitigation and enhancement measures listed for each impact, negative and positive, must be implemented; especially those relating to:
	  • Impacts on ecotourism operators and establishments;
	  • Water supply and likely increased competition thereof;
	  • Impacts associated with blasting on neighbouring landowners; and
	  • Potential in-migration into the settlement of Lesedi.
	• A social management plan and social monitoring plan must be developed to manage and monitor the implementation of these measures and recommend corrective measures, where necessary; and
	• Implement mitigation measures recommended in other specialist studies, including traffic, dust, blasting, ground and surface water and others, that are likely to have socio-economic impacts.
		X - All recommendations have been considered and included in this report.	Appendix O

List of studies undertaken	Recommendations of specialist reports	Specialist Recommendations that have been included in the EIA report	Reference to applicable section of report where specialist recommendations have been included

Blast and Vibration	• Regulatory requirements indicate specific requirements for all non-mining structures and installations within 500 m from the mining operation.
	• The mine will have to apply for the necessary authorisations as prescribed in the various acts.
	• Regulatory requirements indicate specific requirements for all non-mining structures and installations within 100 m from the mining operation. The mine will have to apply for the necessary authorisations as prescribed in the various acts.
	• Relocation or purchasing of one farmstead identified within 500 m from the opencast operations. Relocation/Purchase will reduce the general impact on the surrounding areas of the opencast pit.
	• A detail design with blast planning will be required for efficient and safe mining of the pit. Blast designs should be reviewed prior to first blast planned and done. The geology for the pit area and the required drill depths should be confirmed. Due to stripping of topsoil that will take place there may be variances in required final depths and thus design applied to be confirmed.
	• It is always good to conduct a first test blast to confirm levels and ground vibration and air blast. It is recommended that such a blast be done, and detail monitoring done and used to help define blasting operations going forward. This test blast can be based on the existing design and only after this blast it may be necessary to define if changes are required or not.
	• The current proposed stemming lengths at least must be maintained to ensure some form of fly rock control. Specific designs where distance between point of concern and blast is known should be considered with this. It may be required to increase stemming lengths for additional control.
	• Calculated minimum safe distance is 302 m. This is the estimated area that must be cleared at least around a blast before firing. It is recommended that at least 500 m be used as a safe distance from any blast. The final blast designs that may be used will determine the final decision on safe distance to evacuate people and animals.
	• During blasting, gravel roads in the vicinity of the Project area should be taken into consideration. The gravel road should be closed. Stop and Go will be required when blasting is done within 500 m from these gravel roads. Road closure will be required with inspection for after blast fly rock. Further it will be required that clearance distances are set, and road travel managed during blasting operations.
	• The option of photographic survey of all structures up to 2100 m from the pit area is recommended.
	• Regarding the game farms adjacent to the mining area the following is recommended:
	    • As far as possible game should be moved to areas furthest possible away from the first blasts to be done. It is recommended that game should not be closer than a minimum of 500 m from the blast area.
	    • Monitoring of the wildlife reaction due to blasting should be done and recorded as well. Communication between farmers and mine will be imperative. Frequent meetings and regular updates on operations must be communicated from both sides.
	• It is recommended not to blast too early in the morning when it is still cool or when there is a possibility of atmospheric inversion or too late in the afternoon in winter. Do not blast in fog. Do not blast in the dark. Refrain from blasting when wind is blowing strongly in the direction of an outside receptor. Do not blast with low overcast clouds. It is recommended that a standard blasting time is fixed and blasting notice boards setup at various routes around the Project area that will inform the community of blasting dates and times.
	• Third party consultation and monitoring should be considered for all ground vibration and air blast monitoring work.
	• Video monitoring of each blast is recommended. This will help to define if fly rock occurred and from where. Immediate mitigation measure can then be applied if necessary. The video will also be a record of blast conditions.
		X - All recommendations have been considered and included in this report.	Appendix P

Traffic and Transport	• The D1675 (Steenbokpan Road) is in a bad condition and it is therefore recommended that the potholes on this road be patched and that the road be resurfaced where needed to improve the condition and overall safety on this road. • It is recommended that the road upgrades as proposed in traffic report be implemented as set out in Drawing 20024/AL/01 (attached to Appendix Q) and to the relevant standards of the Waterberg District Municipality / Lephalale Local Municipality.	X - All recommendations have been considered and included in this report.	Appendix Q

List of studies undertaken	Recommendations of specialist reports	Specialist Recommendations that have been included in the EIA report	Reference to applicable section of report where specialist recommendations have been included
Rehabilitation and Closure	• Develop a post mining landform design and develop and maintain a LoM materials balance to ensure a free draining landform can be constructed with the available material and topsoil resources are allocated suitably to achieve the end land use objectives. • Ensure that future topsoil stripping is done according to the pre-mining topsoil survey, mixing topsoil and high clay content subsoils will lead to compaction that is difficult to reverse. • Care should be taken to keep topsoil separate from subsoils and hards. Mixing increases compaction and reduces effective rooting depth for vegetation and can increase the surface water recharge into the backfilled pit and compound residual risks. • Concurrent rehabilitation must take place where possible. • Closure is an ongoing and iterative process, and continuous refinement of the Rehabilitation and Closure Plan (RCP) is necessary to facilitate the successful transition between the operational to decommissioning and closure phase at Dalyshope. • Closure must be considered early in the mining cycle, at the pre-mining stage if possible, so Digby Wells therefore advises UCD to start planning closure options and operational mining designs that facilitates a seamless closure process even prior to gaining approval for the nearby mining right applications. In this regard, green technologies and building design, and modernisation of mining technology in the operational phase, will likely significantly reduce the closure environmental liability and minimise residual and latent impacts. • A Closure Environmental Management Programme (CEMPr) which fulfils all regulatory needs to be five detailed years prior to the application of a closure certificate. • In line with the above, a detailed gap analysis should be completed to indicate specialist studies required to assist Universal/ Anglo with achieving closure at Dalyshope, as well as additional monitoring and maintenance requirements. • Long-term inspection, monitoring, and maintenance of the discard facility is recommended. • Should the LoM be significantly extended, investigations into alternative final land-uses and/or blue waste management systems should be considered as technological advances occur, that will result in community development and economic growth in line with Africa Mining Vision (2009). • Digby Wells recommends ongoing stakeholder engagement, so the needs of key stakeholders and the community can be taken into consideration when considering closure alternatives. • It is advised that closure planning is managed by a few single key personnel/consultants so there is a single database that holds all necessary information, specialist studies, etc and this knowledge can be easily transferred between relevant key personnel. • The RCP and costs must be updated on an annual basis as per NEMA requirements. This will ensure that the liabilities are reflected as accurate as possible. • When stripping and stockpiling topsoil as new mining areas are opened up and expanded, care must be taken, and topsoil must be placed separately from overburden dumps or directly placed during concurrent rehabilitation activities. • Ensure rehabilitation is conducted using a clear plan for the mined area's end land use. Consider post-mining landscape designs. Ensure rehabilitation contractor is aware of rehabilitation requirements. • UCD must take cognisance that the compliance date for aligning the site wide rehabilitation and closure planning and costing with GNR 1147 has recently been extended to 19 June 2021. • Regular groundwater monitoring must take place to determine possible changes in groundwater flow and groundwater quality; and • AIPs must be removed on an on-going basis.	X - All recommendations have been considered and included in this report.	Appendix R

16 Item 3(o): Environmental Impact Statement

16.1 Item 3(o)(i): Summary of the Key Findings of the Environmental Impact Assessment

The Environmental Impact Statement is utilised to summarise all the potential environmental impacts identified during each phase of the proposed Project. The significance of the impacts associated with the relevant Project Phases, pre-mitigation and post-mitigation, is summarised in Table 14-1, above.

Negative impacts are to be expected with undertaking the proposed activities at the Dalyshope Mine as they will require direct environmental disturbance. The most significant negative impacts identified are associated with site clearing during the construction phase and general operational and maintenance activities during the operational phase which may result in soil erosion, soil compaction, topsoil loss, subsequent sedimentation of watercourses leading to water quality deterioration. The Dalyshope Project will have a very high visual impact on the receiving environment. The greatest visual impact of the proposed Project will be from the opencast pit, and the overburden, topsoil and discard stockpiles due to the proposed height of this infrastructure. These cover a large area and will dramatically change the natural landscape and contrast with its surroundings thereby drawing attention to the Dalyshope Project from a distance of up to 20 km.

A key finding is that the proposed mining activities will have a major impact on protected fauna and flora. An Offset Assessment is recommended (Appendix I). In addition, the findings in the Wetlands Assessment (Appendix I) show that three wetlands were recorded on or directly adjacent to OC1, which are ecologically important and sensitive on a provincial or local scale. Only small sections of these wetlands and the associated buffer zones are located on the OC1 area. All three these wetlands are classified as Non-Perennial Episodic Endorheic Depression Pans. No mining or development will occur within the wetland areas or the associated buffer zones. It is highly recommended that water courses (wetlands and pans) be avoided and not impacted with at least 100 m zones of regulation buffers to any infrastructure and construction activities. Furthermore, the project is not likely to result in significant impacts on the receiving Limpopo River if the recommended mitigation measures are implemented.

16.2 Item 3(o)(ii): Final Site Map

The infrastructure layout plan on which this impact assessment is based is provided in Figure 5-2 above and appended as Appendix B.

16.3 Item 3(o)(iii): Summary of the Positive and Negative Implications and Risks of the Proposed Activity and Identified Alternatives

The negative and positive impacts are tabulated in Section 11.1 of this report, in Table 11-2.

The proposed activities will have a considerable impact on the vegetation and associated habitat types present in the mining and infrastructure area. The key negative impacts include the loss of topsoil resources, soil erosion, loss of habitat, removal of protected species and subsequent sedimentation of freshwater systems from cleared areas as a result of construction site clearance as well as operational activities.

Mitigation and management measures have been proposed for each identified impact associated with the proposed activities. The loss of protected tree species and Baboon Spider nests within the development footprint cannot be mitigated or reduced, however; species removal must be kept within the footprint and an Offset Assessment should be undertaken to compensate for biodiversity impacts associated with the Project.

Mine decant into freshwater systems is possible, which would result in the deterioration of water quality. Major negative impacts were also found to occur during the decommissioning and post closure phases of the Project (i.e. pit backfilling resulting in AMD and dissolution of heavy metals). Mine dewatering is crucial to keep the mined area dry for safe working conditions. This can potentially impact the groundwater environment negatively by lowering the water level and creating a cone of depression.

The key negative impacts associated to the proposed Dalyshope Project include but are not limited to:

- Air and Noise pollution;
- Potential negative impacts on ecology, including protected species and soil quality;
- Potential for alien invasive plants proliferation;
- Potential for water resource contamination;
- Degradation of view-scape; and
- Potential social impacts (i.e. change sense of place, impacts associated with Population Influx, Increased competition for water resources, impacts associated with blasting on neighbouring landowners, etc.).

Please Note: if the proposed mitigation and management strategies are implemented, the impacts can be reduced.

The key positive impacts associated to the proposed Dalyshope Project include but are not limited to:

- Significant socio-economic contributions to the local economy. The capital investment and contributions to the GDP associated with the mine, along with the potential multiplier effects, are significant over the life of the operation (approximately 30 years), which will provide a sustained contribution to the local and national economy;
- Increased life quality through improved employment options; and
- Restoration of pre-mining streamflow regime in nearby watercourses.

17 Item 3(p): Proposed Impact Management Objectives and the Impact Management Outcomes for Inclusion in the EMPR

The EMP Report seeks to achieve a required end state and describes how activities that have, or could have, an adverse impact on the environment and surrounding communities will be mitigated, controlled and monitored.

The EMP will address the environmental impacts and possible unplanned events during each phase of the Project (Construction, Operational, Decommissioning and Post-Closure). Due regard must be given to environmental protection during the entire Project; a number of environmental recommendations are made to achieve environmental protection. These recommendations are aimed at ensuring that the Applicant and contractors maintain adequate control over the Project to:

- Minimise the extent of an impact during the life of the Project;
- Ensure appropriate restoration of areas affected by the Project; and
- Prevent long term environmental degradation.

18 Item 3(q): Final Proposed Alternatives

The location of the Project has been decided upon based on the location of the identified coal seams. Anglo undertook prospecting activities on the area of interest and determined the extent of the mine based on the location of coal. The location is therefore dictated by Anglo's Prospecting Right and therefore there are no feasible alternative locations for Anglo.

Alternatives were therefore assessed for the layout of the Project with consideration given to the environmental and technical assessments undertaken, these are detailed in Section 8 and 9.1 above. The final proposed layout (Figure 5-2 above) considered the placement of infrastructure in such a manner as to avoid and minimise potential environmental impacts as far as possible. Where impacts cannot be avoided, mitigation and management measures have been provided to lessen the significance of the adverse impacts (Table 14-1). The opencast mining method is deemed economically viable for the Dalyshope Project. The Steenbokpan Road (D1675), D175 and new access road are preferred routing alternatives as they are positioned in relation to the mining area.

The alternatives considered and motivations for the preferred alternatives are detailed in Section 9 above.

19 Item 3(r): Aspects for Inclusion as Conditions of Authorisation

The EAP recommends the following conditions for the DMRE to consider for inclusion into the Authorisation:

- The mitigation/enhancement measures contained in the attached specialist reports and EMPr must be adhered to;

- An independent Environmental Control Officer (ECO) must be appointed for construction phase of the proposed activities to conduct environmental inspections on a monthly basis;
- Monitoring must be undertaken as described in the monitoring programme provided in Part B Section 8;
- CFPs must be developed for the construction phase in the event of accidental exposure of unidentified heritage resources;
- The closure cost assessment should be updated and submitted as per the legislative requirements;
- Performance assessments must be undertaken as set out in conditions for authorisation and license conditions;
- The Rehabilitation Plan will be implemented concurrently;
- A fauna and flora offset must be implemented prior to any activities taking place;
- A water source must be identified pre-construction;
- No mining/ development should occur within the wetland areas or the associated buffer zones; and
- A WUL in terms of Section 21 of the NWA must be issued by the DWS prior to any activities taking place.

The studies and impact assessment have been based on the proposed mine layout and mine works programme. Should there be any changes to the proposed Project description, the adequacy and accuracy of the work may be affected, and additional work may be required to address the limitations.

The EAP and Specialist team will be required to review the mine infrastructure layout and provided opportunity to amend the respective impact assessments. The Applicant will amend the layout based on the outcomes of this impact assessment process. The full extent of the proposed Mining Right area has been assessed to establish the environmental baseline.

20 Item 3(s): Description of any Assumptions, Uncertainties and Gaps in Knowledge

This section highlights the assumptions, uncertainties, limitations and knowledge gaps relevant to the assessment and mitigation measures of the various specialist studies undertaken. Refer to Table 20-1 below.

Table 20-1: Specialist Studies Assumptions, Uncertainties, and Gaps

Specialist Study	Assumptions, Uncertainties and Gaps
Soil, Land Use, and Land Capability	• A detailed soil chemical and physical analysis was not completed as per the scope. Soil characteristics and descriptions in the report were supported by data obtained from the Soil Survey Report (Digby Wells, 2013); • The area surveyed during a two-day site visit was based on the initial layout plan provided by Universal/Anglo; • Land suited for crop production was assumed to be suitable for other, less intensive uses such as pasture, natural grazing, forestry, and wildlife; • Soils are contiguous hence differentiation is not abrupt, and the transition zone cannot be completely captured during any given soil survey; and • The soils within the capability classes are similar only concerning the degree of limitations in soil used for agricultural purposes or concerning the impact on the soils when they are so used.
Surface water	• Only a five water quality samples were collected on the streams within and around the study area, sampling points which could not be sampled due to access issues or which were dry at the sampling moment have been included on the proposed monitoring programme for the mine to continue monitoring; and • Water balance process flow was obtained from the Mining Works Programme report and this was adopted for the current excel based static water balance model developed for this Project.
Groundwater	• Geological fractures change their openings and hydraulic properties by orders of magnitude within a short distance. The groundwater ingress and environmental impacts are dependent on the rock permeability. However, no drilling and aquifer testing had been conducted within the Dalyshope pit area. Aquifer permeability conducted outside the pit area has been interpolated to predict on the values within the pit zone; • It may not be practical to drill a borehole at every fracture and investigate its permeability, calculate flow rates through each fracture, or assess how much rainfall infiltrates through individual rock openings. It is necessary to make some assumptions and interpolations to simplify the complex, real world hydrogeological conditions into a simplified, manageable model. Considering the hydrogeological heterogeneity and data gaps in the aquifer parameters, the Dalyshope model is expected to predict with accuracy of approximately 50%. The model is recommended to be updated as more hydrogeological information is obtained during mine operations; specifically once in every two years in the first four years of operation and then every five years thereafter;

Specialist Study	Assumptions, Uncertainties and Gaps
	• The groundwater ingress rate is dependent on the LoM. This has been incorporated into the groundwater model for inflow rate as well as impact predictions. If the mine plan changes, the model needs updating to simulate the updated mine plans. • There is currently only one water level monitoring borehole (DH2) that is located within the pit area with a water level depth of 8.0 m. The water level in the region ranges between 2 and 50 m, and only one borehole may not represent the entire pit footprint; and • Pit backfilling is assumed to start 8 years after closure and continue until closure.
Fauna and Flora	• Due to access limitations, the Riparian vegetation recorded in the Digby Wells survey in 2014 was not accessed during the survey in 2020. For monitoring purposes and a continuous flow of data, the vegetation community has been included in this report to maintain the consistency of data; and • The fauna and flora assessment occurred during a two-day site visit during the wet season/summer and was undertaken during February 2020. The assessment focussed on the Project area, specifically the proposed infrastructure and OC1 areas. Broader focus of the assessment was on the farms Klaarwater and Dalyshope.
Wetlands	• The information provided by the client forms the basis of the planning and layouts discussed; • All wetlands within 500 m of any developmental activities should be identified as per the DHWS regulations. In order to meet the timeframes constraints for the project, wetlands within the study sites were verified on a fine scale based on detailed soil and vegetation sampling. Wetlands that fall outside of the site, but that fall within 500 m of the proposed activities were delineated based on desktop analysis of vegetation gradients visible from aerial imagery; • The detailed field study was conducted on a single visit of several days and thus would not depict any seasonal variation in the wetland plant species composition and richness; • Description of the depth of the regional water table and geohydrological and hydropedological processes falls outside the scope of the current assessment (please refer to Digby Wells specialist reports in this regard); • Floodline calculations fall outside the scope of the current assessment; • A Red Data scan, fauna and flora, and aquatic assessments were not included in the current study (please see Digby Wells specialist studies in this regard); • Species composition described for landscape units aimed at depicting characteristic species and did not include a survey for cryptic or rare species;

Specialist Study	Assumptions, Uncertainties and Gaps
	• The recreation grade GPS used for wetland and riparian delineations is accurate to within five meters; • Wetland delineation plotted digitally may be offset by at least five meters to either side. Furthermore, it is important to note that, during the course of converting spatial data to final drawings, several steps in the process may affect the accuracy of areas delineated in the current report. It is therefore suggested that the no-go areas identified in the current report be pegged in the field in collaboration with the surveyor for precise boundaries. The scale at which maps and drawings are presented in the current report may become distorted should they be reproduced by for example photocopying and printing; • The calculation of buffer zones does not take into account climate change or future changes to watercourses resulting from increasing catchment transformation; and • Some sections of the study area were not accessible during the site visit. Wetlands here have been delineated using aerial photography and other visual cues. This area should ideally be assessed during a follow up study
Aquatics	• The sampled Limpopo River reach was in flood at the time of the survey, this, however, is deemed typical of the Limpopo River where flood-drought cycles have been observed in the past several years. Thus, the application of the selected assessment indices should therefore be interpreted with caution, as each of the selected indices were primarily designed for application within typical riverine systems with a moderate hydrology and diverse habitat availability; • Local farmers warned of freely-roaming dangerous animals (hippopotami and crocodiles) along the Limpopo River. While sampling, two crocodiles were spotted in the water, this restricted sampling to the shallow riverbanks where it was deemed safer; • Like-for-like comparisons of data between the current survey and the 2013 wet season survey could only be done for sites DAL 1 and DAL 3 since the positions of sites DAL 2 and DAL 4 were not the same between the two surveys; and • At the time of writing this report, layout plans for linear infrastructure such as water supply pipelines and powerlines were not finalised yet, thus the impact assessment did not include these components. Should these be made available at a later stage, it is recommended that the assessment be updated to incorporate these ancillary infrastructures.
Air Quality	• The assessment excludes the other three pits (OC2, OC3 and OC4) and only considered pit “OC1”; and • The uncertainty associated with dispersion models. Since mining activities were selected to demonstrate the worst-case scenario, the predicted model GLC may have resulted in an overestimation.

Specialist Study	Assumptions, Uncertainties and Gaps
Noise	• It is impossible to quantify and identify the numerous sources that influenced a measurement using the reading result at the end of the measurement. Therefore, trying to define ambient sound levels using the result of one 10-minute measurement can be inaccurate (very low confidence level in the results) for the reasons mentioned above. The more measurements that can be collected at a location the higher the confidence levels in the ambient sound level determined. The more complex the sound environment, the longer the required measurement. When singular measurements are used, a precautious stance must be adopted (as done in this report). • It is assumed that the measurement locations represent other residential dwellings in the area (similar environment), yet, in practice, this can be highly erroneous as there are numerous factors that can impact on ambient sound levels. • Measurements over wind speeds of 3 -5 m/s could provide data influenced by wind-induced noises; • Ambient sound levels recorded near rivers, streams, wetlands, trees and bushy areas can be high due to faunal activity, which can dominate the sound levels around the measurement point (specifically during summertime, rainfall event or during the dawn chorus of bird songs). This generally is still considered naturally quiet and accepted as features of the natural baseline, and in various cases sought after and pleasing. Using this data to define the ambient sound level will result in a higher rating level, and data collected close to such measurement locations will not be considered; • Considering one or more sound descriptor or equivalent can improve an acoustical assessment. Parameters such as LAMin, LAeq, LAMax, LA10, LA90 and spectral analysis forms part of the many variables that can be considered. However, South African legislation requires consideration of the impulse-weighted LAeq setting that will be considered when measuring ambient sound levels; • Exact location of a sound level meter in an area in relation to structures, infrastructure, vegetation, wetlands and external noise sources will influence measurements. It may determine whether you are measuring anthropogenic sounds from a receptors dwelling, or measuring environmental ambient baseline contributors of significance (faunal, roads traffic, railway traffic movement etc.); • The impact of atmospheric absorption is simplified and very uniform meteorological conditions are considered. This is an over-simplification and the effect of this in terms of sound propagation modelling is difficult to quantify; • Acoustical characteristics of the ground are over-simplified, with ground conditions accepted as uniform. Ground conditions will not be considered in this assessment;

Specialist Study	Assumptions, Uncertainties and Gaps
	• Due to these assumptions, modelling generally could be out with as much as +10 dBA, although realistic values ranging from 3 dBA to less than 5 dBA are more common in practice; • Noise experienced at a certain location is the cumulative result of innumerable sounds emitted and generated both far and close, each in a different time domain, each having a different spectral character at a different sound level. Each of these sounds is also impacted differently by surrounding vegetation, structures and meteorological conditions that result in a total cumulative noise level represented by a few numbers on a sound level meter; • It was assumed the mitigation measures proposed for the construction phase will be implemented and continued during the operational phase; • This assessment did not include a noise audit to identify all potential noise sources nor to define the sound power emission levels of these activities (and equipment) within the focus area but used aerial images to identify potential noise generating activities. These noise generating activities was used to develop the noise contours to illustrate the impact from existing activities; and • Modelling cannot capture the potential impulsive character of a noise that can increase the potential nuisance factor.
Visual	• Despite the evidence presented in this report, it must be noted that a VIA is arguably subjective by nature. This subjectivity is due to the different opinions that receptors may have of a proposed project; • The VIA modelling process includes a viewshed analysis, which takes topography and proposed development dimensions into account. Certain factors that have the potential to reduce or increase the visual impact of a proposal development have not been accounted for as part of the modelling process including vegetative cover and weather conditions. For instance, vegetation near a receptor's viewpoint can greatly reduce that receptor's view of a proposed project. Weather conditions and seasonal changes can also affect a receptor's view of a proposed project; • A topographical model was created using the available 5-m resolution (where resolution refers to the minimum mapping unit) contour data from Chief Directorate: National Geo-Spatial Information (CD:NGI). The CD:NGI 5-m contour dataset is a South African dataset with coverages restricted to the national extent. As a component of the modelling environment extended beyond South Africa's border in Botswana, elevation data supplements had to be made with the 30-m resolution ALOS World 3D-30m (AW3D30) dataset;

Specialist Study	Assumptions, Uncertainties and Gaps
	• It must be noted that vegetation and existing surface infrastructure around the proposed development was not included in the theoretical viewshed model, due to the elevation inputs into the modelling process being Digital Terrain Model (DTM) in nature, opposed to a Digital Surface Model (DSM); • A limitation to this study was that some infrastructure heights were not available, and assumptions were made in this regard. These assumptions were based on the heights of infrastructure from similar projects; and • At the time that this VIA was conducted, no aerial imagery and associated site-specific contour data was made available. The accuracy of the elevation data therefore relates to the CD:NGI and AW3D30 products. Alternative sources of aerial imagery were therefore used to characterise the study area, which included interpretations from satellite imagery hosted through the Google Earth platform. Digby Wells has, however; validated the receptor identification process by conducting a site visit to the Project area.
Cultural Heritage	• Whilst every attempt was made to obtain the latest available information, the reviewed literature does not represent an exhaustive list of information sources for the various study areas; • Heritage resources identified previously within the Project area through the previous pre-disturbance survey or other heritage assessments were not verified in-field; • Archaeological and palaeontological resources commonly occur at subsurface levels. These types of resources cannot be adequately recorded or documented by assessors without destructive and intrusive methodologies and without the correct permits issued in terms of Section 35 of the NHRA; • The final infrastructure design layout was not available at the time of the pre-disturbance survey or compilation of this report; and • Details regarding the infrastructure required for the water supply, electricity supply and transportation of the coal were not confirmed at the time of the pre-disturbance survey or compilation of this report.
Social	• Due to the national hard lockdown associated with COVID-19, stakeholder's reluctance to hold one-to-one meetings after the easing of the lockdown, their non-responsiveness to emails communication (with short social questionnaires) and telephonic interviews consultation - only a limited number of stakeholders were consulted as part of the social specialist study. Stakeholders consulted included the directly affected landowner (the farmer currently leasing the farms Dalyshope and Klaarwater), and representatives from the Lesedi community who were interviewed as part of the SLP at the beginning of 2020;

Specialist Study	Assumptions, Uncertainties and Gaps
	• The report used secondary data that was drawn from Census 2011 as the last official census and Community Survey 2016. Data from the latter is only available on municipal level (i.e. not always at the ward level). It must be further noted that since 2001, the ward boundaries within the LLM have been regularly changing. For example, the Project would have been located in Ward 1 in 2000 if this study was undertaken in 2006 or 2009 and in Ward 2. In addition, due to travel restrictions and other COVID-19 related regulations, the data could not be augmented with primary data in the form of interviews and a site visit; and • A socio-economic survey was not conducted with households located in the primary study area (Ward 3). Instead, the socio-economic indicators were derived from official census data, on ward level, where available (2011; 2016).
Blast and Vibration	• The data provided from client and information gathered was sufficient to conduct this study. Surface surroundings change continuously, and this should be considered prior to initial blasting operations considered. This report may need to be reviewed and updated if necessary. This report is based on data provided and internationally accepted methods and methodology used for calculations and predictions.
Rehabilitation and Closure	• The information contained within the RCP is based on the current plans and information provided by Universal and it is assumed that these are accurate; • Digby Wells compiled the report considering information from work previously completed by other specialists, and information supplied by Universal/Anglo and it is assumed that these are accurate; • Project consists of a natural, untouched area (i.e. greenfield land); • The recommendations contained within the RCP currently exclude any comments or issues raised by stakeholders and/or Interested and Affected Parties (I&APs); and • The RCP report must be considered as a dynamic document.

21 Item 3(t): Reasoned Opinion as to Whether the Proposed Activity should or should not be Authorised

The proposed Dalyshope Project is not without risk and impact, however, after careful assessment the potential impacts associated with the proposed activities, can be mitigated and managed to have a minimal impact. A summary of the specialists' findings which has informed the EAP's opinion is summarised in Section 21.1 below.

21.1 Reasons why the Activity should be Authorised or Not

Various specialist studies were undertaken during the EIA Phase with the objective of identifying and weighing anticipated impacts and risks associated with the proposed activities. The findings of the impact assessment have shown that the Dalyshope Project will have impacts on the receiving environment, namely, the loss of topsoil on cleared land, soil erosion, subsequent sedimentation of wetland and river systems and loss of habitats and protected species. The site is also characterised by ecologically sensitive areas, especially with regards to flora, fauna, and wetlands.

In terms of fauna and flora, highly sensitive species were identified within the development footprint. The recommended mitigation measures will not restore protected species that will be removed as a result of the Project. Therefore, the Ecologist has advised that a Tree Removal Permit application would be required to remove protected trees and that these species (including Baboon Spider nests) should be relocated. Therefore, an offset assessment is recommended to compensate for significant residual adverse impacts.

The wetlands specialist has identified three wetlands within the Project area, however; the Applicant does not intend to mine these sensitive areas and will adhere to the mitigation measures provided by the specialist. The layout plan has also been revised to take these sensitive areas into consideration. Further to this, due to the lack of watercourses draining into the Limpopo River and a gentle slope (0° to 2°) between the Project area and the Limpopo River (Digby Wells, 2013), it is deduced that the proposed Project's footprint will result in minor impacts onto the Limpopo River provided all mitigation measures are implemented properly.

The Surface Water Impact Assessment has also highlighted that the Project area is located in a catchment with scarce water resources and water availability, which is exacerbated by low MAP, high evaporation and endoreic areas within the catchment. Therefore, an adequate external water supply is required prior to the commencement of the Dalyshope Project.

The potential positive impacts of the proposed Project include the creation of jobs, generation of wealth within the community and economy and potential community development through the implementation of the SLP.

Based on the assessment of the impacts associated with the Project, it is concluded that the proposed Dalyshope Project should be authorised, provided that the mitigation measures proposed herein are applied diligently. It should, however, be noted that the feasibility of the Project depends on securing the required external water supply.

21.2 Conditions that must be Included in the Authorisation

All mitigation measures included in this EIA/EMP Report and the associated specialist studies should be conditions to the authorisation. All specialist recommendations have been captured in Table 15-1.

21.2.1 Specific Conditions to be Included into the Compilation and Approval of the EMPR

The following specific conditions are proposed:

- The mitigation/enhancement measures contained in the attached specialist reports and EMPr must be adhered to;
- An independent ECO must be appointed for the construction phase of the proposed activities to conduct environmental inspections on a monthly basis;
- Monitoring must be undertaken as described in the monitoring programme provided in Part B Section 8;
- CFPs must be developed for the construction phase in the event of accidental exposure of unidentified heritage resources;
- The closure cost assessment should be updated and submitted as per the legislative requirements;
- Performance assessments must be undertaken as set out in conditions for authorisation and license conditions;
- The Rehabilitation Plan will be implemented concurrently; A fauna and flora offset must be implemented prior to any activities taking place;
- A fauna and flora offset must be implemented prior to any activities taking place;
- A water source must be identified pre-construction;
- No mining/ development should occur within the wetland areas or the associated buffer zones; and
- A WUL in terms of Section 21 of the NWA must be issued by the DWS prior to any activities taking place.

21.2.2 Rehabilitation Requirements

The rehabilitation requirements, as set out in the rehabilitation plan (Appendix R) will be adhered to.

22 Item 3(u): Period for which the Environmental Authorisation is Required

The expected LoM for the Dalyshope Project is 30 years. The Environmental Authorisation should be aligned to this LoM.

23 Item 3(v): Undertaking

The undertaking required to meet the requirements of this section is provided at the end of the EMPr in Part B, Section 12.

24 Item 3(w): Financial Provision

The financial provision is done in terms of regulation 53 and 54 of the MPRDA regulations (2004) and in accordance with the requirements of NEMA, as amended which provides that the holder of a mining right must make full financial provision for rehabilitation of negative environmental impacts.

The closure cost calculation is aligned with the Financial Provision Regulations, 2015 (GN R. 1147) as amended. The estimated financial provision for the first year, 10-year forecast and LoM for Dalyshope is **R77,788,977, R654,911,299** and **R539,699,486** respectively (excl. VAT). The closure cost estimate breakdown is included Table 24-1 below.

Table 24-1: 1st Year, 10 Year and LoM Closure Cost Summary

Area and Description	1 Year Disturbance	10 Year Forecast	Life of Mine
Infrastructure and Rehabilitation			
Area 1: Plant & Related Infrastructure	R54,028	R6,307,727	R6,307,727
Area 2: Water Management Facilities	R3,339,752	R3,339,752	R3,339,752
Area 3: Other Infrastructure	R16,576,314	R21,883,713	R21,883,713
Area 4: Stockpiles, Dumps and Pit	R32,332,853	R472,053,325	R376,323,718
Area 5: Offices	R311,024	R311,024	R311,024
Area 6: Linear Infrastructure	R4,040,913	R7,327,864	R7,327,864
Sub-total	**R56,654,884**	**R511,223,405**	**R415,493,798**
Monitoring and Maintenance			
Monitoring Costs 10 years (Groundwater and Surface water)	R3,960,050	R3,960,050	R3,960,050
Monitoring Costs 3 years (Vegetation)	R45,904	R157,632	R213,425
Maintenance Costs 3 years (Vegetation)	R2,964,417	R11,764,361	R16,158,763
Sub-total	**R6,970,371**	**R15,882,042**	**R20,332,238**
Preliminary and General	R8,498,233	R76,683,511	R62,324,070
Contingency	R5,665,488	R51,122,341	R41,549,380
TOTAL	**R77,788,977**	**R654,911,299**	**R539,699,486**

The Closure Cost Report is included in Appendix R. The closure cost calculation using the DMRE rule-based model has been undertaken for the first year of mining and the LoM. The estimated financial provision for the Dalyshope Project is **R 31,634,761** for year 1 and **R 337,542,083** for the LoM (Incl. VAT) (this is base money value) and is summarised in Table 24-2 below.

Table 24-2: 1st Year and LoM Closure Cost Summary

Component	Description	Total Cost (1st Year)	Total Cost (LoM)
1	Dismantling of processing plant & related structures (incl. overland conveyors & Power lines)	R 0	R 102,466
2 (A)	Demolition of steel buildings & Structures	R 5,600,085	R 6,322,457
2 (B)	Demolition of reinforced concrete buildings & structures	R 2,906,154	R 35,515,406
3	Rehabilitation of access roads	R 2,366,126	R 3,273,835
4(A)	Demolition & rehabilitation of electrified railway lines	R 0	R 0
4(B)	Demolition & rehabilitation of non-electrified railway lines	R 0	R 0
5	Demolition of housing &/or administration facilities	R 1,387,725	R 1,387,725
6	Open pit rehabilitation including final voids & ramps	R 1,108,758	R 89,512,919
7	Sealing of shafts, adits & inclines	R 0	R 0
8(A)	Rehabilitation of overburden & spoils	R 1,522,679	R 21,089,102
8(B)	Rehabilitation of processing waste deposits & evaporation ponds (basic, salt producing waste)	R 0	R 0
8(C)	Rehabilitation of processing waste deposits & evaporation ponds (acidic, metal-rich waste)	R 1,031,808	R 38,653,121
9	Rehabilitation of subsided areas	R 0	R 0
10	General surface rehabilitation	R 1,189,804	R 2,736,656
11	River diversions	R 0	R 0
12	Fencing	R 2,726,478	R 2,726,478
13	Water management	R 229,319	R 18,513,530
14	2 to 3 years of maintenance & aftercare	R 429,193	R 10,193,622
15(A)	Specialist studies	R 0	R 0
	Total cost + Weighting Factor 2	**R 22,547,941**	**R 253,030,047**
	Preliminary and General	R 2,705,753	R 15,181,803
	Contingency	R 2,254,794	R 25,303,005
	VAT (15%)	R 4,126,273	R 44,027,228

Component	Description	Total Cost (1st Year)	Total Cost (LoM)
	Grand Total(Incl. VAT)	R 31,634,761	R 337,542,083

24.1 Explain how the Aforesaid Amount was Derived

Digby Wells calculated the financial provision for the Project in accordance with the Financial Provision Regulations (2015) (GN R. 1147), of which Regulation 10 requires a Mining Right Applicant to determine the financial provision through detailed itemisation of all activities and costs. The financial provision model was compiled using Microsoft Excel, and comprises of the following:

- An input sheet, containing measurements of the infrastructure;
- A standard rate sheet; and
- A summary sheet, which summarizes the costs for closure.

24.1.1 Rates

The DMRE rates were published in 2005, however, due to inflation, are no longer accurate. The 2005 Master Rates have been updated using an inflationary figure to reflect the current 2020 rates.

24.1.2 DMRE Classification

The DMR Guideline Document classifies a mine according to a number of factors which allows one to determine the appropriate weighting factors to be used during the quantum calculation. The following factors are considered:

- The mineral mined;
- The risk class of the mine;
- Environmental sensitivity of the mining area;
- Type of mining operation; and
- Geographic location.

Once the risk class (i.e. Class A, B or C) and the sensitivity of the area where the mine is located (i.e. Low, Medium or High) had been determined, the unit rates for the applicable closure components were identified. The classification of the Project area has been summarised in Table 24-3. It must be noted, however, that of the 18 closure components that exist, only three are influenced by the risk class and sensitivity, the remaining 15 have a standard multiplication factor, irrespective of the class or sensitivity.

Table 24-3: Mine Classification

Mine	Risk Class	Sensitivity	Terrain	Proximity to Urban Area
Dalyshope	A	High	Flat	Remote

24.2 Confirm that this Amount can be Provided for from Operating Expenditure

Anglo/Universal has made provision for closure as legally required. A liability assessment update will continue to be undertaken annually to ensure the financial provision is in line with the closure cost.

25 Item 3(x): Deviations from the Approved Scoping Report and Plan of Study

The layout plan was amended to include the stockpiles and overburden dumps. The footprint of the opencast pit was also revised to take the wetland buffer into consideration (Figure 5-1)

26 Item 3(y): Specific Information Required by the Competent Authority

The sub-sections below provide additional information which should be considered by the competent authority for the Project. The impact on the socio-economic conditions and the potential impacts and risks on heritage resources are considered below.

26.1 Impact on the Socio-economic Conditions of any Directly Affected Person

The potential socio-economic impacts expected to arise as a result of the Project have been investigated and assessed in the Social Impact Assessment (Appendix O). The findings of this report take into consideration the project's proposed activities, location of the project, the status of the existing socio-economic environment, and the ultimate effect that the project will have on this environment. The pre- and post-mitigation ratings assigned to the various impacts discussed in the report are summarised in Table 26-1 below. A total of 15 socio-economic impacts were identified for the proposed Project, of which six were rated positive and nine negative. It was found that the majority of impacts fall within ratings of minor positive and moderate negative.

Adequate mitigation measures are expected to reduce the significance of negative impacts to acceptable levels, while positive impacts will be enhanced to maximise benefits to surrounding communities such as the sustainable development of the local economy. It is recommended that the mitigation measures, where relevant, be incorporated into the contract conditions to be issued to the contractors. Measures should also be put in place to monitor and assess the implementation of these mitigation measures and to take corrective action where necessary. If land acquisition occurs, care must be taken in ensuring that any vulnerable persons and sensitive land occupiers are considered in any management measures.

Table 26-1: Summary of Socio-Economic Impacts

Phase	Activity	Aspect	Impacts	Rating (Pre-Mitigation)	Rating (Post Mitigation)
Construction	All Construction Activities	Socio-economic	Creation of Employment Opportunities	Minor (positive)	Minor (positive)
Construction	• Site/vegetation clearance'; • Temporary PCD; • Contractors laydown yard; • Access and haul road construction; • Infrastructure construction; • Diesel storage and explosives magazine; • Septic tanks; and • Topsoil stockpiling.	Socio-economic	Opportunities and Capabilities within the Supply Chain	Minor (positive)	Moderate (positive)
Construction	All project related activities as sociated with construction and operations.	Socio-economic	Change Sense of Place	Moderate (negative)	Minor (negative)
Construction	All project related activities associated with construction and operation.	Socio-economic	Impacts associated with Population Influx	Moderate (negative)	Minor (negative)
Construction	All project related activities associated with construction and operation	Socio-economic	Community unrest due to perceived lack of economic opportunities and unfulfilled promises.	Moderate (negative)	Minor (negative)
Operational	• Open pit establishment • Removal of rock (blasting) • Stockpiling (rock dumps, soft dumps, soils, ROM, product, discard dump) establishment and operation.	Socio-economic	Creation of employment, work skills development and experience.	Minor (positive)	Moderate (positive)
Operation	All project related activities associated with construction and operation.	Socio-economic	Opportunities and Capabilities within the Supply Chain.	Minor (positive)	Moderate (positive)
Operational	All project related activities associated with construction and operation.	Socio-economic	Multiplier effects on the local and regional economy.	Minor (positive)	Moderate (positive)
Operational	Water use and storage on-site – during the operation water will be required for various domestic and industrial uses.	Socio-economic	Increased competition for water resources.	Major (negative)	Moderate (negative)
Operational	• Open pit establishment; • Removal of rock (blasting); and • Stockpiling (rock dumps, soft dumps, soils, ROM, product, discard dump) establishment and operation.	Socio-economic	Potential economic impacts on eco-tourism operators and establishments.	Moderate (negative)	Moderate (negative)
Operational	Blasting	Socio-economic	Impacts associated with Blasting on Neighbouring Landowners	Moderate (negative)	Minor (negative)
Operational	All project related activities associated with construction and operation.	Socio-economic	Workforce health, safety and security risks	Moderate (negative)	Minor (negative)

Phase	Activity	Aspect	Impacts	Rating (Pre-Mitigation)	Rating (Post Mitigation)
Operational	All project related activities associated with construction and operation.	Socio-economic	Social Development as part of the SLP.	Minor (positive)	Moderate (positive)
Operation	All project related activities associated with construction and operation.	Socio-economic	Impacts to community health safety and security.	Moderate (negative)	Moderate (negative)
Decommissioning	Decommissioning	Socio-economic	Economic boom-bust after the construction and operation phases.	Moderate (negative)	Minor (negative)

26.2 Impact on any National Estate Referred to in Section 3(2) of the National Heritage Resources Act

The HIA (Appendix N) was completed as part of this Project. Potential impacts and risks on heritage resources were investigated and assessed, and where possible, mitigation measures were provided. Thirty-two (32) heritage resources, comprising isolated occurrence representing Stone Age and isolated occurrence representing the Farming Community Period were identified during the field and verification surveys. The assessment of the Cultural Significance (CS) and field ratings demonstrated that the identified archaeological resources have negligible CS. There are no envisaged impacts to the heritage resources of significance from Project activities.

27 Item 3(z): Other Matters Required in Terms of Sections 24(4)(a) and (b) of the Act

This section is not applicable to the proposed Project.

DIGBY WELLS
ENVIRONMENTAL

Part B: Environmental Management Programme Report

1 Item 1(a): Details of the EAP

Digby Wells Environmental (Digby Wells) has been appointed as the independent Environmental Assessment Practitioner (EAP) to conduct the Environmental Authorisation Application and the Integrated Water Use Licence Application (IWULA) application processes, the associated specialist studies and the required Public Participation Process for the proposed Dalyshope Project in the Limpopo Province of South Africa. The details of the EAP are contained in the table below and the Curriculum Vitae and Qualifications of the EAP are attached in Appendix A.

Table 1-1: Contact details of the EAP

Name of Practitioner:	Xan Taylor
Telephone:	+27 11 789 9495
Fax:	+27 11 789 9495
Email:	Xan.Taylor@digbywells.com

2 Item 1(b): Description of the Aspects of the Activity

Anglo/Universal intends to develop the Dalyshope Project near Steenbokpan, Limpopo Province. The plan of study was approved in the Scoping Report, which was approved by the DMRE on 18 September 2020. This EMPr has been compiled as a tool which will be utilised to manage and mitigate as far as possible against any potential adverse environmental impacts associated with each phase of the Dalyshope Project.

A number of specialist studies were undertaken as part of the environmental regulatory process during the EIA Phase for the proposed Project. Table 2-1 below provides each aspect investigated and the appendix they are found under. Specialist studies are valuable as they investigate the bio-physical and socio-economic environmental aspects of the Project area.

Table 2-1: Specialist Reports and Associated Appendices

Specialist Study	Appendix
Visual Impact Assessment	Appendix D
Soil, Land Use and Land Capability Assessment	Appendix E
Surface Water Assessment	Appendix F
Groundwater Assessment	Appendix G
Geochemical and Waste Classification Assessment	Appendix H
Fauna and Flora Assessment	Appendix I
Wetland Assessment	Appendix J
Aquatics Impact Assessment	Appendix K
Air Quality Assessment	Appendix L

Specialist Study	Appendix
Noise Assessment	Appendix M
Heritage Assessment	Appendix N
Social Assessment	Appendix O
Blast and Vibration Assessment	Appendix P
Traffic and Transport Assessment	Appendix Q
Rehabilitation and Closure Assessment	Appendix R

3 Item 1(c): Composite Map

A composite map is shown in Figure 3-1 (also found in Appendix B), which depicts the mining associated infrastructure and environmental aspects assessed which informed the impact assessment.

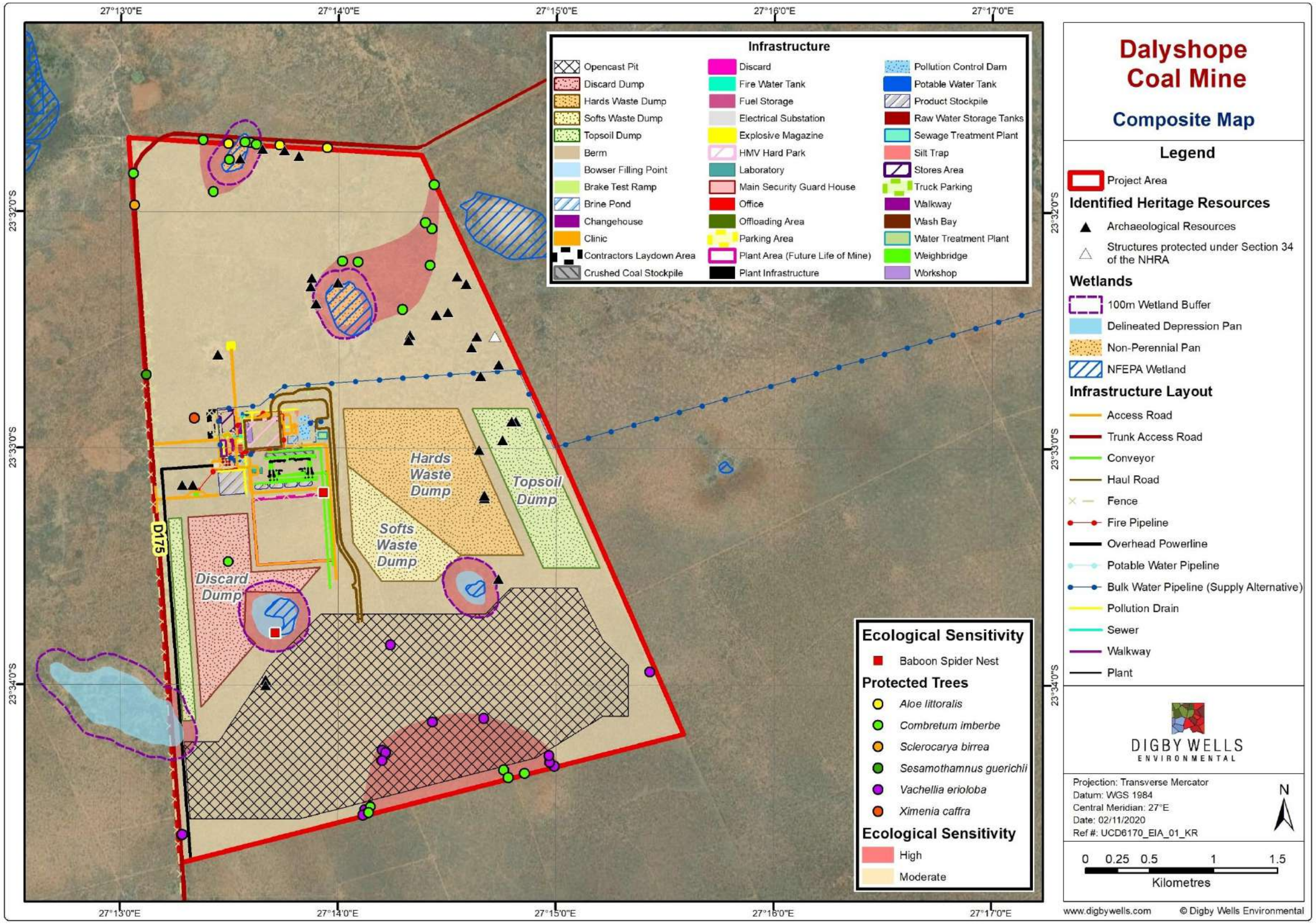


Figure 3-1: Composite Map of Environmental Sensitivities within the Mining Right Boundary

4 Item 1(d): Description of Impact Management Objectives Including Management Statements

The Closure and Rehabilitation Phases of the Project are important as their successful management aims to return the Project area, as much as possible, to its original state of environment. The following subsections describe the closure objectives, the Emergency Response Plan, the possibility of Acid Mine Drainage (AMD) and measures to assess and remedy AMD post-closure.

4.1 Item 1(d)(i): Determination of Closure Objectives

Closure and rehabilitation are a continuous series of activities that begin with planning prior to the Project's design and construction, and end with achievement of long-term site stability and the establishment of a self-sustaining ecosystem. Not only will the implementation of this concept result in a more satisfactory environmental conclusion, but it will also reduce the financial burden of closure and rehabilitation. The following points outline the main objectives for rehabilitation and closure:

- To return land impacted by relevant infrastructure as far as possible to a land capability to that which existed prior to mining or as close as possible thereto. To also ensure that the management level required to utilise the rehabilitated land is within the means of the surrounding land uses;
- To ensure that as little water as possible seeps out of the waste dump during operational phase and where this is unavoidable, to ensure that the water is contained or treated if it does not meet statutory water quality requirements. Prevent any soil and surface/groundwater contamination by managing all water on site;
- To remove infrastructure that cannot be used by a subsequent landowner or a third party. Where buildings can be used by a third party, arrangements will be made to ensure their long term sustainable use;
- To clean up all coal stockpiles and loading areas and rehabilitate these as far as possible to a land capability to that which existed prior to mining;
- To follow a process of closure that is progressive and integrated into the short and long-term plans and that will assess the closure impacts proactively at regular intervals throughout the Project life. Implement progressive rehabilitation measures, beginning during the construction phase wherever possible;
- To leave a safe and stable environment for both humans and animals and make their condition sustainable;
- To comply with local and national regulatory requirements;
- To form active partnerships with local communities to take care of management of the land after mining, where possible; and

- To maintain and monitor all rehabilitated areas following re-vegetation or capping and, if monitoring shows that the objectives have been met, making an application for closure.

4.2 Item 1(d)(ii): The Process for Managing any Environmental Damage, Pollution, Pumping and Treatment of Extraneous Water or Ecological Degradation as a Result of Undertaking a Listed Activity

Listed and specified activities associated with the Dalyshope Project area will result in ecological degradation and environmental damage and pollution. The potential impacts associated with such activities have been identified and assessed for each environmental aspect in Section 11.1, Part A. Mitigation measures have been provided to reduce the significance of these associated impacts in Section 6 below. In addition, monitoring programmes have been provided in Section 8 below to monitor potential impacts, which will allow alternative mitigation measures to be implemented if necessary.

The construction of the proposed Dalyshope Mine will result in the loss of agricultural land, protected species, and grasslands. The loss of protected species will be compensated for through an offset strategy. The loss of agricultural and grassland areas is unavoidable. However, processes for managing environmental damage and ecological degradation are to ensure that water and sediment from the operational areas are contained and do not report to the catchment, which will prevent surface water quality deterioration and resultant impacts on the wetlands and aquatic ecosystems. This can be achieved by implementing a Storm Water Management Plan (SWMP), constructing preventative measures such as berms and implementing the use of buffer zones. Similarly, erosion and generation of dust from exposed areas must be managed through dust suppression and limiting the areas cleared to operational areas only and rehabilitation of disturbed areas.

An Emergency Response Plan, which details a process to respond rapidly and effectively to and manage emergency situations that may arise at the mine should be implemented. The Environmental Response Plan must have the following objectives:

- Categorisation of emergency situations through hazard identification and to define procedures for responses to the situations;
- Assigning responsibilities for responding to emergency situations;
- Implementation of an effective system to receive, record and communicate reports of environmental incidents and emergencies; and
- Ensuring that all environmental incidents or emergencies are investigated, and the necessary procedures are in place to implement corrective and preventative actions to a recurrence of the incident.

The Emergency Preparedness and Response Code of Practice will be compiled in accordance with the Occupational Health and Safety OHSAS 18001 and Mine Health and Safety Act, 1996 (Act No. 29 of 1996).

In the event of an emergency, the Emergency Response Plan/Procedure will be consulted, and the required actions implemented. To facilitate the effective implementation of the procedures, copies of the Emergency Response Plan will be placed in accessible and visible locations around the site.

4.3 Item 1(d)(iii): Potential Risk of Acid Mine Drainage

Acid Mine Drainage is metal-rich water formed from chemical reaction between water and rocks containing sulphur-bearing minerals. The runoff formed is usually acidic and frequently comes from areas where ore or coal mining activities have exposed rocks containing pyrite, a sulphur bearing mineral.

Anglo/Universal will be mining coal and consequently there is an increased potential for the formation of AMD if proper mitigation measures are not implemented. Post-mining water decant commonly occurs once the final void has been rehabilitated and groundwater levels return to a natural level. This often produces acid, giving way to AMD. If AMD is encountered, there is a very high risk that there will be significant long-term negative impacts on surface water and groundwater quality and on aquatic systems, unless the decant water is effectively intercepted, collected and treated.

A geochemical assessment is currently being undertaken for this application process to assess the potential for AMD from the proposed coal mining activities and will be included in the Final EIA.

4.4 Item 1(d)(iv): Steps taken to Investigate, Assess, and Evaluate the Impact of Acid Mine Drainage

Eight waste rock samples were taken for laboratory analyses. Given the nature of this project, there is an increased potential for the formation of AMD, hence the need to investigate this aspect thoroughly. The report and findings of the investigation thereof will be included in the Final EIA report.

4.5 Item 1(d)(v): Engineering or Mine Design Solutions to be Implemented to Avoid or Remedy Acid Mine Drainage

Possible mitigation measures could include the following:

- Stockpile acid generating material separately from non-acid generating material (if applicable);
- Concurrent rehabilitation to be undertaken during the operational life of the mine. Care must be taken when placing material back into the opencast pit in terms of the sequence that the material is placed back. This is important to minimise impacts post closure with respect to the surface and groundwater environments;

- Monitoring these locations on a quarterly basis for the next 10 years to identify trends and to determine if AMD is occurring;
- Place the acid generating material (potential acid generating waste rock) at the bottom of the pit and encapsulate this material with a clay layer (limited to the lower lying areas). This minimises the movement of oxygen between the acid generating and non-acid generating material (place acid generating material at the bottom of the pit);
- Identify groundwater and surface water monitoring locations that are related directly downstream of the decant positions;
- Preventing oxygen ingression by rehabilitating the opencast pit area with an upper layer of soil which is placed over a layer of weathered material or using a capping layer of clay;
- Preventing water from ponding on rehabilitated areas and ensure a free draining environment over rehabilitated areas;
- On-going biomonitoring post closure; and
- Investigations into the potential of constructing a water treatment facility post closure to treat AMD water.

4.6 Item 1(d)(vi): Measures That Will be Put in Place to Remedy any Residual or Cumulative Impact that may Result from Acid Mine Drainage

Based on the 2014 Digby Wells geochemistry work that is now compared to the NEM:WA 2014 guidelines, the following assumptions can be made:

- Coal may be classified as at least type 4 waste based on the Total Concentration Threshold, which means no liner is required. However, the Leachate Concentration Threshold test was not conducted to solidify the conclusion; and
- Waste rock samples demonstrate similar chemistry to the coal material. However, results from the lab are still pending and will be included in the Final EIA report.

4.7 Item 1(d)(vii): Volumes and Rate of Water Use Required for the Mining, Trenching or Bulk Sampling Operation

The water balance indicates that the water that needs to be sourced from external sources at the inception of mining in Dalyshope is 1 488 373 m^3/annum, which decreases to 495 318 m^3/annum during year 1 to year 4 of mining operations. The reduction of the required external water may be attributed to water being recycled within the mine reticulation and contribution of flow from mine areas.

During year 5 of operations, the water that needs to be sourced externally increases from 495 318 m^3/annum to 828 976 m^3 in year 5. This increase in demand is mainly due to the increase in water consumption by the mine plant in order to increase tonnage of coal production. A further increase in coal production during year 6 to year 28 of mining operations is estimated to increase the water to be sourced externally from 828 976 m^3/annum to 1 629 367 m^3/annum.

The water reticulation system at Dalyshope Mine is presented in Table 4-1 to Table 4-3 below for the different phases of production.

4.8 Item 1(d)(viii): Has a Water Use Licence Been Applied for?

Anglo/Universal will be applying for a Water Use Licence from DWS as per the requirements in terms of the National Water Act, 1998 (Act No. 36 of 1998) (NWA). The Project infrastructure and activities trigger water uses in terms of Section 21 of the NWA and as such a Water Use Licence is required. This can only be applied for once the source(s) of water can be determined and volumes each source will need to provide to meet the demand of the LoM.

Table 4-1: Annual Water Balance for Year 1 to Year 4 Scenario in the Dalyshope Mine

Annual Average Water Balance for Dalyshope Mine					
	Water In		**Water Out**		**Balance**
Facility Name	**Water Circuit/stream**	**Quantity (m^3/a)**	**Water Circuit/stream**	**Quantity (m^3/a)**	
Raw water storage tank	External water supply (under investigation)	495,318	Mine Plant	1,296,000	
	PCD	993,055	Water Treatment Plant	19,091	
			Water in storage	173,282	
	Total	**1,488,373.25**		**1,488,373.25**	0
PCD	Rainfall	6,252	Dust Suppression	175,018	
	Pit Dewatering	210,181	Evaporation	27,702	
	Mine Plant/Raw water storage tank	907,200	Raw water storage tank	993,055	
	Mine Plant Area	546			
	Dumps (Hards, Softs and Discard)	3,557			
	Product Stockpile Area	63			
	Hard Park, Workshop and Fuel Storage Areas	50,345			
	Brine pond	2,011			
	Sewage Treatment Plant	15,620			
	Total	**1,195,774.45**		**1,195,774.45**	0
Mine Plant	Raw water storage tank	1,296,000	Losses	388,800	
			PCD	907,200	
	Total	**1,296,000.00**		**1,296,000.00**	0
Workshop, Offices and Ablution Facilities	Water Treatment Plant	19,091	Consumption and other uses	1,736	
			Sewage Treatment Plant	17,356	
	Total	**19,091.33**		**19,091.33**	0
Sewage Treatment Plant	Workshop; Offices & Ablution Facilities	17,356	PCD	15,620	
			Losses	1,736	
	Total	**17,355.75**		**17,355.75**	0
Brine Pond	Rainfall	2,011	Evaporation	1,736	
	Water Treatment Plant	1,736	PCD	2,011	
	Total	**3,746.70**		**3,746.70**	0
Pit 1	Rainfall	1,780,523	Evaporation	1,050,907	
	Groundwater inflow	321,291	PCD	210,181	
			Seepage/recharge	840,726	
	Total	**2,101,814.05**		**2,101,814.05**	0
Total Water Balance		**6,122,155.53**		**6,122,155.53**	

Table 4-2: Annual Water Balance for Year 5 Scenario in Dalyshope Mine

Annual Average Water Balance for Dalyshope Mine					
	Water In		**Water Out**		**Balance**
Facility Name	**Water Circuit/stream**	**Quantity (m^3/a)**	**Water Circuit/stream**	**Quantity (m^3/a)**	
Raw water storage tank	External water supply (under investigation)	828,976	Mine Plant	2,592,000	
	PCD	1,955,398	Water Treatment Plant	19,091	
			Water in storage	173,282	
	Total	**2,784,373.25**		**2,784,373.25**	0
PCD	Rainfall	6,252	Dust Suppression	175,018	
	Pit Dewatering	265,324	Evaporation	27,702	
	Mine Plant/Raw water storage tank	1,814,400	Raw water storage tank	1,955,398	
	Mine Plant Area	546			
	Dumps (Hards, Softs and Discard)	3,557			
	Product Stockpile Area	63			
	Hard Park, Workshop and Fuel Storage Areas	50,345			
	Brine pond	2,011			
	Sewage Treatment Plant	15,620			
	Total	**2,158,116.83**		**2,158,116.83**	0
Mine Plant	Raw water storage tank	2,592,000	Losses	777,600	
			PCD	1,814,400	
	Total	**2,592,000.00**		**2,592,000.00**	0
Workshop, Offices and Ablution Facilities	Water Treatment Plant	19,091	Consumption and other uses	1,736	
			Sewage Treatment Plant	17,356	
	Total	**19,091.33**		**19,091.33**	
Sewage Treatment Plant	Workshop; Offices & Ablution Facilities	17,356	PCD	15,620	
			Losses	1,736	
	Total	**17,355.75**		**17,355.75**	0
Brine Pond	Rainfall	2,011	Evaporation	1,736	
	Water Treatment Plant	1,736	PCD	2,011	
	Total	**3,746.70**		**3,746.70**	0
Pit 1	Rainfall	1,780,523	Evaporation	1,326,619	
	Groundwater inflow	872,715	PCD	265,324	
			Seepage/recharge	1,061,295	
	Total	**2,653,237.80**		**2,653,237.80**	0
Total Water Balance		**10,227,921.65**		**10,227,921.65**	

Table 4-3: Annual Water Balance for Year 6 to Year 28 Scenario in the Dalyshope Mine

Annual Average Water Balance for Dalyshope Mine					
	Water In		**Water Out**		**Balance**
Facility Name	**Water Circuit/stream**	**Quantity (m^3/a)**	**Water Circuit/stream**	**Quantity (m^3/a)**	
Raw water storage tank	External water supply (under investigation)	1,629,367	Mine Plant	5,184,000	
	PCD	3,747,006	Water Treatment Plant	19,091	
			Water in storage	173,282	
	Total	**5,376,373.25**		**5,376,373.25**	0
PCD	Rainfall	6,252	Dust Suppression	175,018	
	Pit Dewatering	242,532	Evaporation	27,702	
	Mine Plant/Raw water storage tank	3,628,800	Raw water storage tank	3,747,006	
	Mine Plant Area	546			
	Dumps (Hards, Softs and Discard)	3,557			
	Product Stockpile Area	63			
	Hard Park, Workshop and Fuel Storage Areas	50,345			
	Brine pond	2,011			
	Sewage Treatment Plant	15,620			
	Total	**3,949,724.96**		**3,949,724.96**	0
Mine Plant	Raw water storage tank	5,184,000	Losses	1,555,200	
			PCD	3,628,800	
	Total	**5,184,000.00**		**5,184,000.00**	0
Workshop, Offices and Ablution Facilities	Water Treatment Plant	19,091	Consumption and other uses	1,736	
			Sewage Treatment Plant	17,356	
	Total	**19,091.33**		**19,091.33**	
Sewage Treatment Plant	Workshop; Offices & Ablution Facilities	17,356	PCD	15,620	
			Losses	1,736	
	Total	**17,355.75**		**17,355.75**	0
Brine Pond	Rainfall	2,011	Evaporation	1,736	
	Water Treatment Plant	1,736	PCD	2,011	
	Total	**3,746.70**		**3,746.70**	0
Pit 1	Rainfall	1,780,523	Evaporation	1,212,660	
	Groundwater inflow	644,796	PCD	242,532	
			Seepage/recharge	970,128	
	Total	**2,425,319.11**		**2,425,319.11**	0
Total Water Balance		**16,975,611.09**		**16,975,611.09**	

5 Item 1(e): Impacts to be Mitigated in their Respective Phases

The proposed mitigation measures and its compliance with the relevant standards are presented in Table 5-1.

Table 5-1: Impacts to be Mitigated in their Respective Phases

Phase	Activity	Aspect	Impacts	Mitigation Measures	Compliance with standards	Time frame for implementation
Construction	• Movement of vehicles, and heavy machinery; • Site clearing, and preparation by the removal of vegetation, and topsoil, leading to the exposure of soils; • Construction of infrastructure, including access, and haul roads, contractor's laydown yard, diesel storage, and explosive magazine, and infrastructure, Offices; • Waste management activities, including handling of hydrocarbon chemicals, hauling, and transportation of waste material, transportation of product coal, and disposal of waste material; and • Temporary PCD.	• Soil, Land Use and Land Capability	• Compaction of soil; • Increased erosion, and consequently sedimentation potential; • Compaction of soil; • Increased runoff potential; • Increased wind, and water erosion, and consequently sedimentation of water bodies; • Removal of vegetation, basal cover, and thus increasing the potential of loss of topsoil, organic material, and increased erosion potential; • Compaction, ponding, and landscaping of the area; • Increased vehicle movement in the area, increasing soil compaction, and runoff potential; • Increased hardened surfaces resulting in increased hydrological functioning; • Potential spillage of hydrocarbons such as oils, fuels, and grease, thus contamination of the soils; • Increased dust, erosion, and sedimentation; • Removal of natural vegetation, and loss of basal cover; • Soil Contamination from Hydrocarbon waste (lubricants, explosives, and fuels); • Soil compaction resulting from the movement of heavy machinery within the OC1 Area; and • Soil Contamination from PCD spills.	• Keep site clearing to a minimal, and restrict vehicle movement outside of dedicated areas, specifically close to wetlands (pans); • Make use of existing roads to encourage minimal impacts/footprint to the OC1 area; • Runoff must be controlled, and managed by use of proper stormwater management measures; • After topsoil is stockpiled, it should be revegetated to limit erosion and loss of organic material; • Topsoil stockpile height should not exceed three meters: • Establishment of effective vegetation around constructed infrastructure for adequate soil protection from wind, and water erosion; • If any erosion occurs, corrective actions must be taken to minimise any further erosion from taking place at regular intervals or after high rainfall events; • While soils are being stockpiled, the soils should be revegetated to limit erosion and loss of organic material; • Vehicles should be serviced in accordance with the maintenance plans and checked that soils are not exposed to oil spills and other contaminants; • Re-fuelling must take place on bunded impervious surfaces to prevent seepage of hydrocarbons into the soil; • All vehicles and machines must be parked within hard park areas, and must be checked daily for fluid leaks; • Fuel, grease, and oil spills should be remediated using a commercially available emergency clean up kits. However, for major spills (>5L), if soils are contaminated, they must be stripped, and disposed of at a licensed waste disposal site; • Ensure proper lining of the temporary PCD as per the engineering design, and maintenance to prevent spillage, and leakages into the soils, and water resources; and • Spills should be remediated using a commercially available emergency clean up kits. However, for major spills (>5L), if soils are contaminated, they must be stripped and disposed of at a licensed waste disposal site.	• Chamber of Mines Guidelines • NEMA; and • The Conservation of Agricultural Resources Act, 1983 (Act No. 43 of 1983) (CARA).	• Life of Construction Phase.
Construction	• Site clearing; • Access and haul road construction;	• Surface Water	• Siltation of water resources due to increased turbidity from dust and soil erosion; and	• Clearing of vegetation must be limited to the development footprint, and the use of any existing access roads must be prioritised to minimise creation of new ones and a stormwater management plan should be established and implemented;	• NWA; • NEMA; • DWS Best Practice Guideline G1: Storm	• During the Construction Phase

Phase	Activity	Aspect	Impacts	Mitigation Measures	Compliance with standards	Time frame for implementation
	• Construction of Infrastructure; • Topsoil stockpiling; and • Loading, transport, tipping and spreading of materials.		• Water contamination due to leaks or spills of hazardous and hydrocarbon containing material.	• If possible, construction activities must be prioritised to the dry months of the year to limit mobilisation of sediments, dust generation and hazardous substances from construction vehicles used during site clearing; • Dust suppression with water on the haul roads and cleared areas must be undertaken to limit dust; • Hydrocarbon and hazardous waste storage facilities must be appropriately bunded to ensure that leakages can be contained. Spill kits should be in place and construction workers should be trained in the use of spill kits, to contain and immediately clean up any potential leakages or spills; • Vehicles should regularly be maintained as per the developed maintenance program. This should also be inspected daily before use to ensure there are no leakages underneath; • Drip trays must be used to capture any oil leakages. Servicing of vehicles and machinery should be undertaken at designated hard park areas. Any used oil should be disposed of by accredited contractors; and • Implementation of the proposed stormwater management plan including installation of drains, berms and storage structures.	Water Management; and • GN R 704.	
Construction	• Site clearing	• Groundwater	• Lowering of the water table if excavation during the site clearing process is going to take place below the water table.	• Fill the area with soil if it is low-laying and is below the water table. This will ensure that the construction takes place above the water table; • If trenches are going to be excavated below the water level, dewatering of the aquifer to locally lower the water table can be considered to ensure that the construction takes place above the groundwater level and the water quality remains acceptable. The abstracted water can be utilised for dust suppression, vegetation or discharged to pollution control dams for evaporation. Since the groundwater is not expected to be polluted at this stage, the utilisation of the water for activities such as dust suppression or irrigation is not expected to cause environmental impacts; and • Groundwater monitoring.	• NEMA; • NWA; • DWS Best Practice Guideline G1: Storm Water Management; and • NEM: WA.	• Groundwater monitoring must commence from the start of the construction phase; and • Protection of the water table and groundwater quality should commence with the start of the construction phase.
Construction	• Hydrocarbon spills from storage tanks, vehicles and heavy machinery or hazardous materials or waste storage facilities.		• Deterioration of groundwater quality.	• Hydrocarbons and hazardous materials must be stored in bunded areas and refuelling should take place in contained areas; • Ensure that oil and silt traps are well maintained; • Vehicles and heavy machinery should be serviced and checked in a demarcated area on a regularly basis to prevent leakages and spills; • Hydrocarbon spill kits must be available on site at all locations where hydrocarbon spills could take place; • Monitoring boreholes, particularly those located within the construction area, have to be monitored for both water level and quality to detect any changes in quality; and • If a considerable amount of fluid is accidentally spilled, the contaminated soil should be scraped off and disposed of at an acceptable dumping facility. The excavation should be backfilled with soil of good quality.		• During the Construction Phase

Phase	Activity	Aspect	Impacts	Mitigation Measures	Compliance with standards	Time frame for implementation
Construction	• Site clearing, and preparation by the removal of vegetation and associated habitats and removal of soils; • Movement of vehicles, and heavy machinery; • Construction of infrastructure, including access and haul roads, diesel storage, and explosive magazine and Open Cast Pits; and • Waste management activities, including handling of hydrocarbon chemicals, transportation of waste material, transportation of product coal, and disposal of waste material.	• Fauna and Flora	• Removal of vegetation, basal cover, and thus increasing the potential of loss of topsoil, organic material, and increased erosion potential; • Removal of flora and fauna SCC and faunal habitat; • Removal of vegetation communities such as woodlands and pans (wetlands); • Alien Invasive Plants (AIP) proliferation; • Increased runoff potential and consequently sedimentation and compaction of the soil; • Potential spillage of hydrocarbons such as oils, fuels (diesel), and grease, thus contamination of the soils and surrounding grounds; • Risk of fire during the dry season; and • Increased dust pollution.	• Keep site clearing to an absolute minimum by adhering to the Project layout only, and restrict vehicle movement outside of dedicated areas, specifically close to wetlands (pans); • Make use of existing roads to encourage minimal impacts/footprint to the Project area; • Removal of vegetation is unavoidable in some areas of the Project Area, it is thus recommended that small trees of the protected species (100 cm and below in height) be stored in a nursery for replanting purposes at the rehabilitation phase or all plants may be purchased during rehabilitation phase; • Whilst the removal of vegetation and topsoil is underway, key monitoring methods should be focussed on the prevention of AIP proliferation during the construction and operational phase. Measures must be in place to prevent the spread of AIPs; • It is recommended that AIP management plan be established to control the spread of AIP; • Erosion prevention is key thus runoff must be controlled, and managed by use of proper stormwater management measures; • Management of dust may involve the spraying of water; • Vehicles should regularly be surveyed and checked that oils spill and other contaminants are not exposed to the soils; • Storage and re-fuelling of vehicles must take place on bunded impervious surfaces to prevent seepage of hydrocarbons into the soil; • Fuel, grease, and oil spills should be remediated using a commercially available emergency clean up kits. However, for major spills (>5L), if soils are contaminated, they must be stripped, and disposed of at a licensed waste disposal site; and • Fire management plan is recommended in case of uncontrolled fires during the dry season.	• NEMA; • NEM:BA; • Limpopo Environmental Management, 2003 (Act 7 of 2003) (LEMA); and • The Convention on International Trade in Endangered Species (CITES).	• Life of Construction Phase
Construction	• Vegetation removal and surface water redirection	• Wetlands	• Changes in water flow regime.	• A temporary fence or demarcation must be erected around No-Go Areas outside the proposed works area prior to any construction taking place as part of the contractor planning phase when compiling work method statements to prevent access to the adjacent portions of the watercourse; • Effective stormwater management should be a priority during both construction and operational phase. This should be monitored as part of the EMP; • High energy stormwater input into the watercourses should be prevented at all cost. Changes to natural flow of water (surface water as well as water flowing within the soil profile) should be taken into account during the design phase and mitigated effectively; • External monitoring should commence from prior to the Construction Phase to ensure baseline information regarding soils and vegetation and to monitor any changes thereof; and • Throughout the Construction Phase, external monitoring should be done annually for soils and vegetation, preferable right after the rainy season (March to May).	• NEMA; • NWA; • NEM: BA; and • the Ramsar Convention and the South African Wetlands Conservation Programme (SAWCP).	• Pre-construction and construction

Phase	Activity	Aspect	Impacts	Mitigation Measures	Compliance with standards	Time frame for implementation
Construction	• Construction activities	• Wetlands	• Changes in sediment entering and exiting the system.	• Water may seep into trenching and earthworks. It is likely that water will be contaminated within these earthworks and should thus be cleaned or dissipated into a structure that allows for additional sediment input and slows down the velocity of the water thus reducing the risk of erosion. Effective sediment traps should be installed; • Remove only the vegetation where essential for construction and do not allow any disturbance to the adjoining natural vegetation cover; • Rehabilitation plans must be submitted and approved for rehabilitation of damage during construction and that plan must be implemented immediately upon completion of construction; • Cordon off areas that are under rehabilitation as no-go areas using danger tape and steel droppers. If necessary, these areas should be fenced off to prevent vehicular, pedestrian and livestock access; • Protect all areas susceptible to erosion and ensure that there is no undue soil erosion resultant from activities within and adjacent to the construction camp and work areas. • Runoff from the mining area must be managed to avoid erosion and pollution problems; • Implementation of best management practices; • Implement buffer zones to trap sediments; and • Monitoring should be done to ensure that sediment pollution is timeously dressed.		
Construction	• Vegetation removal	• Wetlands	• Introduction and spread of alien vegetation.	• AIPs should be continuously monitored and controlled throughout the life of the mine and thereafter; • Retain vegetation and soil in position for as long as possible, removing it immediately ahead of construction / earthworks in that area and returning it where possible afterwards; • Monitor the establishment of alien invasive species within the areas affected by the construction and maintenance and take immediate corrective action where invasive species are observed to establish; and • Rehabilitate or revegetate disturbed areas.		
Construction	• Construction activities	• Wetlands	• Loss and disturbance of watercourse habitat and fringe vegetation.	• Drying out of wetlands and loss of hydrological zonation (loss of catchment) should be monitored and addressed through an offset program.		
Construction	• Construction activities	• Wetlands	• Changes in water quality due to pollution.	• Provision of adequate sanitation facilities located outside of the watercourse or its associated buffer zone; • Implementation of appropriate stormwater management around the excavation to prevent the ingress of run-off into the excavation and to prevent contaminated runoff into the watercourse; • The development footprint must be fenced off from the watercourses and no related impacts may be allowed into the watercourse e.g. water runoff from cleaning of equipment, vehicle access etc; • Maintenance of vehicles / equipment should not take place within the watercourse or watercourse buffer; • Control of waste discharges; • Maintenance of buffer zones to trap sediments with associated toxins; • Ensure that no operational activities impact on the watercourse or buffer area. This includes edge effects;		

Phase	Activity	Aspect	Impacts	Mitigation Measures	Compliance with standards	Time frame for implementation
				• Control of waste discharges and do not allow dirty water from operational activities to enter the watercourse; • Control of waste discharges and do not allow dirty water from operational activities to enter the watercourse; • Regular independent water quality monitoring should form part of operational procedures in order to identify pollution; and • Treatment of pollution identified should be prioritized according to best practice guidelines.		
Construction	• Site clearing, access and haul road construction, and topsoil stockpiling.	• Aquatics	• Erosion and sedimentation; and • Altered hydrology.	• Limit the footprint area of the construction activities to what is essential in order to minimise impacts as a result of vegetation clearing and potential erosion areas; • If possible, construction activities must be prioritised to the dry months of the year to limit mobilisation of sediments, dust generation and hazardous substances from construction vehicles used during site clearing; • Ensure soil management programme is implemented and maintained to minimise erosion and sedimentation; and • An efficient drainage system (e.g. diversion trenches > settling area (or sump) > baffled discharge outlets) should be implemented prior to construction.	• NWA; • NEM:BA; • NEMA; and • National Freshwater Ecosystems Priority Areas (NFEPA, Nel et al., 2011).	• Prior to construction activities are initiated
Construction	• Construction activities, including vehicular activities and maintenance of haul roads.		• Water quality impairment	• Spillage management kits or controls should be taken seriously and put in place in order to reduce oil or fuel run offs to enter nearby river systems. • All vehicles must be frequently inspected for leaks; and • All waste must be removed and transported to appropriate waste facilities.		• Ongoing throughout the Construction and Operational Phases
Construction	• Site clearing; • Access and haul road construction; • Construction of infrastructure; • Topsoil stockpiling; and • Loading, transport, tipping, and spreading of materials.	• Air quality	• Reduction in the quality of ambient air due to the generation of dust.	• Apply wetting agents, dust suppressants, or binders on exposed areas; • Limit activity to non-windy days (with wind speed ≥ 5.4 m/s), where necessary and practical; • Keep the area of disturbance to a minimum and avoid any unnecessary clearing, digging, or scraping, especially on windy days; • Construct surfaces of all access roads from lateritic soils and avoid fine/colloidal (e.g. clays and silts) materials; • Minimise the drop heights when loading onto trucks and at tipping points; • Set maximum speed limits and have these limits enforced; and • Implement an air quality management plan.	• NEMA; • National Environmental Management: Air Quality Act, Act.39 of 2004, 2004; and • National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004), National Dust Control Regulations (2013).	• On commencement of the Construction Phase and for the duration of the phase
Construction	• Diesel storage and explosives magazine.		• Airborne vapour will lead to poor air quality.	• Strict adherence to products and waste management plan; • Handled, stored, and disposed of hazardous substances in accordance with the local regulations; • Store hazardous substances in clearly labelled containers; • Deal with emergencies promptly i.e. spills; and • Provision of secondary containment for fuel storage.		
Construction	• Construction activities.	• Noise	• Noise disturbance.	• The mine should construct berms between mining areas and identified NSD; • The mine must ensure that noise levels are less than 45 dBA at night at all NSD;	• Mitigation measures will assist in keeping noise levels as low as possible to comply	• During Construction Phase.

Phase	Activity	Aspect	Impacts	Mitigation Measures	Compliance with standards	Time frame for implementation
				• Include a component covering environmental noise in the Health and Safety Induction to sensitize all employees and contractors about this subject, especially those employees and contractors that have to travel past receptors at night (within 200m), or might be required to do work close (within 1,000m) to receptors at night; • Establish complaints register with an open line to a relevant person that can act if there is a noise complaint; and • It is recommended that a noise monitoring programme is developed and implemented for the construction and operational phases.	with the National Noise Control Regulations.	
Construction	• Construction activities during the day	• Noise	• Noise disturbance- All NSD	• Due to NSD R1 located within 100m from the main access road, projected noise levels would be higher than the recommended zone rating level, or the noise limit as recommended for residential use (WHO and IFC guideline). Due to the proximity to the mining area mitigation will be difficult, with the most viable option being the relocation of NSD R1.		
Construction	• Construction activities at night	• Noise	• Noise disturbance- All NSD	• Due to NSD R1 located within 100m from the main access road, projected noise levels would be higher than the recommended zone rating level, or the noise limit as recommended for residential use (WHO and IFC guideline). Due to the proximity to the mining area mitigation will be difficult, with the most viable option being the relocation of NSD R1. Other measures that would reduce the night-time noise levels at other NSD include: • the construction of berms between active and future mining areas (including the plant infrastructure) and the identified NSD. The berms should be as high as possible and should ideally break the line of sight between the mining activities and the NSD. The berms should ideally be constructed during the daytime period with the dumping of material taking place behind these berms at night; • the mine should consider the recommendations defined in Section 13 of the Noise Study (Appendix M); • the mine should implement a noise monitoring programme. Recommendations regarding a potential monitoring programme is defined in Section 14 of the Noise Study (Appendix M); and • it is recommended that the mine development team minimize night-time (22:00 – 06:00) traffic that may pass within 200 m from residential areas, such as Sandbult.		
Construction	• Site / Vegetation Clearance	• Visual	• Site / vegetation clearance will reduce the screening properties that the natural vegetation has on the environment making the project more visible to receptors.	• Only remove vegetation within the infrastructure footprint areas; and • Limit the footprint area of surface infrastructure where possible	• NEMA.	• Construction Phase
Construction	• Infrastructure Construction		• The surface infrastructure will change the sense of place of the Project area from an undisturbed natural bushveld to a mining sense of place. This change in landscape and land use will draw attention to the project area.	• Ensure that the surface infrastructure does not exceed the proposed heights; • Limit the footprint area of surface infrastructure where possible; • Only remove vegetation within the infrastructure footprint areas; • Plant trees and plants along the fence line to assist in screening the surface infrastructure; and		• Throughout LoM

Phase	Activity	Aspect	Impacts	Mitigation Measures	Compliance with standards	Time frame for implementation
				• Revegetate after construction phase to assist in screening the surface infrastructure.		
Construction	• Topsoil Stockpiling		• The topsoil stockpile will have a negative visual impact due to the proposed height and footprint size.	• Limit the footprint area of topsoil stockpiles where possible; • Limit the height of topsoil stockpiles to 3 m to prevent negative visual impacts, if possible; • Topsoil stockpiles must be shaped and contoured to prevent erosion and slope failure; and • Apply dust suppression techniques to limit dust generated from topsoil stockpiles.		Throughout LoM
Construction	• Site/vegetation clearance; • Temporary PCD; • Contractors laydown yard; • Access and haul road construction; • Infrastructure construction; • Diesel storage and explosives magazine; • Topsoil stockpiling; • Sewage treatment plant; and • Water treatment plant.	• Socio-economic	• Creation of employment opportunities.	• Develop and implement an Employment Policy in compliance with the South African legal framework and company standards. As part of the Policy, set targets for local employment regardless of the size the work program; prioritise employment and training of local people over outsiders; and targets must include employment of youths and women from historically disadvantaged backgrounds; and be continuously monitored; • Establish a Local Employment Office to facilitate access to employment opportunities for local candidates with appropriate skill sets; • Develop and implement a Work Readiness and Vocational Training Plan in consultation with local stakeholders, including women's groups; • Develop and maintain a database of people looking for work within the study area; • Widely advertise all Project employment opportunities in local community newspapers and placed in public places in local languages; • Comply with minimum wage requirements for unskilled labour and all other requirements, including gender equity, of the Employment Equity Act to ensure maximum benefits accrue to workers; • Ensure that no employment take place at the entrance to the site (to avoid people congregating at the work site). Only formal channels for employment will be used; and • Develop and implement a grievance procedure to record and resolve complaints and issues/ concerns of project affected communities.	• NEMA; • Employment Equity Act, 1997 (Act No. 75 of 1997); • Labour Relations Act 1995 (Act No. 66 of 1995); • Skills Development Act, 1998 (Act No. 97 of 1998); •	• Pre-construction and construction
Construction	• Site/vegetation clearance; • Temporary PCD; • Contractors laydown yard; • Access and haul road construction; • Infrastructure construction; • Diesel storage and explosives magazine; • Septic tanks; • Septic tanks; and • Topsoil stockpiling.		• Opportunities and Capabilities within the Supply Chain.	• Conduct an audit of local businesses and their capacity to meet Project needs, including those businesses in the study area, and maintain a database of local business information; • Establish local procurement and business development office in central and accessible location to enhance accessibility of information about contract and training opportunities and promote opportunities through trade forums and other events; • Establish relevant training and capacity building initiatives to support businesses' ability to meet the Project requirements, based on audit results and needs assessments; • Develop and implement a local Procurement Policy or Plan. The policy/ plan shall provision for the following: • Setting of targets the numbers of local businesses used by the Project at all levels will be tracked. • Adaptation of Project procurement documents to suit local businesses as far as possible within the standards required of the Project.		

Phase	Activity	Aspect	Impacts	Mitigation Measures	Compliance with standards	Time frame for implementation
				• Provision of incentives for Project contractors to purchase locally and partner with local businesses, including tender requirements regarding local procurement. • Creation of an SME electronic portal to facilitate communication of contract opportunities and management training materials to SMEs. • Considerations for unbundling of contracts into small work programs to ensure that small and locally based businesses can benefit. • Promotion of joint ventures between large and small Contractors to ensure equitable sharing of economic benefits and skills development. • Procedure for dissemination of procurement opportunities as early as possible, with clearly defined requirements for the goods or service to manage expectations. • Partner with relevant organisations where available and appropriate (e.g., government agencies, civil society, and NGOs) to provide access for local businesses to finance and advisory services to develop their capacity to competitively supply to the Project; and • Implementation of the grievance procedure.		
Construction	• All project related activities associated with construction and operations		• Change to the sense of place.	• Implement mitigation measures proposed in the Visual Impact Assessment Study. Implement induction programmes for all employees and contractors to increase sensitivity to local norms and customs; • Project contractors shall implement a 'no fraternization' policy at the worker's camp to minimise relations with prostitutes and unsafe sexual interaction with residents; • Implement traffic safety measures, particularly speed control and driver awareness training for all drivers; • Minimise the construction footprint in forested areas and ensure that disturbed areas are rehabilitated with indigenous trees and other plants. • Implement mitigation measures suggested in for the creation of employment opportunities during the construction phase along with the mitigation measures as recommended in the relevant specialist reports; • Adequate plan for rehabilitation; • Offset negative experience of altered sense of place by maximising local employment/ economic benefits; and • Implementation of the grievance procedure.		• All project phases
Construction	• All project related activities associated with construction and operation		• Impacts associated with Population Influx such as increased competition for residential land and other natural resources as well as an increased strain in accessing government services.	• Develop an In-Migration Plan that addresses how the Project will seek to minimise Project-induced in-migration as far as possible. Implement mitigation measures to address the adverse environmental and social consequences, and maximise the benefits, of in-migration. The management plan should be developed together with other industry role players and government; • To discourage influx of job-seekers, consider prioritisation of employment of unemployed members of local communities; • Liaise with Local Government to ensure that expected population influx is considered in infrastructure development and spatial development planning. Create synergies with CDP to ensure that infrastructure development initiatives can off-set increased pressure on local services; • Identify if recorded criminal activities involved members of the Project's workforce;		• Pre-construction, construction, and operational phase

Phase	Activity	Aspect	Impacts	Mitigation Measures	Compliance with standards	Time frame for implementation
				• Engage with government authorities on issues, risks, and opportunities regarding in-migration; • Engage with local communities to understand their concerns, raise awareness of risks and opportunities, and identify solutions to issues relating to in-migration; • Develop and implement a targeted communications plan in areas known to be potential sources of in-migration and, using migrant networks, inform potential in-migrants of the scale and nature of opportunities, manage their expectations, and where appropriate discourage them from moving to the study area; • Maintain a clear security zone around all Project land to avoid informal settlement around the perimeter of Project activities; • Operate employee bus services from local settlements to discourage people from moving from their village to locations closer to Project sites in search of jobs and improve existing roads and build new roads to facilitate access from larger centres to Project sites; • Focusing Project-workforce housing and vocational training and business support services in larger towns with the most capacity to accommodate new residents; • Working with and assisting local authorities and relevant partners; • Develop information, education and communication campaigns around diseases and health practices including sanitation and hygiene; • Monitoring changes in land cover and land use outside the Project site to identify loss of areas of importance for biodiversity and cultural heritage; • Discourage informal settlements along Project roads to minimise loss of habitat of value for biodiversity; • Where available and appropriate to design and implement an information and awareness programme regarding sustainable harvesting and conversation of natural resources; • Provide education for local agencies and communities on threats to biodiversity from human activities and develop case studies of coexistence between human activities and natural habitat; working with local leaders and community groups to support local cultural events and conserve and reinforce local traditions and culture; and • Supporting community-based and inter-settlement youth programmes for sport, arts, and culture.		
Construction	• All project related activities associated with construction and operation.		• Community unrest due to a perceived lack economic opportunities and unmet expectations.	• Implement enhancement measures associated with all positive impacts to minimise or avoid protest and unrests; • Implement community development initiatives associated with the Project SLP; • Undertake ongoing consultation with local communities (including local authorities and traditional leadership) and clearly communicate Project needs and schedule; • Utilise existing procurement and employment plans that promote transparent and fair recruitment and procurement; and		• Pre-construction, construction, and operational phases

Phase	Activity	Aspect	Impacts	Mitigation Measures	Compliance with standards	Time frame for implementation
				• Encourage stakeholders to utilise the grievance procedure to communicate their issues and ensure timeous response to all lodged complaints and grievances.		
Operational	• Vehicle, and heavy machinery movement; • Open-pit establishment; • Removal of rock (blasting); • Stockpiling (rock dumps, soils, ROM, discard dump) establishment, and operation; • Waste management activities; • Diesel storage, explosives magazine, and handling, and treatment of hazardous products (including fuel, explosives, and oil); and • Operating crush, and screen, and coal washing plant.	• Soil, land use and land capability	• Compaction of soil; • Increased runoff potential; • Increased erosion, and consequently sedimentation potential; • Removal of soil, and decreased soil depth; • Increased erosion, and sedimentation potential; • Soil compaction, and increased surface runoff; • Movement of the soil strata; • Changes to the landscape, causing ponding, and undulating topographies; • Increased vehicle movement in the area, increasing soil compaction, and runoff potential; • Potential spillage of hydrocarbons such as oils, fuels, and grease, thus contamination of the soils; • Unexpected changes in the depth, and the nature of the soil; • Soil Contamination from Hydrocarbon waste (lubricants, explosives, and fuels); • Soil contamination from sewage; • Soil Contamination; • Soil contamination from Hydrocarbon waste/spills (lubricants, oil, explosives, and fuels); • Soil contamination from sewage, and wastewater; and • Soil Contamination from wastewater, and spillages.	• Keep site clearing to a minimal, and restrict vehicle movement outside of dedicated areas, specifically close to wetlands (pans); • All areas not proposed to be mined of high land capability, should be demarcated as “No-Go” areas, and avoided as far as possible (including vehicle movement, infrastructure, roads and mining related activities; • Make use of existing roads to encourage minimal impacts/footprint to the OC1 area; • Topsoil should be stockpiled separate from the subsoil to enhance the rehabilitation process; • Areas of high land capability should be demarcated and marked as no-go zones. Access should be limited as far as possible; • Ensure proper soil stripping, and stockpiling for optimum rehabilitation; • Vegetate stockpiles to prevent soil loss, organic material loss, erosion, and sedimentation; • Monitoring must be carried out during the operational phase to ensure no unnecessary impact to the soil resources present, and if so that a remedy is put in place as soon as possible; • The disturbance must be minimised, and suitably rehabilitated; • A Topsoil Management Plan (TMP) must be prepared to demonstrate how topsoil will be preserved in a condition as near as possible to its pre-mining condition to allow successful mine rehabilitation (Statham, 2014); • Long term stockpiles should be revegetated to minimise loss of soil quality. This will minimise AIPs, maintain soil organic matter levels, maintain soil structure, and microbial activity; • All long-term topsoil material stockpiles should be located outside the active mine path, and away from drainage lines; • Soil pollution monitoring should be conducted at selected locations on the project site to detect any extreme levels of pollutants; • Any spillages of sewage effluent from the treatment plant or ablution facilities should be cleaned up immediately, and the removed contaminated soils should be disposed of at accredited disposal sites; • Chemicals, such as paints, and hydrocarbons, should be used in an environmentally safe manner with correct storage as per each chemical’s specific storage descriptions; • All spills should be immediately cleaned up, and treated accordingly; • Re-fuelling must take place on a sealed surface area away from wetlands to prevent the ingress of hydrocarbons into the topsoil; • Stormwater must be diverted from construction activities, and managed in such a manner to disperse runoff, and prevent the concentration of stormwater flow; • Water used at construction sites should be utilised in such a manner that it is kept on-site, and not allowed to run freely into nearby watercourses (i.e. installation of clean, and dirty water separation systems); and	• Chamber of Mines Guidelines; • NEMA; and • CARA.	• Life of Operational Phase

Phase	Activity	Aspect	Impacts	Mitigation Measures	Compliance with standards	Time frame for implementation
				• A SWMP should already be implemented. This should consider all high land capability area, high potential erosion areas, wetlands, and other watercourses associated with the new developments/infrastructure which should divert stormwater away from the surface infrastructure, and back into natural watercourses to maintain catchment yield as far as possible. The SWMP should also convey stormwater to silt traps to limit erosion and the subsequent increase of suspended solids in downstream watercourses.		
Operational	• Open pit establishment and operation; • Stockpiling; • Diesel storage and explosives magazine; • Movement of vehicles and mine machinery; and • Storage, handling and treatment of hazardous products (including fuel, explosives and oil) and waste.	• Surface Water	• Siltation of water resources due to increased turbidity from dust and soil erosion; • Water contamination due to leaks or spills of hazardous and hydrocarbon containing material; and • Reduction of runoff reporting to the Limpopo River.	• Runoff from dirty areas should be directed to the storm water management infrastructure (drains and PCDs) and should not be allowed to flow into the stream, unless DWS discharge authorisation and compliance with relevant discharge standards as stipulated in the NWA is obtained; • The PCDs and dirty water channels should be lined either by concrete or High-Density Polyethylene (HDPE) in order to prevent contamination of groundwater through seepage; • The water quality monitoring program provided in this report should be adhered to for monitoring water resources within and in close proximity to the study area to allow detection of any contamination arising from operational activities; • The management of general and other forms of waste must ensure collection and disposal into clearly marked skip bins that can be collected by approved contractors for disposal to appropriate disposal sites; • The overall housekeeping and storm water system management (including the maintenance of berms, de-silting of dams and conveyance channels and clean-up of leaks) must be maintained throughout the LoM; and • The hydrocarbon and chemical storage areas and facilities must be located on hard-standing area (paved or concrete surface that is impermeable), roofed and bunded in accordance with SANS1200 specifications. This will prevent mobilisation of leaked hazardous substances; • Training of mine personnel and contractors in proper hydrocarbon and chemical waste handling procedures is recommended; • Vehicles must only be serviced within designated service bays; and • Wash bay and workshop runoff should flow through an oil separator as indicated on the infrastructure plan prior to discharge into the PCD.	• NEMA; • NEM:WA; • NWA; and • DWA BPGs, 2008	• During the Operational Phase
Operational	• Overburden rock and topsoil stockpile	• Groundwater	• Infiltration to the subsurface and groundwater quality deterioration.	• Overburden stockpiles should be managed to minimise infiltration of contaminants to the groundwater. • Management of the stockpile shape to control the ease with which water can run off; • The vegetation of the stockpile and covering them with soil to minimise rainfall infiltration and mobilisation of dissolved metals;and • Groundwater monitoring.	• NEMA; • NWA; • DWS Best Practice Guideline G1: Storm Water Management; and • NEM: WA.	• Stockpile design should be completed before the construction starts. • Groundwater monitoring must commence from the start of the

Phase	Activity	Aspect	Impacts	Mitigation Measures	Compliance with standards	Time frame for implementation
						construction phase.
Operational	• Seepage from the PCD		• Groundwater contamination.	• All contaminant, storm water, waste and hazardous waste storage facilities and other contaminated water storage areas (pollution control dams) should be lined to prevent infiltration of contaminated seepage water proactively; and • Monitoring of groundwater quality and water levels is recommended with continuous refining and updating of the monitoring network based on the results obtained.		• PCD design should be completed before the construction starts. • Groundwater monitoring must commence from the start of the construction phase.
Operational	• Pit dewatering		• Depletion of the groundwater and • Lowering of water tables in private boreholes.	• Mine should supply equal/better amount of water to affected parties; • Monitoring of water levels; and • Updating of the numerical model as aquifer properties become available.		• Before the mine depth reaches the water table
Operational	• Groundwater contamination		• Groundwater contamination	• Mine should supply equal/better amount of water to affected parties; • Nitrate-based explosives should be avoided to minimise groundwater contamination; • Pit dewatering to intercept the contamination plume to within the pit area; • Monitoring of groundwater quality and water levels.; and • Update the numerical model as more groundwater information is collected.		• During the Operation Phase
Operational	• Vehicle, and heavy machinery movement • Open-pit establishment • Removal of rock (blasting) • Stockpiling (rock dumps, soils, ROM, discard dump) establishment, and operation • Waste management activities • Diesel storage, explosives magazine, and handling, and treatment of hazardous products (including fuel, explosives, and oil) • Operating crush, and screen, and coal washing plant.	• Fauna and Flora	• Increased vehicle movement in the area, Increasing the risk of faunal casualties due to road kill; • Increased risk of AIP proliferation without adequate control measures; • Increased dust pollution; • Increase risk of fire during dry season; • Increased erosion, runoff and compaction of soil and consequently sedimentation potential; • Changes to the landscape with subsequent removal of faunal habitats and a decrease in biodiversity and loss of SCC (faunal and floral); and • Potential spillage of hydrocarbons such as oils, fuels, and grease, thus contamination of the soils and surrounding grounds.	• Make use of existing roads to encourage minimal impacts/footprint to the Project Area; • Monitor AIPs and ensure measures are in place to prevent spread and proliferation; • Avoid pockets of Combretum imberbe and Vachellia erioloba (see Sensitivity Map); • Adhere to a protective 100 m buffer around the pans; • Adhere to a protective 100 m buffer around the pans; • Further investigation is recommended to determine the extent of the presence of burrows of the *Pyxicephalus adspersus* in relation to the infrastructure of the Project area; • It is recommended that a nursery for indigenous flora that represent the identified vegetation communities be developed as a community-based project, if possible and practical. Alternatively, all plants may be purchased during rehabilitation phase; • Excavated topsoil should be stockpiled separate from the subsoil to enhance the rehabilitation process. Long term stockpiles should be revegetated to minimise loss of soil quality and minimise AIPs; • Management of dust may involve the spraying of water; • Monitoring must be carried out during the operational phase to ensure no unnecessary impact to the remaining vegetation and associated habitats, and if so that a remediation plan is put in place as soon as possible;	• NEMA; • NEM:BA; • LEMA; and • CITES.	• Life of Operational Phase

Phase	Activity	Aspect	Impacts	Mitigation Measures	Compliance with standards	Time frame for implementation
				• In support of the Digby Wells Soil Land Use and Land Capability Report 2020, a Topsoil Management Plan (TMP) must be prepared to demonstrate how topsoil will be preserved in a condition as near as possible to its pre-mining condition to allow successful mine rehabilitation (Statham, 2014). In addition, a SWMP should already be implemented. This should consider all high land capability area, high potential erosion areas, wetlands, and other watercourses associated with the new developments/infrastructure which should divert stormwater away from the surface infrastructure, and back into natural watercourses to maintain catchment yield as far as possible. The SWMP should also convey stormwater to silt traps to limit erosion and the subsequent increase of suspended solids in downstream watercourses; • Fire management plan is recommended in case of uncontrolled fires during the dry season; • Hydrocarbons should be used in an environmentally safe manner with correct storage as per each chemical's specific storage descriptions; and • Re-fuelling of vehicles and machinery must take place on a sealed surface area away from wetlands to prevent the ingress of hydrocarbons in the surrounding area.		
Operational	• Operational activities.	• Wetlands	• Changes in water flow regime.	• A temporary fence or demarcation must be erected around No-Go Areas outside the proposed works area prior to any construction taking place as part of the contractor planning phase when compiling work method statements to prevent access to the adjacent portions of the watercourse; • Effective stormwater management should be a priority during both construction and operational phase. This should be monitored as part of the EMP; and • High energy stormwater input into the watercourses should be prevented. Changes to natural flow of water (surface water as well as water flowing within the soil profile) should be taken into account during the design phase and mitigated effectively.	• NEMA; • NWA; • NEM: BA; and • the Ramsar Convention and the South African Wetlands Conservation Programme (SAWCP).	• Operational Phase
Operational	• Operational activities.	• Wetlands	• Changes in sediment entering and exiting the system.	• Surface water dissipation structures and Effective sediment traps should be installed; • Remove only the vegetation where essential and do not allow any disturbance to the adjoining natural vegetation cover; • Rehabilitation plans must be submitted and approved for rehabilitation of damage and that plan must be implemented immediately upon completion of construction; • Restrict vehicular and human movement in no-goes areas and clearly indicate these areas with signs; • Protect all areas susceptible to erosion and ensure that there is no undue soil erosion resultant from activities within and adjacent to the work areas; • Runoff from the mining area must be managed to avoid erosion and pollution problems; • Implementation of best management practices; and		

Phase	Activity	Aspect	Impacts	Mitigation Measures	Compliance with standards	Time frame for implementation
				• Monitoring should be done to ensure that sediment pollution is timeously dressed.		
Operational	• Operational activities.	• Wetlands	• Introduction and spread of alien vegetation.	• AIPs should be continuously monitored and controlled throughout the life of the mine and thereafter; • Retain vegetation and soil in position for as long as possible, removing it immediately ahead of construction / earthworks in that area and returning it where possible afterwards; • Monitor the establishment of alien invasive species within the areas affected by the construction and maintenance and take immediate corrective action where invasive species are observed to establish; and • Rehabilitate or revegetate disturbed areas.		
Operational	• Operational activities.	• Wetlands	• Loss and disturbance of watercourse habitat and fringe vegetation.	• Drying out of wetlands and loss of hydrological zonation (loss of catchment) should be monitored and addressed through an offset program; and • Throughout the Operational and Decommissioning Phases, bi-annual (twice a year) external monitoring of soils and vegetation, preferable one survey after the rainy season (March to May) and one after the dry season (July to September) should be undertaken.		
Operational	• Operational activities.	• Wetlands	• Changes in water quality due to pollution.	• Provision of adequate sanitation facilities located outside of the watercourse or its associated buffer zone; • Implementation of appropriate stormwater management around the mining area to prevent the ingress of run-off into the excavation and to prevent contaminated runoff into the watercourse; • The development footprint must be fenced off from the watercourses and no related impacts may be allowed into the watercourse e.g. water runoff from cleaning of equipment, vehicle access etc; • Maintenance of vehicles / equipment should not take place within the watercourse or watercourse buffer; • Control of waste discharges; • Maintenance of buffer zones to trap sediments with associated toxins; • Ensure that no operational activities impact on the watercourse or buffer area. This includes edge effects; • Control of waste discharges and do not allow dirty water from operational activities to enter the watercourse; • Control of waste discharges and do not allow dirty water from operational activities to enter the watercourse; • Regular independent water quality monitoring should form part of operational procedures in order to identify pollution; and • Treatment of pollution identified should be prioritized according to best practice guidelines.		
Operational	• Operational aspects of proposed Coal Mine	• Aquatics	• Erosion and sedimentation; and • Water quality improvement/impairment.	• Runoff from dirty areas should be directed to the storm water management infrastructure (drains and PCDs); • The water quality monitoring program provided in this report should be adhered to for monitoring water resources within and in close proximity to the Project Area to allow detection of any contamination arising from operational activities; • The overall housekeeping and storm water system management (including the maintenance of berms, de-silting of dams and	• NWA; • NEM:BA; • NEMA; and • NFEPA, Nel et al., 2011).	• Ongoing

Phase	Activity	Aspect	Impacts	Mitigation Measures	Compliance with standards	Time frame for implementation
				conveyance channels and clean-up of leaks) must be maintained throughout the life of mine; and • The hydrocarbon and chemical storage areas and facilities must be located on hard-standing area (paved or concrete surface that is impermeable), roofed and bunded in accordance with SANS1200 specifications. This will prevent mobilisation of leaked hazardous substances; • Training of mine personnel and contractors in proper hydrocarbon and chemical waste handling procedures is recommended; • Vehicles must only be serviced within designated service bays; and • Wash bay and workshop runoff should flow through an oil separator as indicated on the infrastructure plan prior to discharge into the PCD.		
Operational	• Drilling and blasting of ROM ore and overburden; • Operation of the open pit workings; • Loading, handling, and stockpiling of ROM ore and overburden; • Storage, handling and treatment of hazardous material; • Stockpiling (rock dumps, soils, ROM, discard dump) establishment and operation; • Operation of the processing plant (including crushing and screening); • Operating sewage treatment plant; and • Storage, handling and treatment of hazardous products (including fuel, explosives, and oil) and waste.	• Air Quality	• Reduction in the quality of ambient air due to the generation of dust.	• Apply wetting agents, dust suppressants, or binders on exposed areas and haul roads; • Limit activity to non-windy days (with wind speed ≥ 5.4 m/s), if possible and practical; • Keep the area of disturbance to a minimum and avoid any unnecessary clearing, digging, or scraping, especially on windy days; • Construct surfaces of all access roads from lateritic soils and avoid fine/colloidal (e.g. clays and silts) materials; • Minimise the drop heights when loading onto trucks and at tipping points; • Set maximum speed limits and have these limits enforced; • Wet drilling • Handled, stored, and disposed of hazardous substances in accordance with the local regulations; • Store hazardous substances in clearly labelled containers; • Emergencies must be dealt with promptly i.e. spills; and • Provision of secondary containment for fuel storage.	• NEM: AQA and • National Ambient Air Quality Standards	• Measurements must commence before the start of the operation phase and for the LoM.
Operational	• Operational activities	• Noise	• Noise disturbance	• The mine must implement a line of communication (i.e. a helpline where complaints could be lodged). All potential sensitive receptors should be made aware of these contact numbers, or alternative means to communicate issues. The mine should maintain a commitment to the local community and respond to concerns in an expedient fashion. Sporadic and legitimate noise complaints could develop and if valid, should be investigated. Feedback must be provided to the affected stakeholder(s) with details of any steps taken to mitigate the impact (if valid complaint) or preventative steps to minimise this from happening again;	• Mitigation measures will assist in keeping noise levels as low as possible to comply with the National Noise Control Regulations.	• Operational Phase

Phase	Activity	Aspect	Impacts	Mitigation Measures	Compliance with standards	Time frame for implementation
				• All employees and contractors should receive induction that includes an environmental awareness component (noise). This is to allow employees and contractors to realize the potential noise risks that activities (especially night-time activities) pose to the surrounding environment; • The continuation of a noise measurement programme (if recommended by the noise measurement specialist to continue during the construction phase measurements); and • Compliance with the Noise conditions of the Environmental Management Plan that covers; • Potential mitigation measures as defined in this report; • Formal register where receptors can lodge any noise complaints; • Noise measurement protocol to investigate any noise complaints; and • The commitment from the mine to consider reasonable mitigation if the noise complaint investigation indicates the validity of a noise complaint. These measures could include steps ranging from process changes, development of barriers or enclosure of the noise source and even relocation of the NSD (if no other feasible alternatives exist).		
Operational	• Operational activities at night	• Noise	• Noise disturbance	• Other measures that would reduce the night-time noise levels at other NSD include: • the mine should consider the recommendations defined in Section 13 of the Noise Study (Appendix M); • the mine should implement a noise monitoring programme. Recommendations regarding potential a monitoring programme is defined in Section 14 of the Noise Study (Appendix M); • it is recommended that the mine development team minimize night-time (22:00 – 06:00) traffic that may pass within 200m from residential areas, such as Sandbult, with no hauling at night.		
Operational	• Open Pit Establishment	• Visual	• Blasting to remove rock will result in noise and dust thereby attracting attention to the project area. • The open pit will dramatically contrast with the surrounding area as it will result in a scar on the landscape.	• Apply dust suppression techniques to limit the dust generated from the blasting; • Construct a berm along the perimeter of the open pit, • Ensure that the open pit is completely backfilled with material from the overburden stockpiles; • Rehabilitate all disturbed areas; • Ensure that the rehabilitated area is contoured and profiled to create a free-draining topography; • Spread topsoil over the rehabilitated area; • Revegetate the rehabilitated areas with grasses; and • Ensure all the mitigation/management actions outlined in the Closure and Rehabilitation reports are conducted.	• NEMA; • NEM: PAA; and • NHRA.	• Operational Phase
Operational	• Establishment and operation of stockpiling infrastructure.		• The overburden, product and discard stockpile will have a negative visual impact due to their proposed height and footprint size. And will dominate the landscape. • Dust from the stockpiles will also affect receptors.	• Limit the footprint area of stockpiles where possible; • Limit the height of the stockpiles to not exceed the proposed heights; • Stockpiles must be shaped and contoured to prevent erosion and slope failure; and • Apply dust suppression techniques to limit dust generated from the stockpiles.		

Phase	Activity	Aspect	Impacts	Mitigation Measures	Compliance with standards	Time frame for implementation
Operational	• Backfilling and concurrent rehabilitation.		• The potential impact is a neutral visual impact as it assists to reduce the negative visual impact of mining on the receiving environment.	• Backfill void with overburden stockpiles; • Ensure that the open pit is completely backfilled with material from the overburden stockpiles; • Ensure that the rehabilitated area is re-contoured and profiled to create a free-draining topography; • Spread sub-soil and topsoil over the backfilled and rehabilitated area; • Revegetate the backfilled and rehabilitated areas with grasses; and • Ensure all the mitigation/management actions outlined in the Closure and Rehabilitation reports are conducted.		
Operational	• Coal transportation through trucking, tail and tonveyer belts.		• Dust and heavy traffic in the area will change the visual character of the area.	• Apply dust suppression techniques to limit dust generated from the trucks; and • Minimise heavy traffic by reducing the frequency of coal transportation schedule and avoid night time use where possible.		
Operational	• All project related activities associated with construction and operation.	• Socio-economic	• Creation of employment, work skills development and experience.	• Develop and continuously update (throughout the LoM) an Employment Policy with the objective of increasing local employment and transferring operational positions from migrant workers to people from within the study areas • Establish a Local Employment Office to facilitate access to employment opportunities for local candidates with appropriate skill sets. • Develop and implement a Work Readiness and Vocational Training Plan in consultation with local stakeholders, including women's groups. • Ensure the implementation of the Social and labour Plan to support the promotion of education and skills uplift among local communities within the study areas, including the implementation of on-the-job training and scholarship programme. • Develop and implement a grievance procedure which local communities can utilise reporting their issues and concerns related to the Project. • Implementation of the SLP workforce programs.	• NEMA; • MPRDA; • Employment Equity Act, 1998 (Act No. 55 of 1998); • Skills Development Act (Act No. 97 of 1998 as amended); and • Company employment policies.	• Construction and operation
Operational	• All project related activities associated with construction and operation.		• Multiplier effects on the local and regional economy.	• Implement enhancement measures linked to employment creation and opportunities associated with the supply chain; • Implement the SLP related interventions; • Compliance with SLP commitments to make maximum use of local SMMEs and BBBEE companies; and • Implement the grievance procedure.		
Operational	• Water use and storage on-site – during the operation water will be required for various domestic and industrial uses.		• Increased competition for water resources.	• Implement mitigation from the Underground and Surface Water Specialist Studies; • Implement the grievance procedure; and • Consult with municipality regarding the provision of additional water in case of underground water resources disruptions due to the Project.		• Operation
Operational	• Open pit establishment • Removal of rock (blasting) • Stockpiling (rock dumps, soft dumps, soils, ROM, product, discard dump) establishment and operation		• Potential economic impacts on eco-tourism operators and establishments	• Implement mitigation measures and recommendations of the Visual Impact Assessment Specialist Study; • Commission a stand-alone Tourism Impact Assessment Study with economic modelling to develop a baseline and set-out monitoring indicators; • Implement the recommendations and mitigation measures of the Tourism Impact Assessment Study; and • Implement the grievance procedure.		

Phase	Activity	Aspect	Impacts	Mitigation Measures	Compliance with standards	Time frame for implementation
Operational	• Removal of rock (blasting)		• Impacts associated with blasting on neighbouring landowners such as dust, noise, vibrations from blasting activities, road closures, etc.	• Implement mitigation measures outlined in the Blasting and Vibrations Specialist Study; • Maintain a grievance procedure established during the construction phase; and • Widely publicise the daily blasting schedule to neighbouring communities.		
Operational	• All project related activities associated with construction and operation.		• Occupational health and safety risks to mine workers such as dust-induced occupational lung diseases and noise induced hearing loss.	• Project workers including third party Contractors to be subject to health and safety standards and policies. • Develop and implement a detailed Occupational Health and Safety Management Plan and System. The Occupational Health and Safety (OHS) management plan should include, but not limited to: • Hazard identification and risk assessment procedure. • A 'fitness for work' programme to ensure that all employees are physically able to undertake their work without impact to their health. • Mandatory OHS training programmes provided to all employees, including contractors to ensure staff are aware of the health and safety guidelines. • Specific OHS training programmes provided for workers assigned to tasks associated with H&S risks. • All workers should be provided with Personal Protective Equipment (PPE) and be mandated to use it. • Placement of visual warning signs in place, including those for the electrical and mechanical equipment safety warning, and chemical hazard warning. • Toolbox talks or health and safety meeting daily to ensure that procedures are being adhered to, and to discuss any incidents that have occurred. • Develop and implement a workforce grievance procedure where they can raise issues and concerns relating to OHS. • Conduct information, education, and communication campaigns amongst Project Personnel on hygiene and sanitation; and • Provide awareness, counselling, and testing (ACT) for all Project personnel, including voluntary testing for STIs and HIV/AIDS in pre-employment and on-going health screening. (Workers will not be denied employment or discriminated against in any way based on their HIV status).		• Construction and operation
Operational	• All project related activities associated with construction and operation		• Social Development as part of SLP.	• Consultation with Project beneficiaries regarding proposed community development needs and associated initiatives; • Early identification of community members for enrolment in ABET and portable skills training to improve likelihood of employment on the mine; • Conduct baseline socio-economic survey of households located within primary study area prior to commencement of community development initiatives to enable accurate identification of eligible LED role players during implementation; • Establishing an external monitoring programme to monitor and evaluate community development initiatives as well as HRDP and procurement policy implemented by the mine and its contractors;		

Phase	Activity	Aspect	Impacts	Mitigation Measures	Compliance with standards	Time frame for implementation
				• Expanding skills development and capacity building programmes to non-employees; and • Maintaining a record of training courses completed per individual and community. Where training is offered to non-employees, their contact information and qualifications can be shared with other industries.		
Operational	• All project related activities associated with construction and operation		• Impacts associated with decreased community health, safety, and security.	• To mitigate the risk of increased transmission sexually transmitted diseases and other communicable diseases; • To mitigate the potential for diseases associated with access to water and sanitation facilities; • To manage potential impacts related to hazardous substances; • To mitigate risks associated with safety at the mine works and road traffic; and • To promote the security of the public and communities.		
Operational	• Blasting operations	• Blasting	• Ground vibration impact on: • Farmstead; • Ruins (inside pit); • Borehole (DH2) (inside pit); • Cement Dam; and • Borehole (LD04).	• Specific blast design to be done, shorter blast holes, smaller diameter blast hole, using electronic initiation instead of shock tube systems to obtain single hole firing; • Monitor ground vibration and air blast from blasting operations; and • Purchase of nearest Farmstead.	• NEMA; • MPRDA; • Mine Health and Safety Act, 1996 (Act No. 29 of 1996); and • Explosives Act, 2003 (Act No. 15 of 2003).	• Operational
Operational	• Blasting operations	• Blasting	• Air blast impact on: • Farmstead; • Borehole (DH2) (inside pit); • Borehole (GT02); and • Borehole.	• Specific blast design to be done, shorter blast holes, smaller diameter blast hole, use of specific stemming materials to manage air blast, increased stemming lengths to reduce air blast effect. Used of specific stemming to manage fly rock - crushed aggregate of specific size. Re-design with increased stemming lengths; and • Monitor ground vibration and air blast from blasting operations.		
Operational	• Blasting operations	• Blasting	• Fly rock impact on Borehole (DH2).	• Specific blast design to be done, shorter blast holes, smaller diameter blast hole, use of specific stemming materials to manage air blast, increased stemming lengths to reduce air blast effect; and • Monitor fly rock situation using video camera, when blasting near receptors in the zone the zone of influence.		
Decommissioning	• Movement of vehicles, and heavy machinery removing infrastructure; • Demolition, and removal of infrastructure – once mining activities have been concluded infrastructure will be demolished in preparation for the final land rehabilitation; • Rehabilitation – rehabilitation mainly consists of spreading, and landscaping of the preserved subsoil, and topsoil, profiling of the	• Soil, Land Use and Land Capability	• Compaction of soil; • Increased runoff potential; • Increased erosion, and consequently sedimentation potential; • Disturbance of soils, and subsequent erosion by wind, and water; • Increased vehicle movement in the area, increasing soil compaction, and runoff potential; • Potential spillage of hydrocarbons such as oils, fuels, and grease, thus contamination of the soils; • Unexpected changes in the depth, and the nature of the soil;	• Continue with Concurrent Rehabilitation, and implement land rehabilitation measures; • Address compacted areas by deep ripping to loosen the soil, and revegetate the area as soon as possible; • Ensure proper stormwater management designs are in place to ensure no run-off or pooling occurs; • Only designated access routes are to be used to reduce any unnecessary compaction; • The backfilled, reprofiled landscape should be top soiled, and revegetated to allow free drainage close to the pre-mining conditions; • Inventory of hazardous waste materials stored on-site should be compiled, and arrange complete removal; and • Rehabilitation and Monitoring Plan should be implemented.	• Chamber of Mines Guidelines; • NEMA; and • CARA.	• Life of Decommissioning Phase

Phase	Activity	Aspect	Impacts	Mitigation Measures	Compliance with standards	Time frame for implementation
	land, and re-vegetation; and • Post-closure monitoring, and rehabilitation.		• Ponding of water, and creation of drainage channels; • Exposure of soils, and subsequent compaction, erosion, and sedimentation; • Soil compaction, and increased runoff potential due to vehicle movement during rehabilitation programs; • Loss of organic material, and vegetation cover; • Potential spillage of hydrocarbons such as oils, fuels, and grease, thus contamination of wetlands; • Minimal negative impacts on the environment; and • Soil Monitoring Plan.			
Decommissioning and Closure	• Demolition and removal of infrastructure; • Rehabilitation and closure.	• Surface Water	• Siltation of water resources due to increased turbidity from soil erosion; • Restoration of the pre-mining streamflow regime in the Limpopo River; and • AMD due to potential decant from the pit.	• Restore the topography to pre-mining conditions as much as is practically possible by backfilling, removing stockpiles and restore the slope gradient and angle of the site; • Clearing of vegetation should be limited to the decommissioning footprint area and immediate revegetation of cleared areas; • Decommissioning activities should be prioritized during dry months of the year where practical; • Disturbance of soils during infrastructure demolition should be restricted to relevant footprint areas; • Movement of demolition machinery and vehicles should be restricted to designated access roads to minimise the extent of soil disturbance; • Use of accredited contractors for removal or demolition of infrastructure during decommissioning is recommended; this will reduce the risk of waste generation and accidental spillages; • The groundwater levels should be taken into account during excavations to minimize potential impact of groundwater quality; • Ensure that the infrastructure (pipelines, fuel storage areas, pumps) are first emptied of all residual material before decommissioning; and • Capping, reprofiling and revegetation of TSF post-closure to limit the potential for future oxidation of stored tailings, and enable clean runoff to be discharged to the surrounding environment.	• NEMA; • NEM:WA; • NWA; • GN R 704; and • DWA BPGs, 2008.	• During the Decommissioning Phase
Decommissioning and Closure	• Pit backfilling	• Groundwater - AMD and dissolution of heavy metals.	• Groundwater contamination.	• Mine should supply equal/better amount of water to affected parties; • Nitrate-based explosives should be avoided to minimise groundwater contamination; • Pit dewatering to intercept the contamination plume to within the pit area; • Monitoring of groundwater quality and water levels; and • Update the numerical model as more groundwater information is collected.	• NWA; and • NEM:WA.	• During Operation and Decommissioning

Phase	Activity	Aspect	Impacts	Mitigation Measures	Compliance with standards	Time frame for implementation
Decommissioning and Closure	• Movement of vehicles, and heavy machinery removing infrastructure; • Demolition, and removal of infrastructure – once mining activities have been concluded infrastructure will be demolished in preparation for the final land rehabilitation; • Rehabilitation – rehabilitation mainly consists of reprofiling the landscape via re-vegetation, and landscaping of the preserved subsoil and topsoil; and • Post-closure monitoring, and rehabilitation.	• Fauna and Flora	• Increased vehicle movement in the area, Increasing the risk of faunal casualties due to road kill; • Increased risk of AIP proliferation without adequate control measures; • Increased dust pollution; • Increase risk of fire during dry season; • Increased erosion, runoff and compaction of soil and consequently sedimentation potential; • Changes to the landscape with subsequent removal of faunal habitats and a decrease in biodiversity and loss of SCC (faunal and floral); and • Potential spillage of hydrocarbons such as oils, fuels, and grease, thus contamination of the soils and surrounding grounds.	• Address areas that have been impacted by erosion, compaction, sedimentation by loosening the soil, and revegetate the area as soon as possible; • Begin with the rehabilitation of the vegetation and replant with indigenous flora identified in vegetation communities. Ensure the landscape has been reprofiled with the preserved topsoils and subsoils. Replant saplings and small trees removed and preserved during construction phase; • Ensure removal of all AIPs. This can be done manually and if necessary, with a systemic solution; • Ensure designated access routes and roads are used to reduce any unnecessary compaction and degradation; • Inventory of hazardous waste materials stored on-site should be compiled, and complete removal must be arranged; and • Rehabilitation and Monitoring Plan should be implemented.	• NEM: BA; • NEMA • NEM: PAA (as amended); and • CARA.	• Decommissioning Phase
Decommissioning and Closure	• Demolition and removal of infrastructure; Rehabilitation and closure.	• Aquatics	• Erosion and sedimentation; • Altered hydrology; and • Restoration of the pre-mining streamflow regime in the Limpopo River.	• Restore the topography to pre-mining conditions as much as is practically possible by backfilling, removing stockpiles and restore the slope gradient and angle of the site; • Clearing of vegetation should be limited to the decommissioning footprint area and immediate revegetation of cleared areas; • Decommissioning activities should be prioritized during dry months of the year where practical; • Disturbance of soils during infrastructure demolition should be restricted to relevant footprint areas; • Movement of demolition machinery and vehicles should be restricted to designated access roads to minimise the extent of soil disturbance; • Use of accredited contractors for removal or demolition of infrastructure during decommissioning is recommended; this will reduce the risk of waste generation and accidental spillages; • Ensure that the infrastructure (pipelines, fuel storage areas, pumps) are first emptied of all residual material before decommissioning; and • Capping, reprofiling and revegetation of TSF post-closure to limit the potential for future oxidation of stored tailings, and enable clean runoff to be discharged to the surrounding environment.	• NWA; • NEM:BA; • NEMA; and • NFEPA, Nel et al., 2011).	• During the decommissioning phase and post-decommissioning phase
Decommissioning and Closure	• Dismantling removal of infrastructure; • Rehabilitation of MRA; and • Post-closure monitoring and rehabilitation.	• Air Quality	• Reduction in the quality of ambient air due to the generation of dust.	• Apply wetting agents, dust suppressants, and binders on exposed areas; • Limit activity to non-windy days (with wind speed ≥ 5.4 m/s), if possible; • Keep the area of disturbance to a minimum and avoid any unnecessary clearing, digging, or scraping, especially on windy days;	• NEM: AQA and • National Ambient Air Quality Standards.	• On commencement of the decommissioning phase and for the

Phase	Activity	Aspect	Impacts	Mitigation Measures	Compliance with standards	Time frame for implementation
				• Minimise the drop heights when loading onto trucks and at tipping points; • Set maximum speed limits and have these limits enforced; • The dismantling of infrastructure must occur in phases; • Limit demolition activities to non-windy days, where possible and practical; • Rehabilitated landscape should be vegetated; and • Use of dust suppressant on dirt roads and exposed areas.		duration of the phase
Decommissioning and Closure	• Demolition and Removal of Infrastructure.	• Visual	• The potential impact is a neutral visual impact as it assists to restore the landscape to its pre-development state.	• Apply dust suppression techniques to limit the dust from the demolition area; • Ensure all infrastructure is demolished and removed from the site; • Ensure that all rubble is removed from site; and • Rehabilitate all disturbed areas as detailed in the Closure and Rehabilitation Plan.	• NEMA	• Decommissioning
Decommissioning and Closure	• Rehabilitation			• Ensure that the open pit is backfilled with material from the overburden stockpiles; • Rehabilitate all disturbed areas; • Ensure that the rehabilitated area is re-contoured and profiled to create a free-draining topography; • Spread topsoil over the rehabilitated area; • Revegetate the rehabilitated areas with grasses; and • Ensure all the mitigation/management actions outlined in the Closure and Rehabilitation reports are conducted.		
Decommissioning and Closure	• All Project activities	• Cultural Heritage	• Damage to or destruction of previously unidentified heritage resources.	• Develop and implement CFP.	• NHRA	• Before the commencement of the Project
Decommissioning and Closure	• Decommissioning	• Social	• Economic boom-bust after the construction and operation phases.	• Develop and implement an integrated Mine Closure Plan; and • Proactively assess and manage the social and economic impacts on individuals, regions, and economies where retrenchment and/or closure of the Project are certain.	• NEMA	• Operation and decommission.

6 Item 1(f): Impact Management Outcomes

Table 6-1 explains the measures to rehabilitate the environment affected by the undertaking of any listed activity.

Table 6-1: Impacts to be Mitigated in their Respective Phases

Phase	Activity	Aspect	Impacts	Mitigation Type	Standard to be Achieved
Construction	• Movement of vehicles, and heavy machinery; • Site clearing, and preparation by the removal of vegetation, and topsoil, leading to the exposure of soils; • Construction of infrastructure, including access, and haul roads, contractor's laydown yard, diesel storage, and explosive magazine, and infrastructure, Offices; • Waste management activities, including handling of hydrocarbon chemicals, hauling, and transportation of waste material, transportation of product coal, and disposal of waste material; and • Temporary PCD.	• Soil, Land Use and Land Capability	• Compaction of soil; • Increased erosion, and consequently sedimentation of water bodies; • Compaction of soil; • Removal of vegetation, basal cover, and thus increasing the potential of loss of topsoil, organic material, and increased erosion potential; • Compaction, ponding, and landscaping of the area; • Increased vehicle movement in the area, increasing soil compaction, and runoff potential; • Increased hardened surfaces resulting in increased hydrological functioning; • Potential spillage of hydrocarbons such as oils, fuels, PCD spills, and grease, thus contamination of the soils; • Increased dust, erosion, and sedimentation; and • Soil compaction resulting from the movement of heavy machinery within the OC1 Area.	Manage through: • Erosion control. Remedy through: • Rehabilitation Plan	• Soil Management in terms of the Chamber of Mines Guidelines for Rehabilitation; and • To prevent the loss of topsoil as a resource.
Construction	• Site clearing; • Access and haul road construction; • Construction of Infrastructure; • Topsoil stockpiling; and • Loading, transport, tipping and spreading of materials.	• Surface Water	• Siltation of water resources due to increased turbidity from dust and soil erosion; and • Water contamination due to leaks or spills of hazardous and hydrocarbon containing material.	• Storm water management: Control contamination of receiving waterbodies by consideration of potential contamination sources and strategic decommissioning to minimize on potential environmental impacts	• DWS Best Practice Guideline G1: Storm Water Management and GN 704; and • Mine Closure Plan.
Construction	• Site clearing	• Groundwater	• Lowering of the water table if excavation during the site clearing process is going to take place below the water table.	• Minimise impact on the groundwater by operating in the unsaturated zone above the water table.	• To prevent excavation below the water table; and • To avoid spillages of hazardous substance into the natural environment
Construction	• Hydrocarbon spills from storage tanks, vehicles and heavy machinery or hazardous materials or waste storage facilities. •		• Deterioration of groundwater quality.	• Control the release of hydrocarbons by the use of barriers or property hydrocarbon management.	
Construction	• Site clearing, and preparation by the removal of vegetation and associated habitats and removal of soils; • Movement of vehicles, and heavy machinery; • Construction of infrastructure, including access and haul roads, diesel storage, and explosive magazine and Open Cast Pits; and • Waste management activities, including handling of hydrocarbon chemicals, transportation of waste material, transportation of product coal, and disposal of waste material.	• Fauna and Flora	• Removal of vegetation, basal cover, and thus increasing the potential of loss of topsoil, organic material, and increased erosion potential; • Removal of flora and fauna SCC and faunal habitat; • Removal of vegetation communities such as woodlands and pans (wetlands); • Alien Invasive Plants (AIP) proliferation; • Increased runoff potential and consequently sedimentation and compaction of the soil; • Potential spillage of hydrocarbons such as oils, fuels (diesel), and grease, thus contamination of the soils and surrounding grounds; • Risk of fire during the dry season; and • Increased dust pollution.	Control through: • Footprint reduction and limitation; • Alien management plan; and • Concurrent rehabilitation through the LoM.	• To minimise disturbance of natural habitats; and • To minimise the loss of SCC.

Phase	Activity	Aspect	Impacts	Mitigation Type	Standard to be Achieved
Construction	• Vegetation removal and surface water redirection	• Wetlands	• Changes in water flow regime.	• Control through mitigation measures outlined in Table 5-1 above.	• To prevent unnecessary impacts on wetlands.
Construction	• Construction activities	• Wetlands	• Changes in sediment entering and exiting the system.		
Construction	• Vegetation removal	• Wetlands	• Introduction and spread of alien vegetation.		
Construction	• Construction activities	• Wetlands	• Loss and disturbance of watercourse habitat and fringe vegetation.		
Construction	• Construction activities	• Wetlands	• Changes in water quality due to pollution.		
Construction	• Site clearing, access and haul road construction, and topsoil stockpiling.	• Aquatics	• Erosion and sedimentation; and • Altered hydrology.	• Modify through construction site planning; and • Control through stormwater management and sediment containment infrastructure.	• To prevent the onset of erosion and sedimentation of water resources.
Construction	• Construction activities, including vehicular activities and maintenance of haul roads.		• Water quality impairment	• Control through driving access permits and permit areas and ongoing maintenance.	
Construction	• Site clearing; • Access and haul road construction; • Construction of infrastructure; • Topsoil stockpiling; and • Loading, transport, tipping, and spreading of materials.	• Air quality	• Reduction in the quality of ambient air due to the generation of dust.	Control through: • The implementation of an air quality management plan; • Dust control measures; and • Ambient air quality monitoring.	• To prevent air pollution.
Construction	• Diesel storage and explosives magazine.		• Airborne vapour will lead to poor air quality.	Manage through: • A hazardous substances management plan.	
Construction	• Construction activities.	• Noise	• Noise disturbance.	• Avoid through vehicle and Machinery Maintenance Plan.	• To comply with the definition of 'noise disturbance' as described by the National Noise Control Regulations.
Construction	• Site / Vegetation Clearance	• Visual	• Site / vegetation clearance will reduce the screening properties that the natural vegetation has on the environment making the project more visible to receptors.	• Remedy through revegetation and limiting vegetation clearance to only footprint areas.	• Minimise visual intrusion from construction & machinery; and • Minimise the visual intrusion and dust pollution.
Construction	• Infrastructure Construction		• The surface infrastructure will change the sense of place of the Project area from an undisturbed natural bushveld to a mining sense of place. This change in landscape and land use will draw attention to the project area.	• Control through creating visual barriers to reduce visual exposure.	
Construction	• Topsoil Stockpiling		• The topsoil stockpile will have a negative visual impact due to the proposed height and footprint size. • Dust from the stockpile will also affect receptors.	• Control through creating visual barriers to reduce visual exposure and through dust suppression.	

Phase	Activity	Aspect	Impacts	Mitigation Type	Standard to be Achieved
Construction	• Site/vegetation clearance ; • Temporary PCD; • Contractors laydown yard; • Access and haul road construction; • Infrastructure construction; • Diesel storage and explosives magazine; • Topsoil stockpiling; • Sewage treatment plant; and • Water treatment plant.	• Socio-economic	• Creation of employment opportunities.	Enhancement measures: • Promotion of employment of local people and compliance with national employment related legislation. • Promotion of local procurement of goods and services as well as SME capacity development.	• To enhance the positive impacts associated with the project to benefit the local communities and economy.
Construction	• Site/vegetation clearance; • Temporary PCD; • Contractors laydown yard; • Access and haul road construction; • Infrastructure construction; • Diesel storage and explosives magazine; • Septic tanks; and • Topsoil stockpiling.		• Opportunities and Capabilities within the Supply Chain.		
Construction	• All project related activities associated with construction and operations		• Change to the sense of place.	Control and prevention measures: • Limiting the modification of the area in terms of visual changes through implementation of concurrent rehabilitation throughout LoM • Limiting interactions between local people and project workers.	
Construction	• All project related activities associated with construction and operation		• Impacts associated with Population Influx such as increased competition for residential land and other natural resources as well as an increased strain in accessing government services.	Prevention measures: • Discourage in-migration of economic seekers settling in the nearby settlements; and • On-going consultation and communication regarding economic opportunities associated with the project.	• To manage potential impacts associated with population influx.
Construction	All project related activities associated with construction and operation.		Community unrest due to a perceived lack economic opportunities and unmet expectations.		• To ensure that compensation is received economic displacement impacts.

Phase	Activity	Aspect	Impacts	Mitigation Type	Standard to be Achieved
Operational	• Vehicle, and heavy machinery movement; • Open-pit establishment; • Removal of rock (blasting); • Stockpiling (rock dumps, soils, ROM, discard dump) establishment, and operation; • Waste management activities; • Diesel storage, explosives magazine, and handling, and treatment of hazardous products (including fuel, explosives, and oil); and • Operating crush, and screen, and coal washing plant.	• Soil, land use and land capability	• Compaction of soil; • Increased erosion, and consequently sedimentation of water bodies; • Removal of soil, and decreased soil depth; • Movement of the soil strata; • Changes to the landscape, causing ponding, and undulating topographies; • Increased vehicle movement in the area, increasing soil compaction, and runoff potential; • Potential spillage of hydrocarbons such as oils, fuels, and grease, thus contamination of the soils; • Unexpected changes in the depth, and the nature of the soil; • Soil Contamination from Hydrocarbon waste (lubricants, explosives, and fuels); • Soil contamination from sewage, and wastewater; and • Soil Contamination from wastewater, and spillages.	Manage through: • Erosion control Remedy through: • Rehabilitation through the LoM.	• Soil Management in terms of the Chamber of Mines Guidelines for Rehabilitation.
Operational	• Open pit establishment and operation; • Stockpiling; • Diesel storage and explosives magazine; • Movement of vehicles and mine machinery; and • Storage, handling and treatment of hazardous products (including fuel, explosives and oil) and waste.	• Surface Water	• Siltation of water resources due to increased turbidity from dust and soil erosion; • Water contamination due to leaks or spills of hazardous and hydrocarbon containing material; and • Reduction of runoff reporting to the Limpopo River.	• Implementation of the proposed SWMP will control the impacts by mitigating the impacts.	• Rehabilitation Plan; and • To avoid impacts to surface water.
Operational	• Overburden rock and topsoil stockpile	• Groundwater	• Infiltration to the subsurface and groundwater quality deterioration.	• Minimise through groundwater monitoring programme.	• To avoid impacts to groundwater as a result of contamination from stockpile areas and PCD.
Operational	• Seepage from the PCD		• Groundwater contamination.		
Operational	• Pit dewatering		• Depletion of the groundwater and • Lowering of water tables in private boreholes.	• Avoid through project designs; and • Minimise through water quality monitoring.	
Operational	• Groundwater contamination		• Groundwater contamination		
Operational	• Vehicle, and heavy machinery movement • Open-pit establishment • Removal of rock (blasting) • Stockpiling (rock dumps, soils, ROM, discard dump) establishment, and operation • Waste management activities • Diesel storage, explosives magazine, and handling, and treatment of hazardous products (including fuel, explosives, and oil) • Operating crush, and screen, and coal washing plant.	• Fauna and Flora	• Increased vehicle movement in the area, Increasing the risk of faunal casualties due to road kill; • Increased risk of AIP proliferation without adequate control measures; • Increased dust pollution; • Increase risk of fire during dry season; • Increased erosion, runoff and compaction of soil and consequently sedimentation potential; • Changes to the landscape with subsequent removal of faunal habitats and a decrease in biodiversity and loss of SCC (faunal and floral); and • Potential spillage of hydrocarbons such as oils, fuels, and grease, thus contamination of the soils and surrounding grounds.	• Control through Rehabilitation Plan.	• To minimise disturbance of natural habitats; and • To prevent the establishment and manage alien invasive vegetation according to the NEM: BA.
Operational	• Operational activities	• Wetlands	• Changes in water flow regime.	• Control through mitigation measures presented in Table 5-1 above.	• To prevent unnecessary impacts on wetlands.
Operational	• Operational activities	• Wetlands	• Changes in sediment entering and exiting the system.		
Operational	• Operational activities	• Wetlands	• Introduction and spread of alien vegetation.		
Operational	• Operational activities	• Wetlands	• Loss and disturbance of watercourse habitat and fringe vegetation.		
Operational	• Operational activities	• Wetlands	• Changes in water quality due to pollution.		

Phase	Activity	Aspect	Impacts	Mitigation Type	Standard to be Achieved
Operational	• Operational aspects of proposed Coal Mine	• Aquatics	• Erosion and sedimentation; and • Water quality improvement/impairment.	• Control through inspection and monitoring, as well as stormwater management and sediment containment infrastructure.	• To prevent the onset of erosion and sedimentation of water resources.
Operational	• Drilling and blasting of ROM ore and overburden; • Operation of the open pit workings; • Loading, handling, and stockpiling of ROM ore and overburden; • Storage, handling and treatment of hazardous material; • Stockpiling (rock dumps, soils, ROM, discard dump) establishment and operation; • Operation of the processing plant (including crushing and screening); • Operating sewage treatment plant; and • Storage, handling and treatment of hazardous products (including fuel, explosives, and oil) and waste.	• Air Quality	• Reduction in the quality of ambient air due to the generation of dust.	Control through: • The implementation of an air quality management plan • Dust control measure • Ambient air quality monitoring • Hazardous substances management plan.	• To minimise dust emissions and to ensure compliance with National Dust Control Regulations (2013).
Operational	• Operational activities	• Noise	• Noise disturbance	• Control through operational hours; and • Avoid through Machinery Maintenance Plan.	• Mitigation measures will assist in keeping noise levels as low as possible to comply with the definition of a 'noise disturbance' as described by the National Noise Control Regulations.
Operational	• Open Pit Establishment	• Visual	• Blasting to remove rock will result in noise and dust thereby attracting attention to the project area. • The open pit will dramatically contrast with the surrounding area as it will result in a scar on the landscape.	• Control through creating visual barriers to reduce visual exposure; and • Control through dust suppression.	• To minimise visual intrusion to nearby receptors.
Operational	• Establishment and operation of stockpiling infrastructure.		• The overburden, product and discard stockpile will have a negative visual impact due to their proposed height and footprint size. And will dominate the landscape. • Dust from the stockpiles will also affect receptors.		
Operational	• Backfilling and concurrent rehabilitation.		• The potential impact is a neutral visual impact as it assists to reduce the negative visual impact of mining on the receiving environment.	• Remedy through rehabilitation.	
Operational	• Coal transportation through trucking, tail and conveyer belts.		• Dust and heavy traffic in the area will change the visual character of the area.	• Control through dust suppression; and • Control through traffic management.	
Operational	• All project related activities associated with construction and operation.	• Socio-economic	• Creation of employment, work skills development and experience.	Enhancement and control measures:	• To enhance the positive impacts associated with the project to benefit the local communities and economy.

Phase	Activity	Aspect	Impacts	Mitigation Type	Standard to be Achieved
Operational	• All project related activities associated with construction and operation.		• Multiplier effects on the local and regional economy.	• Enhancement Promotion of targeted employment of local people and skills development; and • On-going communication about the project related opportunities. Enhancement measures: • through promotion of local procurement, targeted and preference of locals for all employment opportunities as well as implementation of SLP related community developments.	• To enhance the positive impacts associated with the project to benefit the local communities and economy.
Operational	• Water use and storage on-site – during the operation water will be required for various domestic and industrial uses.		• Increased competition for water resources.	Prevention and management measures: • Implementation of control and remedial actions recommended by the Underground and Surface Water Specialist Studies.	• To manage water resources.
Operational	• Open pit establishment • Removal of rock (blasting) • Stockpiling (rock dumps, soft dumps, soils, ROM, product, discard dump) establishment and operation		• Potential economic impacts on eco-tourism operators and establishments	Management: • Monitoring the grievance of eco-tourism operators and establishments and implementation of recommendations of the tourism impact assessment study.	• To take eco-tourism operators into consideration and compensate them for any income losses emanating from this Project.
Operational	• Removal of rock (blasting)		• Impacts associated with blasting on neighbouring landowners such as dust, noise, vibrations from blasting activities, road closures, etc.	Operation: • Publicising the blasting schedule and addressing grievances related to blasting.	• Minimise impacts associated with blasting.
Operational	• All project related activities associated with construction and operation.		• Occupational health and safety risks to mine workers such as dust-induced occupational lung diseases and noise induced hearing loss.	Avoidance/ Prevention: • Through the implementation of hazard assessments and controls.	• To ensure the implementation of the Occupational Health and Safety Management Plan and System.
Operational	• All project related activities associated with construction and operation		• Social Development as part of SLP.	Enhancement: • Through the implementation of SLP related community development and monitoring of performance against the set targets.	• To expand skills development and capacity building programmes to the community.

Phase	Activity	Aspect	Impacts	Mitigation Type	Standard to be Achieved
Operational	• All project related activities associated with construction and operation		• Impacts associated with decreased community health, safety, and security.	Prevention and Management measures: • Development and implementation of an Emergency Prevention, Preparedness and Response Plan.	• To promote the security of the public and communities.
Operational	• Blasting operations	• Blasting	Ground vibration impact on: • Farmstead; • Ruins (inside pit); • Borehole (DH2) (inside pit); • Cement Dam; and • Borehole (LD04).	• Prevention through implementation of mitigation measures.	• To minimise the impacts of blasting operations on a range of structures.
Operational	• Blasting operations	• Blasting	Air blast impact on: • Farmstead; • Borehole (DH2) (inside pit); • Borehole (GT02); and • Borehole.		
Operational	• Blasting operations	• Blasting	• Fly rock impact on Borehole (DH2).		
Decommissioning	• Movement of vehicles, and heavy machinery removing infrastructure; • Demolition, and removal of infrastructure – once mining activities have been concluded infrastructure will be demolished in preparation for the final land rehabilitation; • Rehabilitation – rehabilitation mainly consists of spreading, and landscaping of the preserved subsoil, and topsoil, profiling of the land, and re-vegetation; and • Post-closure monitoring, and rehabilitation.	• Soil, Land Use and Land Capability	• Compaction of soil; • Increased runoff potential; • Increased erosion, and consequently sedimentation potential; • Disturbance of soils, and subsequent erosion by wind, and water; • Increased vehicle movement in the area, increasing soil compaction, and runoff potential; • Potential spillage of hydrocarbons such as oils, fuels, and grease, thus contamination of the soils; • Unexpected changes in the depth, and the nature of the soil; • Ponding of water, and creation of drainage channels; • Exposure of soils, and subsequent compaction, erosion, and sedimentation; • Soil compaction, and increased runoff potential due to vehicle movement during rehabilitation programs; • Loss of organic material, and vegetation cover; • Potential spillage of hydrocarbons such as oils, fuels, and grease, thus contamination of wetlands; • Minimal negative impacts on the environment; and • Soil Monitoring Plan.	• Concurrent rehabilitation through the LoM.	• Soil Management in terms of the Chamber of Mines Guidelines for Rehabilitation.
Decommissioning and Closure	• Demolition and removal of infrastructure; • Rehabilitation and closure.	• Surface Water	• Siltation of water resources due to increased turbidity from soil erosion; • Restoration of the pre-mining streamflow regime in the Limpopo River; and • AMD due to potential decant from the pit.	• Storm water management: Control contamination of receiving waterbodies by consideration of potential contamination sources and strategic decommissioning to minimize on potential environmental impacts.	• To prevent siltation of surface water resources.

Phase	Activity	Aspect	Impacts	Mitigation Type	Standard to be Achieved
Decommissioning and Closure	• Movement of vehicles, and heavy machinery removing infrastructure; • Demolition, and removal of infrastructure – once mining activities have been concluded infrastructure will be demolished in preparation for the final land rehabilitation; • Rehabilitation – rehabilitation mainly consists of reprofiling the landscape via re-vegetation, and landscaping of the preserved subsoil and topsoil; and • Post-closure monitoring, and rehabilitation.	• Fauna and Flora	• Increased vehicle movement in the area, Increasing the risk of faunal casualties due to road kill; • Increased risk of AIP proliferation without adequate control measures; • Increased dust pollution; • Increase risk of fire during dry season; • Increased erosion, runoff and compaction of soil and consequently sedimentation potential; • Changes to the landscape with subsequent removal of faunal habitats and a decrease in biodiversity and loss of SCC (faunal and floral); and • Potential spillage of hydrocarbons such as oils, fuels, and grease, thus contamination of the soils and surrounding grounds.	Manage through: • Footprint reduction and limitation; • Vegetation establishment; • Replanting of endangered species; and • Rehabilitation Plan.	• To minimise disturbance of natural habitats.
Decommissioning and Closure	• Demolition and removal of infrastructure; Rehabilitation and closure.	• Aquatics	• Erosion and sedimentation; • Altered hydrology; and • Restoration of the pre-mining streamflow regime in the Limpopo River.	• Storm water management: Control contamination of receiving waterbodies by consideration of potential contamination sources and strategic decommissioning to minimize on potential environmental impacts.	• To prevent the onset of erosion and sedimentation of water resources.
Decommissioning and Closure	• Dismantling removal of infrastructure; • Rehabilitation of MRA; and • Post-closure monitoring and rehabilitation.	• Air Quality	• Reduction in the quality of ambient air due to the generation of dust.	Control through: • The implementation of an air quality management plan; • Dust control measure; and • Ambient air quality monitoring.	• To minimise dust emissions and to ensure compliance with National Dust Control Regulations (2013).
Decommissioning and Closure	• Demolition and Removal of Infrastructure.	• Visual	• The potential impact is a neutral visual impact as it assists to restore the landscape to its pre-development state.	• Remedy through rehabilitation.	• To restore the landscape to its pre-development state.
Decommissioning and Closure	• Rehabilitation				
Decommissioning and Closure	• All Project activities	• Cultural Heritage	• Damage to or destruction of previously unidentified heritage resources.	• Control.	• Compliance with the NHRA.
Decommissioning and Closure	• Decommissioning	• Social	• Economic boom-bust after the construction and operation phases.	Preventative and Management: • Timeous development of Mine Closure Plan and ongoing consultation of stakeholders about mine closure.	• To avoid local community, collapse due to closure of the mine.

7 Item 1(g) Financial Provision

To complete the Financial Provision Assessment there are several tasks which were undertaken. These tasks are discussed below.

7.1 Item (g)(i): Determination of the Amount of Financial Provision

7.1.1 Item (g)(1)(a): Describe the Closure Objectives and the Extent to Which They Have been Aligned to the Baseline Environment Described under the Regulation

The objective of the Rehabilitation Plan is to ensure activities associated with the infrastructure located within the mining footprint area will be designed to prevent, minimise or mitigate adverse, long-term, environmental and social impacts and create a self-sustaining ecosystem. The following objectives have been identified thus far:

- Comply with the relevant local and national regulatory requirements;
- Re-establishment of the pre-mining land capability to allow for a suitable and sustainable post mining land use;
- Maintain and minimise impacts to the functioning wetlands and waterbodies within the area;
- Implement progressive rehabilitation measures where possible (i.e. contractors camps and areas used during the construction phase);
- Prevent soil, surface water and groundwater contamination; and
- Maintain and monitor the rehabilitated areas.

7.1.2 Item (g)(1)(b): Confirm Specifically that the Environmental Objectives in Relation to Closure have been Consulted with Landowner and Interested and Affected Parties

A Public Participation Process was undertaken during July 2020 for the Scoping Phase. I&APs were consulted, all comments, concerns raised and received during the commenting period were addressed and included in this report in Section 9.2 of Part A. The Rehabilitation and Closure Plan (RCP) has been made available for public review and comment together with this Draft EIA Report (please refer to Appendix R). All comments received that pertain to the RCP will be recorded in the final report.

7.1.3 Item (g)(1)(c): Provide a Rehabilitation Plan that Describes and Shows the Scale and Aerial Extent of the Main Mining Activities, Including the Anticipated Mining Area at the Time of Closure

Table 7-1 provides a summary of the rehabilitation actions and plans which need to be followed. A Rehabilitation Plan has been compiled for the proposed Dalyshope Project area and is provided in Appendix R.

Table 7-1: Summary of Rehabilitation and Closure Actions

Aspect	Rehabilitation measures
Main Plant and related infrastructure	• Demolish and remove all concrete structures to 1 m below ground level; • Dismantle streel structures including tanks and store in designated salvage yard prior to removal/selling off; • Demolish all paving walkways and parking areas; • Dismantle and remove all generators and internal components of substations prior to further structure demolition; and • Demolish brick structures including concrete foundations.
Water Management Facilities	• Demolish and remove all liners and structures; • Remove HDPE liners and geomembranes, shred and place within the pit or disposal at an appropriate landfill site; • Demolish brick structures including concrete foundations; and • Dismantle steel structures.
Other Infrastructure and Offices	• Demolish and remove all concrete structures to 1 m below ground level; • Dismantle carport structures, store in designated salvage yard prior to removal/selling off; • Demolish brick structures including concrete foundations; and • Demolish all paving walkways and parking areas.
Mining, stockpiles and discard dump	• Stockpiles around the Plant • Utilise as backfill for the dam basins and large cavities remaining from plant demolition; and • Replace topsoil once areas are levelled and shaped to align surface water runoff with the site wide drainage framework. • Opencast pit and mining stockpiles • Utilise stockpiled material as backfill for the opencast void to achieve the post mining landform design elevations; • Place topsoil as a final layer over the backfilled pit prior to vegetation establishment; • Rehabilitation of dump footprints after material has been removed; and • Shaping of the pit perimeter and placement of berm around pit. • Coal veneer • Remove the coal veneer from ROM stockpile areas, plant footprint and tip for disposal into the pit, prior to final shaping and rehabilitation.
Linear infrastructure	• Haul roads, tar and gravel roads • Rip all haul roads prior to removal of the carbonaceous layer; • Rip all gravel roads to break compaction; and • Demolish and remove concrete structures and restore pre-mining flow regime. • Lined storm water drains • Demolish and remove liners. • Conveyor belts • Demolish and remove concrete plinths and bases; • Dismantle all ancillary steel structures, transfer houses and chutes; • Dismantle all overland conveyors and associated infrastructure; and • Dismantle suspended conveyors and associated infrastructure. • Powerlines, pipelines, cables and cable racks • Dismantle all internal powerlines; • Dismantle all internal pipelines to 1000 mm below ground level; and • Dismantle and remove cables and cable racks.

Aspect	Rehabilitation measures
General rehabilitation	• General rehabilitation • Shape and level disturbed area to align storm water runoff with the surrounding surface water drainage framework; • Replace topsoil across the backfilled opencast pit area, reshaped areas where infrastructure was demolished, cleared stockpile footprints and backfilled and shaped dams; • Rip all areas to alleviate compaction; and • Establish vegetation including soil amelioration based on dedicated sampling and analysis, seed bed preparation and the application of an appropriate seed mix.
Monitoring and maintenance	• Ground water monitoring costs are included and assumed to take place quarterly at 10 points (sampling locations) for ten years after mine closure; • Surface water monitoring costs are included and assumed to take place monthly at 5 points (sampling locations) for ten years after mine closure; and • Vegetation monitoring and maintenance on rehabilitated areas is included for three years after closure.

7.1.4 Item (g)(1)(d): Explain why it can be Confirmed that the Rehabilitation Plan is Compatible with the Closure Objectives

The Rehabilitation Plan has been compiled in support of the primary closure objectives which are to remove unwanted infrastructure and rehabilitate the land to a suitable mixed end land use which provides a safe and stable environment for surrounding receptors. The post-closure land use should be conducive to livestock grazing and areas not impacted by mining should continue to be utilised as per pre-mining development land use. This end land use can only be determined closer to the end of the LoM. A Rehabilitation Plan has been compiled for the proposed Project area and is provided in Appendix R.

7.1.5 Item (g)(1)(e): Calculate and State the Quantum of the Financial Provision Required to Manage and Rehabilitate the Environment in Accordance with the Applicable Guideline

The closure cost calculation is aligned with the Financial Provision Regulations, 2015 (GN R. 1147) as amended. The estimated financial provision for the first year, 10-year forecast and LoM for Dalyshope is **R77,788,977, R654,911,299** and **R539,699,486** respectively (excl. VAT).

The closure cost calculation using the DMRE rule-based model has been undertaken for the first year of mining and the LoM. The estimated financial provision for the Dalyshope Project is **R 31,634,761** for year 1 and **R 337,542,083** for the LoM (Incl. VAT). The calculations for these are in Table 24-1 and Table 24-2 in Part A.

7.1.6 Item (g)(1)(f): Confirm that the Financial Provision will be Provided as Determined

Anglo/Universal has made provision for closure as legally required. A liability assessment update will continue to be undertaken annually to ensure the financial provision is in line with the closure cost.

8 Item 1(h) Monitoring Compliance and Performance Assessment

Anglo/Universal will be responsible for the implementation of all monitoring of mitigation and management measures, as well as compliance with the EMPr. The recommended monitoring for the identified impacts is detailed in the subsections below. The Applicant will keep a record of all environmental monitoring taken on site. A summary of the environmental monitoring to be undertaken is included in Table 8-9.

8.1 Item 1(h)(i): Monitoring of Impact Management Actions

A monitoring programme is essential as a management tool to detect negative impacts as they arise and to ensure that the necessary mitigation measures are implemented. The monitoring programmes have been discussed below.

8.1.1 Soils, Land Use and Land Capability

The soils monitoring plan guidelines should be put in place to ensure the best chance of rehabilitative success. Monitoring should be done in terms of:

- EIA Regulations, 2014 (as amended);
- NEMA, 1998 (Act No. 107 of 1998);
- NEM: WA, 2008 (Act No. 59 of 2008); and
- CARA, 1983 (Act No. 43 of 1983).

Soil sample results must be measured against the Soil Screening Values (SSV) listed in the NEM: WA, and demarcate values exceeding the SSV. The Soil Specialist is responsible to inform the Environmental Practitioner of the results in a memo and provide possible mitigation measures. The Environmental Practitioner is responsible to report to the Mine Manager. Internal monitoring reports should be required, reporting on the progress, the state of the monitoring, and rehabilitation program. This should be completed after each external monitoring report.

Soil monitoring points will only be selected during the Construction Phase. The monitoring points will be based on infrastructure layout, areas of high erosion potential, topsoil stockpiles, potential soil contamination areas, and areas with low vegetation cover, and increased AIPs.

8.1.2 Surface Water

The current monitoring plan provides a programme to detect any surface water impacts likely to occur during the construction, operation and decommissioning phases of the proposed mine and subsequent rehabilitation of the site when mine operations cease. The surface water monitoring plan is summarised in Table 8-1.

Table 8-1: Surface Water Monitoring Plan

Monitoring Element	Comment	Frequency	Responsibility
Water quality	Water quality monitoring should continue to sample points in the Limpopo River and the non-perennial pan within the study area. Parameters should include but not limited to; pH, Electrical Conductivity, Aluminum, Sulphates, Phosphates, Iron, Manganese, Calcium, Magnesium, Nitrate, Ammonia, Fluoride, Chloride, Total dissolved solids, Suspended Solids; Sodium, Uranium, Potassium, heavy metals (e.g. As, Ni, Cu, Pb, Cr, Bo, Hg) It is also recommended to monitor water quality within the mine water dams or water containment facilities to determine the concentration levels in case of an overflow and for a more accurate estimate of the salt balance.	• Monthly monitoring during operation and decommissioning; (hydrocarbons can be done on a quarterly basis). • Monitoring needs to carry on three years after the project has ceased, as is standard or best practice to detect residual impacts.	Environmental Officer
Water quantity	Flow monitoring should be carried out between flow linkages to obtain accurate flow volumes	In operational areas where automatic flow meters are in place, daily records need to be kept	Environmental Officer
Physical structures and Storm Water Management Plan (SWMP) performance	Personnel should have a walk around facilities to determine the facilities conditions and pick out any anomalies such as leaks or overflows and system malfunctions. Storm water channels, and existing mine dams are inspected for silting and blockages of inflows, pipelines for hydraulic integrity; monitor the overall SWMP performance.	Continuous process and yearly formal report	Environmental Officer

Monitoring Element	Comment	Frequency	Responsibility
Meteorological data	Measure rainfall to provide more accurate rainfall records, if possible	Real time system with tipping bucket rain gauge or alternatively using bulk rain gauge.	Environmental Officer

8.1.3 Groundwater

Groundwater monitoring has to commence as soon as possible when construction commence and continue during all phases of the mine operation to identify impacts over time, and effective measures can be undertaken at an early stage before serious damage to the environment takes place. There are several pieces of legislations that deal with the water management and water contamination prevention and a monitoring programme has to be conducted to ensure compliance with the legislations.

8.1.3.1 *Proposed monitoring boreholes*

The main objectives in positioning the monitoring boreholes are to:

- Monitor the movement of polluted groundwater migrating away from the mine area towards the Limpopo River and nearby farms; and
- Monitor the lowering of the water table and the radius of influence.

Based on the numerical modelling results, Digby Wells proposes that the monitoring network be updated. There are sufficient monitoring boreholes that already exist at the project area that can be used for the long-term groundwater monitoring and there is no need of drilling.

A total of 21 boreholes, which are all existing, are proposed for the Dalyshope Coal Mine Project and their positions are displayed in Figure 8-1 below.

8.1.3.2 *Monitoring frequency*

Groundwater levels is recommended to be recorded using an electrical contact tape or pressure transducer, to detect any changes or trends in groundwater elevation and flow direction. Groundwater levels should be taken from the proposed monitoring points on a monthly basis. In-pit samples are also recommended when operation starts. This will assist with an assessment of recharge and refinement of conceptual and numerical models.

Groundwater is a slow-moving medium and drastic changes in the groundwater composition are not normally encountered within days. Considering the proximity of Limpopo River and private boreholes to the proposed mine, water quality monitoring should be conducted monthly to reflect influences of wet and dry seasons. Samples should be collected, using best practice guidelines and should be analysed by a SANAS accredited laboratory.

Post closure monitoring should continue until a sustainable situation is reached and after it has been signed off by the authorities.

8.1.3.3 Parameters to be monitored

At coal mining facilities, analyses of the following constituents are recommended:

- Macro Analysis i.e. Ca, Mg, Na, K, SO_4, NO_3, F, Cl;
- Al, Fe, Mn and other trace metals using ICP scanning;
- pH and Alkalinity; and
- TDS and EC.

8.1.3.4 Monitoring database management

In any project, good water management decisions require good information developed from raw data. The production of good, relevant and timely information is the key to achieve qualified long-term and short-term plans. For the prevention of water contamination, the development of mine dewatering schemes and the siting of water supply or dewatering boreholes, it is necessary to utilize all relevant water data.

The generation and collection of this data is very expensive as it requires intensive hydrogeological investigations and therefore has to be managed in a centralised database if funds are to be used in the most efficient way. Digby Wells has compiled a WISH-based database during the course of this investigation, and it is recommended that Dalyshope Coal Mine utilises this database and continuously update and manage as new data becomes available.

Table 8-2 presents the proposed monitoring programme.

Table 8-2: Proposed Monitoring Programme

Monitoring Element	Comment	Frequency	Responsibility
• Macro Analysis i.e. Ca, Mg, Na, K, SO4, NO3, F, Cl; • Al, Fe, Mn and other trace metals using ICP scanning; • pH and Alkalinity; and • TDS and EC.	Ensure water quality monitoring as per sampled and proposed monitoring locations.	Monthly monitoring during construction, operation, decommissioning and for at least three (3) years after closure, or until rehabilitation has reached a sustainable state with no further changes.	Environmental Officer

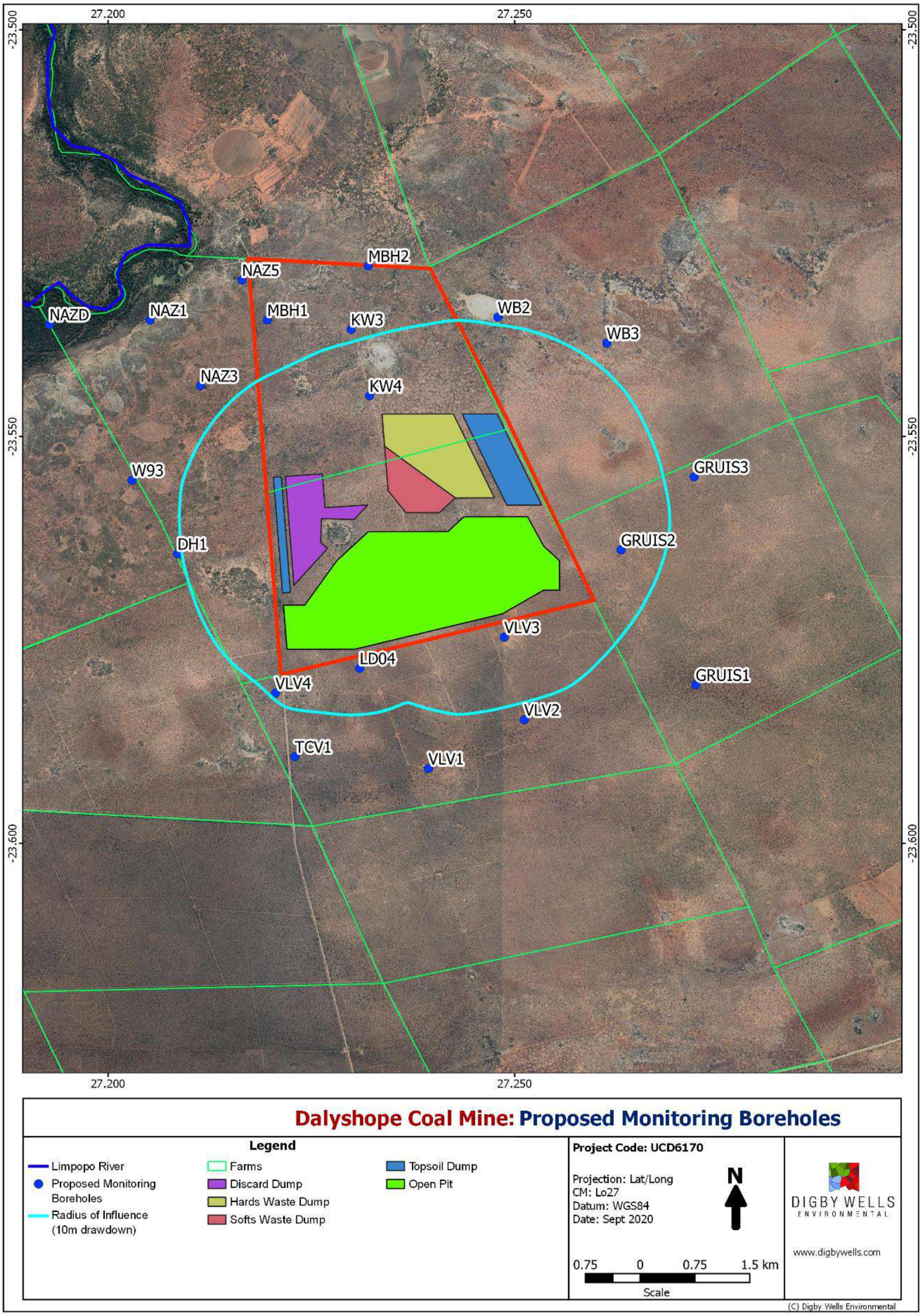


Figure 8-1: Proposed Monitoring Boreholes

8.1.4 Fauna and Flora

All the SSC will require extensive monitoring, based on the flora and fauna assessment. This should be completed by a qualified specialist as specified in Table 8-9. Monitoring should be done in terms of:

- Appendix 6 of the NEMA EIA Regulations, 2014, (as amended);
- National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA);
- National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008) (NEM: WA);
- National Forest Act, 1998 (Act No. 84 of 1998) (NFA); and
- Limpopo Environmental Management Act, 2003 (Act No. 7 of 2003) (LEMA).

The monitoring programme is presented in Table 8-3, below.

Table 8-3: Monitoring Plan

Monitoring Element	Comment	Frequency	Responsibility
Alien Invasive Management	During the operational phase the presence if AIPs should be detected and monitored. An active programme of weed management, to control the presence and spread of invasive weeds, will need to be instituted so that encroaching weeds (from edge effects and fragmentation) are controlled by means appropriate to the species. This should run for the life of the mine and five years after rehabilitation.	Annually during the wet season for the first five years after rehabilitation.	Environmental Officer
Vegetation Cover Monitoring	The natural vegetation cover established on the disturbed areas needs to be monitored annually for the first five years after rehabilitation has been carried out, to ensure that the rehabilitation work has been successful in terms of stabilising the newly formed surfaces (preventing air and water erosion from affecting those surfaces), and that the newly established vegetation cover is trending towards convergence with the original vegetation cover found on the areas prior to disturbance (and on adjacent undisturbed areas). Parameters to be followed during monitoring: • Plant species present/absent; • Weed species composition;	Annually during the wet season for the first five years after rehabilitation.	Botanist / Flora Specialist

Monitoring Element	Comment	Frequency	Responsibility
	• Species density (number of individuals); • Species frequency (number of times species is recorded); • Basal cover; and • Biomass for ground cover.		
Red Data listed fauna and flora	All protected and Red Data plant and animal species must be marked prior to any construction taking place.	Monitored every 6 months from rehabilitation	Field Specialist
Fauna monitoring	This will be closely linked to the flora monitoring to enable scientific conclusions and comparisons. To successfully monitor faunal and floral biodiversity with a Savannah biome, a solid baseline (pre-construction) will be established through the first round of monitoring. This needs to be supplemented with regular repeats to compile a reasonable comparison between the pre-construction faunal communities present and faunal communities found in the same areas during various stages of construction and operation of the proposed project. It is recommended that this monitoring be carried out through the life of the mine and concurrently during rehabilitation.	Monitored every 6 months from rehabilitation	Field Specialist

8.1.5 Wetlands

A monitoring programme is essential as a management tool to detect negative impacts as they arise and to ensure that the necessary mitigation measures are implemented together with ensuring effectiveness of the management measures in place. Table 8-4 describes the monitoring plan which should be followed from the Construction Phase through to the Decommissioning and Monitoring phase. The table below includes each element of monitoring together with the frequency of monitoring and person responsible thereof.

The monitoring programme are based on the following points:

- External monitoring should commence from prior to the Construction Phase to ensure baseline information regarding soils and vegetation and to monitor any changes thereof;
- Throughout the Construction Phase, external monitoring should be done annually for soils and vegetation, preferable right after the rainy season (March to May);

- Throughout the Operational and Decommissioning Phases, bi-annual (twice a year) external monitoring of soils and vegetation, preferable one survey after the rainy season (March to May) and one after the dry season (July to September);
- Monitoring should be done in terms of:
  - Appendix 6 of the NEMA EIA Regulations, 2014, (as amended);
  - NEMA;
  - NEM: WA; and
  - CARA.
- The Mine Manager and the EAP are responsible to report on results of the monitoring program; and
- Internal monitoring reports should be required, reporting on the progress of the state of the monitoring and rehabilitation programme. This should be completed after each external monitoring report.

As the proposed Project area is comprised of wetland habitat, it is recommended that the WET-Health and WET-Ecoservices tools should be used to re-evaluate PES and eco-services on a quarterly basis by a suitably qualified wetland specialist for the duration of the construction phase, and annually for the duration of the operational phase. Upon closure and decommissioning, annual monitoring should take place for another three years to ensure no emerging impacts are identified, which may need to be addressed.

Table 8-4: Wetlands Monitoring Plan

Monitoring Element	Comment	Requirement	Frequency	Responsibility
Wetland area size.	Implementation of intervention measures.	Wetland update report and recommendations for impact mitigation, if any.	Once every year.	Environmental Officer.
Wetland health.	Implementation of intervention measures.	Wetland update report and recommendations for impact mitigation, if any.	Once every year.	Environmental Officer.

Monitoring Element	Comment	Requirement	Frequency	Responsibility
Wetland physical attributes.	Report any irregularities to the Environmental Officer for assessment and mitigation measures.	Take photos of wetland areas and record any impacts seen.	Every two months and after storm events.	Mine Environmental Manager.

8.1.6 Aquatics

An aquatic biomonitoring programme has been developed for the monitoring and preservation of the aquatic ecosystems assessed for the Project. This programme is aimed at better determining the ecological health of the ecosystems as well as to act as an early detection tool for impacts that might severely affect the expected sensitive and conservation important species in the Limpopo River. Table 8-5 outlines the aquatic monitoring methods to be undertaken at the monitoring points on an annual basis by a qualified aquatic ecologist. The annual programme comprises of a single survey during the dry season for the Study area and a single survey during the wet season at the monitoring points indicated. However, due to the characteristic nature of the Study Area (i.e., dry nature of the Limpopo River during the dry season), the biannual surveys should be undertaken during early wet season – for the low-flow assessment – and during late wet season – for the high-flow assessment. This will determine the PES for the assessed aquatic ecosystems which will further determine whether the proposed Project is impacting the associated aquatic ecology and to what extent.

Table 8-5: Biomonitoring Programme

Method and Aquatic Component of Focus	Details	Goal/Target
Water Quality: *In-situ* water testing focusing on temperature, pH, conductivity and oxygen content.	Water quality should be tested on a biannual basis at each monitoring site to determine the extent of change from baseline results.	No noticeable change from determined baseline* water quality for each respective season
Habitat Quality: • Instream and riparian habitat integrity; and • Availability/suitability of macroinvertebrate habitat at each monitoring site.	• The application of the IHI should be done on a site basis for the Limpopo River; and • The IHAS must be applied at each monitoring site prior to sampling.	The Ecological Category determined for each assessed site must be maintained; and The baseline IHAS scores should improve.

Method and Aquatic Component of Focus	Details	Goal/Target
Macroinvertebrates: Macroinvertebrate assemblages must be assessed biannually.	This must be done through the application of the latest SASS5, incorporated with the application of the MIRAI as outlined in this Aquatic Study.	The baseline SASS5 scores should not noticeably deteriorate; and Baseline Ecological Categories should not be allowed to drop in category for each assessed site.
Fish: Fish assemblages must be assessed biannually	Sampling must be done utilising standard electro-narcosis techniques followed by the application of FRAI for applicable reaches.	Baseline Ecological Categories should not be allowed to drop in category for each assessed site. The main goal for the Project must be to conserve the expected sensitive and conservation important species.

8.1.7 Air Quality

It is recommended that the historic dust monitoring network be revived and maintained from the construction phase through the LoM. In addition, it is recommended that a continuous ambient monitoring station with the ability to measure both particulates and gases be commissioned before the commencement of construction phase activities. The frequency of monitoring will ensure that diurnal, seasonal, annual, and inter-annual records are available to inform management decision making. Table 8-6 shows the pollutants to be measured and the frequency of monitoring is depicted.

Table 8-6: Air Quality Monitoring Plan

Method	Frequency	Target	Responsibility
Monitoring in accordance with the NEM:AQA (GN No. 27318 of 2004); NEM:AQA (GN No. 1210 of 2009); and National Dust Control Regulation (GN No. 827 of 2013)	• Monthly dustfall monitoring; • Continuous PM10, PM2.5 monitoring; • Continuous monitoring of gases: SO2, NO2, and CO.	Particulate and gaseous pollutants from the Project must be below the South African standard: • GN No. 827 of 2013; and • GN No. 1210 of 2009.	A designated Environmental Officer (EO) to collect ambient air quality data and submit to an independent consultant for interpretation. The consultant will compile the reports for submission to the authorities

8.1.8 Noise

Environmental noise monitoring can be divided into two distinct categories, namely:

- Passive monitoring – the registering of any complaints (reasonable and valid) regarding noise; and
- Active monitoring – the measurement of noise levels at identified locations.

Because of the projected high noise levels, active noise monitoring is recommended at selected Noise-Sensitive Development (NSD) around the mining areas. In addition, should a reasonable and valid noise complaint be registered, the mine should investigate the noise complaint as per the guidelines below. These guidelines should be used as a rough guideline as site specific conditions may require that the monitoring locations, frequency or procedure be adapted.

8.1.8.1 *Measurement localities and frequency*

Six-monthly noise measurements are recommended at representative locations around the mine, including measurements at NSD R2 and R3. The location(s) and frequency for future noise measurements can be recommended by an acoustic consultant. Should there be a noise complaint, once-off noise measurements must be conducted at the location of the person that registered a valid and reasonable noise complaint. The measurement location should consider the direct surroundings to ensure that other sound sources cannot influence the reading. A second instrument can be deployed at the mine (close to the source of noise) during the measurement.

8.1.8.2 *Measurement procedures*

Ambient sound measurements should be collected as defined in SANS 10103:2008. Due to the variability that naturally occurs in sound levels at most locations, it is recommended that semi-continuous measurements are conducted over a period of at least 24 hours, covering at least a full day- (06:00 – 22:00) and night-time (22:00 – 06:00) period. Measurements should be collected in 10-minute bins defining the 10-minute descriptors such as $L_{AIeq,10min}$ (National Noise Control Regulation requirement), $L_{A90,f}$ (background noise level as used internationally) and $L_{AFeq,10min}$ (Noise level used to compare with IFC noise limit). Spectral frequencies should also be measured to define the potential origin of noise. When a noise complaint is being investigated, measurements should be collected during a period or in conditions similar to when the receptor experienced the disturbing noise event.

The proposed noise monitoring programme is presented in Table 8-7 below.

Table 8-7: Noise Monitoring Programme

Monitoring Element	Comment	Frequency	Responsibility
Noise Monitoring	Noise monitoring must be undertaken in line with the requirements of SANS 10103:2008 on-site, and at selected receivers.	Monthly Noise Monitoring	Environmental Officer

8.1.9 Social

A summary of the aspects of monitoring are provided in the Table 8-8 below. The key social aspects which form the monitoring programme are:

- Local employment targets;
- Local procurement targets;
- Community and workforce health, safety, and security;
- Structural integrity after blasting;
- Local tourism audits;
- Water quality and quantity;
- Air quality;
- Grievance registration;
- Noise levels.; and
- SLP targets

Table 8-8 below presents aspects to be monitored.

Table 8-8: Summary of Aspects to be Monitored

Monitoring Element	Comment	Frequency	Responsible Departments
Local employment targets	Review against set local employment targets	Quarterly	Human Resources Community Development
Local procurement targets	Review the numbers of local businesses engaged in programs either individuals or through joint ventures	Quarterly	Human Resources Community Development
Community and Workforce health, safety, and security;	On-going identification, management, monitoring of H&S risks	Daily	Health and Safety Community Development

Monitoring Element	Comment	Frequency	Responsible Departments
Structural integrity of houses	On-going monitoring of structural integrity of houses near the mine after blasting	Quarterly or when required (i.e., stakeholder logs a grievance)	Health and Safety Stakeholder Engagement
Water quality and quantity;	Implement standard operating protocols Track and monitor the number of grievances registered on the matter	Quarterly Weekly	Environmental Stakeholder Engagement
Air quality	Implement standard operating protocols Track and monitor the number of grievances registered on the matter	Quarterly Weekly	Environmental Stakeholder Engagement
Local tourism audits	Conduct an audit to assess the state of tourism businesses within the vicinity of the mine	Every 6 months	Community Development Stakeholder Engagement
SLP implementation	Conduct annual audits against set targets for implementation	Annually	Stakeholder Engagement
Grievance registration	Track and monitor the number of grievances registered on the matter	Daily/ weekly	Community Development

8.1.10 Blast and vibration

A monitoring programme for recording blasting operations is recommended. The following elements should be part of the monitoring programme:

- Ground vibration and air blast results;
- Blast Information summary;
- Meteorological information at time of the blast;
- Video Recording of the blast; and
- Fly rock observations.

Most of the above aspects do not require specific locations of monitoring. Ground vibration and air blast monitoring requires identified locations for monitoring. Monitoring of ground vibration and air blast is done to ensure that the generated levels of ground vibration and air blast comply with recommendations. Proposed positions were selected to indicate the nearest points of interest at which levels of ground vibration and air blast should be within the accepted norms and standards as proposed in this report. The monitoring of ground vibration will also qualify the expected ground vibration and air blast levels and assist in mitigating these aspects properly. This will also contribute to proper relationships with the neighbours.

Four monitoring positions were identified as possible locations that will need to be considered. Not all points will be required at once but active monitoring and observation of where blasting is done will dictate the requirements for the area around the pit. Monitoring positions are indicated in Figure 8-2. These points will need to be re-defined after the first blast done and the monitoring programme defined.

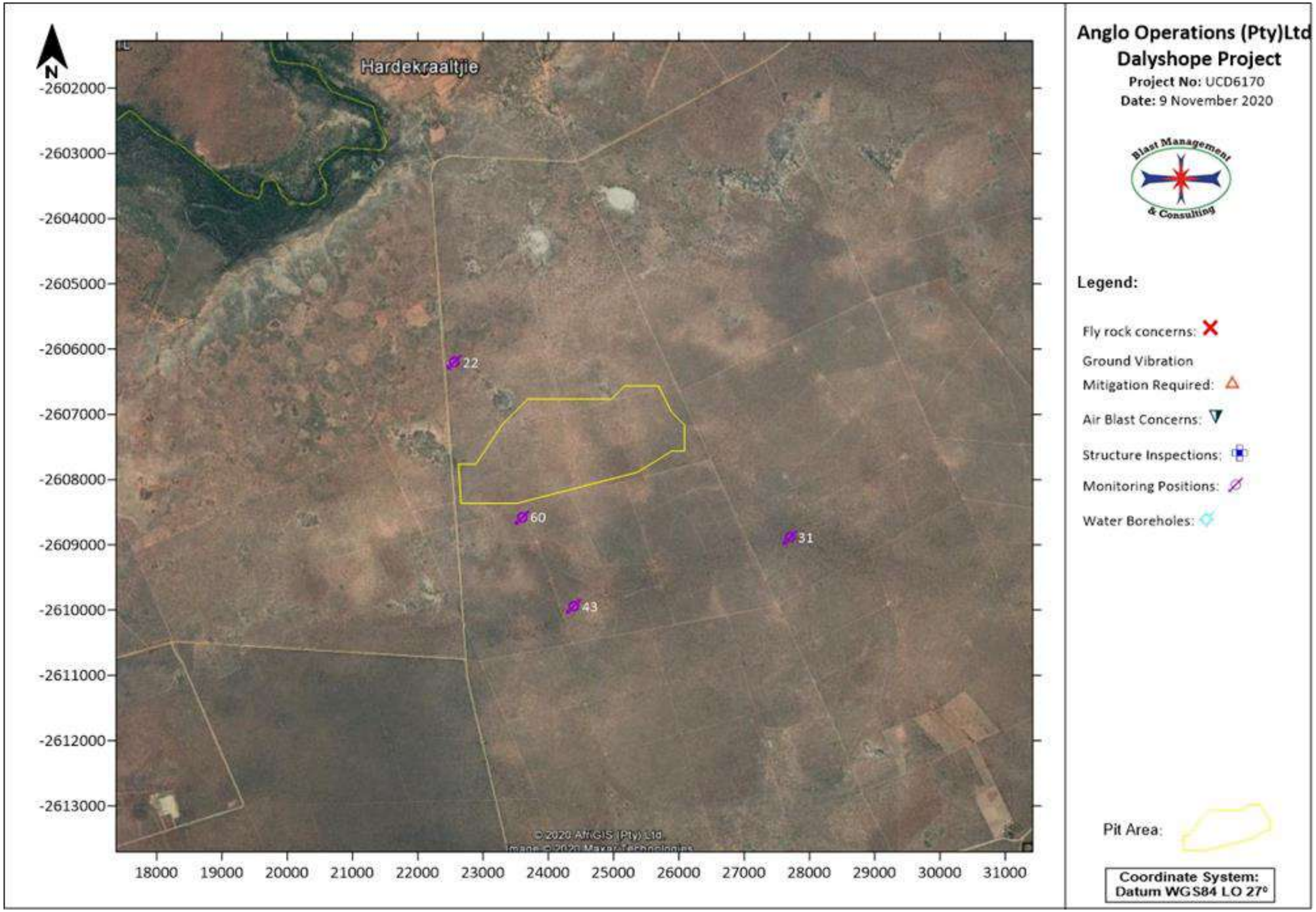


Figure 8-2: Monitoring Positions Suggested for the Opencast Area

8.1.11 Rehabilitation and Closure

The post closure monitoring period will begin once scheduled decommissioning and rehabilitation activities for the site have been completed. The duration of post closure monitoring will be determined based on environmental performance and until it can be demonstrated that the rehabilitation work has achieved the agreed endpoints; however, at present, it has been assumed that post closure monitoring will not continue for more than five years. It is important that the data obtained during monitoring is used to gauge the success of rehabilitation. The physical aspects of rehabilitation should be carefully monitored during the operational phase as well as during the progress of establishment of the desired final land use.

8.2 Item 1(h)(ii): Monitoring and Reporting Frequency

The monitoring and reporting frequency for the monitoring programmes per environmental aspect are supplied in Table 8-9.

8.3 Item 1(h)(iii): Responsible Persons

The responsible persons for the respective monitoring programmes are detailed in Table 8-9.

8.4 Item 1(h)(iv): Time Period for Implementing Impact Management Actions

The time period for implementing impact management actions has been provided for in Table 8-9.

8.5 Item 1(h)(v): Mechanism for Monitoring Compliance

Table 8-9 sets out the monitoring and management programme of environmental impacts for the Dalyshope Project.

Table 8-9: Monitoring and Management of Environmental Impacts

Source Activity	Aspect	Impacts requiring monitoring programmes	Functional requirements for monitoring	Roles and responsibilities (For the execution of the monitoring programmes)	Monitoring and reporting frequency and time periods for implementing impact management actions
All activities throughout the Project	Soil, Land Use and Land Capability	• Erosion status; • Preferential flow paths; • Compaction; • Increased runoff; • Soil contamination; and • Vegetation cover.	• Areas of concern must be inspected in the wet, and dry season, specifically after a large rainfall event; • If soil is polluted, treat the soil using in-situ bioremediation; • If in-situ treatment is not possible then the polluted soil must be classified according to the Minimum Requirements for the Handling, Classification, and Disposal of Hazardous Material, and disposed of at an appropriate, permitted or licensed disposal facility; • Repair any damage caused by erosion; • The deposition of eroded materials and the understanding of volumes moved concerning the plan should be assessed monthly by the Environmental Practitioner (EP); • Continuous erosion monitoring of rehabilitated areas should be undertaken, and zones with excessive erosion should be identified. Erosion can either be quantified or the occurrence there-of simply recorded for the specific location; • Revegetate bare areas, and remove AIPs where necessary; • Monitor long term stockpiles of vegetation cover to avoid increased AIPs, erosion and loss of soil fertility; • There must be no planting of alien plants (e.g. black wattle, eucalyptus, and pampas grass) anywhere within the OC1 Area: • The transportation of soils or other substrates infested with AIPs should be strictly controlled; • Traffic should be limited where possible while the vegetation is establishing; • Implement grazing control to prevent overgrazing, and allow pastures to establish; • The area must be fenced, and animals should be kept off the area until the vegetation is self-sustaining; and • Implement annual monitoring to identify areas of concern early, and implement rehabilitation as soon as possible (such as long term stockpiles).	• The Environmental Practitioner (EP) can be trained to take soil samples, and send it to a SANAS accredited laboratory; • Results must be sent to a Soil Specialist to assess the results and write a short memo regarding soil fertility, and contamination including possible mitigation measures; • The Mine Manager and EP should ensure soil contamination monitoring on-site, especially where hydrocarbons are stored, and applied; • EP to give training to sub-contractors, and all workers on the operational procedures, and mitigation measures; and • The Mine Manager and the EP should be responsible to determine the effectiveness of erosion control structures.	• Annual soil monitoring during the Construction Phase; • Biannual soil monitoring during the operational phase, preferable one survey after the rainy season (March to May), and one after the dry season (July to September); • Biannual soil monitoring during the decommissioning phase, preferable one survey after the rainy season (March to May), and one after the dry season (July to September); and • Annual soil monitoring after decommissioning, and rehabilitation until closure is achieved.
	Surface water	• Water quality	• Water quality should be monitored monthly. The specific monitoring elements are discussed in Section 8.1.2 above.	• Environmental Officer	• Monthly monitoring during operation and decommissioning; (hydrocarbons can be done on a quarterly basis); and • Monitoring needs to carry on three years after the project has ceased, as is standard or

Source Activity	Aspect	Impacts requiring monitoring programmes	Functional requirements for monitoring	Roles and responsibilities (For the execution of the monitoring programmes)	Monitoring and reporting frequency and time periods for implementing impact management actions
					best practice to detect residual impacts.
		• Water quantity	• Flow monitoring should be carried out between flow linkages to obtain accurate flow volumes.		• In operational areas where automatic flow meters are in place, daily records need to be kept.
		• Physical structures and SWMP performance.	• Personnel should have a walk around facilities to determine the facilities conditions and pick out any anomalies such as leaks or overflows and system malfunctions. • Storm water channels, and existing mine dams are inspected for silting and blockages of inflows, pipelines for hydraulic integrity; monitor the overall SWMP performance.		• Continuous process and yearly formal report.
		• Meteorological data.	• Measure rainfall to provide more accurate rainfall records, if possible.		• Real time system with tipping bucket rain gauge or alternatively using bulk rain gauge.
	Groundwater	• Parameters to be monitored should include, but are not limited to: Macro Analysis (i.e. Ca, Mg, Na, K, SO4, NO3, F, Cl), Trace Metals (Al, Fe, Mn and other trace metals) using ICP scanning, pH and Alkalinity and TDS and EC.	• Samples should be collected by an independent groundwater consultant, using best practice guidelines and should be analysed by a SANAS accredited laboratory.	• Environmental Officer	• Monthly monitoring during construction, operation, decommissioning and for at least three years after closure, or until rehabilitation has reached a sustainable state with no further changes.
	Fauna and Flora	• Alien Invasive Management.	• During the operational phase the presence of AIPs should be detected and monitored. An active programme of weed management, to control the presence and spread of invasive weeds, will need to be instituted so that encroaching weeds (from edge effects and fragmentation) are controlled by means appropriate to the species. This should run for the life of the mine and five years after rehabilitation.	• Environmental Officer.	• Annually during the wet season for the first five years after rehabilitation.
		• Vegetation Cover Monitoring.	The natural vegetation cover established on the disturbed areas needs to be monitored annually for the first five years after rehabilitation has been carried out, to ensure that the rehabilitation work has been successful in terms of stabilising the newly formed	• Botanist/Flora Specialist.	• Annually during the wet season for the first five years after rehabilitation.

Source Activity	Aspect	Impacts requiring monitoring programmes	Functional requirements for monitoring	Roles and responsibilities (For the execution of the monitoring programmes)	Monitoring and reporting frequency and time periods for implementing impact management actions
			surfaces (preventing air and water erosion from affecting those surfaces), and that the newly established vegetation cover is trending towards convergence with the original vegetation cover found on the areas prior to disturbance (and on adjacent undisturbed areas). Parameters to be followed during monitoring: • Plant species present/absent; • Weed species composition; • Species density (number of individuals); • Species frequency (number of times species is recorded); • Basal cover; and • Biomass for ground cover.		
		• Red Data listed fauna and flora.	• All protected and Red Data plant and animal species must be marked prior to any construction taking place.	• Field Specialist.	• Should be monitored every 6 months from rehabilitation.
		• Fauna monitoring.	• This will be closely linked to the flora monitoring to enable scientific conclusions and comparisons. To successfully monitor faunal and floral biodiversity with a Savannah biome, a solid baseline (pre-construction) will be established through the first round of monitoring. This needs to be supplemented with regular repeats to compile a reasonable comparison between the pre-construction faunal communities present and faunal communities found in the same areas during various stages of construction and operation of the proposed project. It is recommended that this monitoring be carried out through the life of the mine and concurrently during rehabilitation.	• Field Specialist.	• Should be monitored every 6 months from rehabilitation.
	Wetlands	• Wetland deterioration.	• Wetland area size	• Qualified person or wetlands specialist	• Once every year.
			• Wetland health - Drying out of wetlands and loss of hydrological zonation (loss of catchment) should be monitored and addressed through an offset program.	• Qualified person or wetlands specialist	• Once every year.
			• Wetland physical attributes	• Qualified person or wetlands specialist	• Every two months and after storm events.
	Aquatic Ecology	• Water quality.	• Water quality should be tested on a biannual basis at each monitoring site to determine the extent of change from baseline results.	• Qualified aquatic ecologist.	• Annual basis: comprises of a single survey during the dry season for the Study area and a single survey during the wet season at the monitoring points indicated. However, due to the characteristic
		• Habitat quality.			
		• Macroinvertebrates.	• This must be done through the application of the latest SASS5, incorporated with the application of the MIRAI as outlined in the Aquatic Study.		

Source Activity	Aspect	Impacts requiring monitoring programmes	Functional requirements for monitoring	Roles and responsibilities (For the execution of the monitoring programmes)	Monitoring and reporting frequency and time periods for implementing impact management actions
		• Fish assemblages.	• Sampling must be done utilising standard electro-narcosis techniques followed by the application of FRAI for applicable reaches.		nature of the Study Area (i.e., dry nature of the Limpopo River during the dry season), the biannual surveys should be undertaken during early wet season – for the low-flow assessment – and during late wet season – for the high-flow assessment.
	Air quality	• Deterioration to the ambient air quality.	The following aspects should be monitored: • Dust deposition; and • PM10 and PM2.5. Particulate and gaseous pollutants from the Project must be below the South African standard: • GN No. 827 of 2013; • GN No. 1210 of 2009	• A designated Environmental Officer must collect ambient air quality data and submit to an independent consultant for interpretation. • The consultant will compile the reports for submission to the authorities	• Monthly dustfall monitoring; • Continuous PM10, PM2.5 monitoring; and • Continuous monitoring of gases: SO2, NO2, and CO.
	Noise	• Noise disturbance	Noise monitoring must be in line with the requirements of SANS 10103:2008 on-site, and at selected receivers.	• Monitoring is to be conducted by a designated Environmental Officer.	• Monthly
	Topography and Visual	• Topographic and Visual disturbances.	<u>The following monitoring activities should be undertaken on a monthly basis for the life of the project:</u> • Dust monitoring and management as per the Air Quality Monitoring Plan (Digby Wells, 2020b); • Monitoring the vegetation cover to achieve maximum VAC as per the Rehabilitation and Closure Plan (Digby Wells, 2020a); and • Monitor grievances from visual receptors and address these through a Grievance Mechanism.	• Monitoring is to be conducted by the appropriate ECO.	• Monitoring is to be conducted monthly by the appropriate ECO.
		• Use of hydrocarbons	• Daily inspections of machinery must be undertaken, and spill trays will be placed under the machinery to collect any hydrocarbon leaks and spillages in the event it is required. • Should spillages occur, the soil must be cleared and disposed of to a hazardous waste landfill site.	• Site manager	• Daily
		• Ablution facilities	• The contents of the chemical toilets must be emptied on a regular basis, at least weekly, to prevent spillages.	• Site manager	• Weekly
		• Domestic waste	• Bins will be placed at various places around the Project area to collect the domestic waste and will be disposed of at a registered waste handling facility.	• Site manager	• Weekly
	Audit Reports	• EMPr Conditions	• To determine compliance to EMPr conditions.	• Environmental Officer/Independent Third Party.	• Annual EMPr audits.
		• Financial Provision Update.	• To ensure that the mine is compliant with the financial provision regulations and that there is sufficient funding		• Annually and must be audited by an independent auditor.

Source Activity	Aspect	Impacts requiring monitoring programmes	Functional requirements for monitoring	Roles and responsibilities (For the execution of the monitoring programmes)	Monitoring and reporting frequency and time periods for implementing impact management actions
			provided by the mine for closure and rehabilitation cost and meets the requirements as stipulated in Regulation 11 (1) of the New Financial Provisioning Regulations.		

9 Item 1(i): Indicate the Frequency of the Submission of the Performance Assessment/ Environmental Audit Report

In accordance with the EIA Regulations (2014), as amended, an external independent Environmental Audit will be undertaken every year. The Environmental Audit Report will be submitted to the DMRE and other relevant authorities where required.

10 Item 1(j): Environmental Awareness Plan

The sub-sections below outline the Environmental Awareness Plan for the proposed Dalyshope Project. The Environmental Awareness Plan is primarily a tool to introduce and describe the requirements of the range of environmental and social plans for the proposed Project during the life of the Project.

10.1 Item 1(j)(i): Manner in which the Applicant Intends to Inform his or her Employees of any Environmental Risk which may Result from their Work

Section 39 of the MPRDA requires Mining to develop an environmental awareness plan to inform the employees of any environmental risks which may result from their work. Therefore, the objectives of the environmental awareness plan will be:

- To educate employees regarding their role in conserving the environment and the importance of conserving natural resources,
- To identify environmental training needs for employees and contractors at all levels,
- To ensure that employees whose work could cause significant environmental impact as identified by the mine are competent to perform those tasks to which they are assigned,
- To enable employees to identify environmental impacts or non-conformances of their work activities on the environment,
- To familiarise employees with emergency preparedness and response requirements,
- To be aware of the potential consequences of deviation from specified operating procedures, and
- To conduct their work and manage mining activities in an environmentally responsible manner.

10.2 Item 1(j)(ii): Manner in which Risks will be Dealt with in Order to Avoid Pollution or the Degradation of the Environment

Environmental risk management will be conducted through implementation of the Environmental Management and Mitigation Measures contained in this report. These measures represent a Risk Based Environmental Management Programme and contain all the elements required to effectively deal with all environmental risks to avoid pollution or degradation of the environment.

Management shall establish and maintain procedures for the internal communication between the various levels and functions of the organisation, and receiving, documenting and responding to relevant communication from external I&APs. The organisation shall consider processes for external communication on its significant environmental aspects and record its decisions.

Communication is a management responsibility. All line supervisors are responsible for effective communication within their own sections. Methods for the internal communication between the various levels and functions of the organisation, and receiving, documenting and responding to relevant communication from I&APs must be established for the Project.

11 Item 1(k): Specific Information Required by the Competent Authority

The financial provision for the environmental rehabilitation and closure requirements of mining operations is governed by NEMA, as amended, which provides in Section 24P that the holder of a mining right must make financial provision for rehabilitation of negative environmental impacts. The financial provision will continue to be reviewed annually. The assumptions, uncertainties and gaps in knowledge provided by specialists are presented in Section 20, Part A and conditions of authorisation and approval of the EMP to be considered by the Competent Authority are presented in Section 21.2 (Part A).

12 Undertaking

The EAP herewith confirms: -

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

Signature of the Environmental Assessment Practitioner:	
Name of Company:	Digby Wells Environmental
Date:	

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Appendix A: EAP CV and Qualifications

Appendix B: Plans

Appendix C: PP Chapter

Appendix D: Visual Impact Assessment

Appendix E: Soil, Land Use and Land Capability Assessment

Appendix F: Surface Water Assessment

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Appendix G: Groundwater Assessment

Appendix H: Geochemistry

Appendix I: Fauna and Flora Assessment

Appendix J: Wetland Assessment

Appendix K: Aquatics Assessment

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Appendix L: Air Quality Assessment

Appendix M: Noise Impact Assessment

Appendix N: Heritage Assessment

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Appendix O: Social Impact Assessment

Appendix P: Blast and Vibration Assessment

Appendix Q: Traffic and Transport Assessment

Appendix R: Rehabilitation and Closure Assessment