



May 2023

**BASIC ASSESSMENT REPORT ASSOCIATED WITH THE PROPOSED  
DEVELOPMENT OF THE VLERMUISLAAGTE AND SISHEN STAGING  
LINES ALONG THE EXISTING MANGANESE RAILWAY LINE, KATHU,  
NORTHERN CAPE PROVINCE**



**DRAFT BASIC ASSESSMENT REPORT**

## DOCUMENT SYNOPSIS

<b>Item</b>	Description		
<b>Proposed development and location</b>	The proposed development of the Vlermuislaagte and Sishen staging lines along the existing manganese railway line, Kathu, Northern Cape Province		
<b>Purpose of the study</b>	Draft Basic Assessment Report associated with an application for Environmental Authorisation for the proposed development		
<b>1:50 000 Topographic Map</b>	Attached in <b>Appendix C</b>		
<b>Coordinates (center point)</b>	Sishen staging line start: 27°48'7.50"S 23° 2'27.93"E	Sishen staging line middle: 27°46'37.88"S 23° 2'38.55"E	Sishen staging line end: 27°45'48.36"S 23° 02'9.97"E
	Vlermuislaagte Staging line Start: 27°32'22.63"S 22°56'23.11"E	Vlermuislaagte Staging line Middle: 27°30'12.89"S 22°57'3.44"E	Vlermuislaagte Staging line End: 27°28'0.63"S 22°57'57.28"E
<b>Municipalities</b>	Gamagara Local Municipality		
<b>Predominant land use of surrounding area</b>	Railway infrastructure, mining and agriculture		
<b>Applicant/Developer</b>	Transnet Freight Rail, an operating division of Transnet SOC Ltd		
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<b>Date of report</b>	May 2023		

## TITLE AND APPROVAL PAGE

### Author and review:

Name	Title	Signature	Date
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Tashriq Naicker	Project Manager		16 May 2023

## ACKNOWLEDGEMENTS

The authors acknowledge Transnet Freight Rail, an operating division of Transnet SOC Ltd for their assistance with project information, layouts and the associated project background Information documents (BID) as well as responding to technical queries related to the project.

## EAP UNDERTAKING

### THE INDEPENDENT ENVIRONMENTAL ASSESSMENT PRACTITIONER (EAP)

I **Moses Kgopana**, on behalf of **Remofilwe 2010 Trading (Pty) Ltd**, as the appointed independent environmental practitioner (“EAP”) hereby declare that I:

- act/ed as the independent EAP in this application;
- regard the information contained in this report to be true and correct, and
- do not have and will not have any financial interest in the undertaking of the activity, other than remuneration for work performed in terms of the NEMA, the Environmental Impact Assessment Regulations, 2014 and any specific environmental management Act;
- have and will not have no vested interest in the proposed activity proceeding;
- have disclosed, to the applicant and competent authority, any material information that have or may have the potential to influence the decision of the competent authority or the objectivity of any report, plan or document required in terms of the NEMA, the Environmental Impact Assessment Regulations, 2010 and any specific environmental management Act;
- am fully aware of and meet the responsibilities in terms of NEMA, the Environmental Impact Assessment Regulations, 2014 and any specific environmental management Act, and that failure to comply with these requirements may constitute and result in disqualification;
- have ensured that information containing all relevant facts in respect of the application was distributed or made available to interested and affected parties and the public and that participation by interested and affected parties was facilitated in such a manner that all interested and affected parties were provided with a reasonable opportunity to participate and to provide comments;
- have ensured that the comments of all interested and affected parties were considered, recorded and submitted to the competent authority in respect of the application;
- have kept a register of all interested and affected parties that participated in the public participation process;
- have provided the competent authority with access to all information at my disposal regarding the application, whether such information is favorable to the applicant or not; and
- am aware that a false declaration is an offence in terms of the EIA Regulations.



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Signature of the Environmental Assessment Practitioner:

Name of company: Remofilwe 2010 Trading (Pty) Ltd

Date: 16 May 2023

## **EXECUTIVE SUMMARY**

Remofilwe 2010 Trading (Pty) Ltd (Remofilwe) has been appointed by Transnet Freight Rail, an operating division of Transnet SOC Ltd (hereafter referred to as “Transnet”) (the Applicant) to undertake the required Environmental Authorisation (EA) and Water Use Licence (WUL) applications for the proposed development of the Vlermuislaagte and Sishen staging lines along the existing manganese railway line, Kathu, Northern Cape Province (the project).

Transnet is currently implementing solutions for the Manganese Expansion Program in respect of exporting manganese on the Sishen-Saldanha Corridor and the manganese PE/Ngqura corridor. The current scope of the project will present the expansion program with options to optimally utilize the rail capacities enroute to Sishen and to provide appropriate and cost-effective means of expanding these capacities to meet the validated tonnage demand. The proposed solution is to provide additional staging lines in Sishen and provide additional facilities at the Vlermuislaagte rail siding.

As indicated in Figure 1, the proposed Vlermuislaagte loop is located approximately 20 km west-north of the town of Kathu, 9 km south-south-west of the South32 Mamatwan mine and 9 km north-east of the town of Deben in Ward 2, Gamagara Local Municipality (GLM). The proposed Sishen Erts Yard loop is located adjacent, east of the Sishen Iron Ore mining pit, approximately 7 km South of the Kathu Central Business District in Ward 8 of GLM. The Vlermuislaagte loop and Sishen Erts Yard loop are separated by approximately 26 km.

In terms of the National Environmental Management Act 107 of 1998 (as amended) (NEMA) and the Environmental Impact Assessment Regulations, 2014 (as amended) (EIA Regulations) a Basic Assessment (BA) Process and associated Public Participation is required for the proposed development.

As shown within this BA Report, the proposed project will have minimal environmental impacts which should be manageable through good design practices and following all environmental recommendations made in the sections above and in the Environmental Management Programme (EMPr).

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## LIST OF ACRONYMS

Acronym	Definition
AC	Alternating current
BA	Basic Assessment
BAR	Basic Assessment Report
CBA	Critical Biodiversity Areas
CMA	Catchment Management Agencies
CR	Critically Endangered
dB	Decibel
dB(A)	Decibel average weighted
DC	Direct current
DEA	Department of Environmental Affairs (Old name for DFFE)
DENC	Department of Environment and Nature Conservation Northern Cape
DFFE	Department of Forestry, Fisheries and the Environment
DWS	Department of Water and Sanitation
EA	Environmental Authorisation
EAP	Environmental Assessment Practitioner
ECO	Environmental Control Officer
EHS	Environmental, Health, and Safety
EIA	Environmental Impact Assessment
EIS	Ecological Importance and Sensitivity
EMC	Environmental Management Class
EMP	Environmental Management Plan
EMPr	Environmental Management Programme Report
EN	Endangered
ESA	Ecological Support Area
FEPA	Fresh water ecosystem priority areas
GG	Government Gazette
GN	Government Notice
GPS	Global positioning system
ha	Hectare
Hz	Hertz
I&AP	Interested and Affected Party
IBA	Important Bird Area(s)
IEM	Integrated Environmental Management
km	Kilometre
km/h	Kilometre per hour
kV	Kilovolt
L <sub>Aeq</sub>	A-weighted, equivalent continuous sound level
L <sub>AMax</sub>	A-weighted, maximum sound level
m	Meter

<b>Acronym</b>	<b>Definition</b>
m/s	Meters per second
MAP	Mean Annual Precipitation
NEMAQA	National Environmental Management Act: Air Quality Act 39 of 2004
NFEPA	National Freshwater Ecosystem Priority Areas
NIHLR	Noise-induced hearing loss regulations
NPAES	National Protected Areas Expansion Strategy
ODL	Orange Data Listed
OHSA	Occupational Health and Safety Act 85 of 1993
PDA	Primary Drainage Area
QDA	Quaternary Drainage Area
RDL	Red Data Listed
REC	Recommended Ecological Category (or Class)
REMC	Recommended Ecological Management Category (or Class)
Remofilwe	Remofilwe 2010 (Pty) Ltd
SACNASP	South African Council for Natural Scientific Professions
SAHRA	South African Heritage Resource Agency
SANBI	South African National Biodiversity Institute
SANS	South African National Standard
SCC	Species of conservation concern
SDF	Spatial Development Framework
SR	Sensitive receptor
SWSA	Strategic Water areas of South Africa
TFR	Transnet Freight Rail
TOPS	Threatened or Protected Species
VU	Vulnerable or protected
WHO	World health organisation
WMA	Water Management Areas
WML	Water Management License
WUL	Water Use Licence

## DEFINITIONS

Terms and definitions in this report are aligned with terminology used in the National Environmental Management Act 107 of 1997 (NEMA), and the National Water Act 36 of 1998 (NWA).

Term	Definition
Watercourse	(a) a river or spring; (b) a natural channel in which water flows regularly or intermittently; (c) a wetland, pan, lake or dam into which, or from which, water flows; and any collection of water which the Minister may, by notice in the Gazette, declare to be a watercourse as defined in the National Water Act, 1998 (Act No. 36 of 1998); and a reference to a watercourse includes, where relevant, its bed and banks.
Wetland	Land which is transitional between terrestrial and aquatic systems where the water table is usually at or near the surface, or the land is periodically covered with shallow water, and which land in normal circumstances supports or would support vegetation typically adapted to life in saturated soil.
Linear activity	An activity that is arranged in or extending along one or more properties and which affects the environment or any aspect of the environment along the course of the activity, and includes railways, roads, canals, channels, funiculars, pipelines, conveyor belts, cableways, power lines, fences, runways, aircraft landing strips, firebreaks and telecommunication lines.
Maintenance management plan	A management plan for maintenance purposes defined or adopted by the competent authority.

## STRUCTURE OF THE REPORT

The legislated content requirements for BARs are contained in Appendix 1 of the Environmental Impact Assessment Regulations, 2014 GN R982 published in GG 38282 of 4 December 2014 (as amended) (EIA Regulations). For ease of reference, the table below cross references the content requirements and related section number in this report.

NO.	EIA REGULATIONS, APPENDIX 1 REQUIREMENTS	APPLICABLE SECTION IN THIS REPORT
A	Details of the EAP who prepared the report, including the expertise of the EAP, including curriculum vitae.	2
B (i)	The location of the activity, including the 21 digit Surveyor General code of each cadastral land parcel	4
(ii)	The physical address and farm name of the activity	4
(iii)	The coordinates of the boundary of the property or properties	4
c	A plan which locates the proposed activity or activities applied for as well as associated structures and infrastructure at an appropriate scale; or, if it is on land where the property has not been defined, the coordinates within which the activity is to be undertaken;	4 & Appendix C
d	A description of the scope of the proposed activity, including a description of the activities to be undertaken and associated structures and infrastructure and including all listed and specified activities triggered and being applied for as well as the	4
e	A description of the policy and legislative context within which the development is proposed including an identification and description of compliance to all legislation, policies, plans, guidelines, spatial tools, municipal development planning frameworks, and instruments that are applicable to this activity and have been considered in the preparation of the report	6
f	A motivation for the need and desirability for the proposed development including the need and desirability of the activity in the context of the preferred location	4
g	A motivation for the preferred site, activity and technology alternative	6
H (i)	A full description of the process followed to reach the proposed preferred alternative within the site, including details of all the alternatives considered	6
(ii)	Details of the public participation process undertaken in terms of regulation 41 of the Regulations, including copies of the supporting documents and inputs	5 & Appendix D
(iii)	Summary of the issues raised by interested and affected parties, and an indication of the manner in which the issues were incorporated, or the reasons for not including them	5 & Appendix D

<b>NO.</b>	<b>EIA REGULATIONS, APPENDIX 1 REQUIREMENTS</b>	<b>APPLICABLE SECTION IN THIS REPORT</b>
(iv)	The environmental attributes associated with the alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects;	7
(v)	The impacts and risks identified for each alternative, including the nature, significance, consequence, extent, duration and probability of the impacts, including the degree to which these impacts- (aa) can be reversed; (bb) may cause irreplaceable loss of resources; and (cc) can be avoided, managed or mitigated;	9
(vi)	The methodology used in determining and ranking the nature, significance, consequences, extent, duration and probability of potential environmental impacts and risks associated with the alternatives	8
(vii)	Positive and negative impacts that the proposed activity and alternatives will have on the environment and on the community that may be affected focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects	9
(viii)	The possible mitigation measures that could be applied and level of residual risk	9
(ix)	A full description of the process followed to reach the proposed preferred alternative within the site, including the outcome of the site selection matrix	6
(x) (xi)	A full description of the process followed to reach the proposed preferred alternative within the site, including if no alternatives, including alternative locations for the activity were investigated, the motivation for not considering such, as well as a concluding statement indicating the preferred alternatives, including preferred location of the activity	6
l(i)	A full description of the process and methodology used to identify, assess and rank the impacts the activity will impose on the preferred location through the life of the activity, including a description of all environmental issues and risks that were identified during the environmental impact assessment process;	8
j	An assessment of each identified potentially significant impact and risk, including cumulative impacts, the nature, significance, consequences, extent, duration, probability of the impact and risk, as well as the degree to which the impact and risk may cause irreplaceable loss of resources and the degree to which the impact and risk can be avoided, managed or mitigated	9
k	Where applicable, a summary of the findings and impact management measures identified in any specialist report	N/A
l	An environmental impact statement which contains a summary of the key findings of the environmental impact assessment and a map at an appropriate scale which superimposes the proposed activity and its	9

<b>NO.</b>	<b>EIA REGULATIONS, APPENDIX 1 REQUIREMENTS</b>	<b>APPLICABLE SECTION IN THIS REPORT</b>
	associated structures and infrastructure on the environmental sensitivities of the preferred site indicating any areas that should be avoided, including buffers. It must also contain a summary of the positive and negative impacts and risks of the proposed activity and identified alternatives;	
m	Based on the assessment, and where applicable, impact management measures from specialist reports, the recording of the proposed impact management objectives, and the impact management outcomes for the development for inclusion in the EMPr.	<b>9</b>
n	Any aspects which were conditional to the findings of the assessment either by the EAP or specialist which are to be included as conditions of authorisation	<b>9</b>
o	A description of any assumptions, uncertainties, and gaps in knowledge which relate to the assessment and mitigation measures proposed	<b>3</b>
p	A reasoned opinion as to whether the proposed activity should or should not be authorised, and if the opinion is that it should be authorised, any conditions that should be made in respect of that authorisation	<b>9</b>
q	Where the proposed activity does not include operational aspects, the period for which the environmental authorisation is required, the date on which the activity will be concluded, and the post construction monitoring requirements finalised.	<b>N/A</b>
r	An undertaking under oath or affirmation by the EAP in relation to 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 any information provided by the EAP to interested and affected parties and any responses by the EAP to comments or inputs made by interested and affected parties	<b>Preamble &amp; Appendix A</b>
s	Where applicable, details of any financial provisions for the rehabilitation, closure, and ongoing post decommissioning management of negative environmental impacts;	<b>N/A</b>
t	Any specific information that may be required by the competent authority	<b>Appendix D</b>
u	Any other matters required in terms of Section 24(4)(a) and (b) of the Act.	<b>N/A</b>



# 1 INTRODUCTION

## 1.1 INTRODUCTION

Remofilwe 2010 Trading (Pty) Ltd (Remofilwe) has been appointed by Transnet Freight Rail, an operating division of Transnet SOC Ltd (hereafter referred to as “Transnet”) (the Applicant) to undertake the required Environmental Authorisation (EA) and Water Use Licence (WUL) applications for the proposed development of the Vlermuislaagte and Sishen staging lines along the existing manganese railway line, Kathu, Northern Cape Province (the project).

Transnet is currently implementing solutions for the Manganese Expansion Program in respect of exporting manganese on the Sishen-Saldanha Corridor and the manganese PE/Ngqura corridor. The current scope of the project will present the expansion program with options to optimally utilize the rail capacities enroute to Sishen and to provide appropriate and cost-effective means of expanding these capacities to meet the validated tonnage demand. The proposed solution is to provide additional staging lines in Sishen and provide additional facilities at the Vlermuislaagte rail siding.

As indicated in Figure 1, the proposed Vlermuislaagte loop is located approximately 20 km west-north of the town of Kathu, 9 km south-south-west of the South32 Mamatwan mine and 9 km north-east of the town of Deben in Ward 2, Gamagara Local Municipality (GLM). The proposed Sishen Erts Yard loop is located adjacent, east of the Sishen Iron Ore mining pit, approximately 7 km South of the Kathu Central Business District in Ward 8 of GLM. The Vlermuislaagte loop and Sishen Erts Yard loop are separated by approximately 26 km.

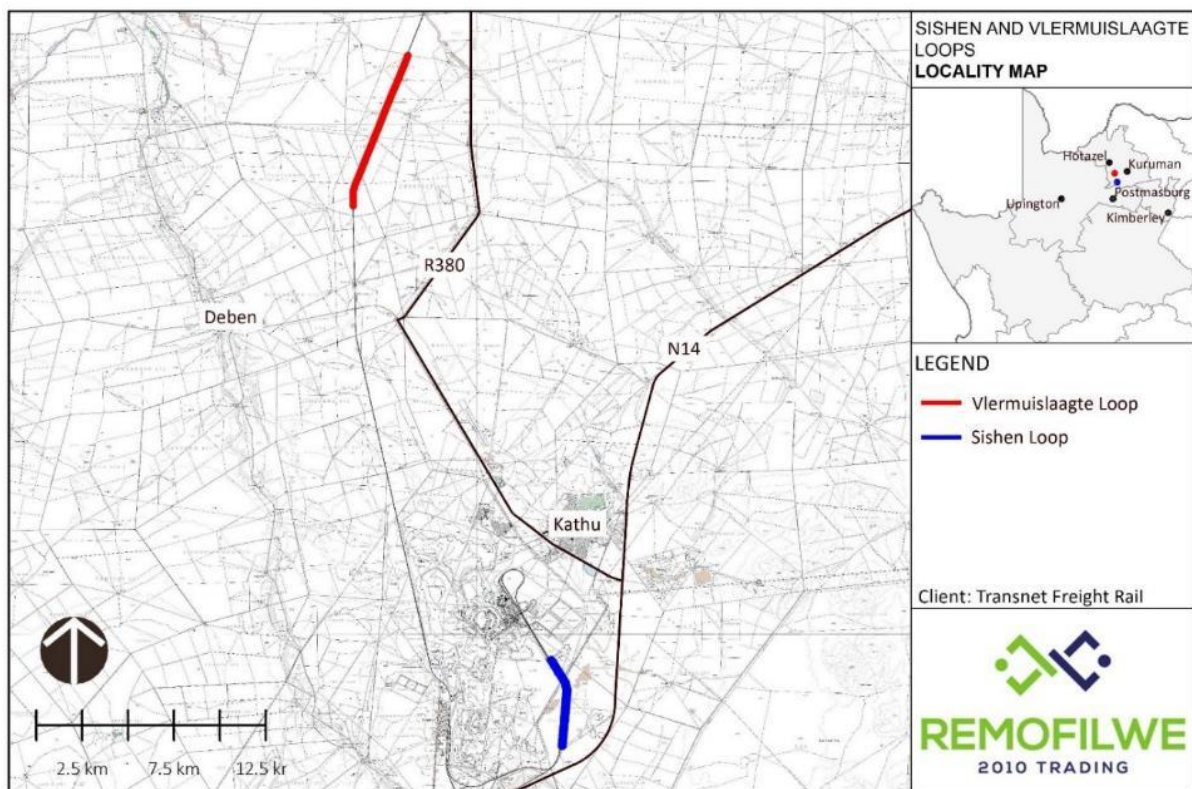


Figure 1: Vlermuislaagte loops and Sishen Erts Yard development locality

## **1.2 LISTED ACTIVITIES AND ENVIRONMENTAL REQUIREMENTS**

In terms of the National Environmental Management Act 107 of 1998 (as amended) (NEMA) and the Environmental Impact Assessment Regulations, 2014 (as amended) (EIA Regulations) a Basic Assessment (BA) Process and associated Public Participation is required for the proposed development.

As indicated in Table 1, the proposed development triggers Listed Activities 11 and 64 in the EIA Regulations Listing Notice 1, 2014 (as amended). The proposed project furthermore triggers water use activities outlined in Section 21 of the National Water Act 36 of 1998 (NWA) as outlined in Table 1.

**Table 1: NEMA, NWA and NHRA listed activities**

<b>Listing Notice</b>	<b>Activity No.</b>	<b>Activity Description</b>	<b>Specific scope item</b>
EIA Regulations Listing Notice 1	11	<p>The development of facilities or infrastructure for the transmission and distribution of electricity:</p> <ul style="list-style-type: none"> <li>(i) Outside urban areas or industrial complexes with a capacity of more than 33 but less than 275 kV; or</li> <li>(ii) Inside urban areas or industrial complexes with a capacity of 275 kV or more.</li> </ul> <p>excluding the development of bypass infrastructure for the transmission and distribution of electricity where such bypass infrastructure is—</p> <ul style="list-style-type: none"> <li>(a) temporarily required to allow for maintenance of existing infrastructure;</li> </ul>	<p><b>Sishen loop</b></p> <p>The existing powerline that will be moved to make space for the proposed staging lines, is 132kV in capacity.</p>
EIA Regulations Listing Notice 1	64	<p>The expansion of railway lines, stations or shunting yards where there will be an increased development footprint, excluding—</p> <ul style="list-style-type: none"> <li>(i) railway lines, shunting yards and railway stations in industrial complexes or zones;</li> <li>(ii) underground railway lines in mines; or</li> </ul>	<p><b>Vlermuislaagte Loop</b></p> <p>The proposed staging loops and crossing loops will increase the development footprint and will lie outside of the existing railway line reserve.</p>

Listing Notice	Activity No.	Activity Description	Specific scope item
		(iii) additional railway lines within the railway line reserve	
NWA Water Uses	Section 21	(a) impeding or diverting the flow of water in a watercourse;  (i) altering the bed, banks, course or characteristics of a watercourse.	<b>Sishen Loop</b>  The Sishen staging lines are within 500m of three (3) depressional wetland systems, and as such trigger S21 c & i water uses. A Water Use license / General Authorisation process would be applicable
NHRA	Section 38	Subject to the provisions of subsections (7), (8) and (9), any person who intends to undertake a development categorised as— (a) the construction of a road, wall, powerline, pipeline, canal or other similar form of linear development or barrier exceeding 300m in length;  must at the very earliest stages of initiating such a development, notify the responsible heritage resources authority and furnish it with details regarding the location, nature and extent of the proposed development.	The proposed staging and crossing loops are longer than 300m in length and as such will require a Heritage Impact Assessment to be undertaken and submitted to the relevant Heritage Authority for their consideration.

### 1.3 PURPOSE OF THE BASIC ASSESSMENT REPORT

The main purpose of this report is to:

- Determine the policy and legislative context within which the activity is located and how the activity complies with and responds to said policy and legislative context.
- Identify feasible alternatives considered, including the activity, site location, and layout alternatives.
- State the need and desirability of the proposed activity.
- Provide a description of the receiving environment that would be affected by the proposed activity.

- Identify the preferred site, which includes an impact and risk assessment process inclusive of cumulative impacts and a ranking process of the identified preferred alternatives focusing on the geographical, physical, biological, social, economic and cultural aspects of the environment.
- Determine the significance, duration and probability of the impacts occurring to inform the technology and micro siting of the activity.
- Identify the most compatible micro-siting for the activity.
- Identify, assess and rank the significant impacts and risks the activity will impose on the preferred site through the lifetime of the activity.
- Identify suitable measures to avoid, reverse, mitigate or manage identified impacts.
- Identify residual risks that need to be managed and monitored.
- Describe the public participation process that was undertaken.
- Make recommendations for decision-making.
- The BA Report for the proposed project will be submitted to the Department of Forestry Fisheries and Environment (DFFE). The WUL Application will be submitted to the Department of Water and Sanitation (DWS) Northern Cape Region.

## 2 DETAILS OF EAP AND APPLICANT

### 2.1 DETAILS OF THE ENVIRONMENTAL CONSULTING TEAM

Remofilwe is an independent environmental consultancy appointed by the Applicant to undertake the required BA process as part of the application for an EA for the proposed project.

Remofilwe does not have any financial or other interests in the undertaking of the proposed development, other than remuneration for work performed in terms of the NEMA, the EIA Regulations, and any specific environmental management Act; and does not have any vested interest in the proposed activity.

The contact details and experience of the EAP undertaking the application are provided in Table 2 below and proof of qualification is attached in **Appendix A**.

Table 2: EAP Details

<b>EAP:</b>	<b>Moses Kgopana (Reg. EAP &amp; Pr.Sci.Nat)</b>
<b>Experience:</b>	<p>Moses Kgopana is an Environmental Manager with a four year bachelor's degree in Environmental Management with over 13 years experience. Mr Kgopana is a registered Professional Natural Scientist with the South African Council for Natural Scientific Professions (SACNASP). Mr Kgopana is also registered with the Environmental Assessment Practitioners Association of South Africa (EAPASA).</p> <p>Mr Kgopana has experience in various aspects of Environmental Management and this includes the following:</p> <p>Undertaking and writing Environmental Impact Assessment;</p> <ul style="list-style-type: none"> <li>• Writing Environmental Management Programmes;</li> <li>• Undertaking and writing Waste Management Report;</li> <li>• Waste License;</li> <li>• Sensitivity analysis, planning and Mapping;</li> <li>• Conducting Public Participation Process;</li> <li>• Conducting environmental awareness training; and</li> <li>• Conducting legal compliance audits.</li> </ul>
<b>Contact details:</b>	<p>Cell phone: 076 328 1558</p> <p>Email: environment@remo2010.co.za.</p>
<b>EAPASA:</b>	Registration number 2022/4555

## **2.2 DETAILS OF APPLICANT/DEVELOPER**

The contact details of the applicant are provided in Table 3 below.

**Table 3: Details of Applicant**

<b>Name of Applicant:</b>	Transnet Freight Rail, an operating division of Transnet SOC Ltd
<b>Contact Person:</b>	Sibongile Sibisi
<b>Tel No:</b>	060 539 6655
<b>Fax No:</b>	-
<b>Email Address:</b>	Sibongile.Sibisi@transnet.net
<b>Postal Address:</b>	150 Commissioner Street, Johannesburg, 2001

### **3 ASSUMPTIONS AND GAPS IN KNOWLEDGE**

The following assumptions and potential gaps in knowledge apply:

- All information provided by the applicant to the EAP was correct and valid at the time it was provided.
- The EAP does not accept any responsibility in the event that additional information comes to light at a later stage of the process.
- All data from unpublished research is valid and accurate at the time this report was written.
- The scope of this investigation is limited to assessing the potential environmental impacts associated with the proposed development only.

It should be noted that findings, recommendations and conclusions provided in this report are based on the author's best scientific and professional knowledge and experience. No part of this report may be amended or extended without prior written consent of the author. Any recommendations, statements or conclusions drawn from or based on this report must clearly cite or refer to this report. Whenever such recommendations, statements or conclusions form part of the main report to current investigation, this report must be included in its entirety.

## **4 PROJECT DESCRIPTION**

### **4.1 PROPOSED PROJECT INFRASTRUCTURE**

The proposed project will comprise the following components:

#### **4.1.1 Sishen scope**

The proposed Sishen expansion (total length of 5 km) includes, but not limited to the following:

- Relocation of Eskom pylons.
- Bridge alterations to ensure space/clearances underneath.
- Lines to be electrified to 50 kV AC.
- Relocation of the following:
  - Relocation of power line (132kV).
  - Relocation of power line (11 kV / 6.6 kV).
  - Service roads (4 m wide).
  - Overhead aerial feeder and return conductors.
  - Optic fibre cables if on the impacted structures.
- Culverts extensions.
- Demolish and relocate retaining wall running parallel to the rail track.
- Drainage for additional lines.
- Two (2) lines to be added on the eastern side of the yard as per considered Option 4, which will accommodate three (3) rakes of 116 CR13/14 wagon for iron ore trains and three (2) rakes of 125 CR17 wagon for Manganese trains. These rakes will be pulled by a combination of 15E and 43D locomotives.
- One (1) line to be added on the locomotive staging area.

#### **4.1.2 Vlermuislaagte scope**

The proposed Vlermuislaagte expansion (total length of 8 km) includes, but not limited to the following:

- Two (2) arrival lines/crossing loops for 125 wagon trains (approximately 1500 m long) to accommodate manganese traffic.
- Two (2) additional loops for staging trains.
- Shunting neck to accommodate 125 wagons.
- Track slab or inspection slab.
- Five (5) non-electrified “Not to Go” shunting spurs to accommodate six (6) wagons. Shunting spurs will be used to uncouple overloaded wagons for load weight rectification onsite.
- Additional inspection road.
- One (1) covered parking with four (4) vehicle parking bays.
- Hot box detector and vehicle identification system (i.e. signaling).
- One (1) level crossing will be relocated and another level crossing will be upgraded at Vlermuislaagte.
- All level crossings will include cattle grids.
- The site will have a 6 m wide surfaced road along its length on the east of the yard and access is proposed from either the Mamatwan Yard or from the R380. The servitude will be increased by approximately 80m.



- Lines to be electrified to 3 kV DC.
- Relay rooms will be constructed for signaling works. Colour signals to be integrated with the Central Traffic Control CS90 train authorization system.
- The turnouts shall be 1:20 or 1:12.
- Catch points will be added to the first loop to protect the mainline.
- 1:12 Runaway sets to be installed to protect loop 1 and 2.

#### **4.1.3 Train types**

A combination of locomotives will be used to haul the wagons. It is proposed that a combination of 15E and 43D locomotives will be used. The 50 kV AC 50 Hz Class 15E are a heavy-duty electric locomotive and the Class 43D are a heavy-duty diesel-electric locomotive. Hauling will be predominantly undertaken with the locomotives configured to the available electrical power supply however, during load shedding, the 43D locomotives will be the primary “workhorse” locomotive. The 43D diesel-electric locomotives are anticipated to be a considerable noise source, with significant engine exhaust noise being emitted at an approximate height of four (4) meters above the rail which makes noise mitigation difficult. The 15E electric locomotives are quieter as they produce less mechanical noise and require no exhaust.

#### **4.1.4 Train frequency**

It is understood that the train frequency on the current line is approximately 22 trains per day operating over a 24-hour period. Under the proposed project, the frequency of the trains will be reduced to approximately 17 trains per day operating over a 24-hour period however, the train wagon length will be approximately doubled. The noise impact at nearby sensitive receptors will be experienced less frequently but for a slightly longer duration as each train passes.

## **4.2 SITE LOCATION**

The proposed project site, comprising both Vlermuislaagte loops and Sishen Erts Yard loop development are located on property owned by Transnet. However, to effect the full upgrades to the Vlermuislaagte loops, it will be necessary to acquire some land from the adjacent landowner (Transnet is currently in negotiations). The proposed project site is located within close proximity of Kathu, Gamagara Local Municipality (GLM), John Taolo Gaetsewe District Municipality (JTGDM), Northern Cape Province (Figure 1). The Vlermuislaagte site is located 20 km north-west of the town of Kathu, in Ward 2 of GLM. The Sishen Erts loop site is located 7 km south-west of the town of Kathu, in Ward 8 of GLM.

The Sishen loop upgrades will be for a length of approximately 5km and the Vlermuislaagte loop is 8km in length. **A corridor of 100m has been assessed for both loops.** The area is fenced off and located within the footprint of existing Transnet infrastructure for majority of the site.

The area coordinates of the boundary points for the proposed project are summarized in Table 4. Figure 1 provides the locality of the proposed staging lines.

**Table 4: Coordinates for the staging lines/loops**

Staging Line	Start	Middle	End
Sishen	27°48'7.50"S 23° 2'27.93"E	27°46'37.88"S 23° 2'38.55"E	27°45'48.36"S 23° 02'9.97"E
Vlermuistlaagte	27°32'22.63"S 22°56'23.11"E	27°30'12.89"S 22°57'3.44"E	27°28'0.63"S 22°57'57.28"E

#### **4.2.1 Sishen loop locality**

The footprint of the Sishen loop of the proposed project is situated at Sishen Mine, east of the main mining areas, approximately 6,5 km south of Kathu and west of the N14 Highway (Figure 1). The footprint of the study site is: 5km long by 100m wide. Below are some of the main coordinates for the project:

- Sishen Mine: 27°45'3.69"S; 23° 0'51.55"E.
- Approximate center of study site: 27°46'37.88"; S 23° 2'38.55"E
- Start of study site: 27°48'7.50"; S 23° 2'27.93"E
- End of study site: 27°45'48.36"; S 23° 02'9.97"E.
- Quarter Degree Square (QDS): 2723CC.
- Quaternary Drainage Area (QDA): D41J.

#### **4.2.2 Vlermuistlaagte loop locality**

The footprint of the proposed Vlermuistlaagte loop of the proposed project is located approximately 25km north of Kathu and 47km west of Kuruman ((Figure 1). The footprint of the study site is 8 km long by 100m wide. Below are some of the main coordinates for the project:

- Vlermuistlaagte: 27°29'24.63"S; 22°57'20.59"E.
- Approximate center of study site: 27°30'12.89"S; 22°57'3.44"E.
- Start of study site: 27°32'22.63"S; 22°56'23.11"E.
- End of study site: 27°28'0.63"S; 22°57'57.28"E
- Quarter Degree Square (QDS): 2722BD & 2722DB.
- Quaternary Drainage Area (QDA): D41K.

### **4.3 PROPERTY DESCRIPTION**

Details of the properties that are directly affected by the project are reflected in Table 5 below.

**Table 5: Properties associated with the project**

Farm Name	Portion	Surveyor-General Cadastral Code No.	Site
Walton 390	Remaining Extent	C0410000000039000000	Vlermuistlaagte
Walton 390	Portion 4	C0410000000039000004	Vlermuistlaagte

Walton 390	Portion 5	C04100000000039000005	Vlermuislaagte
Bruce 544	Portion 1	C04100000000054400001	Sishen
Bruce 544	Portion 2	C04100000000054400002	Sishen
Bruce 544	Portion 6	C04100000000054400006	Sishen
Lylyveld 545	Portion 2	C04100000000054500002	Sishen
Lylyveld 545	Portion 3	C04100000000054500003	Sishen

#### **4.3.1 Sishen loop**

The Applicant owns the farm portions or servitudes that will be directly affected by the proposed Sishen Erts loop development area. Farm portions directly adjacent by the proposed development listed in Table 6 below. Figure 2 depicts the various farm portions in relation to the proposed development area.

**Table 6: Sishen Erts loop directly affected and adjacent properties**

<b>Property Name</b>	<b>Landowner</b>
RE (Portion 0) of the farm Lylyveld No. 545	Sishen Iron Ore Company (Pty) Ltd
Portion 2 of the farm Lylyveld No. 545	Transnet
Portion 3 of the farm Lylyveld No. 545	Transnet
Portion 5 of the farm Lylyveld No. 545	Transnet
RE (Portion 0) of the farm Bruce No. 544	Assmang
Portion 1 of the farm Bruce No. 544	SIOC
Portion 2 of the farm Bruce No. 544	SIOC
Portion 4 of the farm Bruce No. 544	Transnet
Portion 6 of the farm Bruce No. 544	Transnet
Portion 9 of the farm Bruce No. 544	SIOC
Portion 2 of the farm Lylyveld No. 545	Transnet
Portion 3 of the farm Lylyveld No. 545	Transnet

#### **4.3.2 Vlermuislaagte loop**

The Applicant owns most of the directly affected farm portion or servitudes for the Vlermuislaagte loop, but it will be necessary to acquire additional land for sections of the expansion. Farm portions directly adjacent to the proposed development listed in Table 7 below. Figure 3 depicts the various farm portions in relation to the proposed development area.

**Table 7: Vlermuislaagte loop directly affected and adjacent properties**

<b>Property Name</b>	<b>Landowner</b>
RE (Portion 0) of the farm Walton No. 390	Specialized Animal Solutions (Pty) Ltd
Portion 1 of the farm Walton No. 390	Fleming, Jacob Johannes
Portion 2 of the farm Walton No. 390	Maritz, Aletta Johanna
Portion 3 of the farm Walton No. 390	Pienaar, Pieter Andre
Portion 4 of the farm Walton No. 390	Transnet
Portion 5 of the farm Walton No. 390	Transnet
Portion 6 of the farm Walton No. 390	Transnet
Portion 7 of the farm Walton No. 390	Transnet
RE (Portion 0) of the farm Chertsey No. 430	Fleming, Jacob Johannes
Portion 2 of the farm Chertsey No. 430	Maritz, Willem Johannes
Portion 3 of the farm Chertsey No. 430	Transnet
RE (Portion 0) of the farm Flatlands No. 429	Flatlands Boerdery CC
Portion 1 of the farm Flatlands No. 429	MCJ Boerdery LTD
Portion 2 of the farm Flatlands No. 429	Transnet
Portion 3 of the farm Flatlands No. 429	Transnet

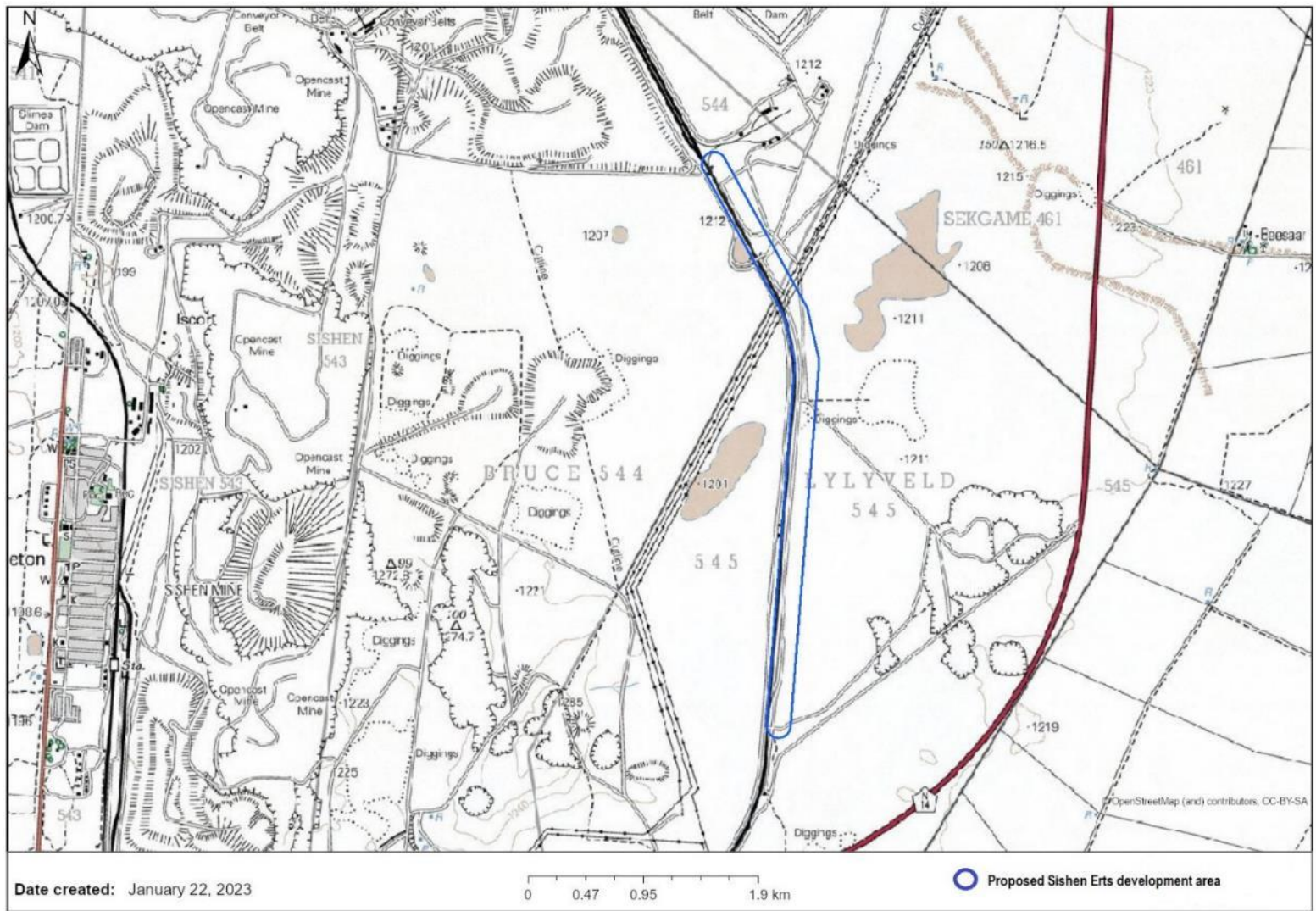


Figure 2: Proposed Sishen Erts loop development area

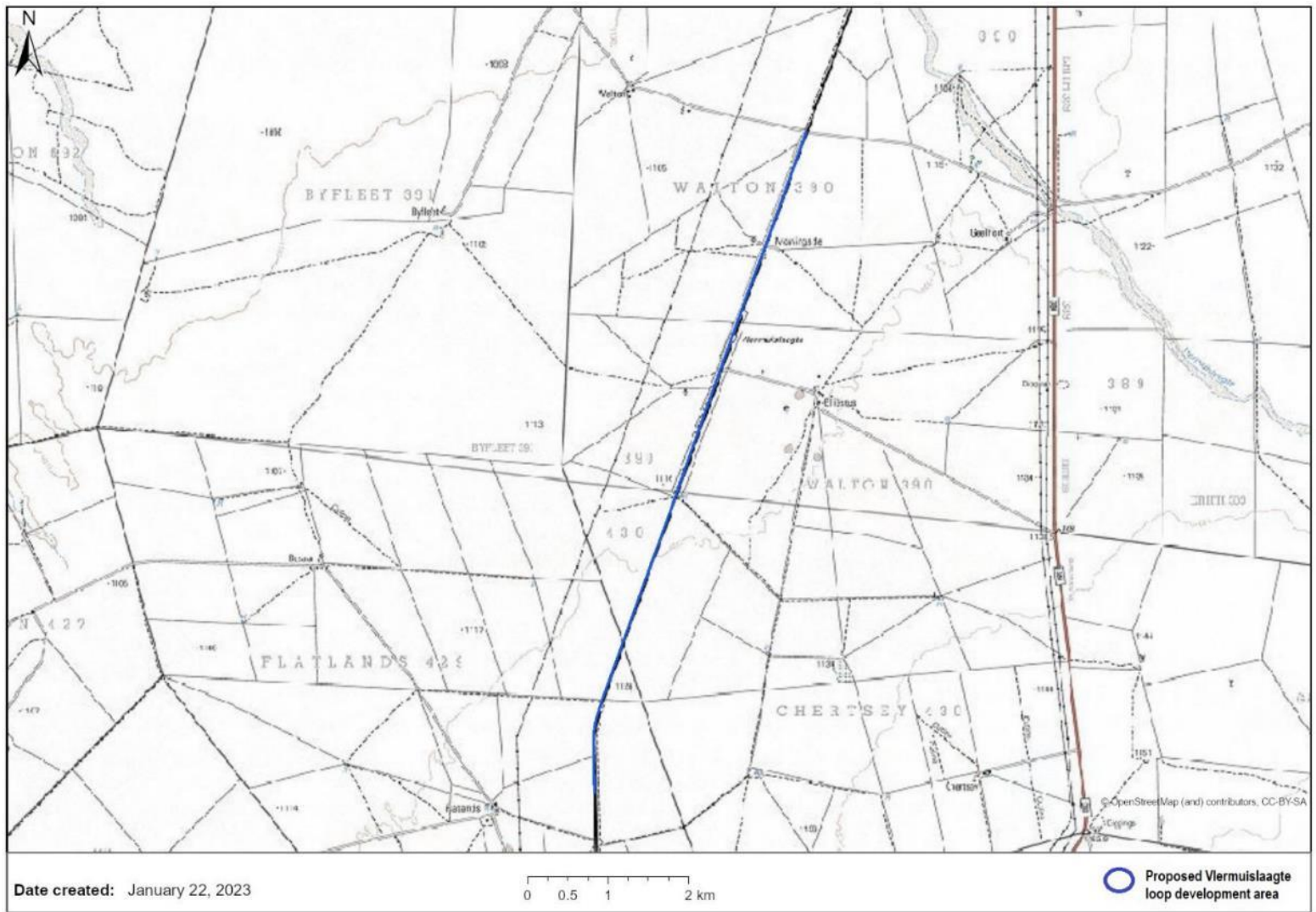


Figure 3: Proposed Vlermuislaagte loop development area

#### **4.4 SITE ACCESS**

Existing site access is present for the current Transnet lines and infrastructure at both Sishen and Vlermuislaagte loops. Prior to construction, Transnet will apply for work permit from the relevant authorities which includes submission of project layout plans to the relevant municipality for review and approval.<sup>1</sup>

#### **4.5 CURRENT LANDCOVER AND LAND USES**

The landcover or land use of proposed Sishen and Vlermuislaagte project site is the shoulder reserve area of the existing railway line. The railway line is within an area that is sparsely urbanized with mostly large grazing farmlands, small, scattered towns and open cast mining operations.

#### **4.6 PROJECT DEVELOPMENT CYCLE**

##### **4.6.1 Construction**

The construction phase is estimated to take approximately 12 - 24 months. During the construction phase of the project the following activities are anticipated:

##### *Site preparation*

Vegetation and topsoil will be cleared to make way for project infrastructure as well as for the access roads. Topsoil that will be removed will be stored for site rehabilitation purposes where practical.

##### *Site establishment works*

The site will have temporary laydown areas and offices for the construction contractors. This will include the contractor's chosen electricity supply infrastructure e.g. use of generators and fuel storage that will be required to conform to acceptable measures to ensure no harm to the environment. The existing laydown areas at the Sishen Erts Yard and the Vlermuislaagte substation will also be used.

##### *Water consumption during construction phase*

Water will be provided by the existing Transnet infrastructure at the existing laydown areas.

##### *Site rehabilitation*

Once all the construction activities are completed, all temporary structures and facilities will be removed and the site will be rehabilitated to the extent possible.

##### **4.6.2 Operation and maintenance**

The estimated life of the facility, once operational, is likely to be a minimum of 30 - 50 year. It is understood that the train frequency on the current line is approximately 22 trains per day operating over a 24-hour period. Under the proposed project, the frequency of the trains will be reduced to approximately 17 trains per day operating over a 24-hour period however, the train wagon length will be approximately doubled.

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<sup>1</sup> Transnet Freight Rail Vlermuislaagte Loop and Sishen Erts Yard Construction Management Plan, April 2022 19.

### **4.6.3 Decommissioning**

The railway infrastructure is not envisaged to be decommissioned within the near future. A Decommissioning study must be undertaken when the project reaches its lifespan. Potential decommissioning impacts are however included in this report to the extent possible.

## **4.7 ELECTRICITY DEMAND AND SUPPLY**

During the construction and operational phases, electricity will be sourced from the existing Eskom infrastructure.

## **4.8 EMPLOYMENT OPPORTUNITIES**

The proposed project will create short-term employment opportunities (approximately 50 jobs) during the construction and decommissioning phases, and long-term employment during the operational phase. Transnet's existing EPC contractors will be utilised to complete the scope of works.

## **4.9 NEED AND DESIRABILITY**

### **4.9.1 Background and need for the proposed project**

It is an important requirement in the BA Process to review the need and desirability of the proposed project. The critical aim of investigating the need and desirability of a proposed project revolves around determining suitability (i.e. is the activity proposed in the right location for the suggested land-use/activity) and timing (i.e. is it the right time to develop a given activity?).

Manganese rail volumes in South Africa have increased over the last five years, from around 8 million tonnes per annum (mtpa) in 2013/14 to 13.7 mtpa in 2017/18, with a customer demand of more than 17mtpa in 2018/19.<sup>2</sup> The unexpected increase in demand, combined with the delay in implementing the Manganese program, which provides an export capacity of 16 million tonnes per annum through the port of Ngqura, has necessitated major operational changes and system adaptation to achieve these volumes in the short term.<sup>3</sup> Almost all manganese volumes start in the Hotazel/Mamathwane area and run on the section between Hotazel and Sishen (section Z1), which has a theoretical capacity of 11 trains per day/direction. Manganese trains north of Sishen destined for Saldanha must be turned around at Haakbosleegte due to the lack of a direct turnout to the iron ore line, requiring the use of two slots between Sishen and Haakbosleegte.<sup>4</sup>

To date, the number of trains has increased to the point where the number of trains planned for the section exceeds the number of theoretically available slots.<sup>5</sup> In addition to being unsustainable in the long term, congestion in this section could increase the risk of volume and revenue loss as a result of:<sup>6</sup>

- Reduce time for maintenance on the line which poses a safety risk.
- Long train cycle times which necessitate an increase in resource requirements (reduce crew and rolling stock performance).
- Train cancellations (not being able to execute the planned trains).

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<sup>2</sup> TFR CMP 2022 (note 1 above) 5.

<sup>3</sup> As above.

<sup>4</sup> As above.

<sup>5</sup> As above.

<sup>6</sup> As above.



Adding a new loop (Vlermuistlaagte) will de-bottleneck this section.<sup>7</sup>

In addition, it should be noted that the Sishen Erts Yard was originally intended to efficiently handle 22 iron ore trains per week (equating to 37 mtpa) to and from the Kumba Iron Ore mine in Sishen.<sup>8</sup> There are two arrival lines and two departure lines in the yard.<sup>9</sup> The addition of manganese and emerging miner iron ore train processing in the yard (with longer processing times) has led to an increase in yard congestion, resulting in a number of train delays and cancellations of time slots.<sup>10</sup>

As such proposed project is intended to alleviate various bottlenecks between Hotazel and Postmasburg. Therefore, both interventions at the Sishen Erts Yard and Vlermuistlaagte loop are required for safe and effective operations to support current and future volumes of up to 24mtpa.<sup>11</sup> This will allow Manganese traffic from the Hotazel region to run directly to the Erts Yard in Sishen and then to the Iron Ore line.<sup>12</sup>

#### **4.9.2 Desirability of the proposed project**

Table 8 includes a list of questions to determine the need and desirability of the proposed project.

**Table 8: Determination of the Need and Desirability of the development**

<b>No.</b>	<b>Question</b>	<b>Response</b>
1.	Is the land use (associated with the activity being applied for) considered within the timeframe intended by the existing approved Spatial Development Framework (SDF) agreed to by the relevant environmental authority? (i.e. is the proposed development in line with the projects and programmes identified as priorities within the IDP).	The proposed project is located within the Sishen-Saldanha railway corridor. The GLM Integrated Development Plan Review for 2021/2022, notes the intention to develop the municipality into a commercial and industrial town and expand opportunities beyond mining. In this regard, the intention is to develop GLM into an industrial city by 2030 and a manufacturing city by 2060.
2.	Should development, or if applicable, expansion of the town/area concerned in terms of this land use (associated with the activity being applied for) occur here at this point in time?	The GLM IDP notes that the Sishen-Saldanha railway line presents the municipality with an opportunity for economic growth.
3.	Does the community/area need the activity and the associated land use concerned (is it a societal priority)? This refers to the strategic as well as local level (e.g. development is a national priority, but within a specific local context it could be inappropriate)	The project is t is aligned with the legal, policy and administrative framework as it pertains to infrastructure development upgrades in South Africa. At a national level, the proposed development is aligned with the National Development Plan 2030 (NDP) and the National Infrastructure Plan 2050 (NIP 2050). In particular, it is Strategic Integrated

<sup>7</sup> As above.

<sup>8</sup> TFR CMP 2022 (note 2 above) 6.

<sup>9</sup> As above.

<sup>10</sup> As above.

<sup>11</sup> As above.

<sup>12</sup> As above.

No.	Question	Response
		Project (SIP) 5, which is a top-priority SIP, targets the Saldanha-Northern Cape development corridor. At a regional and local level, it is anticipated to create employment, skills development and procurement opportunities for people in GLM and the broader JTGDM.
4.	Are the necessary services with appropriate capacity currently available (at the time of application), or must additional capacity be created to cater for the development?	Yes
5.	Is this development provided for in the infrastructure planning of the municipality, and if not what will the implication be on the infrastructure planning of the municipality (priority and placement of services)	The Northern Cape Provincial Development and Resource Management Plan / Provincial Spatial Development Framework (NCPSPDF) approved in 2012 is a statutory document intended to direct spatial land-use planning to promote environmental, economic, and social sustainability through sustainable development. It provides a legal basis to direct provincial government programmes and projects. It provides a framework for integrated land-use planning within the Province. The NCPSPDF highlights the importance of ongoing upgrades to the Saldanha-Sishen Corridor (Figure 4) as a key driver of economic growth in the Provincial economy. This sentiment is echoed in the Spatial Development Framework of the JTGDM which highlights improvement of freight management capacity in the District as a key Strategic Development Objective.
6.	Is this project part of a national programme to address an issue of national concern or importance?	Yes, SIP 5
7.	Is the development the best practicable environmental option (BPEO) for this land/site?	Yes

No.	Question	Response
8.	Would the approval of this application compromise the integrity of the existing approved municipal IDP and SDF as agreed to by the relevant authorities?	No. The proposed project is aligned with planning in the Northern Cape Provincial and GLM SDF and IDP.
9.	Would the approval of this application compromise the integrity of the existing environmental management priorities for the area (e.g. as defined in EMFs), and if so, can it be justified in terms of sustainability considerations?	No.. The project area falls within the Gamagara Corridor, a mining development corridor spanning across JTGDM and Siyanda (ZF Mgcawu) Districts from Lime Acres and Danielskuil in the south to Hotazel in the north. The primary focuses of the Gamagara Corridor is mining of iron and manganese.
10.	Do location factors favour this land use (associated with the activity applied for) at this place? (this relates to the contextualisation of the proposed land use on this site within its broader context).	The proposed project area is located within the shoulder reserve area of the existing railway line. The railway line is within an area that is sparsely urbanised with mostly large grazing farmlands, small, scattered towns and open cast mining operations. Proposed activities are in line with activities undertaken within this area.
11.	How will the activity or the land use associated with the activity applied for, impact on sensitive natural and cultural areas (built and rural/natural environment)?	The proposed project will have minimal impact on potential sensitive receptors due to it already being in an area that is highly transformed.
12.	How will the development impact on people's health and wellbeing (e.g. in terms of noise, odours, visual character and sense of place, etc.)?	The proposed Project is situated within an already transformed site surrounded by various mining operations and rail infrastructure. Section 9 of this BA outlines the potential impacts of the project. It should be noted that the specialists have concluded that the impacts from the activities related to the proposed project are acceptable and minimal.
13.	Will the proposed activity or the land use associated with the activity applied for, result in unacceptable opportunity costs?	No.
14.	Will the proposed land use result in unacceptable cumulative impacts?	Section 9 of this BA outlines the potential impacts of the project. It should be noted that the specialists have concluded that the impacts from the activities related to the

No.	Question	Response
		proposed project are acceptable and minimal. It should be noted that the specialists have concluded that the impacts from the activities related to the proposed project are acceptable and minimal.

#### **4.9.3 Consideration of the NEMA environmental management principles**

Various principles of environmental management as set out in Section 2 of NEMA have also been taken into account.

People and their needs have been placed at the forefront of this assessment by taking into account the impact of the proposed activity on their physical, psychological, cultural and social interests. The following aspects were considered:

- The disturbance of landscapes and sites that constitute the nation's cultural heritage is avoided, or where it cannot be altogether avoided, is minimised and remedied.
- The use and exploitation of non-renewable natural resources.
- Negative impacts on the environment and on people's environmental rights by assessing potentially negative impacts in the selection of preferred alternatives and providing appropriate mitigating measures.

The assessment also followed a risk-averse and cautious approach, which takes into account the limits of current knowledge about the consequences of decisions and actions as is reflected in the opinion of the EAP in this report.

It has been acknowledged in the assessment that all elements of the environment are linked and interrelated, and it must take into account the effects of decisions on all aspects of the environment and all people in the environment by pursuing the selection of the best practicable environmental option / alternative.

Environmental justice has been pursued in that adverse environmental impacts shall not be distributed in such a manner as to unfairly discriminate against any person, particularly vulnerable and disadvantaged persons. This has been achieved by ensuring that the proposed activity will not lead to adverse environmental impacts.

Equitable access to environmental resources, benefits and services to meet basic human needs and ensure human well-being has been pursued and measures have been taken to ensure access to it. The social, economic and environmental impacts of activities, including disadvantages and benefits, have been considered, assessed and evaluated in the report, and decisions are deemed appropriate in the light of such consideration and assessment.

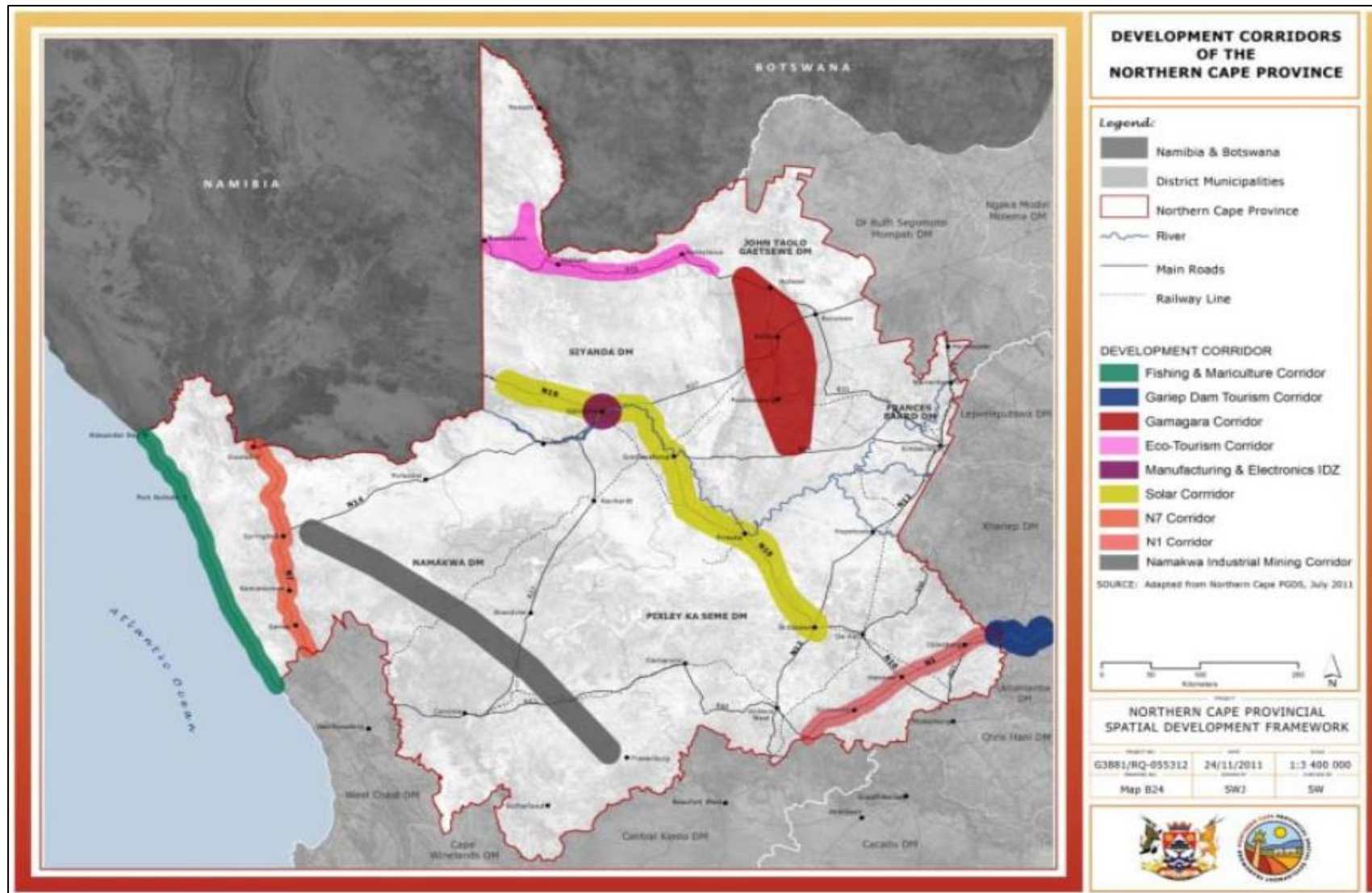


Figure 4: Northern Cape Provincial Spatial Development Framework

Source: NCPSDF, 2012.

## **5 POLICY AND LEGISLATIVE CONTEXT**

All the applicable environmental standards contained within the environmental legislation will be adhered to. Below is an outline of applicable legislation and guidelines for the proposed development that has been identified as relevant:

### **5.1 THE CONSTITUTION OF THE REPUBLIC OF SOUTH AFRICA, 1996 (CONSTITUTION)**

The Constitution provides that, everyone has a right to an environment that is not harmful to their health or well-being. It further provides that, the environment should be protected for future generations through the implementation of the reasonable legislative and other measures that prevent pollution and ecological degradation.

### **5.2 NATIONAL WATER ACT 36 OF 1998 (NWA)**

In terms of Chapter 3 of the NWA, water resources are to be protected, used, developed, conserved, managed and controlled. The NWA recognizes that water is a scarce natural that belongs to all of South Africa's people. The National Department of Water and Sanitation (DWS) is responsible for the nation's water resource. The Minister of Water and Sanitation must ensure that water resources are "protected, used, developed, conserved, managed and controlled" through the implementation of the NWA.

*Water use activities triggered by the proposed project are indicated in Table 1.*

### **5.3 NATIONAL HERITAGE RESOURCE ACT 25 OF 1999 (NHRA) AND ITS REGULATIONS**

No person may, without a permit issued by the responsible heritage resources authority destroy, damage, excavate, alter, deface or otherwise disturb any archaeological or paleontological site. No person may, without a permit issued by the South African Heritage Resource Agency (SAHRA) or a provincial heritage resources authority destroy, damage, alter, exhume, remove from its original position or otherwise disturb any grave or burial ground older than 60 years which is situated outside a formal cemetery administered by a local authority. A grave is widely defined in the Act to include the contents, headstone or other marker of such a place, and any other structure on or associated with such place.

**A Heritage Impact Assessment has been conducted and submitted to the relevant Heritage Department for consideration. Table 1 outlines specific activities that trigger requirements in terms of Section 38 of the NHRA.**

### **5.4 NATIONAL ENVIRONMENTAL MANAGEMENT ACT 107 OF 1998 (NEMA)**

The NEMA aims to improve the quality of environmental decision-making by setting out principles for environmental management that apply to all government departments and organizations that may affect the environment. The IEM principles outlined in the NEMA also aim to ensure that environmental impacts are considered before actions are taken or implemented and to ensure that there are adequate opportunities for public participation in decisions that may affect the environment. The NEMA also creates a framework for facilitating the role of civil society in environmental governance.

## **5.5 EIA REGULATIONS**

The NEMA EIA Regulations were promulgated and came into effect on 4 December 2014. Substantial amendments to the EIA Regulations published in Government Notice 326, GG 40772 came into effect on 7 April 2017. Further amendments were made and took effect on 13 July 2018, 29 May 2020 and 11 June 2021. The EIA Regulations, read with the EIA Regulations Listing Notices 1 - 3 regulate the procedure and criteria as contemplated in Chapter 5 of the NEMA relating to the preparation, evaluation, submission, processing and consideration of, and decision on, applications for EAs for the commencement of listed activities, subjected to environmental impact assessment, in order to avoid or mitigate detrimental impacts on the environment, and to optimise positive environmental impacts, and for matters pertaining thereto.

**Listed activities triggered by the proposed project are indicated in Table 1.**

## **5.6 THE EIA REGULATIONS BASIC ASSESSMENT PROCESS**

The BA process is an effective environmental planning tool. It identifies the environmental impacts of a proposed project and assists in ensuring that a project will be environmentally acceptable and integrated into the surrounding environment in a sustainable way. The BA process for this project complies with the requirements of the NEMA and the EIA Regulations. The guiding principles of a BA process are listed below:

- *Participation*: Appropriate and timely access to the process for all interested and affected parties (I&APs).
- *Transparency*: All assessment decisions and their basis should be open and accessible.
- *Certainty*: The process and timing of the assessment should be agreed in advance and followed by all participants.
- *Accountability*: The decision-makers are responsible to all parties for their action and decisions under the assessment process.
- *Credibility*: Assessment is undertaken with professionalism and objectivity.
- *Cost-effectiveness*: The assessment process and its outcomes will ensure environmental protection at the least cost to society.
- *Flexibility*: The assessment process should be able to adapt to deal efficiently with any proposal and decision-making situation that may arise.
- *Practicality*: The information and outputs provided by the assessment process are readily usable in decision-making and planning.

A BA process is a management tool for collecting and analysing information on the environmental effects that may arise from the implementation of a project. As such, it is used to:

- Identify potential environmental impacts.
- Examine the significance of environmental implications.
- Assess whether impacts can be mitigated.
- Recommend preventive and corrective mitigating measures.
- Inform decision makers and concerned parties about the environmental implications.
- Advise whether development should go ahead.

The public participation process forms an integral part of the BA process and is discussed in greater detail below. Figure 5 illustrates the BA process being followed as part of this EA application.

#### **5.6.1 Application for Environmental Authorisation**

The EA application form was submitted to the DFFE on Thursday, 01 June 2023.

#### **5.6.2 Information Gathering**

At the inception of the BA process, available information regarding the receiving environment was obtained from reliable sources, and previous documented studies in the area.

#### **5.6.3 Specialist Studies**

The following specialist studies were undertaken for the BA process:

- Biodiversity Assessment.
- Palaeontological Study.
- Phase 1 Archaeological and Heritage Impact Assessment.
- Social Impact Assessment.
- Noise Impact Assessment.



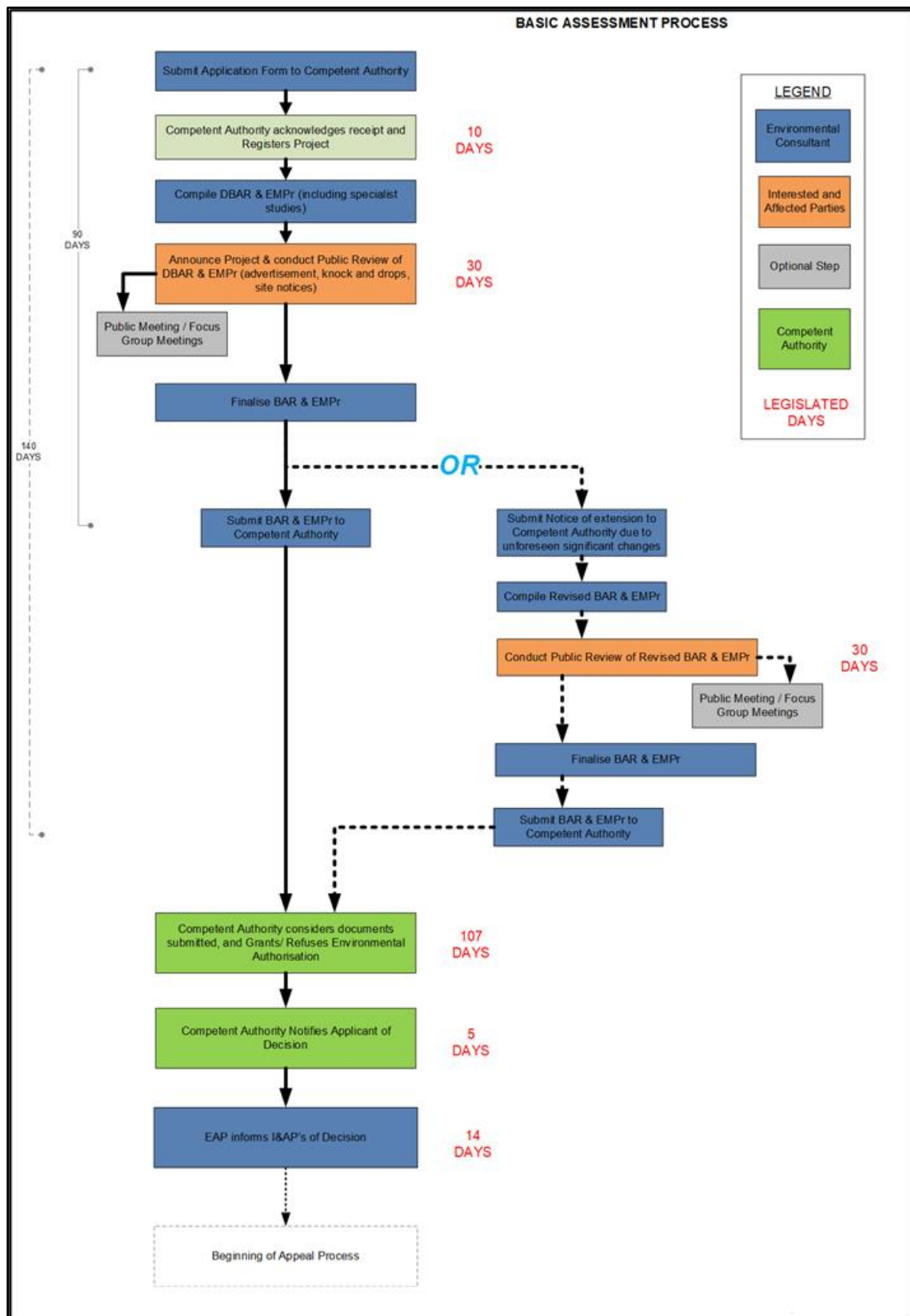


Figure 5: Basic Assessment Process Flow

#### **5.6.4 Public Participation Process**

The principles of NEMA govern many aspects of the BA process, including consultation with I&APs. These principles include the requirement that sufficient and transparent information flow to I&APs on an ongoing basis, to allow them to comment on the proposed project. The public participation process must ensure participation of historically disadvantaged individuals including women, youth or persons who desire but are unable to participate in the process due to illiteracy; disability; or any other disadvantage.

The primary objectives of the public participation process are to:

- Inform and notify potentially I&APs of the proposed application (explain steps that were taken to achieve this).
- Initiate or promote meaningful and timely participation of I&APs by providing proof that notice boards, advertisements and notices to potential I&APs of the proposed application have been displayed, placed or given in accordance with the EIA Regulations.
- Maintain a list of all persons, organisation and organs of state that were registered as I&APs in relation to the application.
- Identify issues and concerns of key stakeholders and I&APs with regards to the application for the proposed project.
- Provide a summary of the issues raised by I&APs, the date of receipt of and the response of the EAP to those issues.
- Provide responses to I&AP queries.

##### ***5.6.4.1 Identification of Interested and Affected Parties and Database management***

I&APs representing the following sectors of society have been identified (see **Appendix D** for a preliminary I&AP database):

- National Authorities.
- Provincial Authorities.
- Local Authorities.
- Ward Councillors.
- Landowners.
- Adjacent Landowners.
- Agricultural Organisations.

The I&AP database will be updated throughout the BA process and any new participants will be registered during the various BA process phases. All I&APs who register will be included in this database and included in project related correspondence going forward.

##### ***5.6.4.2 Public Announcement of the Project***

I&APs will be informed of the project and will be requested to register and submit their comments. The notification will be published/distributed by the following methods (see **Appendix D** for public announcement documentation):

- Publication of a newspaper advertisement in the Gemsbok newspaper on Wednesday, 31 May 2023.
- Notices placed on site, detailing the proposed development, the BA process and an invitation to register and comment. Notices have been placed at strategic places on site and in the vicinity of the site (along the road, at intersections, etc.).

- Distribution of letters by email and post to I&APs.
- Telephonic calls and SMSs exchanged with I&APs.

#### **5.6.4.3 Draft BA Report for Public Review**

A period of 30 calendar days (from **Friday, 02 June 2023 to Monday, 03 July 2023**) has been allowed for public review and commenting on the Draft BA Report. The availability of the Draft BA Report will be announced by means of public notice (adverts and site notices) and personal letters to all identified stakeholders on the distribution list. Refer to the I&AP notification letters in **Appendix D**. The Draft BA Report was also made available on the Remofilwe website ([www.remo2010.co.za](http://www.remo2010.co.za)); hard copy at the Kathu Public Library; and electronically to I&APs who requested it.

#### **5.6.4.4 Draft Basic Assessment Report**

All comments made on the Draft BA Report during public review have been captured and adequately responded to in the Comments and Response Report (see **Appendix D**). Once the BA Report has been finalised, it will be submitted to the DFFE for decision-making.

### **5.6.5 Environmental Management Programme**

An Environmental Management Programme (EMPr) will be based on the findings and recommendations set out in the BA Report. The EMPr consists of a set of practical and actionable mitigation, monitoring and institutional measures to be taken into account during construction and operation of the development. The aim is to eliminate adverse environmental and social impacts, offset them, or reduce them to acceptable levels. These plans will include:

- The standards and guidelines that must be achieved in terms of environmental legislation.
- Mitigation measures and environmental specifications which must be implemented at 'ground level' (i.e. during construction and operation).
- Provide guidance through method statements to achieve the environmental specifications.
- Define corrective action that must be taken in the event of non-compliance with the specifications of the EMPr.
- Prevent long-term or permanent environmental degradation.

The EMPr is attached as **Appendix E**.

### **5.7 NATIONAL ENVIRONMENTAL MANAGEMENT: AIR QUALITY ACT OF 2004 (NEMAQA)**

The main objective of the NEMAQA is the protection of the environment and human health in a sustainable (economic, social and ecological) development framework, through reasonable measures of air pollution control.

***The proposed development is not envisaged to impact on the receiving air quality conditions.***

Provision for the control of noise is made under Section 34 of NEMAQA as follows:

- (1) The Minister may prescribe essential national standards -
  - a. For the control of noise, either in general or my specified machinery or activities or in specified places or areas; or
  - b. For determining:

- i. A definition of noise; and
- ii. The maximum levels of noise.

(2) When controlling noise, the provincial and local spheres of government are bound by any prescribed national standards.

Currently, noise standards under NEMAQA have not been published. However the South African National Standard (SANS) 10103 Code of Practice provides typical ambient noise rating levels (LReq,T) in various districts and SANS 10103:2008 outlines the measurement and rating of environmental noise with respect to annoyance and to speech communication.

**Measures to mitigate noise impacts are outlined in the Noise Impact Assessment and EMPr.**

### **5.8 OCCUPATIONAL HEALTH AND SAFETY ACT 85 OF 1993 (OHSA)**

To provide for the health and safety of persons at work and for the health and safety of persons in connection with the use of plant and machinery; the protection of persons other than persons at work against hazards to health and safety arising out of or in connection with the activities of persons at work.

**All permits required in terms of the OHSA must be obtained from the relevant authority prior to construction.**

### **5.9 NATIONAL ENVIRONMENTAL MANAGEMENT: WASTE ACT 59 OF 2008 (NEMWA)**

The NEMWA provides reasonable measures for the prevention of pollution and ecological degradation and for securing ecologically sustainable development. One of its main objectives is to protect health, wellbeing and the environment by providing reasonable measures for securing ecologically sustainable development while promoting justifiable economic and social development.

Prior to undertaking any activities listed in Schedule 1 of NEMWA or the List of waste management activities that have, or are likely to have, a detrimental effect on the environment,<sup>13</sup> a proponent must apply for a waste management licence (WML) and undertake either a BA or Scoping and Environmental Impact Reporting process (S&EIR) process as outlined in the EIA Regulations.<sup>14</sup>

**The proposed project does not trigger any waste management activities as contemplated in the NEMWA.**

### **5.10 NATIONAL ENVIRONMENTAL MANAGEMENT: PROTECTED AREAS ACT 57 OF 2003 (NEMPAA)**

The NEMPA provides for the protection and conservation of ecologically viable areas representative of South Africa's biological diversity and its natural landscapes and seascapes; for the establishment of a national register of all national, provincial and local protected areas; for the management of those areas in accordance with national norms and standards; for intergovernmental co-operation and public

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<sup>13</sup> List of waste management activities that have, or are likely to have, a detrimental effect on the environment GN 921 published in GG 37083 of 29 November 2013 (as amended).

<sup>14</sup> NEMWA Schedule 1, and the NEMWA listed activities (note 13 above) provide that Category A activities require a basic assessment process detailed in the EIA Regulations, Regulations 19 & 20. Category B activities require a S&EIR processes detailed in the EIA Regulations, Regulations 21 – 24.

consultation in matters concerning protected areas; for the continued existence, governance and functions of South African National Parks; and for matters in connection therewith.<sup>15</sup>

The NEMPA places restrictions on commercial activities that may be undertaken within protected areas; protected environments; national parks; nature reserves; mountain catchment areas; wilderness areas; and world heritage sites.

**The project is not located within the boundaries of any of the restricted areas contemplated in the NEMPA.**

#### **5.11 NATIONAL ENVIRONMENTAL MANAGEMENT: BIODIVERSITY ACT 10 OF 2004 (NEMBA)**

The NEMBA is intended to provide for the management and conservation of South Africa's biodiversity within the framework of the NEMA; the protection of species and ecosystems that warrant national protection; the sustainable use of indigenous biological resources; the fair and equitable sharing of benefits arising from bioprospecting involving indigenous biological resources; the establishment and functions of a South African National Biodiversity Institute; and for matters connected therewith.<sup>16</sup>

The NEMBA provides for listing of threatened or protected ecosystems, in one of four categories: Critically Endangered (CR), Endangered (EN), Vulnerable (VU) or protected. The main purpose for the listing of threatened ecosystems is an attempt to reduce the rate of ecosystem and species destruction and habitat loss, leading to extinction. This includes preventing further degradation and loss of structure, function and composition of threatened ecosystems (SANBI).<sup>17</sup>

The proposed project footprint is located completely within the existing railway line servitude for the Sishen staging line and a large portion for the Vlermuislaagte staging line, with a small section to be located within the adjacent transformed agricultural land. With the exception of scattered camel thorn trees, none of the plant species located within the sites have protected status.

**Before any camel thorn trees are removed, a permit must be obtained from the relevant Department.**

#### **5.12 CONSERVATION OF AGRICULTURAL RESOURCES ACT 43 OF 1983 (CARA)**

The CARA is intended to provide for control over the utilization of the natural agricultural resources of the Republic in order to promote the conservation of the soil, the water sources and the vegetation and the combating of weeds and invader plants; and for matters connected therewith.<sup>18</sup>

The CARA lists various categories of alien plant species, some of which are invasive, and stipulates various measures that must be complied with in order to achieve the objectives of this Act.

#### **5.13 NATIONAL DEVELOPMENT PLAN**

The National Development Plan 2030 (NDP) aims to eliminate poverty and reduce inequality by 2030.<sup>19</sup> As part of this overarching goal, Chapter 4 of the NDP highlights the need for targeted interventions to

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<sup>15</sup> NEMPA Preamble.

<sup>16</sup> NEMBA Preamble.

<sup>17</sup> Ecology Report p 16

<sup>18</sup> CARA Preamble.

<sup>19</sup> National Development Plan 2030 (NDP), National Planning Commission, Department: The Presidency, Republic of South Africa 24.

consolidate and selectively expand transport and logistics infrastructure.<sup>20</sup> This includes expanding capacity of the iron ore and manganese railway line between Sishen and Saldanha.<sup>21</sup>

Given the close link between increased capabilities, opportunities and employment on social and living conditions as depicted in Figure 6, the NDP lists prioritisation of public infrastructure investment at 10% of gross domestic product (GDP), financed through tariffs, public-private partnerships, taxes and loans and focused on transport, energy and water.<sup>22</sup> As a key infrastructure project that forms part of the national spatial framework, investment in the Sishen-Saldanha Corridor is therefore intended to support a broader goal of creating employment opportunities, improving social and living conditions and stimulating economic growth.<sup>23</sup>



**Figure 6: NDP approach to change (Source: NDP 2030)**

#### **5.14 NATIONAL INFRASTRUCTURE PLAN 2050**

As part of the NDP vision of achieving inclusive growth, the National Planning Commission (NPC) undertook a review of public sector and state-owned enterprises (SOEs) infrastructure delivery and performance against stated NDP investment-to-GDP targets.<sup>24</sup> It concluded that public sector infrastructure investment is unlikely to meet NDP goals and provided concrete ‘course-correction’ suggestions.<sup>25</sup> These suggestions are outlined in the National Infrastructure Plan 2050 (NIP 2050) Phase 1 document, published in March 2022.<sup>26</sup> The NIP 2050 identifies key steps for improving public infrastructure delivery, leading to both short and long-term impacts.<sup>27</sup> Phase 1 of NIP 2050 focusses on four ‘mission critical’ infrastructure areas including energy, freight transport, water, and digital infrastructure.<sup>28</sup> The NIP 2050 outlines changes to strengthen and augment government’s Strategic Integrated Projects (SIPs) including **SIP 5** which is a top-priority SIP targeting the **Saldanha-Northern**

<sup>20</sup> NDP (note 19 above) 66.

<sup>21</sup> NDP (note 19 above) 64.

<sup>22</sup> NDP (note 19 above) 33.

<sup>23</sup> NDP (note 19 above) 281.

<sup>24</sup> National Infrastructure Plan 2050 (NIP 2050) Phase I, GN 1874 published in GG 46033 of 11 March 2022 6. The review was concluded in 2020. The NDP targets a 30% investment-to-GDP ratio, one-third of which would be delivered by the state.

<sup>25</sup> As above.

<sup>26</sup> As above.

<sup>27</sup> As above.

<sup>28</sup> As above.

**Cape development corridor.**<sup>29</sup> SIP 5 includes aspects such as integrated rail and port expansion and back-of-port industrial capacity.<sup>30</sup>

#### **5.15 NORTHERN CAPE PROVINCIAL SPATIAL DEVELOPMENT FRAMEWORK**

The Northern Cape Provincial Development and Resource Management Plan / Provincial Spatial Development Framework (NCPSDF) approved in 2012 is a statutory document intended to direct spatial land-use planning to promote environmental, economic, and social sustainability through sustainable development. It provides a legal basis to direct provincial government programmes and projects. It provides a framework for integrated land-use planning within the Province. The NCPSDF highlights the importance of ongoing upgrades to the Saldanha-Sishen Corridor (Figure 4) as a key driver of economic growth in the Provincial economy.<sup>31</sup> This sentiment is echoed in the Spatial Development Framework of the JTGDM which highlights improvement of freight management capacity in the District as a key Strategic Development Objective.<sup>32</sup>

#### **5.16 JOHN TAOLO GAETSEWE DISTRICT MUNICIPALITY INTEGRATED DEVELOPMENT PLAN**

The Draft JTGDM Integrated Development Plan 2022/2023 lists as one of its key vision statements, taking steps to migrate mining freight from roads to rail transport.<sup>33</sup> Similarly, in its Political, Economic, Social, Technological, Environmental and Legal (PESTEL) Analysis, the IDP notes with concern the dependence on fossil fuel dependent road freight transportation.<sup>34</sup> The IDP highlights economic and environmental risks associated with continued use of road freight, underscoring a need to migrate to rail transportation. The IDP furthermore list a number of key catalytic projects with associated strategic requirements to give effect to the aforementioned vision and expedite the proposed migration from road to rail freight. In this regard, the Transport Corridor and Gateway, with Related Infrastructure and Networks is listed the IDP as a key catalytic project.<sup>35</sup> The IDP notes that transportation infrastructure and networks are of 'make-or-break importance in all aspects of the development of the District and must be stepped up'.<sup>36</sup>

#### **5.17 GAMAGARA LOCAL MUNICIPALITY INTEGRATED DEVELOPMENT PLAN**

The GLM Integrated Development Plan Review for 2021/2022, notes the intention to develop the municipality into a commercial and industrial town and expand opportunities beyond mining.<sup>37</sup> In this regard, the intention is to develop GLM into an industrial city by 2030 and a manufacturing city by 2060. The GLM IDP notes furthermore that the Sishen-Saldanha railway line presents the municipality with an opportunity for economic growth.<sup>38</sup>

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<sup>29</sup> NIP 2050 (note 24 above) 25 - 32.

<sup>30</sup> NIP 2050 (note 24 above) 32.

<sup>31</sup> Northern Cape Provincial Development and Resource Management Plan / Provincial Spatial Development Framework (NCPSDF) (August 2012) section 138 & 140.

<sup>32</sup> The Inception Report: Review of Spatial Development Framework, John Taolo Gaetsewe District Municipality, Northern Cape Province (June 2016) 61.

<sup>33</sup> Draft John Taolo Gaetsewe District Municipality Integrated Development Plan 2022/2023 163 (JTGDM IDP).

<sup>34</sup> JTGDM IDP (note 33 above) 170 – 171.

<sup>35</sup> JTGDM IDP (note 33 above) 222.

<sup>36</sup> As above

<sup>37</sup> Gamagara Local Municipality Integrated Development Plan 2021/2022 (GLM IDP) 64.

<sup>38</sup> As above.

## 6 FEASIBLE AND REASONABLE ALTERNATIVES

The assessment of alternatives is an objective of the EIA Regulations. The Integrated Environmental Management IEM procedure requires furthermore that an environmental investigation needs to consider feasible alternatives for any proposed development. Therefore, the DFFE requires that a number of possible proposals or alternatives for accomplishing the same objectives should be considered. To ensure that the proposed development enables sustainable development, feasible alternatives must be explored.

The assessment of alternatives is an objective of the EIA Regulations of 2014 (as amended). The Integrated Environmental Management (IEM) procedure requires that an environmental investigation needs to consider feasible alternatives for any proposed development. Therefore, the DFFE requires that a number of possible proposals or alternatives for accomplishing the same objectives should be considered. To ensure that the proposed development enables sustainable development, feasible alternatives must be explored.

In the case of the proposed development, possible alternatives were identified through discussions with the project team, reviewing of existing environmental data, and specialist inputs/studies. In terms of the NEMA Regulations, 2014 (as amended), the definition of alternatives is given as:

‘Alternatives’ in relation to a proposed activity, means different means of meeting the general purpose and

requirement of the activity, which may include alternatives to the –

- (a) **property** on which or location where the activity is proposed to be undertaken;
- (b) **type of activity** to be undertaken;
- (c) **design** or **layout** of the activity;
- (d) **technology** to be used in the activity; or  
**operational aspects** of the activity and includes the **option of not implementing** the activity;

Alternatives for the development were considered as follows:

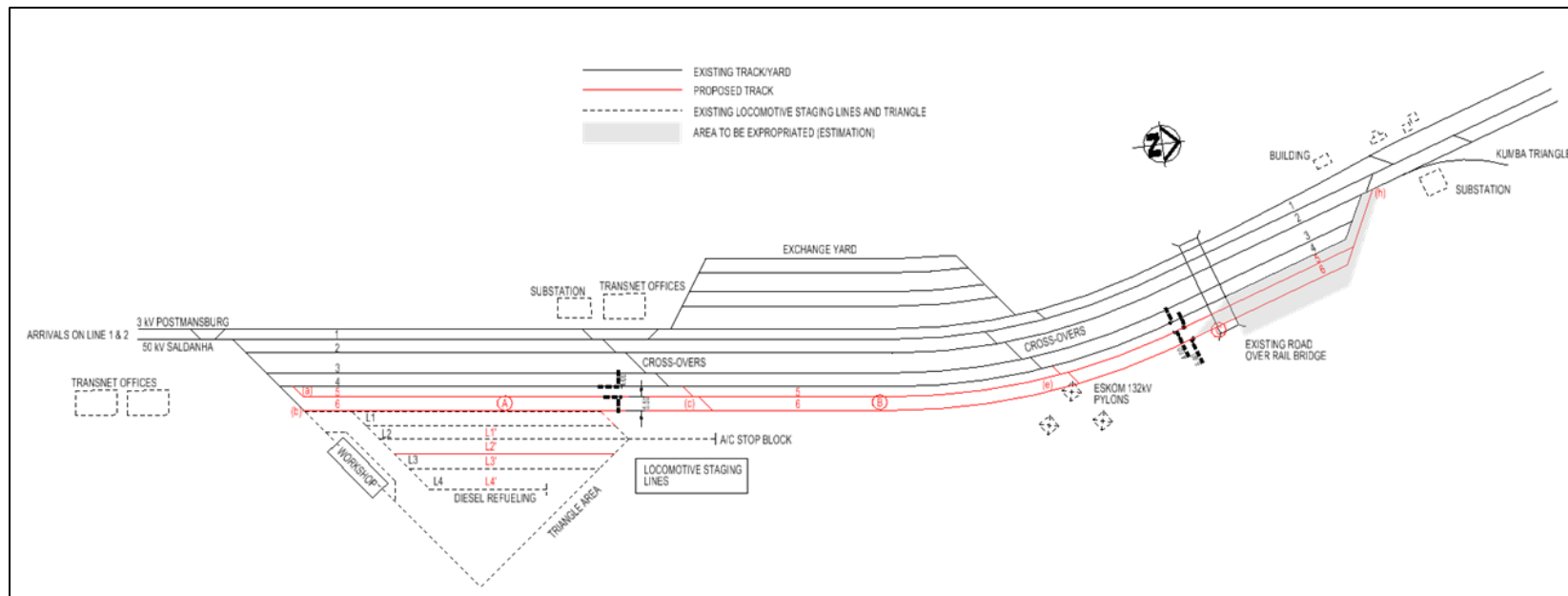
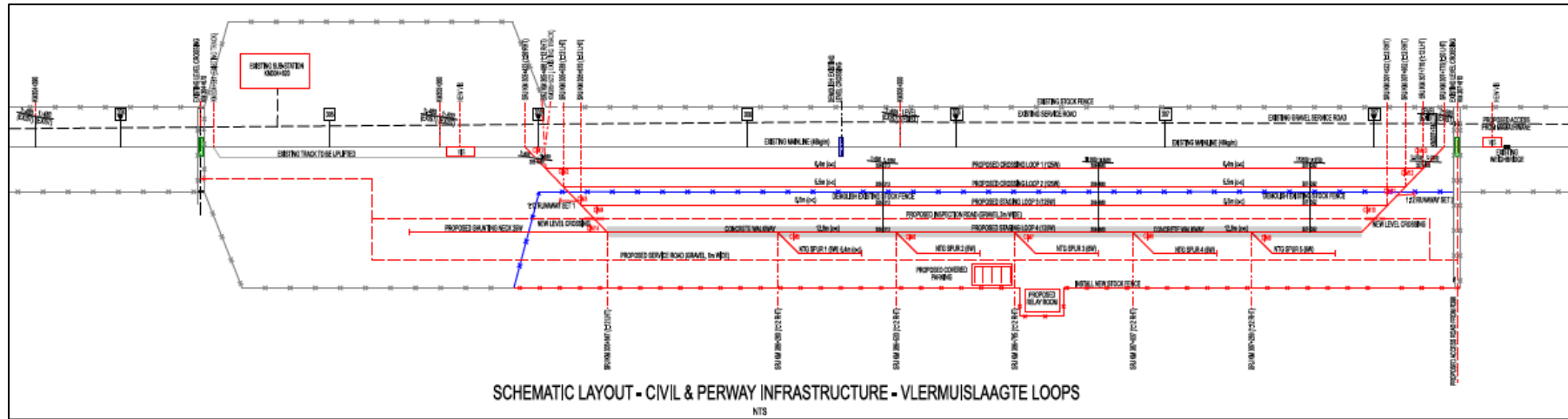
### 6.1 LOCATION AND ACTIVITY ALTERNATIVES

The proposed project is required to expand the current existing manganese and iron ore export lines, and as such location and project alternatives are not applicable.

### 6.2 DESIGN OR LAYOUT ALTERNATIVES

The BA assesses an area much larger than the footprint of the proposed project to allow for micro-sitting as needed for the relocation of the 132kv Powerline at the Sishen Erts Loop. Please refer to **Appendix C** for a detailed illustrations of the project design, layout and planned activities. In terms of additional layout alternatives, this is not possible given that the purpose and need of the project is to expand the existing Manganese and iron ore railway line with crossing loops and staging lines. Which implies that the layout of the proposed infrastructure is fairly fixed given the space availability at both sites.





Sishen Loop Schematic

### **6.3 TECHNOLOGY ALTERNATIVES**

The latest technology is already implemented with the proposed crossing loops and staging lines. No further technology alternatives are considered for the proposed project.

### **6.4 OPERATIONAL ALTERNATIVES**

There are no operational alternatives applicable to this project.

### **6.5 NO-GO ALTERNATIVES**

The proposed project is intended to alleviate bottlenecks and congestion between Hotazel and Postmasburg on the existing Sishen-Saldanha Corridor. If the No-Go option is followed, it could increase the risk of volume and revenue loss as a result of reduced time for maintenance on the line which poses a safety risk; long train cycle times which necessitate an increase in resource requirements (reduce crew and rolling stock performance); and train cancelations (not being able to execute the planned trains). Both interventions at the Sishen Erts Yard loops and Vlermuislaagte loop are required for safe and effective operations to support current and future volumes of up to 24mtpa. This will allow Manganese traffic from the Hotazel region to run directly to the Erts Yard in Sishen and then to the Iron Ore line and ultimately contribute to the GDP of the province and country.

As such, it is not recommended that the No-Go option be followed.

## **7 RECEIVING ENVIRONMENT**

### **7.1 TOPOGRAPHY**

The topography of the study area is open flat to semi-arid bushveld and thornveld plains with few to no rocky outcrops or hills.<sup>39</sup> The average height above sea level across the study site is about 1 210m. The Sishen site has a maximum and minimum elevation of around 1 114m and 1 107m, respectively.<sup>40</sup> The Vlermuislaagte site has a maximum and minimum elevation of around 1 129m and 1 112m, respectively.<sup>41</sup> The average gradient (slope) is very low at less than 1%, with the general downward slope being flat or moving mainly eastward.<sup>42</sup>

### **7.2 CLIMATE AND RAINFALL**

The site is situated within the low (201mm – 400mm) summer rainfall region of South Africa.<sup>43</sup> Kuruman, which is about 46km east of the study site, normally receives about 266mm of rain per year, with most rainfall during the late summer months.<sup>44</sup> Kuruman receives the lowest rainfall (0mm) in June and the highest (58mm) in February.<sup>45</sup> The monthly distribution of average daily maximum temperatures of the town shows that the average midday temperatures range from 17.5°C in June to 32.6°C in January. The region is the coldest during June when the temperature can regularly drop to 0°C on average during the night. Frost is not frequent but does occur (saexplorer.co.za).<sup>46</sup>

### **7.3 LAND USE**

The landcover or land use of the study site is the shoulder reserve area of the existing railway line.<sup>47</sup> The railway line is within an area that is sparsely urbanised with mostly large grazing farmlands, small, scattered towns and open cast mining operations.<sup>48</sup>

All proposed activities to be undertaken at the Sishen site will be within the existing Transnet boundary. The proposed activities at the Vlermuislaagte site will be undertaken within a corridor of 60m towards the East of the existing mainline which exceeds the current railway line servitude. Photograph 1 depicts various aspects of the study area observed during a site visit undertaken on 30 November 2022.

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<sup>39</sup> Flori Scientific Services, Terrestrial and Aquatic Assessments for the proposed Railway Staging Lines, Sishen Erts yard and Vlermuislaagte Loop (January 2023) 21.

<sup>40</sup> As above.

<sup>41</sup> As above.

<sup>42</sup> As above.

<sup>43</sup> Flori Scientific (note 39 above) 24.

<sup>44</sup> As above.

<sup>45</sup> As above.

<sup>46</sup> As above.

<sup>47</sup> Flori Scientific (note 39 above) 25.

<sup>48</sup> As above.

**Sishen Loop**







**Vlermuislaagte Loop**









**Photograph 1: Infrastructure and vegetation observed on site during the site visit**

## **7.4 VEGETATION**

The South African natural environment has been divided up into nine major terrestrial Biomes. The study area is within the **Savanna Biome**, which is also known as the Bushveld Biome (Figure 7).<sup>49</sup> Savanna vegetation types tend to have a mix of a lower grassy layer; middle woody shrub layer; and an upper woody tree layer.<sup>50</sup> The mix and ratio of the three layers varies from veldtype to veldtype within the Savanna Biome.<sup>51</sup>

The Savanna Biome was divided into six Bioregions by Mucina & Rutherford (2010), namely, Central Bushveld; Mopane; Lowveld; Sub-Escarpment Savanna; Eastern Kalahari Bushveld; and Kalahari Duneveld (Mucina & Rutherford, 2006).<sup>52</sup> The study area is found within the **Eastern Kalahari Bushveld Bioregion** and within the veldtypes / vegetation units commonly known as **Kathu Bushveld** and **Kuruman Thornveld** (Mucina & Rutherford, 2010).<sup>53</sup> Both veldtypes / ecosystems are not threatened and both have a status of 'Least Concern'.<sup>54</sup>

Kathu Bushveld is characterised by a medium-tall tree layer with *Vachellia (Acacia) erioloba* (Camelthorn) in places, but mostly open and including *Boscia albitrunca* (Shepherd's Tree) as the prominent trees. The dominant species present in the middle shrub layer are, *Sengalia (Acacia) mellifera*, *Diospyros lycioides* and *Lycium hirsutum*, while the lower grass layer is variable in cover depending on annual rainfall (Mucina & Rutherford, 2010).<sup>55</sup> Kuruman Thornveld is characterised by flat rocky plains and some sloping hills with very well-developed, closed shrub layer and well-developed open tree stratum consisting of *Vachellia (Acacia) erioloba* (Camelthorn). (Mucina & Rutherford, 2010).<sup>56</sup>

At the Sishen site, the northern half of the study site is within Kathu Bushveld and the southern half within Kuruman Thornveld. However, for the most part the environment of the study area is altered and degraded, with the presence of railway lines and gravel roads, resulting in the lack of any significant thornveld or bushveld. Although the study area (which is a linear footprint) crosses through the original extent of two veldtypes, there is little significant difference in the floral mix present. There are more camelthorn (*Vachellia (Acacia) erioloba*) present in the south in adjacent less disturbed farm areas. Common acacia thorn trees such as *Vachellia (Acacia) karoo* (Sweet thorn) and *Senegalia (Acacia) mellifera* (Black thorn) are dominant.

At the Vlermuislaagte site, the vegetation of the study site is mostly degraded Kathu Bushveld, with low levels of species richness. The veld is dominated by a few thorn tree species, such as black thorn (*Vachellia (Acacia) mellifera*) and common grasses. There levels of alien species infestation are low.

During field investigations no red data listed (RDL) (Critically endangered, endangered or vulnerable) species were observed. Furthermore, no orange data listed (ODL) plant species were observed either.<sup>57</sup>

Table 9, below, shows the hierarchy and classifications of the vegetation of the study area.

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<sup>49</sup> Flori Scientific (note 39 above) 25.

<sup>50</sup> As above.

<sup>51</sup> As above.

<sup>52</sup> As above.

<sup>53</sup> As above.

<sup>54</sup> As above.

<sup>55</sup> Flori Scientific (note 39 above) 26.

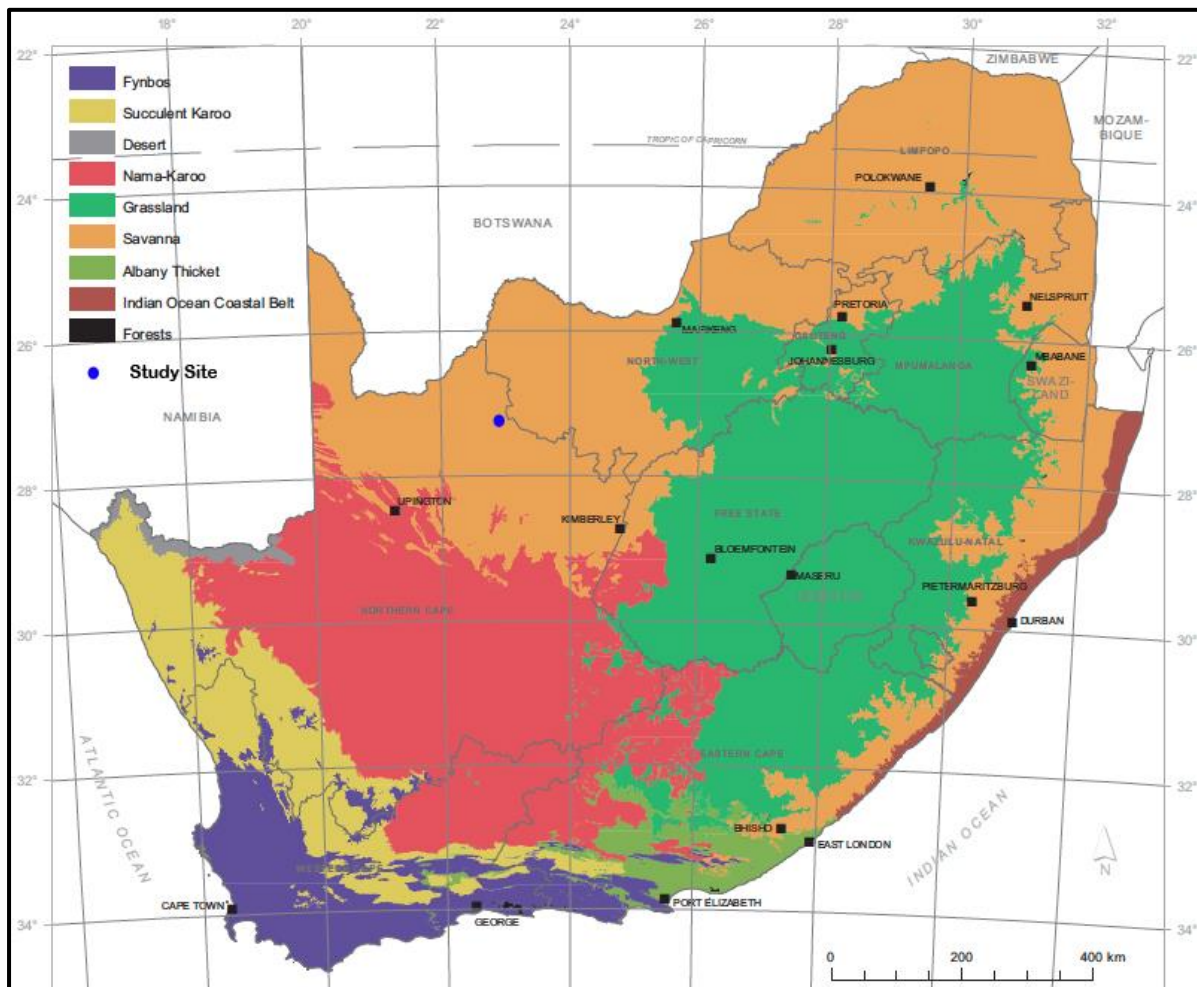
<sup>56</sup> Flori Scientific (note 39 above) 24.

<sup>57</sup> Flori Scientific (note 39 above) 27.

**Table 9: Vegetation classification of the study site**

Category Description	Classification
Biome	Savanna (Bushveld)
Bioregion	Eastern Kalahari Bushveld
Vegetation Types	Kathu Bushveld & Kuruman Thornveld
Status	Not threatened. Status of 'Least Concern'

A list of species noted during the site investigations is found in the appendices of the Terrestrial and Aquatic Biodiversity Study.



**Figure 7: Biomes of South Africa**

## 7.5 FAUNA

There are potentially a number of different faunal species present in the study area and surrounding areas.<sup>58</sup> There are some ideal habitats, especially within the less impacted on small drainage lines /

<sup>58</sup> Flori Scientific (note 39 above) 34.

streams and open grassland areas.<sup>59</sup> However, although the area is open, with low density urbanisation, the natural environment has been badly impacted on over the years by cultivated farmlands and open-cast mining operations.<sup>60</sup> This has led to a significant loss in faunal species, including large- to medium-sized mammals and reptiles in particular.<sup>61</sup> Other negative impacts have been on grassland birds, including the large storks and cranes that are very much ground foraging and dwelling birds.<sup>62</sup>

During field investigations **no faunal species of conservation concern were encountered**. This can also be due to the limited time available for site investigations. There are some ideal habitats for some priority faunal species, which are mainly in less degraded grassland situated along or close to small seasonal streams and wetlands. Table 10 lists priority faunal species likely to occur in the area.

**Table 10: Priority Faunal Species likely to occur in the area**

Species	Common Name	Red Data Status	Preferred Habitat	Habitat Restrictions	Present in Study area
<b>Frogs</b>					
<i>Pyxicephalus adspersus</i>	Giant bullfrog	Threatened	Grassland; savanna	Temporary floodplains, pans	No
<b>Mammals</b>					
<i>Atelerix frontalis</i>	SA hedgehog	Near threatened	Most, broad	Broad	Possible
<i>Manis temmincki</i>	Pangolin (Scaly anteater)	Vulnerable	Grassland, savanna	Woody savanna, ants, termites	Possible
<i>Mellivora capensis</i>	Honey badger (Ratel)	Near threatened	Most, broad	Broad	Possible
<i>Cloeotis percivali</i>	Short-eared trident bat	Critically endangered	Savanna	Caves and subterranean habitat	No
<i>Pipistrellus rusticus</i>	Rusty bat	Near threatened	Most, broad	Woody savanna, large trees	No
<b>Snakes</b>					
<i>Python natalensis</i>	Southern African python	Vulnerable	Ridges, wetlands	Rocky areas; open water	No

## 7.6 WATERCOURSE

At the Vlermuislaagte site, there are no watercourses in the study area or immediate vicinity, including rivers, streams and wetlands such as salt pans.<sup>63</sup> The main rivers or streams in the larger area are the Ga-Mogara and the Vlermuislaagte (Figure 9).<sup>64</sup> The closest the study area comes to the Vlermuislaagte site comes to a river or stream is 1,5km.<sup>65</sup>

The Sishen study site is within an arid region of the country with few perennial rivers or streams.<sup>66</sup> There are no rivers or streams in the study area and the closest significant river is the Ga-Mogara, which is approximately 1,7km at the closest point (Figure 9).<sup>67</sup>

<sup>59</sup> As above.

<sup>60</sup> As above.

<sup>61</sup> As above.

<sup>62</sup> As above.

<sup>63</sup> Flori Scientific (note 39 above) 30-31.

<sup>64</sup> As above.

<sup>65</sup> As above.

<sup>66</sup> As above.

<sup>67</sup> As above.

At the Sishen there is, however, a **depressional wetland** and drainage line system that runs across the middle of the study site in a southwest to northeast direction.<sup>68</sup> The system has been cut in half (impeded) over decades now with the original construction of the existing railway lines and roads in that area that run in a north – south direction (Figure 10).<sup>69</sup> Due to the aridness of the region the wetlands are dry for long periods of the year.<sup>70</sup> However, they are still sensitive ecological features within the landscape.<sup>71</sup> The wetland systems are not highlighted in the national wetland map (Map 5, 2018), but are in the NFEPA (2011) priority areas.<sup>72</sup>



**Figure 8: Main Rivers / Streams in the Region (Vlermuislaagte)**

Given the presence of the three depressional wetland systems within 500m of the Sishen staging lines, water uses in terms of Section 21(c) & (i) are triggered. A Water Use license / General Authorisation process is therefore required as part of the proposed project.

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<sup>68</sup> As above.

<sup>69</sup> As above.

<sup>70</sup> As above.

<sup>71</sup> As above.

<sup>72</sup> As above.



**Figure 9: Main Rivers / Streams in the Region (Sishen site)**



**Figure 10: Depression Wetlands close to the Sishen Site and Railway**

## **7.7 DRAINAGE REGIONS**

A summary of the information for the drainage regions / catchment areas for the site is shown below in Table 11. The study site is situated within the Quaternary Drainage Area (QDA) of D41K.

The site is also not situated within a priority quaternary drainage catchment, in terms of guidelines and legislation from both the Department of Water and Sanitation (DWS). According to DWS the following are priority quaternary catchments, namely: A21F, A21G, B31A, B31B, B31C, B20E, B20F, B20H, B20J, C21A, C21B and C21C.

**Table 11: Summary of Catchment Area information**

<b>Level</b>	<b>Category</b>
Primary Drainage Area (PDA)	D
Quaternary Drainage Area (QDA)	D41K
Water Management Area (WMA) – Previous / Old	Lower Vaal
Water Management Area (WMA) – New (as of Sept. 2016)	Vaal (WMA 5)
Sub-Water Management Area	Molopo
Catchment Management Agency (CMA)	Vaal (CMA 5)
Wetland Vegetation Ecoregion (WetVeg)	Eastern Kalahari Bushveld (Group 1)
RAMSAR Site	No
River FEPA	No
Wetland FEPA	No
Fish FEPA	No
Fish FSA	No
Fish Corridor	No
Fish Migratory	No
Strategic Water Source Area (SWSA)	Yes (Sishen-Kathu)
Provincial important Water Source Area (WSA)	No
Priority Quaternary Catchment	Lower Vaal

## **7.8 STRATEGIC WATER SOURCE REGIONS**

The study site is situated within the Sishen-Kathu national Strategic Water Source Areas (SWSA) of South Africa in terms of groundwater.<sup>73</sup> A Water Source Area (WSA) is a water catchment or aquifer system that either supplies a relatively large volume of water for its size, or is the primary source of water for a town, city or industrial activity. Strategic Water Source Areas (SWSAs) are defined as areas of land that either: (a) supply a disproportionate (i.e. relatively large) volume of mean annual surface water runoff (i.e. water in streams, rivers and wetlands) in relation to their size and so are considered nationally important; or (b) have relatively high groundwater recharge and groundwater forms a nationally important resource (has high levels of use or settlements depend on it); or (c) areas that meet both criteria (a) and (b). A SWSA<sup>[SEP]</sup> is one where the water that is supplied is considered to be of national importance for water security, but there are others, which are considered to be sub-nationally important (WRC, 2019).

<sup>73</sup> Flori Scientific (note 39 above) 35.

According to SANBI, a Strategic Water Source Areas of South Africa (SWSA) are those areas that supply a disproportionate amount of mean annual runoff in relation to the size of the geographical region. These areas are important because they have the potential to contribute significantly to overall water quality and supply, supporting growth and development needs that are often a far distance away. These areas make up 8% of the land area across South Africa, Lesotho and Swaziland, but provide 50% of the water in these countries (SANBI).

## **7.9 AGRICULTURAL POTENTIAL**

The agricultural potential of the project site is low as the majority of the site is within the existing railway line servitudes. Within the wider project area, small scale crop agriculture is encountered around Deben along the Ga-mogara river.<sup>74</sup> Low density cattle, goat farming and game farming is also common through the wider area.<sup>75</sup>

## **7.10 GEOLOGY AND SOILS**

The geology and soils of the study site and surrounding areas are typically that of Aeolian red sand and surface calcrete, deep (>1.2 m) sandy soils of Hutton and Clovelly soil forms. Land types are predominantly Ah and Ae, with some Ag (Mucina & Rutherford, 2010).<sup>76</sup> Short descriptions of the prominent land types of the study area are shown below (Table 12).<sup>77</sup>

**Table 12: Description of land types found in the region**

<b>Land Type</b>	<b>Description</b>
Ae	RED-YELLOW APEDAL, FREELY DRAINED SOILS (Red, high base status soils, > 300 mm deep, without dunes). Moderately deep (average 500-1200 mm) red, freely drained, apedal (= structureless) soils. Soils occur in areas associated with low to moderate rainfall (300-700 mm per annum) in the interior of South Africa and have a high fertility status. A wide range of texture occurs (usually sandy loam to sandy clay loam).
Ag	RED-YELLOW APEDAL, FREELY DRAINED SOILS (Red, high base status soils, < 300 mm deep). These shallow (< 300 mm), red, freely-drained, apedal (= structureless) soils occur in arid to semi-arid areas associated with low rainfall (< 500 mm per annum) and are underlain by hard to weathered rock. A wide range of textures may occur (usually loamy sand to sandy loam). Stones or rocks are often present on the soil surface.
Ah	RED-YELLOW APEDAL, FREELY DRAINED SOILS (Red and yellow, high base status soils, usually < 15% clay). These red and yellow, apedal (= structureless), freely drained soils have a low clay content (< 15%) and thus a low fertility status. The soils usually have a sand or loamy sand texture and occur in moderately low rainfall areas (400-600 mm per annum). Wind-blown dunes may occasionally be present.

## **7.11 NATIONAL PRIORITY AREAS**

The Study Site is not within any national priority areas, including protected areas and important bird areas (IBAs).<sup>78</sup> National priority areas include formal and informal (private) protected areas (nature reserves);

<sup>74</sup> ATB Photography, Noise Impact Assessment, 25.

<sup>75</sup> As above.

<sup>76</sup> Flori Scientific (note 39 above) 23.

<sup>77</sup> As above.

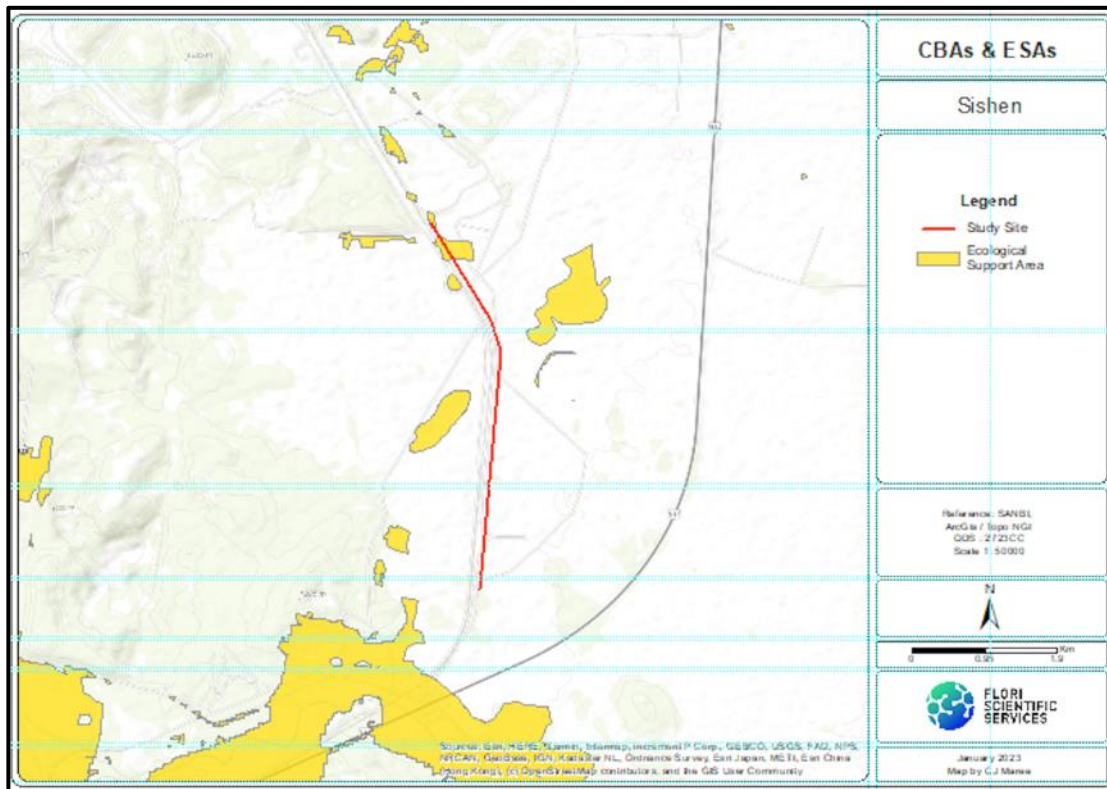
<sup>78</sup> Flori Scientific (note 39 above) 40.



important bird areas (IBAs); RAMSAR sites; National fresh water ecosystem priority areas (NFEPA) and National protected areas expansion strategy focus areas (NPAES).<sup>79</sup>

**7.12 CRITICAL BIODIVERSITY AREAS AND ECOLOGICAL SUPPORT AREAS**

According to the Northern Cape Critical Biodiversity Areas (2016), the study site is not within a critical biodiversity (CBA). However, for the Sishen site, the northern end of the site is within an ecological support area (ESA). The demarcated depression wetlands are also demarcated ESAs (Figure 11).



**Figure 11: CBAs and ESAs (Sishen)**

**7.13 DFFE SCREENING TOOL**

The Department of Forestry, Fisheries and Environment (DFFE) (Previously DEA) Screening Tool ([www.screening.environment.gov.za](http://www.screening.environment.gov.za)) is required for all applications. The assessment of sensitivities according to the screening tool and actual site verification of themes are detailed in Table 13.

**Table 13: Sensitivity screening**

Theme	Screening tool sensitivity rating	Specialist rating after site verification
Agricultural	Sishen site: Medium Vlermuistlaagte site: Medium	Sishen site: Low Vlermuistlaagte site: Low
Animal Species	Sishen site: Medium Vlermuistlaagte site: Medium	Sishen site: Medium Vlermuistlaagte site: Medium

<sup>79</sup> As above.

<b>Theme</b>	<b>Screening tool sensitivity rating</b>	<b>Specialist rating after site verification</b>
Plant Species	Sishen site: Low Vlermuistlaagte site: Low	Sishen site: Low Vlermuistlaagte site: Low
Aquatic Biodiversity Combined	Sishen site: Very High Vlermuistlaagte site: Very High	Sishen site: Low Vlermuistlaagte site: Low
Terrestrial Biodiversity Combined	Sishen site: Low Vlermuistlaagte site: Low	Sishen site: Low Vlermuistlaagte site: Low
Paleontological	Sishen site: Very High Vlermuistlaagte site: Medium	Sishen site: Low Vlermuistlaagte site: Low

For the Vlermuistlaagte site, the sensitivity levels of the terrestrial biodiversity, plants and animals were verified to be as per the screening tool assessment. However, the aquatic sensitivity is disputed. There are no watercourses in the study area or immediate surroundings and therefore the Aquatic sensitivity was determined to be 'Low'. It is understood that the site is within a SWSA groundwater area, but the project will have absolutely no impact on groundwater.<sup>80</sup>

For the Sishen site, the sensitivity levels of the terrestrial biodiversity, plants and animals were verified to be as per the screening tool assessment. However, the aquatic sensitivity is disputed. There are no watercourses in the study area or immediate surroundings and therefore the Aquatic sensitivity was determined to be 'Low'. It is understood that the site is within a SWSA groundwater area, but the project will have absolutely no impact on groundwater.<sup>81</sup> Furthermore the development will not have an impact on the adjacent wetlands.

#### **7.14 SOCIO-ECONOMIC ENVIRONMENT**

The proposed project is located within the jurisdiction of the GLM which is a Category-B municipality.<sup>82</sup> The municipality is comprised of 8 Wards and is governed by way of an Executive Mayoral System in conjunction with a Ward-participatory System.<sup>83</sup> The GLM Municipal Council is comprised of 13 members which includes the Executive Mayor, Speaker, Wards Councillors and Proportional Representative Councillors.<sup>84</sup> The majority party in the Council is the African National Congress.<sup>85</sup> The GLM occupies an area of 2 648 km<sup>2</sup> and is one of five municipalities in the District.<sup>86</sup> The local study area is not subject to the jurisdiction of a Tribal Council.<sup>87</sup>

Demographic information in this section was sourced from Statistics South Africa (Stats SA) Local Municipality Population Estimates 2002 – 3030 (MYPE 2021).<sup>88</sup> Table 14 provides an overview of key demographic indicators for JTGD and TLM. The data is based on estimates for 2016 and 2021.

<sup>80</sup> Flori Scientific (note 39 above) 39-42.

<sup>81</sup> As above.

<sup>82</sup> Local Government Handbook <https://municipalities.co.za/overview/135/john-taolo-gaetsewe-district-municipality> (accessed 9 January 2023). A Category-B municipality is a municipality that shares executive and legislative authority with the relevant Category-C (District) municipality within whose area it falls.

<sup>83</sup> IEC website <https://www.elections.org.za/pw/StatsData/List-Of-Current-Ward-Councillors> (accessed 12 January 2023) and the GLM IDP (note 37 above) 17.

<sup>84</sup> GLM IDP (note 37 above) 47-48.

<sup>85</sup> As above.

<sup>86</sup> Local Government Handbook (note 82 above).

<sup>87</sup> Solaris, Social Impact Assessment, 21.

<sup>88</sup> Stats SA [https://www.statssa.gov.za/publications/P0302/LM\\_MYPE\\_2021%20series.xlsx](https://www.statssa.gov.za/publications/P0302/LM_MYPE_2021%20series.xlsx) (accessed 13 January 2023).

**Table 14: Key demographic indicators for John Taolo Gaetsewe District and GLM**

Indicator	JTGDM		GLM	
	2016	2021	2016	2021
Total population	253 138	276 358	53 161	64 846
% population increase	9.17		21.98	
% of population below the age of 15	33.23	32.67	23.75%	22.94%
% of population between 15 and 64	61.39	61.73	73.65%	74.59%
% of population aged 65+	5.38	5.60	2.60%	2.47%
Dependency ratio	62.89	61.99	35.77	34.07
<i>Child (&lt;14) dependency ratio</i>	54.12	52.92	32.25	30.76
<i>Old age (64+) dependency ratio</i>	8.77	9.07	3.53	3.31
% of population male / female	48.33 / 51.67	48.39 / 51.61	56.04 / 43.96	57.03 / 42.97

Source: Stats SA MYPE 2021

As seen in Table 14, the estimated total population of JTGDM increased between 9.17%. GLM on the other hand experienced a 21.98% increase in its total population between 2016 and 2021 which is significantly higher than the District average. The ratio of males versus females remained largely the same over the 2016 to 2021 period for JTGDM. There was however a slight increase (1%) in the number of males versus females in GLM between 2016 to 2021. In both municipalities there was slight decrease in the overall dependency ratio.<sup>89</sup>

The predominant race group in the Northern Cape Province, JTGDM and GLM is Black African (48.57%, 83.52% and 48.1% respectively). In GLM, Coloured people comprise 32.63% of the total population while Whites comprise 17.97%.

According to the Stats SA Community Survey 2016, the dominant language in GLM is Afrikaans (62.68%). Other languages spoken in households in GLM include IsiXhosa (29.7%), English (1.5%) and Sesotho (1.13%).

In the 2016 Community Survey, the water system within all geographical levels was fairly formalised. In GLM 67.46% of households had access to piped water within dwellings. Households with access to weekly refuse disposal services was however recorded higher in JTGDM (69.61% than in GLM (10.71%). In both district and local municipality, electricity proved to be the primary energy source for cooking as opposed to gas; paraffin; or wood.

## 7.15 BASELINE HERITAGE ENVIRONMENT

Desktop studies, drive-throughs and fieldwalking (30 November 2022) were conducted in order to identify heritage landmarks within the proposed project sites. The study site is not on pristine ground, having seen significant transformations owing to previous and current land use activities. The general project area is known for occurrence of archaeological and historical sites. In terms of the built environment the

<sup>89</sup> The dependency ratio is an indicator of the potential dependency burden of children (0-14) and the elderly (65+) on those who are of economically productive ages (15-64).

study noted that the buildings and railway infrastructures are younger than 60 years old and do not require Section 34 of the NHRA protection. It should be noted that archaeological material and unmarked graves may exist and when encountered during construction (even though unlikely in this instance), work must be stopped forth-with, and the finds must be reported to the South African Heritage Resource Agency (SAHRA) or the heritage practitioner. The Heritage and Archaeological report must be submitted to the SAHRA for review in terms of Section 38 (4) of the NHRA.

The report makes the following observations:

- The findings of this report have been informed by desktop data review, field survey and impact assessment reporting which include recommendations to guide heritage authorities in making decisions with regards to the proposed project.
- All sections of the proposed project sites are accessible; the field survey was effective enough to cover significant sections of the project receiving environments.
- The immediate project area is predominantly railway infrastructures and livestock farms.
- Some sections of the proposed project sites are severely degraded from previous and current land use activities.

The report sets out the potential impacts of the proposed project on heritage matters and recommends appropriate safeguard and mitigation measures that are designed to reduce the impacts where appropriate. The Report makes the following recommendations:

1. It is recommended that SAHRA endorse the report as having satisfied the requirements of Section 38 (8) of the NHRA requirements.
2. It is recommended that SAHRA make a decision in terms of Section 38 (4) of the NHRA to approve the proposed project on condition that no confirmable archaeological and heritage sites were recorded within the proposed development sites.
3. From a heritage perspective supported by the findings of this study, the proposed development is supported. However, the proposed development should be approved under observation that construction does not extend beyond the area considered in this report (100m corridor).
4. Should chance archaeological materials or human remains be exposed during construction on any section of the site, work should cease on the affected area and the discovery must be reported to the heritage authorities immediately so that an investigation and evaluation of the finds can be made. The overriding objective, where remedial action is warranted, is to minimize disruption in construction scheduling while recovering archaeological and any affected cultural heritage data as stipulated by the NHRA regulations.
5. Subject to the recommendations herein made and the implementation of the mitigation measures and adoption of the project EMP, there are no significant cultural heritage resources barriers to the proposed development. The Heritage authority may approve the upgrading of Sishen and Vlermuislaagte loops as planned with special commendations to implement the recommendations herein made.

The Heritage authority may approve the upgrading of Sishen and Vlermuislaagte loops as planned with special commendations to implement the recommendations herein made.

**Refer to Appendix F for the Heritage and Archaeological Impact Assessment**

## **7.16 BASELINE PALAEOLOGICAL ENVIRONMENT**

The Sishen study site is underlain by the calcrete duricrust constituting the Kalahari Formation of the Kalahari Group, that is considered to have a High Palaeontological Sensitivity. The Vlermuislaagte study site is mainly underlain by the sands of the Gordonia Formation of the Kalahari Group that is considered to have a Moderate Palaeontological Sensitivity.

An overview of the literature on the palaeontology and associated geology of the area is given. The fossil record of the Kalahari Group is sparse, occurs sporadically and is low in diversity. Although no fossils have been reported for the study area, fossils such as root casts, burrows, termitaria, ostrich egg shells, mollusc shells and isolated bones have been discovered in the Kalahari Group elsewhere.

Based on the nature of the upgrades, location of the proposed sites (within existing disturbed land, adjacent to the existing railway line), a Desktop Assessment is considered sufficient for the proposed project, with the implementation of the Chance Find Procedure as included within the EMPr for the unlikely event a fossil discovery is made during construction.

**Refer to Appendix F for the Palaeontological Assessment Report**

## **7.17 BASELINE NOISE ENVIRONMENT**

A qualitative Noise impact assessment was conducted for the proposed project, by ATB Environmental Consulting. **Refer to Appendix F for the Noise Impact Assessment report.**

Based on the assessment of the anticipated noise impacts of the construction, operation and decommissioning phases:

- There is no substantive reason why the development of the Sishen Erts Yard Loop cannot be authorised as no noise impacts serve as project fatal flaws for this proposed project site;
- There is no substantive reason why the development of the Vlermuislaagte Loops cannot be authorised as no noise impacts serve as project fatal flaws for this proposed project site; and
- No cumulative noise impacts were identified which would serve as a fatal flaw to the proposed project.

It must also be noted that it is unreasonable to expect the noises generated by this proposed project to be inaudible at the sensitive receptors under all circumstances, even mitigated noise. This would be an unrealistic expectation which is not required or expected from any other noise source (i.e. agricultural, transportation related, commercial, or industrial noise sources etc). Care must be taken to ensure that the sound produced by the proposed development is at a reasonable level in relation to the existing ambient sound levels considering that the proposed project is not increasing the capacity of the railway lines but allows for the frequency of trains to be increased for ease of operations and increased ore hauling aligned to the aims of the expansion project.

## 8 IMPACT ASSESSMENT METHODOLOGY

An environmental impact is the change to the environment, whether desirable or undesirable, that will result from the effect of an activity. An impact may be the direct or indirect consequence of an activity. A description of potential impacts or consequence of an aspect of the development on a specified component of the biophysical, social or economic environment within a defined time and space.

### 8.1 IMPACT ASSESSMENT METHODOLOGY

The section below is the method used for determining the significance of impacts. Each of the impacts were listed taking into consideration the different phases (construction, operation, decommissioning). A description of the findings and potential implications of such findings on the impact of the proposed activity, including identified alternatives on the environment was provided. Impacts and risks were identified, including the nature, significance, consequence, extent, duration and probability of the impacts, including the degree to which these impacts - (a) can be reversed; (b) may cause irreplaceable loss of resources; and (c) can be avoided, managed or mitigated.

It should be noted that all findings and recommendations for mitigation are included in the EMPr (included as **Appendix E**). Specialist studies supporting preparation of this BA as well as the EMPr are provided in **Appendix F**. The contents of all specialist reports and EMPr include information as prescribed in the EIA Regulations and provide preference ranking of the site.

In addition, the following was identified:

- Positive and negative impacts that the proposed development will have on the environment and on the community that may be affected focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects.
- The possible mitigation measures that could be applied and level of residual risk.

The following methodology was applied to the prediction and assessment of impacts/risks. Potential impacts were rated in terms of the direct, indirect and cumulative impacts:

- Direct impacts are impacts that are caused directly by the activity and generally occur at the same time and place of the activity. These impacts are usually associated with the construction, operation or maintenance of an activity and are generally obvious and quantifiable.
- Indirect impacts of an activity are indirect or induced changes that may occur as a result of the activity. These types of impacts include all the potential impacts that do not manifest immediately when the activity is undertaken or which occur at a different place as a result of the activity.
- Cumulative impacts are impacts that result from the incremental impact of the proposed activity on a common resource when added to the impacts of other past, present or reasonably foreseeable future activities. Cumulative impacts can occur from the collective impacts of individual minor actions over a period of time and can include both direct and indirect impacts.
- Nature of impact - this reviews the type of effect that a proposed activity will have on the environment and should include "what will be affected and how?"

**Table 15: Potential Intensity/Severity Rating**

Potential Intensity Description (negative)	Intensity	Score
Change is slight, often not noticeable, natural functioning of environment not affected.	Negligible	1
Natural functioning of environment is minimally affected. Natural, cultural and social functions and processes can be reversed to their original state.	Low	2
Environment remarkably altered, still functions, but in a modified way. Negative impacts cannot be fully reversed.	Medium	3
Cultural and social functions and processes disturbed – potentially ceasing to function temporarily.	High	4
Natural, cultural and social functions and processes permanently cease, and valued, important, sensitive or vulnerable systems or communities are substantially affected. Negative impacts cannot be reversed.	Very high	5

Note that the concept of “irreplaceable loss of a resource” is to be taken into account in the Potential Intensity score of an impact:

**Irreplaceability** of resource loss caused by impacts –

- High irreplaceability of resources (project will destroy unique resources that cannot be replaced, i.e. this is the least favourable assessment for the environment. For example, if the project will destroy unique wetland systems, these may be irreplaceable);
- Moderate irreplaceability of resources;
- Low irreplaceability of resources; or

Resources are replaceable (the affected resource is easy to replace/rehabilitate, i.e. this is the most favourable assessment for the environment).

**Spatial extent** – The size of the area that will be affected by the risk/impact (Table 16).

**Table 16: Extent description and score**

Extent Description	Score
Site specific (Impacted area is only at the site – the actual extent of the activity).	1
Local (Impacted area is limited to the site and its immediate surrounding area).	2
Regional (Impacted area extends to the surrounding area, the immediate and the neighboring properties).	3
Provincial (Impact considered of provincial importance).	4
International/Global (e.g. Greenhouse Gas emissions or migrant birds).	5

**Duration** – The timeframe during which the risk/impact will be experienced:

The concept of “reversibility” is reflected in the duration scoring, i.e. the longer the impact endures the less likely it will be reversible.

**Table 17: Duration description and score**

<b>Duration Description</b>	<b>Score</b>
<b>Temporary</b> (less than 3 year) or duration of the construction period. This impact is fully reversible. E.g. the construction noise temporary impact that is highly reversible as it will stop at the end of the construction period	1
<b>Medium term</b> (3 to 10 years). The impact is reversible with the implementation of appropriate mitigation and management actions.	2
<b>Long term</b> (> 10 years but where the impact will cease after the operational life of the activity). The impact is reversible with the implementation of appropriate mitigation and management actions. E.g. the noise impact caused by the desalination plant is a long-term impact but can be considered to be highly reversible at the end of the project life, when the project is decommissioned	3
<b>Permanent</b> (mitigation will not occur in such a way or in such a time span that the impact can be considered transient). This impact is irreversible. E.g. The loss of a palaeontological resource on site caused by construction activities is permanent and would be irreversible.	4
<b>Permanent</b> – no mitigation measures of natural process will reduce impact after implementation – impact will remain after operational life of project.	5

**Reversibility** of impacts:

- High reversibility of impacts (impact is highly reversible at end of project life, i.e. this is the most favorable assessment for the environment. For example, the nuisance factor caused by noise impacts associated with the operational phase of an exporting terminal can be considered to be highly reversible at the end of the project life).
- Moderate reversibility of impacts.
- Low reversibility of impacts.

Impacts are non-reversible (impact is permanent, i.e. this is the least favorable assessment for the environment. The impact is permanent. For example, the loss of a paleontological resource on the site caused by building foundations could be non-reversible).

Using the criteria above, the impacts were further be assessed in terms of the following:

Probability – The probability of the impact/risk occurring (Table 18).

**Table 18: Probability description and score**

<b>Probability Description</b>	<b>Score</b>
<b>Improbable</b> (little or no chance of occurring <10%)	1
<b>Low Probability</b> (10 - 25% chance of occurring)	2
<b>Probable</b> (25 - 50% chance of occurring)	3
<b>Highly probable</b> (50 – 90% chance of occurring)	4
<b>Definite</b> (>90% chance of occurring).	5



**Magnitude**—The anticipated severity of the impact (Intensity + Extent + Duration):

- Extreme (extreme alteration of natural systems, patterns or processes, i.e. where environmental functions and processes are altered such that they permanently cease);
- Severe (severe alteration of natural systems, patterns or processes, i.e. where environmental functions and processes are altered such that they temporarily or permanently cease);
- Substantial (substantial alteration of natural systems, patterns or processes, i.e. where environmental functions and processes are altered such that they temporarily or permanently cease);
- Moderate (notable alteration of natural systems, patterns or processes, i.e. where the environment continues to function but in a modified manner); or
- Slight (negligible alteration of natural systems, patterns or processes, i.e. where no natural systems/environmental functions, patterns, or processes are affected).

Significance – Will the impact cause a notable alteration of the environment? To determine the significance of an identified impact/risk, the consequence is multiplied by probability.

Impact Magnitude = Potential Intensity + duration + extent

**Significance rating = Impact magnitude \* Probability**

**Table 19: Guide to assessing risk/impact significance as a result of consequence and probability**

Scoring	Significance rating	Description
81-100	Very High	The project cannot be authorised unless major changes to the design are carried out to reduce the significance rating.
60-80	High	The impacts will result in major alteration to the environment even with the implementation on the appropriate mitigation measures and will have an influence on decision-making.
45-59	Medium high	The impact will result in moderate alteration of the environment and can be reduced or avoided by implementing the appropriate mitigation measures, and will only have an influence on the decision-making if not mitigated.
30-44	Medium Low	The impact may result in minor alterations of the environment and can be easily avoided by implementing appropriate mitigation measures, and will not have an influence on decision-making.
15-29	Low	The impact may result in very minor alterations of the environment and can be avoided through the implementation of mitigation measures.
1-14	Very Low	No action required.

**Significance** was rated as follows (based on Table 19 above)

- **Very low** (the risk/impact may result in very minor alterations of the environment and can be easily avoided by implementing appropriate mitigation measures, and will not have an influence on decision-making).

- **Low** (the risk/impact may result in minor alterations of the environment and can be easily avoided by implementing appropriate mitigation measures, and will not have an influence on decision making).
- **Medium** (the risk/impact will result in moderate alteration of the environment and can be reduced or avoided by implementing the appropriate mitigation measures, and will only have an influence on the decision-making if not mitigated).
- **High** (the risk/impacts will result in a considerable alteration to the environment even with the implementation on the appropriate mitigation measures and will have an influence on decision making).
- **Very high** (the risk/impacts will result in major alteration to the environment even with the implementation on the appropriate mitigation measures and will have an influence on decision making (i.e. the project cannot be authorized unless major changes to the engineering design are carried out to reduce the significance rating)).

Impacts have been described both before and after the implementation of the proposed mitigation and management measures. The scenario “without mitigation” considers all management actions already proposed by the proponent as part of the project description. “With mitigation” assesses the significance rating of the potential impact, taking into account any additional management actions recommended by the specialist.

Linked to the above, for each impact assessment, mitigation measures are generally listed under the following three categories (as applicable):

- Mitigation measures inherent to the project design (i.e. mitigation/management actions that the proponent had planned to implement as part of the project description).
- Key management actions proposed by specialist (pertinent measures that will be written into, and enforced through the EMPr for implementation to ensure that the significance of the associated impact is acceptable).
- Additional management actions proposed by the specialist (management actions to be considered by proponent and authority).

The impact assessment has attempted to quantify the magnitude of potential impacts (direct and cumulative effects) and outline the rationale used. Where appropriate, national standards are used as a measure of the level of impact.

## 9 ASSESSMENT OF POTENTIAL IMPACTS AND MITIGATION

This section identifies and evaluates the actual and potential environmental consequences of the proposed activity. Furthermore, the potential for mitigation of negative impacts and enhancement of positive impacts are described. The below impacts on the biophysical, socio-economic and cultural/historical environment have been assessed based on the methodology provided in section 8. For each impact assessed, mitigation measures have been proposed to reduce or avoid negative impacts and enhance positive impacts. These mitigations were also incorporated in the EMPr to ensure that they are implemented during the various phases of the proposed project.

### 9.1 SUMMARY OF IMPACTS TO ASSESSED

The following impacts were identified as potentially significant:

**Table 20: Summary of potentially significant impacts**

Aspect	Potential Impacts	
	Construction Phase	Operational Phase
<b>Air Emissions</b>	<ul style="list-style-type: none"> <li>▪ Generation of dust from site clearance and construction activities.</li> <li>▪ Engine emissions from construction Vehicles.</li> </ul>	N/A – no additional emissions due to the proposed project
<b>Terrestrial Fauna and Flora</b>	<ul style="list-style-type: none"> <li>▪ Loss of natural vegetation</li> <li>▪ Loss or impact on wildlife</li> <li>▪ Impeding and impounding waterflow</li> <li>▪ Fringe impacts arising from the construction phase</li> </ul>	N/A
<b>Land use and soils</b>	The development is planned to take place within the property boundary of land that has already been completely transformed due to historic and current agricultural practices	
<b>Heritage Resources</b>	The field survey did not identify any heritage resources of significance within the study area.	
<b>Paleontological Resources</b>	There is a possibility that fossils may be discovered during development in the southern part of the study site. Vertebrate fossils and fossilised	

Aspect	Potential Impacts	
	Construction Phase	Operational Phase
	burrows occur very sporadically in surface deposits and are very scarce but scientifically very important.	
<b>Noise</b>	<ul style="list-style-type: none"> <li>▪ Generation of noise (85 dB(A)Max) from construction activities and machinery may have an impact on sensitive receptors in close proximity (&lt;100m) of the construction site, primarily at the Vlermuislaagte site.</li> <li>▪ Noise and vibration from construction traffic along main transport/access routes.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Noise disturbance associated with trains. Key “loud” train noise sources include: train hooters; curve squeal; and brake squeal.</li> <li>▪ Noise disturbance associated with activities at train yards.</li> </ul>
<b>Socio-economic Impacts</b>	<ul style="list-style-type: none"> <li>▪ A limited number of employment opportunities will be created.</li> <li>▪ Goods and services will be procured from local suppliers where practicable.</li> <li>▪ An increase in demand for municipal social services.</li> </ul>	
<b>Traffic Impacts</b>	<ul style="list-style-type: none"> <li>▪ Increase in traffic associated with delivery vehicles for building materials and equipment</li> <li>▪ Accidents with pedestrians, animals and other drivers on the surrounding tarred/gravel roads</li> <li>▪ Change in quality of surface condition of the roads.</li> </ul>	N/A
<b>Cumulative Impacts</b>	A temporary increase in noise levels due to vehicles and equipment. All other construction and operational impacts will remain the same / minimal increase. The impacts associated with the footprint of the proposed project overlaps with existing mining, industrial and agricultural activities and as such will not increase the significance of those impacts.	

## 9.2 BIO-PHYSICAL AND SOCIO-ECONOMIC IMPACTS ASSESSMENT

### 9.2.1 Air Emission

Generally, construction and decommissioning activities generate dust. The emission of particulates into the atmosphere is through vehicle dust entrainment, demolition, excavation, ground levelling, etc. The main environmental problem with dust that is generated from these activities is that it settles on surrounding properties and land which is often more of a nuisance problem than a health issue. The dust is generally coarse, but may include fine respirable particles (PM10) and these are known to be a risk to human health.

Exhaust emissions from construction vehicles and equipment typically include particulates (including PM10), carbon monoxide (CO), nitrogen oxides (NO<sub>x</sub>), and sulphur dioxide (SO<sub>2</sub>). The construction and decommissioning activities are typically short lived and the pollutants are released close to ground level with little or no buoyancy which limits their dispersion and the potential impacts to the site.

Table 21: Impact Significance of Air Emission

Theme	Air Quality		
	Construction Phase	Operation Phase	Decommissioning Phase
Nature and Status of Impact.	<ul style="list-style-type: none"> <li>▪ Generation of dust from site clearance and construction activities.</li> <li>▪ Engine emissions from construction vehicles.</li> </ul>	Engine emissions from maintenance vehicles.	Generation of dust from site clearance and decommissioning activities.
Extent	Local (1)	Local (1)	Local (1)
Duration	Temporary (1)	Medium Term (2)	Temporary (1)
Intensity	Low (2)	Negligible (1)	Negligible (1)

Theme	Air Quality		
	Highly Probable (3)	Probable (3)	Probable (3)
Probability			
Confidence	High		
Level of Significance before mitigation (Inherent risk)	$(1+1+2)*4 = 16$	$(1+2+1)*3 = 12$	$(1+1+1)*3 = 9$
	Low (-)	Very low (-)	Very low (-)
Reversibility	High	High	High
Irreplaceability	Replaceable	Replaceable	Replaceable
Mitigation Measures	<b>Construction Phase</b>	<b>Operational Phase</b>	<b>Decommissioning Phase</b>
	<ul style="list-style-type: none"> <li>▪ Covering of vehicle loads.</li> <li>▪ Loading and unloading materials in wind-sheltered areas.</li> <li>▪ Speed restrictions on site.</li> <li>▪ Spraying of roads to minimise dust.</li> <li>▪ Maintenance of vehicles and equipment.</li> </ul>	Maintenance of vehicles and equipment.	<ul style="list-style-type: none"> <li>▪ Covering of vehicle loads.</li> <li>▪ Loading and unloading materials in wind-sheltered areas.</li> <li>▪ Speed restrictions on site.</li> <li>▪ Spraying of roads to minimise dust.</li> <li>▪ Maintenance of vehicles and equipment.</li> </ul>
Level of Significance with Mitigation (Residual risks)	Very low (-)	Very low (-)	Very low (-)

### 9.2.2 Terrestrial Fauna and Flora

The potential impacts of the proposed project activities are low-level negative impacts on the natural environment due to the footprint of the proposed development being completely transformed. The study area is not situated within a threatened ecosystem and there are no 'high sensitivity' habitats present. There are three depressional wetland systems adjacent to the Sishen project footprint. The impact is rated as **Low** both with and without mitigation.

Table 22: Impact Significance of Terrestrial Fauna and Flora

Theme	Terrestrial Fauna and Flora		
Phases	Construction Phase	Operation Phase	Decommissioning Phase
Nature and Status of Impact.	<ul style="list-style-type: none"> <li>▪ Loss of natural vegetation</li> <li>▪ Loss or impact on wildlife</li> <li>▪ Impeding &amp; impounding waterflow</li> <li>▪ Fringe impacts arising from construction phase</li> </ul>	Operational impacts on fauna	<ul style="list-style-type: none"> <li>▪ Decommissioning will leave the site vulnerable to erosion.</li> <li>▪ Decommissioning will leave the site vulnerable to alien plant invasion.</li> </ul>
Extent	Local (2)	Site (1)	Site (1)
Duration	Medium Term (2)	Permanent (5)	Temporary (1)
Intensity	High (4)	High (4)	Negligible (1)
Probability	Probable (3)	Low (2)	Probable (3)
Confidence	High		
Level of Significance before mitigation (Inherent risk)	$(2+2+4)*3 = 24$	$(1+5+4)*3 = 20$	$(1+1+1)*3 = 9$
	Low (-)	Low (-)	Very Low (-)
Reversibility	Moderate	Moderate	Moderate
Irreplaceability	Low	Low	Low

Theme	Terrestrial Fauna and Flora		
Mitigation Measures	Construction Phase	Operational Phase	Decommissioning Phase
	<ul style="list-style-type: none"> <li>▪ Before any camel thorn trees are removed, a permit must be obtained from the relevant Department.</li> <li>▪ Environmental Control Officer (ECO) to provide supervision and oversight of vegetation clearing activities.</li> <li>▪ Open fires along the study site are not allowed.</li> <li>▪ A basic weed control programme should be implemented by the Applicant. This can form part of the routine maintenance programme.</li> <li>▪ Stormwater culverts must be installed and where possible be in line with existing culverts along the adjacent existing railway line. This is important to allow for the free flow of any surface stormwater during rainfall periods.</li> <li>▪ Care must be taken with heavy machinery used on the project. All access roads used</li> </ul>	<ul style="list-style-type: none"> <li>▪ Care must be taken not to interact directly with any wild life encountered.</li> <li>▪ Any bird nests encountered in the vegetation or in the watercourses must not be interfered with. If encountered must first be discussed with the ECO.</li> <li>▪ Any potentially dangerous fauna such as snakes or fauna threatened by the maintenance and operational activities should be removed to a safe location.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Revegetation of cleared areas with monitoring and follow-up to ensure that rehabilitation is successful. Monitoring and rehabilitation must continue until such time as the benchmark has been attained.</li> <li>▪ Alien management plan to be implemented during the decommissioning phase.</li> </ul>



Theme	Terrestrial Fauna and Flora		
	<p>during construction must be monitored and maintained.</p> <ul style="list-style-type: none"> <li>▪ Excavated soils and rocks may not be simply dumped in any open veld or even on the site.</li> <li>▪ All temporary access roads must be fully rehabilitated by the contractors prior to final signing off of the construction phase of the project.</li> <li>▪ The study area / project area must be securely fenced to prevent livestock and wild animals from wondering into the construction area and later the operational area.</li> </ul>		
<p><b>Level of Significance with Mitigation (Residual risks)</b></p>	<p>Low (-)</p>	<p>Low (-)</p>	<p>Very Low (-)</p>

### **9.2.3 Heritage Resources (archaeological and paleontological)**

The main cause of impacts to archaeological sites is direct, physical disturbance of the archaeological remains themselves and their contexts. It is important to note that the heritage and scientific potential of an archaeological site is highly dependent on its geological and spatial context. This means that even though, for example, a deep excavation may expose buried archaeological sites and artefacts, the artefacts are relatively meaningless once removed from their original position.

**The field survey did not identify any graves within the study area or any other heritage resources of significance.** However, should chance archaeological materials or human remains be exposed during construction on any section of the site, work should cease on the affected area and the discovery must be reported to the heritage authorities immediately so that an investigation and evaluation of the finds can be made.

In respect of paleontological finds, in the unlikely event of finding fossils during construction, the ECO must follow the Procedure for Chance Paleontological Finds as stipulated in the EMPR and contact a paleontologist for further advice.

**Therefore, this impact is rated as having a Very low significance before and after mitigation.**

#### **9.2.4 Landscape and Visual Aspects**

Given that the development will be limited to an areas already utilised for rail and mining infrastructure, it is not envisaged that the development of the will have a significant impact to the receiving landscape and visual aesthetics.

### 9.2.5 Noise Pollution

Activity which generates noise during the construction, operation and decommissioning phases of the project will result in an increase in ambient noise levels within the local area. The impacts of the increase in noise will depend on the level of increase.

Table 23: Impact on Noise Pollution

Theme	Noise Pollution		
Phases	Construction Phase	Operation Phase	Decommissioning Phase
Nature and Status of Impact.	<ul style="list-style-type: none"> <li>▪ Generation of noise (85 dB(A)<sub>Max</sub>) from construction activities and machinery may have an impact on sensitive receptors in close proximity (&lt;100m) of the construction site, primarily at the Vlermuislaagte site.</li> <li>▪ Noise and vibration from construction traffic along main transport/access routes.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Noise disturbance associated with trains. Key “loud” train noise sources include: train hooters; curve squeal; and brake squeal.</li> <li>▪ Noise disturbance associated with activities at train yards.</li> </ul>	Noise and vibration from construction traffic along main transport/access routes.
Extent	Local (2)	Local (2)	Site (1)
Duration	Temporary (1)	Long Term (3)	Temporary (1)
Intensity	High (4)	Medium (3)	Low (2)
Probability	Definite (5)	Probable (3)	Probable (3)

Theme	Noise Pollution		
Confidence	High		
Level of Significance before mitigation (Inherent risk)	$(2+1+4)*5 = 35$	$(2+3+3)*3 = 24$	$(1+1+2)*3 = 12$
	Medium Low (-)	Low (-)	Very Low (-)
Reversibility	Moderate	High	High
Irreplaceability	Low	Low	Low
Mitigation Measures	<b>Construction Phase</b>	<b>Operational Phase</b>	<b>Decommissioning Phase</b>
	<ul style="list-style-type: none"> <li>▪ Construction camps, mobile equipment storage yards and other noisy fixed facilities should be located away from the development corridor boundaries to reduce the noise emission levels leaving the sites</li> <li>▪ All construction vehicles and equipment are to be kept in good repair to reduce operational noise levels.</li> <li>▪ Stationary stationary noisy equipment (e.g. compressors, pumps, pneumatic breakers) should be encapsulated in acoustic covers, screens or sheds where possible.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Consideration of a 40 km/h train speeds limit between the Sishen Erts Yard and Vlermuislaagte loops.</li> <li>▪ Consider conducting regular maintenance of rail head maintenance and grinding to ensure that the correct rail head profile is maintained to eliminate corrugated rails.</li> <li>▪ Cracked, corrugated or damaged rails should be mended or replace immediately to reduce noise and vibrations.</li> <li>▪ Locomotive and/or wagon wheels with defects and/or flat spots must be repaired or replace to minimise vibrations.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Construction camps, mobile equipment storage yards and other noisy fixed facilities should be located away from the Portion boundaries to reduce the noise emission levels leaving the sites</li> <li>▪ All construction vehicles and equipment are to be kept in good repair to reduce operational noise levels</li> </ul>

Theme	Noise Pollution	
	<ul style="list-style-type: none"> <li>▪ Construction activities are only to be undertaken during the daytime (i.e. 06:00 to 18:00).</li> <li>▪ Prior to undertaking noisy activities, liaise with local residents on how best to minimize the impact.</li> <li>▪ Vehicles should not be allowed to idle for more than 5-minutes when not in use.</li> <li>▪ All equipment must be well maintained and fitted with appropriate noise abatement measures.</li> <li>▪ Rigorous speed control to reduce the noise from vehicle traffic onsite must be implemented on site with a maximum speed of 30 km/h to be set on all construction roads.</li> <li>▪ Ensure that exposure to noise above 85 dB(A) on the construction site is controlled to below that level via implementing engineering control measures or</li> </ul>	<ul style="list-style-type: none"> <li>▪ Vehicles should not be allowed to idle for more than 5-minutes when not in use;</li> <li>▪ Locomotives should not be allowed to idle for more than 10-minutes when not in use.</li> <li>▪ Noisy operational phase maintenance activities, are to be confined to reasonable hours during the day. No noisy maintenance activities are to be undertaken at night.</li> <li>▪ Rigorous speed control to reduce the noise from vehicle traffic onsite must be implemented on site with a maximum speed of 30 km/h to be set on all construction roads.</li> <li>▪ Shunting operations should be limited to daytime operating periods (where possible) to limit the night-time impacts.</li> </ul>

Theme	Noise Pollution		
	administration control measures or by enforcing the wearing of hearing protection by people exposed to above noise limit levels.		
<b>Level of Significance with Mitigation (Residual risks)</b>	Low (-)	Low (-)	Low (-)

## 9.2.6 Social Aspects

Given that the development will be limited to an areas already utilised for rail and mining infrastructure, it is not envisaged that the development will have a significant negative impact on the receiving socio economic environment. Employees will likely be recruited from an existing pool of resources within Transnet or its contractor companies.

Table 24: Socio-economic impacts (employment creation, procurement opportunities)

Theme	Socio-economic impacts		
Phases	Construction Phase	Operation Phase	Decommissioning Phase
Nature and Status of Impact.	Creation of employment, skills development, procurement and business opportunities.		
Extent	Local (2)	Local (2)	Local (2)
Duration	Temporary (1)	Long Term (3)	Temporary (1)
Intensity	Negligible (1)	Medium (3)	Low (2)
Probability	Probable (3)	Probable (3)	Probable (3)
Confidence	High		
Level of Significance before mitigation (Inherent risk)	$(2+1+1)*2 = 8$	$(2+3+1)*2 = 12$	$(2+1+1)*2 = 8$
	Very Low (+)	Very Low (+)	Very Low (+)
Reversibility	High	High	High
Irreplaceability	Low	Low	Low
Proposed enhancements	<b>Construction Phase</b>	<b>Operational Phase</b>	<b>Decommissioning Phase</b>
	<ul style="list-style-type: none"> <li>▪ Prioritise employment of local people from GLM, particularly for semi and unskilled job categories as far as possible.</li> <li>▪ Employment of Coloured and Black African people; women; and youth should be prioritised.</li> <li>▪ Engage with JTGDM and GLM to enquire about any district or local skills databases.</li> </ul>		



Theme	Socio-economic impacts		
	<ul style="list-style-type: none"> <li>▪ Implement training and on-the-job skills development programmes for temporary employees where feasible.</li> <li>▪ Employ local contactors that are compliant with Broad Based Black Economic Empowerment (BBBEE) criteria to the extent possible.</li> <li>▪ Recruitment and employment practices must be in accordance with all labour legislation in South Africa.</li> <li>▪ Vacancies should be advertised in the local media when they become available.</li> </ul>		
<b>Level of Significance with Mitigation (Residual risks)</b>	Very Low (+)	Low (+)	Very Low (+)

Table 25: Socio-economic impacts (influx, demand for social services)

Theme	Socio-economic impacts		
Phases	Construction Phase	Operation Phase	Decommissioning Phase
Nature and Status of Impact.	Strain on community health & safety services due to influx of hopeful job seekers		
Extent	Local (2)	Local (2)	Local (2)
Duration	Temporary (1)	Medium Term (2)	Temporary (1)
Intensity	High (5)	High (5)	High (5)
Probability	Low (2)	Low (2)	Low (2)
Confidence	High		
Level of Significance before mitigation (Inherent risk)	(2+1+1)*2 = 8	(2+3+1)*2 = 12	(2+1+1)*2 = 8
	Low (-)	Low (-)	Low (-)
Reversibility	High	High	High

Theme	Socio-economic impacts		
Irreplaceability	Low	Low	Low
Proposed enhancements	<b>Construction Phase</b>	<b>Operational Phase</b>	<b>Decommissioning Phase</b>
	<ul style="list-style-type: none"> <li>▪ Prioritise employment of local people from the various communities in GLM.</li> <li>▪ The Applicant as well as any contractors that are appointed to undertake the construction phase activities should develop and agree a code of conduct which sets standards for acceptable behaviour and outlines behaviour and activities which could constitute grounds for dismissal. Any employee or contractor appointed by the Developer to undertake construction phase activities that is found to be in breach of the code of conduct should be dismissed after following due process in accordance with prevailing labour legislation. Criminal activities should be reported to SAPS immediately for investigation and further action.</li> <li>▪ The Applicant and contractor should agree and implement an HIV/AIDS/TB awareness programme.</li> <li>▪ The Applicant should develop and implement an appropriate method of communication with the local community. A community liaison officer should be appointed during the construction phase to engage with local community members regarding any issues, complaints or grievances that they may have as per the Transnet Stakeholder Engagement Procedure.</li> </ul>		
<b>Level of Significance with Mitigation (Residual risks)</b>	Very Low (-)	Very Low (-)	Very Low (-)

### 9.2.7 Traffic and Road Network

The proposed development will require delivery trucks to drop off equipment and materials required for the project. Given the remoteness of the actual railway lines it is not envisaged that this would be significant.

Table 26: Impact on Traffic and Road Network

Theme	Traffic and Road Network		
Phases	Construction Phase	Operation Phase	Decommissioning Phase
Nature and Status of Impact.	<ul style="list-style-type: none"> <li>Increase in traffic associated with delivery vehicles.</li> <li>Accidents with pedestrians, animals and other drivers on the surrounding tarred/gravel roads</li> <li>Change in quality of surface condition of the roads.</li> </ul>	<ul style="list-style-type: none"> <li>No Impact as there will not be additional staff hired.</li> </ul>	<ul style="list-style-type: none"> <li>Increase in traffic.</li> <li>Accidents with pedestrians, animals and other drivers on the surrounding tarred/gravel roads.</li> </ul>
Extent	Local (2)	-	Local (2)
Duration	Temporary (1)	-	Temporary (1)
Intensity	Medium (3)	-	Medium (3)
Probability	Probable (3)	-	Probable (3)
Level of Significance before mitigation (Inherent risk)	$(2+1+3)*3 = 18$	-	$(2+1+2)*3 = 15$
	Low (-)	-	Low (-)
Reversibility	Moderate	-	Moderate
Irreplaceability	Low	-	Low

Mitigation Measures	Construction Phase		Decommissioning Phase
	<ul style="list-style-type: none"> <li data-bbox="631 255 2042 456">▪ Appropriate warning traffic signs, in accordance with the South African Road Traffic Signs Manual, should be erected to protect road users on the approaches to the sharp curves and the access road junction. Temporary signs should be erected on the approaches to the access road junction warning motorists of heavy vehicle traffic during the construction phase.</li> <li data-bbox="631 475 2042 564">▪ Any maintenance of the access roads required due to the construction phase, must be collectively implemented by the applicants in agreement with the Local Municipality.</li> </ul>		
<b>Level of Significance with Mitigation (Residual risks)</b>	Low (-)		Low (-)

### 9.3 IMPACT STATEMENT

#### 9.3.1 Residual impacts

This application for EA and WULA will form part of Transnet’s Manganese Expansion Program along the Sishen-Saldanha Corridor and the manganese PE/Ngqura corridor. The project will present the expansion program with options to optimally utilize the rail capacities enroute to Sishen and to provide appropriate and cost-effective means of expanding these capacities to meet the validated tonnage demand. The proposed solution is to provide additional staging lines in Sishen and provide additional facilities at the Vlermuistlaagte rail siding.

The proposed Vlermuistlaagte loop is located approximately 20 km west-north of the town of Kathu, 9 km south-south-west of the South32 Mamatwan mine and 9 km north-east of the town of Deben in Ward 2, GLM. The proposed Sishen Erts Yard loop is located adjacent, east of the Sishen Iron Ore mining pit, approximately 7 km South of the Kathu Central Business District in Ward 8 of GLM. The Vlermuistlaagte loop and Sishen Erts Yard loop are separated by approximately 26 km.

Table 27 summarizes the potential residual risk associated with the proposed project.

**Table 27: Residual Risk Summary**

<b>Impact theme</b>	<b>Construction Phase</b>	<b>Operational Phase</b>	<b>Decommissioning</b>
<b>Air Emissions</b>	Very Low (-)	Very Low (-)	Very Low (-)
<b>Terrestrial Fauna &amp; Flora</b>	Low (-)	Low (-)	Very Low (-)
<b>Heritage &amp; Paleo Resources</b>	Very Low The field survey did not identify any heritage & Paleo resources of significance.		
<b>Landscape and Visual Aspect</b>	Very Low Given that the development will be limited to an areas already utilised for rail and mining infrastructure, it is not envisaged that the development of the will have a significant impact to the receiving landscape and visual aesthetics.		
<b>Noise Pollution</b>	Low (-)	Low (-)	Low (-)
<b>Social (employment / procurement)</b>	Very Low (+)	Low (+)	Very Low (+)
<b>Social (strain on municipal services)</b>	Very Low (-)	Very Low (-)	Very Low (-)
<b>Traffic</b>	Low (-)	N/A	Low (-)

#### 9.3.2 Cumulative impacts

During both construction and operational phases, the following cumulative impacts may be applicable:

- The presence of several significant noise sources within a 10 km radius of the proposed site include national and regional road infrastructure; existing rail infrastructure; mining activities; industrial

activities; Sishen airport; commercial activities; and power generation may significantly impacted the baseline noise levels within the wider project area.

- The noise contributions by the proposed project's construction and operational phase activities may serve to nominally increase the baseline levels, although most of the noise nuisance is anticipated to be absorbed by the existing noise climate of the local area.
- Cumulative impacts on terrestrial fauna and flora are low in terms of localized impact on the study site; and very low in terms of cumulative impact on the region.
- Given the scale of the proposed project, and the fact that Transnet is the only rail freight operator in the area, it is unlikely that there will be any significant cumulative impacts in the study area from a socio-economic point of view.

## 10 CONCLUSIONS AND RECOMMENDATIONS

As shown within the BA Report, the proposed project will have minimal environmental impacts which should be manageable through good design practices and following all environmental recommendations made in the sections above and in the EMPr. Although all foreseeable actions and potential mitigations or management actions are contained in the EMPr, the document should be considered as a day-to-day management document which can be adjusted as and when required. Major changes should however be communicated to the authorities. The current EMPr thus sets out the environmental standards that are required to minimise the negative impacts and maximize the positive benefits of the local community. An EMPr is a “live document” and its continuous review and correct management will definitely result to the successful construction and operation of the proposed development.

Based on the impact assessment conducted, it is the EAP’s opinion that the proposed development be authorised with the inclusion of the following conditions:

- The EMPr is a legally binding document and must be adhered too at all times.
- The monitoring of the development site must be carried out by an Environmental Control Officer with at least monthly ECO audits.
- Decommissioning of the facility and associated infrastructure is not foreseen / planned for. Therefore, in the unlikely event that the facility needs to be decommissioned, a decommissioning specific technical assessment needs to be undertaken and associated EMPr, for implementation during the planned works. This BA, thus only assesses the potential construction and operational impacts for the project and limited focus on the decommissioning phase.
- Noise monitoring should be conducted during the operational phase of the project to ensure it is within occupational health and safety limits.
- All mitigation measures listed in the BA as well as the EMPr must be implemented and adhered to.
- All permits required in terms of the Occupational Health and Safety Act, 1993 (Act No. 85 of 1993) as amended and other relevant legislation must be obtained from the relevant authority prior to decommissioning.
- Tree removal permits must be obtained prior to any camel thorn trees being removed.

## APPENDICES