KOMATI POWER STATION SHUTDOWN & DISMANTLING

DRAFT ENVIRONMENTAL & SOCIAL IMPACT ASSESSMENT REPORT
Part I – ESIA Report

DRAFT

August 2022

NEMAI CONSULTING

Environmental, Social and OHS Consultants

P.O. Box 1673
Sunninghill
2157

147 Bram Fisher Drive
Ferndale
2194

Tel: 011 781 1730
Fax: 011 781 1731
Email: info@nemai.co.za

A. TITLE & APPROVAL PAGE

Project Name:	Komati Power Station Shutdown and Dismantling
Report Title:	Draft Environmental and Social Impact Assessment Report – Part I
Report Status	Draft

Client:	Eskom Holdings SOC Ltd

Prepared By:	Nemai Consulting			
NEMAI CONSULTING	☎	+27 11 781 1730		147 Bram Fischer Drive, FERNDALE, 2194
		+27 11 781 1731		
		donavanh@nemai.co.za		PO Box 1673, SUNNINGHILL, 2157
		www.nemai.co.za		
Report Reference:	10756-20220708		R-PRO-REP|20150514	

Authors:

D Henning, D Naidoo, C Chidley, K Rainford and M Ledwaba

B. AMENDMENTS PAGE

Date:	Nature of Amendment	Amendment No.
08/07/2022	Draft for Client Review	0
17/08/2022	Updated Draft addressing Comments from Eskom and the World Bank	1
26/08/2022	Updated Draft addressing Comments from the World Bank	2

C. EXECUTIVE SUMMARY

1. INTRODUCTION

Eskom has proposed to shut down, dismantle and repurpose the Komati Power Station (KPS) as it reaches its end of life.

The overall scope for KPS, in line with Eskom's 2035 Plan and the Just Energy Transition (JET) partnership, entails the following:

- Component A – Shutdown and dismantling of KPS (the "Project") (focus of this report);
- Component B – Repurposing KPS by repowering the plant with solar PV, batteries and wind and adaption of innovative technical solutions to improve quality of power supply; and
- Component C – This component is centred around three key pillars: (a) Transition support for Komati Permanent Workers, Suppliers and Contract Workers; (b) Community Development and Economic Diversification; and (c) Stakeholder engagement.

Nemai Consulting (Pty) Ltd was appointed by Eskom to undertake an Environmental and Social Impact Assessment (ESIA) for Component A. The ESIA must satisfy the requirements of the World Bank Group (WBG) as adhere to the South African environmental legal requirements.

This draft ESIA Report for the Project presents a baseline of the receiving environment so that potential impacts can be identified and relevant mitigation measures, based on a hierarchy approach, are assessed at an early stage of the ESIA process. The draft ESIA is necessary to create an accurate scope for the detailed assessment. As a minimum, the draft ESIA Report is aligned with the indicative outline provided in World Bank Environmental and Social Standard (ESS) 1: Assessment and Management of Environmental and Social Risks and Impacts.

2. LEGISLATIVE AND INSTITUTIONAL FRAMEWORK

The draft ESIA Report presents the Project's environmental and social governance framework by exploring the following:

- The requirements of the World Bank, including the Environmental and Social Framework (ESF), General Environmental, Health and Safety (EHS) Guidelines, Industry specific EHS Guidelines and Good International Industry Practice (GIIP);
- International Agreements and Obligations formally adopted by South Africa (SA);

- SA's environmental regulatory framework, which includes the country's key environmental legislation and their possible relevance to the Project, social-related legislation, existing environmental approvals granted for KPS, and environmental approvals required for the Project.

A legislative gap analysis was undertaken by considering the key requirements of the World Bank ESS and related provisions in SA legislation.

3. PROJECT DESCRIPTION

The KPS is situated approximately 37km south of the town of Middelburg next to the R35 in the Mpumalanga Province of SA. It falls within the Steve Tshwete Local Municipality (STLM) and Nkangala District Municipality (NDM). The GPS coordinates for the power station are 26°05'24.77"S, 29°28'20.39"E. The station is located on the Farm Komati Power Station 56 IS.

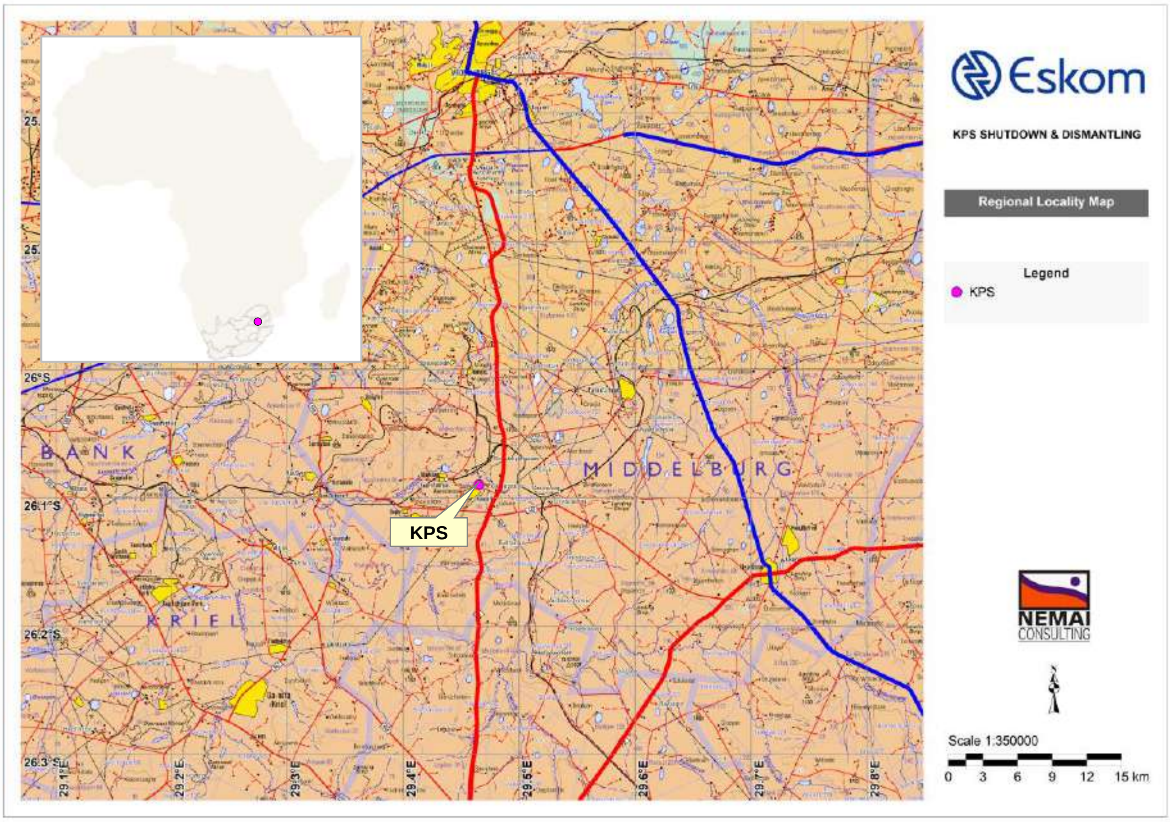


Figure A: KPS regional locality map

An overview is provided of the areas which are proposed to be kept or removed as part of the retiring and repurposing of KPS. Decommissioning activities applicable to retiring and repurposing are also explained in terms of the main power station complex, ash dam and related infrastructure, water monitoring, rehabilitation monitoring, care and maintenance, and water treatment.

A detailed Decommissioning Strategy and Plan is to be provided by Eskom to provide information necessary for the undertaking of the ESIA and for compiling the associated documentation.

KPS operates a wet ash system. The ash dam area includes the existing ash dam, old asbestos disposal facility, old ash dam, new partially constructed 3D ash dam, ash water return (AWR) dams and a third water recovery dam. The options under consideration for the repurposing and decommissioning of the ADF include the rehabilitation of the ash system dams or ash beneficiation.

While the repurposing of the KPS (Component B) falls outside of the shutdown and dismantling ESIA (Component A), the intention is to ensure that the decommissioned infrastructure is fit for re-use. Various facilities occur on the areas earmarked for the proposed renewable energy development at KPS. The respective project teams will collaborate to ensure that stakeholders are informed in a transparent manner and have complete knowledge of both projects. Similarly, the specialist on both projects will be briefed to ensure integration and interrogation of data so that the cumulative impacts of the projects are fully understood.

4. ENVIRONMENTAL & SOCIAL CONTEXT

The status quo of the Project's physical, biological, and socio-economic environment is described. The baseline serves to provide the environmental and social context within which the draft ESIA was conducted.

The following features of the receiving environment are explained:

1. Climate
2. Geology
3. Topography
4. Groundwater
5. Surface water
6. Soil
7. Land use
8. Air quality
9. Terrestrial Biodiversity
10. Noise and vibration
11. Services
12. Heritage and palaeontology
13. Visual quality
14. Socio-economic environment
15. Transportation
16. Waste
17. Pollution sources
18. Land capability

Monitoring results are presented for groundwater, surface water, soil, air quality and noise.

The evaluation of the environmental and social context allows for an appreciation of sensitive environmental and social features that may be affected by the Project. Some of these key receptors include the following:

- Groundwater resources, which are vulnerable to contamination and are used by the surrounding communities.
- Surface water resources. KPS drains towards the Koring Spruit which is located to the north of the power station. Tributaries of this system that occur in the Project Area

include the southeast-northwest orientated Komati Spruit (drains the area west of the ash dams) and the southeast-northwest orientated Geluk Spruit (drains the area east and north on the site). The area includes numerous drainage lines and wetland areas, which are in various degrees of disturbance.
- Neighbouring communities (including Komati Village, Blinkpan and Koornfontein), farms, small settlements (including Gelukplaas 1, Gelukplaas 2 and Snybroer Plaas) and informal settlements (including Big House and Broodesnyers Plaas), which will be affected.
- Although the land on which the KPS is situated has been transformed by the various facilities and activities associated with the operation of the power station, the site is situated in the Eastern Highveld Grassland which is listed as a Vulnerable Ecosystem. Areas classified as Critical Biodiversity Area (CBA) Optimal occur on the western part of the property, next to the Komati Village, as well as to the north of KPS (linked to Koring Spruit). Other natural areas occur in various parts of the site, including along the surrounding watercourses.
- Due to the age of the KPS, structures older than 60 years will need to be decommissioned, which will require a permit.

The preliminary list of pollution sources identified at KPS include the following:

- Coal Stockyard;
- Lake Stoffel;
- Lake Finn;
- Ash dams;
- Asbestos disposal area;
- Hazardous substances storage area;
- Hazardous waste temporary storage;
- Bulk fuel storage areas;
- Bulk chemical store; and
- Fuel station.

The above list is not regarded as exhaustive at this stage, and it will be updated based on the detailed findings of the specialist studies, including the Soil and Groundwater Assessments.

5. POTENTIAL ENVIRONMENTAL & SOCIAL IMPACTS & MITIGATION

This draft ESIA was undertaken at a scoping level to identify environmental and social impacts for further detailed assessment as part of the ESIA. Preliminary mitigation measures are also provided, which will be updated through the detailed findings of specialist studies and further outcomes of the ESIA.

The potential environmental and social risks and impacts associated with the proposed Project were identified during the draft ESIA through an appraisal of the following:

- Legal context;
- International and national case studies;
- Existing infrastructure, structures and areas earmarked for closure at KPS;
- Activities associated with the closure of KPS;
- Waste to be generated during closure;
- Nature and profile of the receiving environment and social environment, including potential sensitive features and receptors;
- Preliminary findings of specialist studies;
- Outcomes from the initial stakeholder engagement; and
- Input received from authorities and the Project Team (including the World Bank and Eskom).

As part of the ESIA, suitable measures will be identified to manage the identified environmental and social impacts according to the mitigation hierarchy. An Environmental and Social Management Plan (ESMP) will be developed as part of the ESIA. The mitigation measures provided in the draft ESIA Report are by no means exhaustive, as detailed specialist studies and technical investigations (including design measures) still need to be completed to provide a sufficiently comprehensive list of mitigation measures.

The table to follow provides a summary of the potential environmental and social impacts associated with the Project, as identified during the draft ESIA.

Table A: Preliminary summary of potential environmental & social impacts

Themes	Potential Environmental & Social Impacts
Geohydrology	• Negative impacts - ○ Failure to identify and isolate pollution sources and to remediate contaminated land will result in legacy impacts to groundwater that will persist beyond the closure of the power station. ○ Possible influence on groundwater flow as a result of trenching and excavations. ○ Potential contamination of groundwater through poor decommissioning. ○ An indirect impact of groundwater pollution is the negative effects to surrounding landowners that utilise the groundwater for agricultural purposes. • Positive impacts – ○ The remediation of the site and removal of the pollution sources as part of the Project will benefit groundwater resources
Surface Water	• Negative impacts - ○ Failure to identify and isolate pollution sources and to remediate contaminated land will result in legacy impacts to surface water that will persist beyond the closure of the power station. ○ Reduction in water quality caused by poor decommissioning practices. ○ Reduction in water quality through sedimentation. ○ Alteration of drainage at KPS due to the removal of facilities. ○ Encroachment of decommissioning activities into buffers of wetlands and damage to wetland vegetation as well as soil and sub-surface flow characteristics. • Positive impacts – ○ The aquatic systems will benefit from the remediation of the site and removal of the pollution sources as part of the Project.

Themes	Potential Environmental & Social Impacts
	○ With the closure of KPS, the power station's water consumption will be considerably reduced.
Soil	• Negative impacts - ○ Failure to identify and isolate pollution sources and to remediate contaminated land will result in legacy impacts to soil that will persist beyond the closure of the power station. ○ There is a likelihood of localised soil erosion during decommissioning as a result of creating open areas from dismantling existing facilities, excessive use of the gravel roads at the ADF, changes to site drainage, earthworks and improper storm water management. ○ The use of heavy equipment during the decommissioning could lead to soil compaction. ○ Soil could be contaminated through poor decommissioning practices. • Positive impacts – ○ There will be a net benefit to the land at KPS from the remediation of the site and removal of the pollution sources as part of the Project.
Air Quality	• Negative impacts - ○ Dust from bare areas that have been cleared or other exposed areas on the site. ○ Dust from the use of dirt roads by vehicles. ○ Emissions from equipment, machinery and vehicles used for decommissioning purposes. • Positive impacts – ○ With the cessation of the operation of KPS, emissions from coal combustion will come to an end. ○ Fugitive emissions at KPS from coal storage and handling will cease.
Climate	• Negative impacts - ○ Indirect emissions of GHG from grid power consumption. ○ Mobile combustion emissions from fuel used in vehicles / mobile equipment. ○ Emissions of GHG from use of diesel generators for back-up power production ○ Emissions associated with transporting materials for offsite reuse, recycling or disposal. ○ Rainfall in excess of the designed capacity of the storm water system will result in runoff from the site, which may pollute soil, surface water and groundwater. • Positive impacts – ○ The closure of KPS will cease the emission of greenhouse gases directly associated with coal combustion. ○ The proposed solar PV and wind energy development that forms part of the repurposing of KPS, which will be enabled by the decommissioning of the power station, will generate energy from renewable resources and mitigate climate change.
ADF	• Linked to ADF options. • Impacts to air quality, water resources, soil, and visual quality. • Risks of structural failure. • Environmental and social risks related to handling, storage, transportation and processing of ash (related to ash beneficiation option).
Land Use	• Constraints to rehabilitation. • Constraints posed by contamination of surrounding land uses (historical and future).
Terrestrial Ecology	• Negative impacts - ○ Failure to identify and isolate pollution sources and to remediate contaminated land will result in legacy impacts that will persist beyond the closure of the power station, and which will impact negatively on fauna and flora that are reliant on the receiving environment. ○ Encroachment of decommissioning activities into natural areas due to poor planning and execution, which may lead to the loss of vegetation and threaten animal life.

Themes	Potential Environmental & Social Impacts
	○ Invasive alien plants and weeds may proliferate in areas cleared during decommissioning and if rehabilitation is not undertaken properly, which may spread to adjoining areas. ○ Animals may be killed (road collisions, poaching) or disturbed (noise, light, dust, vibration, etc.). ○ Pollution caused by poor decommissioning practices may result in the offsite migration of contaminants, which will harm flora and fauna. ○ Poor waste management practices may result in the occurrence of pest animals. • Positive impacts – ○ The closure of the power station and the remediation and rehabilitation of the land will benefit terrestrial ecology.
Visual Quality	• Negative impacts - ○ Temporary visual impacts will be caused during the decommissioning phase, due to the various activities associated with dismantling facilities • Positive impacts – ○ The shutdown and dismantling of the power station, particularly the large structural components that are highly visible, will have a positive impact on the overall visual quality of the area.
Noise & Vibration	• Negative impacts - ○ Noise and vibration will be caused by the operation of equipment used to dismantle and rehabilitate facilities, and by the transportation of equipment, materials and people to and from the site. ○ Noise can be created by the labour force used to undertake the decommissioning. ○ Noise and vibration may disturb surrounding communities and animal life and can also pose occupational risks. • Positive impacts – ○ Cessation of operations at coal-fired power station.
Waste	• Negative impacts - ○ Linked to options for managing non-hazardous and hazardous waste. ○ Risk to human health (occupational and community health and safety). ○ Soil pollution (spillages and leachate). ○ Surface and groundwater pollution (spillages and leachate). ○ Air pollution (e.g., smoke if set alight and emissions) and odours. ○ Compromised aesthetics (e.g., poor storage, windblown litter). ○ Vermin. • Positive impacts – ○ KPS will no longer generate waste related to the operation of the power station, such as ash.
Transportation	• Negative impacts - ○ During the decommissioning phase, a large number of trucks will utilise the road network to transport waste and workers. This may pose potential traffic and road safety risks to workers, the surrounding communities and road users. • Positive impacts – ○ The surrounding round network will no longer be used by trucks hauling coal to KPS. ○ The renewable energy facility will not have as many employees as the power station during its operational phase, and the roads will not carry as many commuters to KPS.
Socio-Economic Aspects	• Negative impacts - ○ Threats to the stability of the local area. ○ Potential economic losses and reduced employment and loss of household income, due to closure of KPS and impacts on those dependent on the coal value chain. ○ 661 workers (236 permanent Eskom workers, 292 contract workers and 133 employed with Eskom Rotek Industries) will be directly affected by the closure of KPS. ○ Deterioration of the communities' health.

Themes	Potential Environmental & Social Impacts
	○ Exodus of skills from the area. ○ Decline in property values and social cohesion. ○ Possible deterioration of the built environment. ○ Reduction in the standard of living. • Positive impacts – ○ Create opportunities for the development of the local economy. ○ Create green jobs. ○ Reduction in coal dependency. ○ *Cross-cutting mitigation measures under other themes, especially related to Component C in terms of support to workers and communities.*
Social Aspects	• Negative impacts - ○ Insufficient or inadequate stakeholder engagement. ○ Dwellings of community members situated approximately 100m to the south-east of Ash Dam 1. Depending on the required buffer zone around the ash dam, these dwellings may need to be relocated for their own safety. ○ Health and social well-being impacts. ○ Quality of the living environment impacts. ○ Economic and material well-being impacts. ○ Displacement of people and influx of construction workers. ○ Institutional, legal political and equity impacts. ○ Gender related impacts. ○ *Cross-cutting adverse impacts under other themes*. • Positive impacts – ○ Economic and material well-being impacts. ○ *Cross-cutting mitigation measures under other themes, especially related to Component C in terms of support to workers and communities.*
Heritage	• Negative impacts - ○ Dismantling of structures older than 60 years. • Positive impacts – ○ Opportunity for conserving structures older than 60 years.
Occupational Health and Safety	• Negative impacts - ○ Occupational injuries and diseases.
Community Health and Safety	• Negative impacts - ○ Impacts caused by poor planning and communication with the affected communities in the Project Area. ○ Failure to identify and isolate pollution sources and to remediate contaminated land, with resultant legacy impacts to local communities that will persist beyond the closure of the power station. ○ Contamination of air, soil and water from decommissioning activities or facilities, with resultant impacts to local communities. ○ Accidents occurring during decommissioning that involve communities and their animals and livestock. ○ Impacts of Project's security on local communities. ○ Spread of communicable diseases by workers to the local communities. ○ Transfer of disease from in-migrants and workforce to community. ○ Potential exposure to vector-related diseases. ○ Increased competition for the direct and indirect economic opportunities created by the Project (labour Influx). ○ SEA/SH regarding community members. ○ Forced labour and child labour. ○ Risks to vulnerable and marginalised groups (including informal settlements surrounding KPS). ○ Drowning risks related to water bodies at KPS. ○ Risk of dam failure (ADF) to the community. ○ Breakdown in worker–community relationship. • Positive impacts – ○ Benefits associated with removal of pollution sources and remediation of contamination.

The potential negative and positive cumulative impacts associated with the Project were also identified, based on the current understanding of the Project and the receiving environment. In terms of cumulative impacts, the spatial area of influence (AOI) encompasses the geographical area impacted by the Project. The timescale over which the Project is likely to cause impacts include the decommissioning phase as well as post-closure. The final ESIA Report will contain a detailed assessment of cumulative impacts, which will incorporate the findings of the specialist studies and technical investigations. This will include as appraisal of the cumulative impacts associated with Component A and Component B.

6. ANALYSIS OF ALTERNATIVES

The alternatives considered in the draft ESIA Report are tabulated below.

Table B: Preliminary alternatives considered

Theme / Project Component	Alternatives
ADF	• Default option: keep and rehabilitate ADF • Ash beneficiation • Treatment
Waste Management	• Non-hazardous waste: ○ Permanent onsite waste disposal facility ○ Offsite disposal • Hazardous waste: ○ Treat and manage as non-hazardous waste ○ Offsite disposal
Land Use & End-State Options	• Remain vacant • Agriculture
Repurposing Options	• Repurposing options (other than renewable energy) that will benefit the surrounding communities.
Remediation Options	• Ex situ remediation • In situ remediation
No-Go / Without Project Option	-

The final ESIA Report will include a detailed comparative analysis of the Project's feasible alternatives, taking into consideration the environmental, social, technical, and economic factors

7. STAKEHOLDER ENGAGEMENT

The Stakeholder Engagement Plan (SEP) outlines the stakeholder engagement process that will be undertaken throughout the ESIA with stakeholders who are either interest in the Project or who will be or are likely to be affected by the proposed closure of KPS. The SEP also identifies and describes the different categories of stakeholders, how they are going to be included in the ESIA process and the specific way they should be engaged with. Lastly, the SEP describes how engagement will be documented throughout the Project and it includes a Grievance Redress Mechanism (GRM).

8. PLAN OF STUDY FOR THE FULL ESIA

The Plan of Study explains the approach to be adopted to conduct the ESIA for the proposed Project. To ensure alignment with the South African regulatory framework, is also conforms to the content requirements stipulated in SA's Environmental Impact Assessment Regulations.

Terms of Reference are provided for the following specialist studies that were identified to be required for the ESIA, due to the nature of the proposed Project and its receiving environment:

1. Soil, Surface Water and Groundwater Assessment;
2. Aquatic Impact Assessment and Delineation;
3. Terrestrial Ecological Impact Assessment;
4. Social Impact Assessment;
5. Visual Impact Assessment;
6. Waste Management Assessment;
7. Holfontein Feasibility Study;
8. Fugitive Emission Assessment;
9. Noise Impact Assessment;
10. Heritage Impact Assessment; and
11. Health and Safety Assessment.

The engineering assessments and technical studies needed to be completed to inform the ESIA, include the following aspects:

- Water management;
- ADF management;
- Geotechnical conditions;
- Climate change;
- Waste management;
- Temporary facilities;
- Rehabilitation of the site;
- Traffic; and
- Occupational health and safety.

The ESMP will be compiled in accordance with the indicative outline provided in the World Bank's ESS1. The ESMP will contain the following Management Plans:

- Generic Management Plan, which will contain mitigation measures to address general aspects and impacts associated with the Project.
- Monitoring Plan –
  - Baseline monitoring; and
  - Environmental and Social Monitoring Programmes.
- Thematic Management Plans, which will include discipline-specific mitigation and monitoring measures covering the following topics that related to potential sources of environmental and social impacts.

D. TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDICES

E. List of Acronyms

ADF	Ash Disposal Facility
AEL	Atmospheric Emission License
AEV	Acute Effect Value
Al	Aluminium
AOI	Area of Influence
AQM	Air Quality Management
ASPT	Average Score Per Taxon
AWR	Ash Water Return
BCEA	Basic Conditions of Employment Act (Act No. 75 of 1997)
BESS	Battery Energy Storage System
BID	Background Information Document
BPEO	Best Practicable Environmental Option
BTEX	Benzene, Toluene, Ethylbenzene and Xylene
Ca	Calcium
$CaCO_3$	Calcium Carbonate
CBA	Critical Biodiversity Areas
CER	Centre for Environmental Rights
CEV	Chronic Effect Value
CITES	Convention on the Illegal Trade in Endangered Species
Cl	Chloride
CO_2	Carbon Dioxide
CO_x	Carbon Oxides
COIDA	Compensation for Occupational Injuries and Diseases Act
CoPC	Contaminants of Potential Concern
Cr^{3+}	Chromium
Cr^{6+}	Hexavalent Chromium
CRR	Comments and Response Report
CSM	Conceptual Site Model
CV	Calorific Value
DARDLEA	Department of Agriculture, Rural Development, Land and Environmental Affairs
DEA	Department of Environmental Affairs
DEL	Department of Employment and Labour
DFFE	Department of Forestry, Fisheries and the Environment
DMRE	Department of Mineral Resources and Energy
DPE	Department of Public Enterprise
DSD	Dead Stop Date
DSI	Department of Science and Innovation
DTIC	Department of Trade, Industry and Competition

DWAF	Department of Water Affairs and Forestry
DWS	Department of Water and Sanitation
EA	Environmental Authorisation
EC	Electrical Conductivity
EIR	Environmental Impact Report
EIS	Ecological Importance and Sensitivity
EHS	Environmental, Health and Safety
EIA	Environmental Impact Assessment
EMP	Environmental Management Plan
EMPr	Environmental Management Programme
EPA	Environmental Protection Agency
ERI	Eskom Rotek Industries
ERP	Emergency Response Plan
ESA	Ecological Support Area
ESF	Environmental and Social Framework
ESI	Energy Supply Industry
ESIA	Environmental and Social Impact Assessment
ESMP	Environmental and Social Management Plan
ESS	Environmental and Social Standards
ESTA	Extension of Security of Tenure Act (Act No. 62 of 1997)
Fe	Iron
FTE	full-time equivalent
GBV	Gender-Based Violence
GDP	Gross Domestic Product
GHG	Green House Gas
GIIP	Good International Industry Practice
GN	Government Notice
GPN	Good Practice Notes
GRS	Grievance Redress Mechanism
GRO	Gasoline Range Organics
GVA	Gross Value Added
GWS	Ground Water Survey
HDPE	High Density Poly-Ethylene
HH	Households
HIV/AIDS	Human Immunodeficiency Virus, Acquired Immunodeficiency Syndrome
HPA	Highveld Airshed Priority Area
HV	High Voltage
IBA	Important Bird and Biodiversity Area
IDP	Integrated Development Plan
IWWMP	Integrated Water and Waste Management Plan
IZOI	Immediate Zone of Influence
JET	Just Energy Transition
K	Potassium

KPS	Komati Power Station
KWS	Komati Water Scheme
LC	Leachable Concentrations
LCT	Leachable Concentration Threshold
LRA	Labour Relations Act (Act No.66 of 1995)
mamsl	meters above mean average sea level
MBSP	Mpumalanga Biodiversity Sector Plan
MEJCON-SA	Mining and Environmental Justice community Network of South Africa
Mg	Magnesium
Mn	Manganese
MPHRA	Mpumalanga Provincial Heritage Resource Authority
MPRDA	Mineral and Petroleum Resources Development Act (Act No. 28 of 2002)
MSDS	Material Safety Data Sheet
MTPA	Mpumalanga Tourism and Parks Agency
MW	Mega Watt
Na	Sodium
NDM	Nkangala District Municipality
NDP	National Development Plan
NEMA	National Environmental Management Act (Act No. 107 of 1998)
NEM:AQA	National Environmental Management: Air Quality Act (Act No. 39 of 2004)
NEM:BA	National Environmental Management: Biodiversity Act (Act No. 10 of 2004)
NEM:WA	National Environmental Management: Waste Act (Act No. 59 of 2008]
NERSA	National Energy Regulator of South Africa
NHRA	National Heritage Resources Act (Act No. 25 of 1999)
NO_2	Nitrite
NO_3	Nitrate
NO_x	Nitrogen Oxides
NS	North-South
NTU	Nephelometric Turbidity Units
NUMSA	National Union of Metalworkers of South Africa
NWA	National Water Act (Act No. 36 of 1998)
OE	Owner's Engineer
OHS	Occupational Health & Safety
OHSA	Occupational Health & Safety Act (Act No. 85 of 1993)
PAH	Polycyclic Aromatic Hydrocarbon
PCB	Polychlorinated Biphenyl
PES	Present Ecological State
PF	Pulverised Fuel
PPE	Personal Protective Equipment
PSA	Primary Study Area
PV	Photovoltaic
PWRT	Department of Public Works, Roads and Transport
RAP	Resettlement Action Plan

RSIP	Rehabilitation Strategy and Implementation Plan
RSLs	Regional Screening Levels
SA	South Africa
SADC	Southern African Development Community
SAHRA	South African Heritage Resources Agency
SAHRIS	South African Heritage Resources Information System
SANAS	South African National Accreditation System
SANRAL	South African National Roads Agency Limited
SANS	South African National Standard
SAPS	South African Police Service
SASS5	South African Scoring System Version 5
SATAWU	South African Transport and Allied Workers Union
SAWQG	South African Water Quality Guidelines
SEA/SH	Sexual Exploitation and Abuse and Sexual Harassment
SEP	Stakeholder Engagement Plan
S&EIR	Scoping and Environmental Impact Reporting
SO_2	Sulphur Dioxide
SO_4	Sulphate
SO_x	Sulphur Oxides
SOC	State Owned Company
SOP	Standard Operating Procedure
SOTER	Soil and Terrain Digital Database
SSLs	Soil Screening Levels
SSV	Soil Screening Value
STDs	Sexually Transmitted Diseases
STIs	Sexually Transmitted Infections
STLM	Steve Tshwete Local Municipality
SVOC	Semi-Volatile Organic Compounds
TB	Tuberculosis
TBD	To Be Determined
TC	Total Concentrations
TCT	Total Concentration Threshold
TDS	Total Dissolved Solids
TIC	Tentatively Identified Compounds
TOC	Total Organic Carbon
ToR	Terms of Reference
TPH	Total Petroleum Hydrocarbon
TWQR	Target Water Quality Range
USA	United States of America
USEPA	United States Environmental Protection Agency
VAC	Violence Against Children
VOC	Volatile Organic Compounds
WAP	Working Age Population

WBG	World Bank Group
WHO	World Health Organisation
WMA	Water Management Area
WML	Waste Management Licence
WUL	Water Use Licence
YTD	Year to Date
ZLED	Zero Liquid Effluent Discharge

F. Definition of Key Terms

Closure	*To take out of active service permanently or dismantle partly or wholly, or permanent shutdown of a facility to the extent that it cannot be readily re-commissioned.* *(Environmental Impact Assessment Regulations [EIA] of 2014, as amended).*
Dismantling	*To take (something, such as a machine or structure) apart so that it is in separate pieces.* *(Britannica)*
Disposal	*The burial, deposit, discharge, abandoning, dumping, placing or release of any waste into, or onto, any land.* *(National Environmental Management: Waste Act [Act No. 59 of 2008] [NEM:WA]).*
End-Point / End-State	*Pre-determined criteria defining the point at which the specific task or process is to be considered completed.*
General (/ Non-Hazardous) Waste	*Waste that does not pose an immediate hazard or threat to health or to the environment, and includes:* *(a) domestic waste;* *(b) building and demolition waste;* *(c) business waste;* *(d) inert waste; or* *(e) any waste classified as non-hazardous waste in terms of the regulations made under Section 69 of NEM:WA,* *and includes non-hazardous substances, materials or objects within business, domestic, inert, building and demolition wastes as outlined in Schedule 3 of NEM:WA.* *(NEM:WA)*
Hazardous Waste	*Any waste that contains organic or inorganic elements or compounds that may, owing to the inherent physical, chemical or toxicological characteristics of that waste, have a detrimental impact on health and the environment and includes hazardous substances, materials or objects within business waste, residue deposits and residue stockpiles as outlined in Schedule 3 of NEM:WA.* *(NEM:WA)*
Pollution	*Any change in the environment caused by substances, radioactive or other waves, or noise, odours, dust or heat, emitted from any activity, including the storage or treatment of waste or substances, construction and the provision of services, whether engaged in by any person or an organ of state, where that change has an adverse effect on human health or well-being or on the composition, resilience and productivity of*

	natural or managed ecosystems, or on materials useful to people, or will have such an effect in the future. *(National Environmental Management Act [Act No. 107 of 1998] [NEMA]).*
Remediation	*The management of a contaminated site to prevent, minimise, or mitigate harm to human health or the environment.*
Resource Quality	*The quality of all the aspects of a water resource including -* *a) the quantity, pattern, timing, water level and assurance of instream flow;* *b) the water quality, including the physical, chemical and biological characteristics of the water;* *c) the character and condition of the instream and riparian habitat; and* *d) the characteristics, condition and distribution of the aquatic biota.* *(National Water Act [Act No. 36 of 1998] [NWA]).*
Riparian Habitat	*Includes the physical structure and associated vegetation of the areas associated with a watercourse which are commonly characterised by alluvial soils, and which are inundated or flooded to an extent and with a frequency sufficient to support vegetation of species with a composition and physical structure distinct from those of adjacent land areas.* *(NWA)*
Shutdown	*The act of stopping the operation or activity of a business, machine, etc., for a period of time or forever.* *(Britannica)*
Waste	*Any substance, material or object, that is unwanted, rejected, abandoned, discarded or disposed of, or that is intended or required to be discarded or disposed of, by the holder of that substance, material or object, whether or not such substance, material or object can be re-used, recycled or recovered and includes all wastes as defined in Schedule 3 of NEM:WA.* *(NEM:WA).*
Watercourse	*a) a river or spring;* *b) a natural channel in which water flows regularly or intermittently;* *c) a wetland, lake or dam into which, or from which, water flows; and* *d) any collection of water which the Minister of Water and Sanitation may, by notice in the Gazette, declare to be a watercourse, and a reference to a watercourse includes, where relevant, its bed and banks.* *(NWA)*

Chapter 1: Introduction

1 INTRODUCTION

1.1 Project Background

Eskom Holdings SOC (Ltd) (“Eskom) is a South African utility that generates, transmits and distributes electricity. Eskom supplies about 95% of the country's electricity. Eskom’s 2035 strategy encompasses the journey that Eskom intends to take in response to the changing energy environment and the impact this has towards a sustainable power utility. This strategy is necessitated by the challenges that Eskom faces as a business as well as the global and local shifts occurring in the energy sector particularly environmental and climate change challenges, difficulties in accessing financing and changes to the macro industry environment which has significantly altered the energy supply industry (ESI).

The focus of the 2035 plan is to: (i) facilitate a competitive future energy industry; (ii) modernise Eskom’s power system; and (iii) strive for net zero emissions by 2050 with an increase in sustainable jobs. This plan will prepare Eskom for competition, leverage technology and transition responsibly while maintaining grid security. This implies that a number of coal-fired power stations would need to be shut down by 2035, with a new focus of repurposing and repowering, delivering new clean generation projects, expanding the Transmission grid, and rolling out micro grid solutions.

The National Development Plan (NDP) of South Africa (SA) is a long-term development plan for the country that was published in 2012. The NDP aims to alleviate key national challenges and as the triple challenge of poverty, unemployment and social inequality by 2030, on the path towards a sustainable future. According to the NDP, to manage a just transition to a low-carbon economy, it is essential that there is policy alignment at all levels of government in relation to priorities and considerations when investing in infrastructure that has long-term consequences for the environment and national mitigation targets. As outlined in the NDP, the Just Transition refers to a transition towards a low-carbon economy and a climate resilient society in a manner that does not impede socio-economic development, is socially just, and results in an increase in sustainable jobs.

Eskom’s 2035 plan is in line with the intentions of the Just Energy Transition (JET), a long-term partnership between the governments of SA, France, Germany, the United Kingdom, and the United States of America, along with the European Union. The Partnership aims to accelerate the decarbonisation of SA's economy, with a focus on the electricity sector, to help it achieve the ambitious goals set out in its updated Nationally Determined Contribution emissions goals.

1.2 Project Rationale

In support of a decarbonised energy sector, Eskom has identified several power stations, under its management, that have reached their end-of-life stage. These stations are initially intended to go into extended cold reserve and are most likely to be fully decommissioned in the future. The **Komati Power Station (KPS)** is one of these facilities that Eskom has proposed to shut down, dismantle and repurpose as it reaches its end of life. The shutdown and dismantling of KPS will reduce Green House Gas (GHG) Emissions in the Middleburg area which is part of the Mpumalanga Highveld region that is known to suffer elevated air pollution concentrations.

The overall scope for KPS, in line with Eskom's 2035 plan and the JET partnership, entails the following:

- **Component A** – Shutdown and dismantling of KPS (the "Project") (focus of this report);
- **Component B** – Repurposing KPS by repowering the plant with solar Photovoltaic (PV), batteries and wind and adaption of innovative technical solutions to improve quality of power supply; and
- **Component C** – This component is centred around three key pillars: (a) Transition support for Komati Permanent Workers, Suppliers and Contract Workers; (b) Community Development and Economic Diversification; and (c) Stakeholder engagement.

1.3 Project Timeframes

The timeframes for key milestones for Component A are as follows:

- Appointment of Owner's Engineer (OE) – Dec 2022;
- OE compile Functional Specification and Scope of Work – July 2023;
- Procurement and Contract Award – December 2024; and
- Decommissioning – January 2025 to July 2026.

Note that the above dates are as per the programme dated August 2022, which are subject to change in the future.

1.4 Scope of Work

Nemai Consulting (Pty) Ltd ("Nemai Consulting") was appointed by Eskom to undertake an **Environmental and Social Impact Assessment (ESIA)** for Component A, which encompasses the shutdown and dismantling of the KPS as part of Eskom's decommissioning strategy. The decommissioning strategy could include complete demolition, selective dismantling and demolition or stripping parts of the plant for various reasons/uses. In addition, the decommissioning strategy will explore options for the repurposing and closure of the Ash Disposal Facility (ADF).

The ESIA for the proposed shutdown and dismantling of KPS, must satisfy the following –

- The proposed Project will be supported by funding from the World Bank Group (WBG), and therefore it is to be executed to meet all related requirements. According to the World Bank risk classification, the Project activities are considered to be of high risk and therefore requires the preparation of a full ESIA, associated management plans and framework documents aligned with the requirements set out in the World Bank Environmental and Social Framework (ESF), the WBG General Environmental, Health and Safety (EHS) Guidelines, WBG Industry specific EHS Guidelines and Good International Industry Practice (GIIP).
- SA's environmental legal requirements, including the following:
  - National Environmental Management Act (Act No. 107 of 1998) (NEMA) and the attendant Environmental Impact Assessment (EIA) Regulations of 2014, as amended; and
  - National Environmental Management: Waste Act (Act No. 59 of 2008) (NEM:WA).

In addition to the ESIA, the following plans stipulated in condition 10.3 of the KPS's existing Water Use Licence (WUL) (WUL No. 04/B11B/BCGI/1970) that was granted in terms of the National Water Act (Act No. 36 of 1998) (NWA) must be developed:

- Integrated Water and Waste Management Plan (IWWMP);
- Rehabilitation Strategy and Implementation Plan (RSIP); and
- Closure Plan.

A separate ESIA will be undertaken for the future repurposing of KPS (Component B).

Defining the Project's scope in terms of SA's Regulatory Framework

The framework legislation governing the environment in SA is NEMA. The EIA Regulations of 2014, as amended, which were gazetted under Chapter 5 of NEMA, regulate the procedure and criteria relating to the preparation, evaluation, submission, processing and consideration of, and decision on, applications for an Environmental Authorisation and Waste Management Licence, which will both be required for the Project.

According to the EIA Regulations, "**closure**" means "*to take out of active service permanently or dismantle partly or wholly, or permanent shutdown of a facility to the extent that it cannot be readily re-commissioned*". This definition has direct bearing on the scope of the Project and its linkage with the proposed repurposing of the site. The intended permanent shutdown and dismantling, as it relates to the complete removal of facilities at KPS and the rehabilitation of the affected areas, easily fall within the provisions of the above definition. However, it is interpreted that the shutting down of existing facilities to enable their subsequent repurposing, does not strictly constitute closure in terms of this definition.

The reason for drawing attention to this matter early on in this document is that the scope of the EIA and ESIA for the Project will be guided by the distinction between the activities that form part of closure versus repurposing, and the clear division of the environmental and social assessments between these components.

1.5 Purpose of the Draft ESIA Report

According to the World Bank ESF (World Bank, 2016), an ESIA is "*an instrument to identify and assess the potential environmental and social impacts of a proposed project, evaluate alternatives, and design appropriate mitigation, management, and monitoring measures*".

This **draft ESIA Report** for the Project presents a baseline of the receiving environment so that potential impacts can be identified and quantified and relevant mitigation measures, based on a hierarchy approach, are assessed at an early stage of the ESIA process. The draft ESIA is necessary to create an accurate scope for the detailed assessment.

The scope of the specialist studies and the final ESIA will be informed by the findings of the preliminary assessment.

1.6 Report Outline

As a minimum, the draft ESIA Report is aligned with the indicative outline provided in World Bank Environmental and Social Standard (ESS) 1: Assessment and Management of Environmental and Social Risks and Impacts as presented Table 1 below.

Table 1 Outline of draft ESIA Report in relation to ESS1

Chapter	Indicative outline of ESIA Report in ESS1	Corresponding Chapter in Draft ESIA Report
1	Executive Summary	
2	Legal and Institutional Framework	2
3	Project Description	3
4	Baseline Data	4
5	Environmental and Social Risks and Impacts	5
6	Mitigation Measures	
7	Analysis of Alternatives	6
8	Design Measures	*The design measures for the Project will be guided by the detailed Decommissioning Plan that is awaited from Eskom. The EHS Guidelines applicable to the Project were incorporated into Chapters 7 and 10 of this draft ESIA Report.*
9	Key Measures and Actions for the Environmental and Social Commitment Plan	*To be completed in the final ESIA*

Chapter	Indicative outline of ESIA Report in ESS1	Corresponding Chapter in Draft ESIA Report
10	Appendices	Appendices A - C

In addition, the draft ESIA Report includes the following Chapters in line with the Eskom Terms of Reference (ToR) for the study:

- Chapter 7: Stakeholder Engagement;
- Chapter 8: Plan of Study for the full ESIA; and
- Chapter 9: References.

1.7 Limitations

The draft ESIA Report is largely informed by environmental and social baseline data extracted from existing literature and studies conducted for KPS. It is assumed that the data is factual, and the studies are accepted by Eskom as accurate.

The detailed shutdown and dismantling plan, including the associated engineering designs and drawing were unavailable at the time this report was compiled. Hence, the draft ESIA Report is based on the information contained in the reports compiled by Golder Associates (2017) and VPC GmbH (2021). Nemai Consulting notes a few contradictions between the reports on the infrastructure to be dismantled. The approach taken was to align the proposed dismantling of infrastructure to the definition of closure in the EIA Regulations.

The identified impacts and high-level mitigation measures will be inconsistent if the final shutdown and dismantling plan is different to what is proposed in the reports compiled by Golder Associates (2017) and VPC GmbH (2021).

The environmental approvals required in terms of the legal framework governing the closure / decommissioning activities will only be confirmed as detailed information becomes available. Meetings with mandated and regulatory authorities in terms of the legislation that governs the Project are only scheduled to take place after the due date of the draft ESIA Report, based on the availability of these authorities.

Due to the time constraints to prepare the draft ESIA Report, only a selective number of specialists went to site to confirm the baseline. In addition, only targeted stakeholder engagement was undertaken to identify potential social concerns. Detailed stakeholder engagement and all specialist studies will be conducted during the course of the ESIA process.

Chapter 2: Legislative and Institutional Framework

2 LEGISLATIVE AND INSTITUTIONAL FRAMEWORK

2.1 Introduction

This chapter presents the Project's environmental and social governance framework. The World Bank requirements are discussed, followed by a list of SA's international agreements and obligations, and the chapter is concluded with an explanation of the national environmental regulatory framework that the Project needs to adhere to. Finally, a gap analysis between the World Bank and SA's requirements is presented.

2.2 World Bank Requirements

The ESF sets out the World Bank's commitment to sustainable development and it enables Borrowers to better manage project risks as well as improve environmental and social performance, consistent with good international practices.

The framework consists of the following:

- A Vision for Sustainable Development, which sets out the Bank's aspirations regarding environmental and social sustainability;
- The World Bank Environmental and Social Policy for Investment Project Financing, which sets out the mandatory requirements that apply to the Bank; and
- The Environmental and Social Standards (ESSs), which set out the mandatory requirements that apply to the Borrower and projects. Table 2 below presents the relevance of the WBG's ten (10) ESS to the Project.

Table 2: Relevance of WBG ESSs to the Project

WBG ESS	Relevant to Project
ESS1: Assessment and Management of Environmental and Social Risks and Impacts	**ESS1 is relevant**. The ESIA that is being undertaken for the Project will evaluate and manage the environment and social risks and impacts in a manner consistent with the ESS1.
ESS2: Labor and Working Conditions	**ESS2 is relevant**. The Project will have an impact on current employees and during the dismantling of infrastructure the Project would need to adhere to ESS2 and manage risks and impacts to labour and working conditions.
ESS3: Resource Efficiency and Pollution Prevention and Management	**ESS3 is relevant**. The Project needs to adhere to ESS3 by considering the ambient conditions and applying technically and financially feasible resource efficiency and pollution prevention measures in accordance with the mitigation hierarchy. Coal fired power stations have a legacy of surface water, groundwater and soil pollution linked to coal and ash facilities. Pollution prevention and management measures will be proportionate to the risks and impacts associated with the Project and aligned to the EHS Guidelines.
ESS4: Community Health and Safety	**ESS4 is relevant**. The Project needs to adhere to ESS4 and address potential risks and impacts to communities that may

WBG ESS	Relevant to Project
	be affected by Project. This includes the residents of the Komati Village located adjacent to the KPS, informal settlements in the vicinity of the power station as well as neighbouring mines and agricultural enterprises.
ESS5: Land Acquisition, Restrictions on Land Use and Involuntary Resettlement	**ESS5 is possibly relevant.** Gelukplaas 1 is a small settlement located to the south of the power station, immediately south-east of the ash dams. According to the cadastral boundaries, this area does not form part of KPS. Regardless, there may be a need for relocating these people (e.g., to provide a suitable buffer from the ADF). If so, then the Project will need to adhere to ESS5, and a Resettlement Action Plan (RAP) will need to be developed for the Project. The need for relocation will be informed by the risks identified as part of the technical studies for the Project.
ESS6: Biodiversity Conservation and Sustainable Management of Living Natural Resources	**ESS6 is relevant**. Wetlands and areas of biodiversity importance surround the KPS and may be affected either positively or negatively by the Project. Certain areas to be decommissioned may be rehabilitated to natural areas, depending on the desired end-state. There is also a requirement to manage invasive alien plants at KPS. The Project thus needs to adhere to ESS6.
ESS7: Indigenous Peoples/Sub-Saharan African Historically Underserved Traditional Local Communities	**ESS7 is not deemed to be relevant**. The Project will not impact distinct social and cultural group possessing the characteristics listed in the ESF.
ESS8: Cultural Heritage	**ESS8 is relevant**. In terms of SA's National Heritage Resources Act (Act No. 25 of 1999), heritage resources include *inter alia* structures older than 60 years are protected. The KPS was already built in the 1960's. Given the transformed nature of the study area, it is unlikely that other heritage and cultural resources will be impacted by the project.
ESS9: Financial Intermediaries	**It is unlikely that ESS9 is relevant**. It depends on the future funding of the Project.
ESS10: Stakeholder Engagement and Information Disclosure	**ESS10 is relevant**. Stakeholder engagement represents an integral part of the Project's ESIA. The process of stakeholder engagement will be consistent with ESS10.

Borrowers and projects are also required to apply the relevant requirements of the WBG EHS Guidelines. These are technical reference documents, with general and industry specific examples of GIIP. The General EHS Guidelines are designed to be used together with the relevant Industry Sector EHS Guidelines which provide guidance to users on EHS issues in specific industry sectors.

The General EHS Guidelines consists of the following primary sections:

- Environmental;
- Occupational Health and Safety;
- Community Health and Safety; and
- Construction and Decommissioning.

The Industry Sector Guidelines for thermal power plants are particularly relevant to the Project. Even though these guidelines contain the performance levels and measures that are generally considered to be achievable in new facilities, they nonetheless also provide guidance on aspects to be considered in the decommissioning of an operational power station such as KPS. The Industry Sector Guideline for Waste Management Facilities are also important to the Project, depending on the option(s) to be pursued for managing non-hazardous and hazardous waste.

2.3 International Agreements and Obligations

SA is a signatory to several conventions on sustainable development and is a member of various bilateral and multilateral organisations.

Some of the key conventions and protocols that are relevant to SA include, but are not limited to, the following:

- African Convention on Nature and Natural Resources, 1968;
- Man and Biosphere Programme, 1971;
- Convention on Wetlands of International Importance especially as Waterfowl Habitat (Ramsar Convention), 1971;
- Convention Concerning the Protection of the World Cultural and Natural Heritage, 1972;
- Convention on the Illegal Trade in Endangered Species (CITES), 1973;
- Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention), 1979;
- Montreal Protocol, 1987;
- Basel Convention, 1989;
- Convention on Biological Diversity, 1992;
- United Nations Framework Convention on Climate Change, 1992;
- Convention to Combat Desertification, 1995;
- Southern African Development Community (SADC) Protocol on Wildlife and Law Enforcement, 1999;
- Protocol on Shared Water Courses, 2002;
- United Nations Framework Convention on Climate Change, 2002;
- Stockholm Convention, 2004;
- SADC Regional Biodiversity Strategy, 2006;
- Paris agreement on Climate Change, 2015; and
- International Labour Organization (ILO) Conventions (including 9 Fundamental Conventions, 2 Governance Conventions, and 17 Technical Conventions).

SA's legislative framework often takes cognisance of these conventions and protocols through discussion papers, white papers, legislation, regulations and by-laws.

2.4 SA's Environmental Regulatory Framework

2.4.1 Introduction

SA has a strong and diverse environmental governance framework with mandated authorities within the various spheres of government regulating impacting activities and elements of the environment.

According to Strydom and King (2009), SA has three legislative mechanisms that exist at a national level to afford protection to the environment. The first mechanism is the constitutional entrenchment of environmental protection through either a rights-based or regulatory approach. The second is environmental protection through framework legislation, namely NEMA. Lastly, the third mechanism is to adopt specific environmental legislation that covers a range of environmental topics and media such as waste, biodiversity, air quality, water resources, heritage resources, protected areas, oceans and coasts, and hazardous substances.

2.4.2 Environmental Legislation

Key environmental legislation in SA and their possible relevance to the Project is shown in Table 3 below. Note that this list does not attempt to provide an exhaustive explanation, but rather represents an identification of some of the most appropriate sections from pertinent pieces of legislation.

Table 3: SA's Environmental Regulatory Framework

Legislation	Description and Relevance
The Constitution of the Republic of South Africa (Act 108 of 1996)	▪ Chapter 2 – Bill of Rights. ▪ Section 24 – Environmental Rights.
National Environmental Management Act (Act No. 107 of 1998)	▪ Key sections (amongst others): ○ Section 24 – Environmental Authorisation (control of activities which may have a detrimental effect on the environment). ○ Section 28 – Duty of care and remediation of environmental damage. ▪ Environmental management principles. ▪ Authorisation type – Environmental Authorisation. The Project will require an EA for the listed activities triggered. ▪ Authorities – Department of Forestry, Fisheries and the Environment (DFFE) (national) (competent authority for the Project) and the Mpumalanga Department of Agriculture, Rural Development, Land and Environmental Affairs (DARDLEA) (provincial).
EIA Regulations of 2014 (as amended)	▪ Purpose – regulate the procedure and criteria as contemplated in Chapter 5 of NEMA relating to the preparation, evaluation, submission, processing and consideration of, and decision on, applications for environmental authorisations for the commencement of activities, subjected to EIA, in order to avoid or mitigate detrimental impacts on the environment, and to optimise positive environmental impacts, and for matters pertaining thereto.
National Water Act (Act No. 36 of 1998)	▪ Sustainable and equitable management of water resources. ▪ Key sections (amongst others): ○ Chapter 3 – Protection of water resources. ○ Section 19 – Prevention and remedying effects of pollution.

Legislation	Description and Relevance
	○ Section 20 – Control of emergency incidents. ○ Chapter 4 – Water use. ▪ Authorisation type – General Authorisation or WUL. The conditions of the existing WUL for KPS related to closure need to be satisfied. ▪ Authority – Department of Water and Sanitation (DWS).
National Environmental Management: Waste Act (Act No. 59 of 2008)	▪ Management of waste. ▪ Key sections (amongst others): ○ Section 16 – General duty in respect of waste management. ○ Chapter 5 – licensing of waste management activities listed in Government Notice (GN) No. R. 921 of 29 November 2013 (as amended). ▪ Authorisation type – Waste Management Licence (WML). A WML will be required for the Project. ▪ Authority – DFFE (national) and DARDLEA (provincial).
National Environmental Management Air Quality Act (Act No. 39 of 2004)	▪ Air quality management. ▪ Key sections (amongst others): ○ Section 32 – Dust control. ○ Section 34 – Noise control. ▪ Authorisation type – Atmospheric Emission License (AEL). An AEL is not required for the Project. Any conditions related to closure in the AEL need to be adhered to. ▪ Authority – DFFE (national), DARDLEA (provincial) and Nkangala District Municipality (NDM).
National Environmental Management: Biodiversity Act (Act No. 10 of 2004)	▪ Management and conservation of the country's biodiversity. ▪ Protection of species and ecosystems. ▪ Authorisation type – Permit. It is not anticipated that protected fauna and flora species will be affected at KPS, due to the transformed nature of the environment at the facility. It is thus not anticipated that a permit under this Act will be required. ▪ Authority – DFFE (national) and Mpumalanga Tourism and Parks Agency (MTPA) (provincial).
National Forests Act (Act No. 84 of 1998)	▪ Supports sustainable forest management and the restructuring of the forestry sector, as well as protection of indigenous trees in general. ▪ Section 15 – Authorisation required for impacts to protected trees. ▪ Authorisation type – Licence. It is not anticipated that a licence under this Act will be required due to the transformed nature of the environment at KPS. ▪ Authority – DFFE.
National Environmental Management: Protected Areas Act (Act No. 57 of 2003)	▪ Protection and conservation of ecologically viable areas representative of SA's biological diversity and natural landscapes. ▪ There are no formally protected areas in proximity to KPS.
Minerals and Petroleum Resources Development Act (Act No. 28 of 2002)	▪ Equitable access to and sustainable development of the nation's mineral and petroleum resources and to provide for matters related thereto. ▪ Key sections (amongst others): ○ Section 22 – Application for mining right. ○ Section 27 – Application for, issuing and duration of mining permit. ○ Section 53 – Use of land surface rights contrary to objects of Act. ▪ Authorisation type – Mining Permit / Mining Right. Approval may be required if a Borrow Pit is required for the Project to provide soil needed to fill, level and re-vegetate areas where infrastructure had been removed. ▪ Authority – Department of Mineral Resources and Energy (DMRE).
National Heritage Resources Act (Act No. 25 of 1999)	▪ Key sections: ○ Section 34 – protection of structure older than 60 years. ○ Section 35 – protection of heritage resources. ○ Section 36 – protection of graves and burial grounds. ○ Section 38 – Heritage Impact Assessment for linear development exceeding 300m in length; development exceeding 5 000m^2 in extent, etc. ▪ Authorisation type – Permit. Due to the age of the structures at KPS, a permit under this Act will be required.

Legislation	Description and Relevance
	▪ Authority – South African Heritage Resources Agency (SAHRA) (national) and Mpumalanga Provincial Heritage Resource Authority (MPHRA) (provincial).
Conservation of Agricultural Resources Act (Act No. 43 of 1983)	▪ Control measures for erosion. ▪ Control measures for alien and invasive plant species. ▪ Authority – DARDLEA.
Mpumalanga Nature Conservation Act (Act No. 10 of 1998)	▪ Deals with matters related to nature conservation in Mpumalanga. ▪ Authority – MTPA.
Occupational Health & Safety Act (Act No. 85 of 1993)	▪ Provisions for Occupational Health & Safety (OHS). ▪ Authority – Department of Employment and Labour (DEL). ▪ Relevant regulations, such as Construction Regulations, etc.
Asbestos Abatement Regulations (GN No. R.11196 of 10 November 2020)	▪ Requirements for occupational use and exposure to asbestos.
Explosives Regulations (GN No. 109 of 17 January 2003)	▪ Applies to any employer, self-employed person or user who operates an explosives workplace for the purpose of manufacturing, testing, storing or using explosives. ▪ Provides for safety distances, safe handling of explosives, emergencies, incidents, etc.
Explosives Act (Act No. 15 of 2003)	▪ Provides for the control of explosives. ▪ Key sections (amongst others): o Chapter 5 - Endangering life or property.
Hazardous Substances Act (No 15 of 1973) and Regulations	▪ Provides for the control of substances which may cause injury or ill-health to or death of human beings by reason of their toxic, corrosive, irritant, strongly sensitising or flammable nature or the generation of pressure thereby in certain circumstances, and for the control of certain electronic products ▪ Provides for the division of such substances or products into groups in relation to the degree of danger. ▪ Provides for the prohibition and control of the importation, manufacture, sale, use, operation, application, modification, disposal or dumping of such substances and products.
Regulations for Hazardous Chemical Agents (GN No. R.280 of 29 March 2021)	▪ Requirements for protecting employees who work with hazardous chemical substances in the workplace.

2.4.3 Social Legislation

Key pieces of social-related legislation in SA that the Project will need to adhere to include the following (amongst others):

- The Constitution of the Republic of South Africa (Act 108 of 1996);
- Basic Conditions of Employment Act (Act No. 75 of 1997) (BCEA);
- Employment Equity Act (Act No. 55 of 1998);
- Labour Relations Act (Act No.66 of 1995) (LRA);
- Occupational Health and Safety Act (Act No. 85 of 1993) (OHSA);
- Compensation for Occupational Injuries and Diseases Act (Act No. 130 of 1993) (COIDA);
- Extension of Security of Tenure Act (Act No. 62 of 1997) (ESTA);
- Labour Tenants (Land Reform) Act (Act No. 3 of 1996);
- Land Administration Act (Act No. 2 of 1995);

- Land Affairs Act (Act No. 101 of 1987);
- Land Titles Adjustment Act (Act No. 111 of 1993);
- Skills Development Act (Act No. 37 of 2008);
- Development Facilitation Act (Act No. 67 of 1995);
- Traditional Leadership and Governance Framework Amendment Act (Act No. 23 of 2009); and
- Unemployment Insurance Fund Act (Act No. 63 of 1993).

2.4.4 Existing Environmental Approvals for KPS

Table 4 below includes a list of the environmental approvals issued to KPS, as well as the specific conditions that relate to closure and decommissioning.

As a way forward, the following mandated authorities will be engaged to confirm their requirements in terms of the existing and additional environmental approvals that will be required:

- DFFE – Environmental Authorisations and WML's (existing and new authorisations and licences);
- DWS – WUL's (existing and new licences); and
- NDM – AEL (existing licence).

While Eskom is responsible for complying with the existing WUL's (27/2/1/C211/1/1 and 04/B11B/BCGI/1970), Nemai Consulting will assist with meeting condition 10.3 of the last-mentioned WUL.

Table 4: Existing Environmental Approvals for KPS (adapted from VPC GmbH, 2021)

No	Validity Period	Type & Ref. No.	Activities Authorised	Approved Plans / Programs	Closure / Decommissioning Requirements
1	12.01.1996 – (no expiry date)	Section 20 waste permit (**B33/2/210/39/P211**)	Close and rehabilitation of G:C:B class waste disposal site	Komati Site Solid Waste Disposal Site Rehabilitation Programme, 26 July 1994 (Eskom unable to locate a copy of this Programme)	Unknown - these requirements are contained within the Programme which cannot be located. Eskom has also been unable to confirm the location of this site and its connection to KPS. Due to the date issued and type of landfill authorised, it is likely that this site was associated with the residential settlement adjacent to KPS, which received domestic waste rather than waste generated by the plant.
2	13.12.2005 – (no expiry date)	Environmental Authorisation (exemption) (**17/2/1 NK 40**)	Return to service of KPS for generation of electricity	Environmental Management Programme (EMPr), 2010 (operational phase)	Section 3.1.3 of approved EMPr: **Rehabilitation and Closure of Ash Dam Extension 3** *Closure of the ash dam will require the long term maintenance of the dam structure and the vegetation cover. A specific closure plan has not yet been developed for the ash dams at Komati Power Station. Final closure of all the ash dams will be managed in accordance with a closure plan to be developed by Eskom in accordance with the relevant authorities. Eskom will embark on the development of a plan for closure at least two years prior to the planned closure of the site.* (See row 5 of this table – new WML required for decommissioning of ash dam and closure plan will be prepared as part of the application). Section 3.2.3 of approved EMPr: **Rehabilitation and Closure of Power-line deviation** *A specific closure plan has not yet been developed for the powerline deviation at KPS. Final closure of servitude will be managed in accordance with a closure*

No	Validity Period	Type & Ref. No.	Activities Authorised	Approved Plans / Programs	Closure / Decommissioning Requirements
					plan to be developed by Eskom in accordance with the relevant authorities. Eskom will embark on the development of a plan for closure at least two years prior to the planned closure of the servitude. Rehabilitation should be undertaken along the following principles: • Remove all infrastructure not required for future operations. • Recycle all components with remaining life. • Dispose of remaining components at an appropriate landfill site. • Rip surfaces of roads not required by landowner. • Backfill or remediate any areas where soil cover has been lost. • Vegetate either by (a) seeding with appropriate seed mix; or (b) planting grass sods. • Monitor and maintain rehabilitated areas until vegetation is self-sustaining. (See row 5 of Table – should this section or any section of powerline need to be decommissioned, it should be done as part of the application for environmental authorisation for closure activities pertaining to the whole site).
3	18.08.2008 – (no expiry date)	Environmental Authorisation (**12/12/20/1007**)	Construction of Ash Dam [Extension] 3 and deviation of existing power lines at KPS	• Revised EMP (2 October 2008) • Groundwater monitoring programme	**Site closure and decommissioning** Condition 1.17: *Should the activity ever cease or become redundant, the applicant shall undertake the required actions as prescribed by legislation at the time and comply with all relevant legal requirements administered by any relevant and competent authority at that time.*

No	Validity Period	Type & Ref. No.	Activities Authorised	Approved Plans / Programs	Closure / Decommissioning Requirements
4	17.07.2009 – 31.10.2025 (Reviewed every 5 years)	WUL (**27/2/1/C211/1/1**)	S21(a) - taking of water from a water resource for power generation purposes • Maximum of 360 300 000 m^3/a from the Vaal River Eastern Sub-system for 12 Eskom Power Stations, including a maximum of 19.86 million m^3/a at the KPS from the Komati GWS, Komati River	Formal Information Management System	The water consumption needs for decommissioning are unknown at this stage. There are no specific conditions in the WUL that pertain to closure and de-commissioning. Condition 5.10: *the water use may only be utilised on the properties mentioned in paragraph 3(a)* [of the WUL]. Condition 5.31: *No water may be pumped, stored, diverted or alienated for purposes other than intended in this licence, without written approval by the minister or his/her delegated nominee.*
5	07.08.2013 – 07.08.2023 (reviewed every 5 years)	WML (**12/9/11/L1010/6**)	Class H:H (Waste Disposal Facility) - disposal of ash at the ash disposal facility (Ash Dam Extension 3)	• Environmental Management Plan (EMP) • Minimum Requirements for Handling, Classification and Disposal of Hazardous Waste, Waste Management Series, Department of Water Affairs and Forestry (DWAF)	There are no specific conditions that pertain to decommissioning of the facility. An application for surrender of the WML for the disposal of ash into Ash Dam Extension 3 may be applied for in terms of Section 57 of NEM:WA. A new WML will be required for the decommissioning of this facility.
6	26.03.2014 – (no expiry date)	Environmental Authorisation (**14/12/16/3/2/40**) (Amended 01.09.2014)	Construction and operation of infrastructure and facilities for return to service of KPS, including - • Upgrade and extension of haul road for coal trucks • Upgrade of stockpile yard and upgrading and extension of haul road • 3rd recovery dam (to retain run-off volume captured by Lake Stoffel)	EMPr, 2010 (refurbishment and operational phase)	**Site Closure and decommissioning** Condition 16: *Should the activity ever cease or become redundant, the applicant shall undertake the required actions as prescribed by legislation at the time and comply with all relevant legal requirements administered by any relevant and competent authority at that time.*

No	Validity Period	Type & Ref. No.	Activities Authorised	Approved Plans / Programs	Closure / Decommissioning Requirements
			• Construction an extension of haul road and access road onto stockpile • Construction of desalination plant		
7	02.02.2014 – 02.02.2034 (Reviewed every 5 years)	WUL (**04/B11B/BCGI/1970**) (Amended: 07.08.2017 & 22.02.2021)	**Appendix I:** general conditions for the licence	**Appendix I:** None.	**Appendix I:** Condition 3: *The Licensee must immediately inform the Regional Head of any change of name, address, premises and/or legal status.*
			Appendix II: S21(b) – storing of raw water in four reservoirs each with a dam capacity of 50 000m^3	**Appendix II:** • Dam safety requirements	**Appendix II:** It is envisaged that the reservoirs will be retained as Eskom provides water to the surrounding mines and communities. • If the reservoirs are retained, the WUL will need to be retained and amended as necessary and continued compliance with the Dam Safety Regulations will be required. • If at any stage, all or some of the reservoirs are to be decommissioned, a licence will be required in terms of the Dam Safety Regulations, 2021.
			Appendix III: S21(c) & (i) – impeding or diverting the flow of water in a watercourse and altering the bed, banks, course or characteristics of a watercourse - earth berm of pollution control dam - Koornspruit	**Appendix III:** • Storm water management plan • EMP and rehabilitation plan for decommissioning • Financial provision for post-closure water treatment and water supply	**Appendix III:** If any of the water use activities authorised under Appendix III are to be retained, it will be necessary to retain the corresponding sections of the WUL. Alternatively, in terms of Condition 2.2: *An EMP and rehabilitation plan for the decommissioning of any of the water use activities listed in table 2 must be submitted five (5) years before commencing with closure to the regional head for a written approval.*

No	Validity Period	Type & Ref. No.	Activities Authorised	Approved Plans / Programs	Closure / Decommissioning Requirements
			Appendix IV: S21(g) – disposing of waste in a manner which may detrimentally impact on a water resource - • Coal Stockpile Yard • Lake Finn • New ash dam/dump • Old ash dam (EXT 1 & 2) • New ash dump (Extension 3 of the ash dam/dump) • Ash returns water dam (collected from ash dam) • 3rd new pollution control dam – handle station drains runoff • Lake Stoffel • Dust Suppression	**Appendix IV:** • IWWMP and updated RSIP • Plans submitted with IWWMP • Annual water balance • Financial provision • Final Closure Plan	**Appendix IV:** If any of the waste / water containing waste disposal facilities authorised under Appendix IV (which include the ash dams and the pollution control dams) are to be retained, it will be necessary to retain the corresponding sections of the WUL. Alternatively, in terms of Condition 10.3: *The Licensee must, at least 180 days prior to the intended closure of any facility, or any portion thereof, notify the Regional Head of such intention and submit any final amendments to the IWWMP and RSIP as well as final Closure Plan, for approval.* Condition 10.4: *The Licensee shall make full financial provision for all investigations designs, construction, operation and maintenance for a water treatment plant should it become a requirement as a long-term water management strategy*. If any of the monitoring points (bore-holes) need to be changed in response to decommissioning requirements, written approval is required from the Regional Head in terms of Condition 3.7.
8	01.01.2018 – (no expiry date)	WML (**12/9/11/L73467/6**)	Decommissioning of asbestos disposal site within boundaries of Ash Dam 1. It is noted that a waste permit was issued in 2005 (16/2/7/B100/B39/Y1/P503) for the disposal of asbestos at Ash Dam 1. The permit was granted for a once off disposal activity and was	• EMPr • Emergency Preparedness Plan • Komati Power Station Asbestos Disposal Site Closure Report JW244/13/E082 - Rev dated July 2014, Jones & Wagener Consulting Engineers • Groundwater quantity and quality monitoring programme (groundwater	This WML and its requirements will persist during the decommissioning of the plant unless replaced by a new WML sought for a different waste management solution or more integrated approach to the decommissioning of the larger site.

No	Validity Period	Type & Ref. No.	Activities Authorised	Approved Plans / Programs	Closure / Decommissioning Requirements
			valid for a five-year period. It has thus expired.	monitoring to continue for a period of 30 years after closure of the "Site" i.e. the asbestos disposal site)	
9	30.04.2019 – 30.06.2024	AEL (**NDM/AEL/MP313/12/12**)	• Listed activity 1.1: Solid fuels combustion installations used primarily for steam raising or electricity generation • Listed activity 2.4: Storage and Handling of Petroleum Products • Listed activity 5.1: Storage and Handling of Ore and Coal	None.	**General condition 4.1:** *The licence holder must immediately on cessation or decommissioning of the listed activity inform, in writing, the licensing authority* (i.e., NDM).

2.4.5 Environmental Approvals Required for the Project

DFFE will be consulted prior to lodging an application (either separate applications under NEMA and NEM:WA or an integrated application) to present the triggers for an Environmental Authorisation and the WML.

2.4.5.1 National Environmental Management Act

NEMA is the framework legislation regulating the environment in SA and it provides for cooperative governance and establishes principles for decision-making on matters affecting the environment, such as:

- People and their needs must be placed at the forefront of environment management;
- Development must be sustainable and therefore requires avoidances of pollution and degradation of the environment, disturbances of landscapes and sites of cultural heritage;
- The integrated nature of the environment and that responsibility for environmental management exists throughout the life cycle of an activity (from cradle to grave);
- Public Participation;
- Transparent decision making; and
- Intergovernmental co-ordination and harmonization of policies, legislation and actions.

Section 2(4)(p) of NEMA requires that costs of remedying pollution, environmental degradation and consequent adverse health effects and of preventing, controlling or minimising further pollution, environmental damage or adverse health effects are paid for by those responsible for harming the environment.

Section 28(1) of NEMA imposes a duty of care and remediation for environmental damage and requires that “every person who causes, has caused or may cause significant pollution or degradation of the environment must take reasonable measures to prevent such pollution or degradation from occurring, continuing or recurring, or, in so far as such harm to the environment is authorised by law or cannot reasonably be avoided or stopped, to minimise and rectify such pollution or degradation of the environment”.

Section 24 of NEMA provides for the consideration, investigation, assessment and reporting of the potential consequences for, or impacts on, the environment of listed activities (or specified activities) to the competent authority. The Environmental Impact Assessment (EIA) Regulations were promulgated to regulate the procedure and criteria as contemplated in Section 24 of NEMA relating to the preparation, evaluation, submission, processing and consideration of, and decision on, applications for environmental authorisations for the commencement of activities, subjected to an EIA, in order to mitigate detrimental impacts on the environment, and to optimise positive environmental impacts. The EIA Regulations were published under GN No. 982 in Gazette No. 38282 of 4 December 2014 and amended by GN 326 of 7 April 2017 published in Gazette No. 40772 (the “EIA Regulations”).

The EIA Regulations consist of the following:

- GN No. 326 of 7 April 2017 – EIA procedure;
- GN No. 327 of 7 April 2017 (Listing Notice 1) – activities that need to be subjected to a Basic Assessment process, as prescribed in Regulations 19 and 20 of the EIA Regulations;
- GN No. 325 of 7 April 2017 (Listing Notice 2) – activities that need to be subjected to a Scoping and Environmental Impact Reporting (S&EIR) Process, as prescribed in Regulations 21 - 24 of the EIA Regulations; and
- GN No. 324 of 7 April 2017 (Listing Notice 3) – activities in specific identified geographical areas that need to be subjected to a Basic Assessment process, as prescribed in Regulations 19 and 20 of the EIA Regulations.

According to the EIA Regulations, "closure" means "to take out of active service permanently or dismantle partly or wholly, or permanent shutdown of a facility to the extent that it cannot be readily re-commissioned". All infrastructure that can be re-commissioned or re-used in the future is omitted from the definition and therefore falls outside of this application.

Table 5 below lists the activities from the EIA Listing Notices that may possibly be triggered by the Project. The potential listed activities will be confirmed after the specialist studies are completed and the full scope of the Project has been confirmed, including the desired end-state.

Even though the Project only triggers activities under Listing Notice 1, it will be subjected to a full S&EIR process to ensure alignment with the requirements of the WBG ESF. The alignment between NEMA and the WB ESF will be discussed with DFFE during the pending pre-application meeting as DFFE can only authorise activities identified in the listing notices.

Table 5: Listed Activities possibly triggered by the Project in terms of the EIA Listing Notices

Activity	Wording of Listed Activity	Possible Relevance to Project
	Listing Notice 1	
19	The infilling or depositing of any material of more than 10 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 10 cubic metres from a watercourse; but excluding where such infilling, depositing, dredging, excavation, removal or moving - (a) will occur behind a development setback; (b) is for maintenance purposes undertaken in accordance with a maintenance management plan; (c) falls within the ambit of activity 21 in this Notice, in which case that activity applies; (d) occurs within existing ports or harbours that will not increase the development footprint of the port or harbour; or (e) where such development is related to the development of a port or harbour, in which case activity 26 in Listing Notice 2 of 2014 applies.	*Possible activities associated with closure that occur within watercourses.*

Activity	Wording of Listed Activity	Possible Relevance to Project
21	Any activity including the operation of that activity which requires a mining permit in terms of section 27 of the Mineral and Petroleum Resources Development Act, 2002 (Act No 28 of 2002), as well as any other applicable activity as contained in this Listing Notice or in Listing Notice 3 of 2014, required to exercise the mining permit.	*This activity may be triggered if a borrow pit is required as part of the closure (e.g., sourcing of fill material).*
24	The development of a road - (i) for which an environmental authorisation was obtained for the route determination in terms of activity 5 in Government Notice 387 of 2006 or activity 18 in Government Notice 545 of 2010; or (ii) with a reserve wider than 13,5 meters, or where no reserve exists where the road is wider than 8 metres; but excluding a road— (a) which is identified and included in activity 27 in Listing Notice 2 of 2014; (b) where the entire road falls within an urban area; or (c) which is 1 kilometre or shorter.	*Possibly related to new roads to be created to enable closure activities to take place.*
27	The clearance of an area of 1 hectares or more, but less than 20 hectares of indigenous vegetation, except where such clearance of indigenous vegetation is required for - (i) the undertaking of a linear activity; or (ii) maintenance purposes undertaken in accordance with a maintenance management plan.	*Possible clearance of indigenous vegetation on KPS land to enable closure.*
31	The closure of existing facilities, structures or infrastructure for - (i) any development and related operation activity or activities listed in this Notice, Listing Notice 2 of 2014 or Listing Notice 3 of 2014; (ii) any expansion and related operation activity or activities listed in this Notice, Listing Notice 2 of 2014 or Listing Notice 3 of 2014; (iii) ……. (iv) any phased activity or activities for development and related operation activity or expansion or related operation activities listed in this Notice or Listing Notice 3 of 2014; or (v) any activity regardless the time the activity was commenced with, where such activity: (a) is similarly listed to an activity in (i) or (ii) above; and (b) is still in operation or development is in progress; excluding where - (aa) … (bb) the closure is covered by part 8 of the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008) as decommissioning, in which case the National Environmental Management: Waste Act, 2008 applies; or (cc) such closure forms part of a mining application, in which case the requirements of the Financial Provisioning Regulations apply.	*The Project proposes the closure of various activities listed in the EIA Listing Notices.* *Exclusion (bb) excludes the closure of existing facilities, structures or infrastructure for activities where the land has been contaminated and such is covered by Part 8 of NEM:WA. Clarity in this regard will be sought from DFFE.*
56	The widening of a road by more than 6 metres, or the lengthening of a road by more than 1 kilometre - (i) where the existing reserve is wider than 13,5 meters; or (ii) where no reserve exists, where the existing road is wider than 8 metres; excluding where widening or lengthening occur inside urban areas.	*Possible widening or lengthening of existing roads to enable closure activities to take place.*
67	Phased activities for all activities - (i) listed in this Notice, which commenced on or after the effective date of this Notice or similarly listed in any of the previous NEMA notices, which commenced on or after the effective date of such previous NEMA Notices. Certain exclusions apply.	*Possible phasing of the closure activities.*
	Listing Notice 2	
6	The development of facilities or infrastructure for any process or activity which requires a permit or licence or an amended permit or	*The relevance of this activity will need to be confirmed, based on*

Activity	Wording of Listed Activity	Possible Relevance to Project
	licence in terms of national or provincial legislation governing the generation or release of emissions, pollution or effluent, excluding - (i) activities which are identified and included in Listing Notice 1 of 2014; (ii) activities which are included in the list of waste management activities published in terms of section 19 of the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008) in which case the National Environmental Management: Waste Act, 2008 applies; (iii) the development of facilities or infrastructure for the treatment of effluent, polluted water, wastewater or sewage where such facilities have a daily throughput capacity of 2 000 cubic metres or less; or (iv) where the development is directly related to aquaculture facilities or infrastructure where the wastewater discharge capacity will not exceed 50 cubic metres per day.	*the need for new licences or amendment of existing licences related to the release of emissions, pollution or effluent. The detailed designs and activities associated with the closure of KPS will provide guidance on whether this activity is triggered.*
	Listing Notice 3	
4	The development of a road wider than 4 metres with a reserve less than 13,5 metres.	*Possibly related to new roads to be created in sensitive geographical areas (e.g., CBAs) to enable closure activities to take place.*
12	The clearance of an area of 300 square metres or more of indigenous vegetation except where such clearance of indigenous vegetation is required for maintenance purposes undertaken in accordance with a maintenance management plan.	*Possible clearance of indigenous vegetation in sensitive geographical areas (e.g., endangered ecosystem - Eastern Highveld Grassland) as part of closure activities.*
14	The development of - (i) dams or weirs, where the dam or weir, including infrastructure and water surface area exceeds 10 square metres; or (ii) <u>infrastructure or structures with a physical footprint of 10 square metres or more</u>; where such development occurs - (a) within a watercourse; (b) in front of a development setback; or (c) if no development setback has been adopted, within 32 metres of a watercourse, measured from the edge of a watercourse; excluding the development of infrastructure or structures within existing ports or harbours that will not increase the development footprint of the port or harbour.	*Possible activities associated with closure that occur within 32m of watercourses (including wetlands), within sensitive geographical areas (e.g., CBAs).*
18	The widening of a road by more than 4 metres, or the lengthening of a road by more than 1 kilometre.	*Possible widening or lengthening of existing roads within sensitive geographical areas (e.g., CBAs) to enable closure activities to take place.*
23	The expansion of - (i) dams or weirs where the dam or weir is expanded by 10 square metres or more; or (ii) <u>infrastructure or structures where the physical footprint is expanded by 10 square metres or more</u>; where such expansion occurs - (a) within a watercourse; (b) in front of a development setback adopted in the prescribed manner; or (c) if no development setback has been adopted, within 32 metres of a watercourse, measured from the edge of a watercourse;	*Possible activities associated with closure that occur within 32m of watercourses (including wetlands), within sensitive geographical areas (e.g., CBAs).*

Activity	Wording of Listed Activity	Possible Relevance to Project
	excluding the expansion of infrastructure or structures within existing ports or harbours that will not increase the development footprint of the port or harbour.	

2.4.5.2 National Environmental Management: Waste Act

Amongst others, the purpose of NEM:WA includes the following:

1. To reform the law regulating waste management in the country by providing reasonable measures for the prevention of pollution and ecological degradation and for securing ecologically sustainable development;
2. To provide for institutional arrangements and planning matters;
3. To provide for specific waste management measures;
4. To provide for the licensing and control of waste management activities;
5. To provide for the remediation of contaminated land; and
6. To provide for compliance and enforcement.

“Waste” is defined in NEM:WA as “any substance, material or object, that is unwanted, rejected, abandoned, discarded or disposed of, or that is intended or required to be discarded or disposed of, by the holder of that substance, material or object, whether or not such substance, material or object can be re-used, recycled or recovered and includes all wastes as defined in Schedule 3 to this Act”.

Schedule 3 of the NEM:WA groups waste into two categories, namely hazardous waste and general waste. The classification of waste determines the associated management and licencing requirements. ‘‘Hazardous waste’’ is defined as “any waste that contains organic or inorganic elements or compounds that may, owing to the inherent physical, chemical or toxicological characteristics of that waste, have a detrimental impact on health and the environment and includes hazardous substances, materials or objects within business waste, residue deposits and residue stockpiles”.

GN No. R. 921 of 29 November 2013 (as amended) contains a list of waste management activities that have, or are likely to have, a detrimental impact on the environment. If any of the waste management activities are triggered in Category A and Category B, a WML is required.

Table 6 below lists the waste management activities triggered by the Project in terms of GN No. R. 921 of 29 November 2013 (as amended). These activities will need to be confirmed once the end use of the ADF is confirmed. It will also be confirmed with DFFE whether an integrated application under NEMA and NEM:WA will be pursued. As with the EIA Listing Notices, a full S&EIR process will be undertaken regardless of the waste management activities triggered to ensure alignment with the requirements of the WBG for a full ESIA.

Table 6: Waste management activities possibly triggered by the Project in terms of GN No. R. 921 of 29 November 2013 (as amended)

Category	Activity No.	Activity Wording	Relevance to Project
A	6	The treatment of general waste using any form of treatment at a facility that has the capacity to process in excess of 10 tons but less than 100 tons.	*The method of treating general waste generated as part of the closure activities, as well as the volumes involved, need to be confirmed.*
	7	The treatment of hazardous waste using any form of treatment at a facility that has the capacity to process in excess of 500kg but less than 1 ton per day excluding the treatment of effluent, wastewater or sewage.	*The method of treating hazardous waste generated as part of the closure activities, as well as the volumes involved, need to be confirmed.*
	9	The disposal of inert waste to land in excess of 25 tons but not exceeding 25 000 tons, excluding the disposal of such waste for the purposes of levelling and building which has been authorised by or under other legislation.	*The Project needs to determine the feasibility of establishing an on-site general waste disposal facility for the disposal of the inert and non-hazardous demolition waste generated by closure activities.*
	10	The disposal of general waste to land covering an area of more than 50m^2 but less than 200m^2 and with a total capacity not exceeding 25 000 tons.	
	12	The construction of a facility for a waste management activity listed in Category A of this Schedule (not in isolation to associated waste management activity).	
	14	The decommissioning of a facility for a waste management activity listed in Category A or B of this Schedule.	*The proposed decommissioning of the ADF at KPS, as well as listed waste management facilities created for decommissioning purposes.*
B	4	The treatment of hazardous waste in excess of 1 ton per day calculated as a monthly average; using any form of treatment excluding the treatment of effluent, wastewater or sewage.	*The method of treating hazardous waste generated as part of the closure activities, as well as the volumes involved, need to be confirmed.*
	6	The treatment of general waste in excess of 100 tons per day calculated as a monthly average, using any form of treatment.	*The method of treating general waste generated as part of the closure activities, as well as the volumes involved, need to be confirmed.*
	8	The disposal of general waste to land covering an area in excess of 200m^2 and with a total capacity exceeding 25 000 tons.	*The Project needs to determine the feasibility of establishing an on-site general waste disposal facility for the disposal of the inert and non-hazardous demolition waste generated by closure activities.*
	9	The disposal of inert waste to land in excess of 25 000 tons, excluding the disposal of such waste for the purposes of levelling and building which has been authorised by or under other legislation	*The Project needs to determine the feasibility of establishing an on-site general waste disposal facility for the disposal of the inert and non-hazardous demolition waste generated by closure activities.*
	10	The construction of a facility for a waste management activity listed in Category B of this Schedule (not in isolation to associated waste management activity).	*The proposed construction of waste management facilities that form part of Category B.*

NEM:WA also includes the management of contaminated land which is defined as the presence in or under any land, site, buildings or structures of a substance or micro-organism above the concentration that is normally present in or under that land, which substance or micro-organism directly or indirectly affects or may affect the quality of soil or the environment adversely".

Part 8 of NEM:WA provides a legal mechanism for managing contaminated land. It makes provision for the following:

1. Identification and notification of investigation areas;
2. Consequences of identification and notification of investigation areas;
3. Consideration of site assessment reports;
4. Orders to remediate contaminated land;
5. Transfer of remediation sites; and
6. Contaminated land register.

NEM:WA makes the following provisions for the remediation of contaminated land:

- Section 37 states that if the findings of the site assessment determine that the investigation area is contaminated, the site assessment report must at least contain information on whether inter alia the area should be remediated or any other measures should be taken to manage or neutralise the risk.
- Section 38 stated that on the receipt of a site assessment report the mandated authority and any other organ of state concerned, may decide that -
  - The investigation area is contaminated, presents a risk to health or the environment, and must be remediated urgently;
  - The investigation area is contaminated, present a risk to health or the environment, and must be remediated within a specified period;
  - The investigation area is contaminated and does not present an immediate risk, but that measures are required to address the monitoring and management of that risk; or
  - The investigation area is not contaminated.

The 2010 Framework for the Management of Contaminated Land was compiled in support of Part 8 of NEM:WA in order to provide norms and standards for enabling the identification and registration of contaminated sites, to provide a risk-based decision support protocol for assessing sites, and to offer a set of guidelines for the submission of site assessment reports (DEA, 2010).

This Framework consists of the following components:

- Protocol for Site Risk Assessment;
- Reporting Norms and Standards for Contaminated Land;
- The Derivation and Use of Soil Screening Values;
- Application of Site Specific Risk Assessment; and
- Quality Control and Quality Assurance of Field Sampling and Laboratory Analysis.

The following three (3) essential elements (referred to as the source-pathway-receptor model) need to be understood to allow the risk of contaminated land to be assessed (DEA, 2010):

- The source contains a concentration of a contaminant(s) – a substance that is in, or on land that has the potential to cause an impact to human health or the environment;
- The pathway is the route or means that controls the release and migration of a contaminant to environmental media, for instance soil to water or soil to air; and
- The receptor in general terms is something that can be adversely affected by exposure to contaminants. Receptors include humans but may also include animals and plants.

The protocol of Site Assessment provides a conceptual risk-based decision-support tool, which is based on the recognition of pathway-receptor linkages. The decision tree is shown diagrammatically in Figure 1 below.

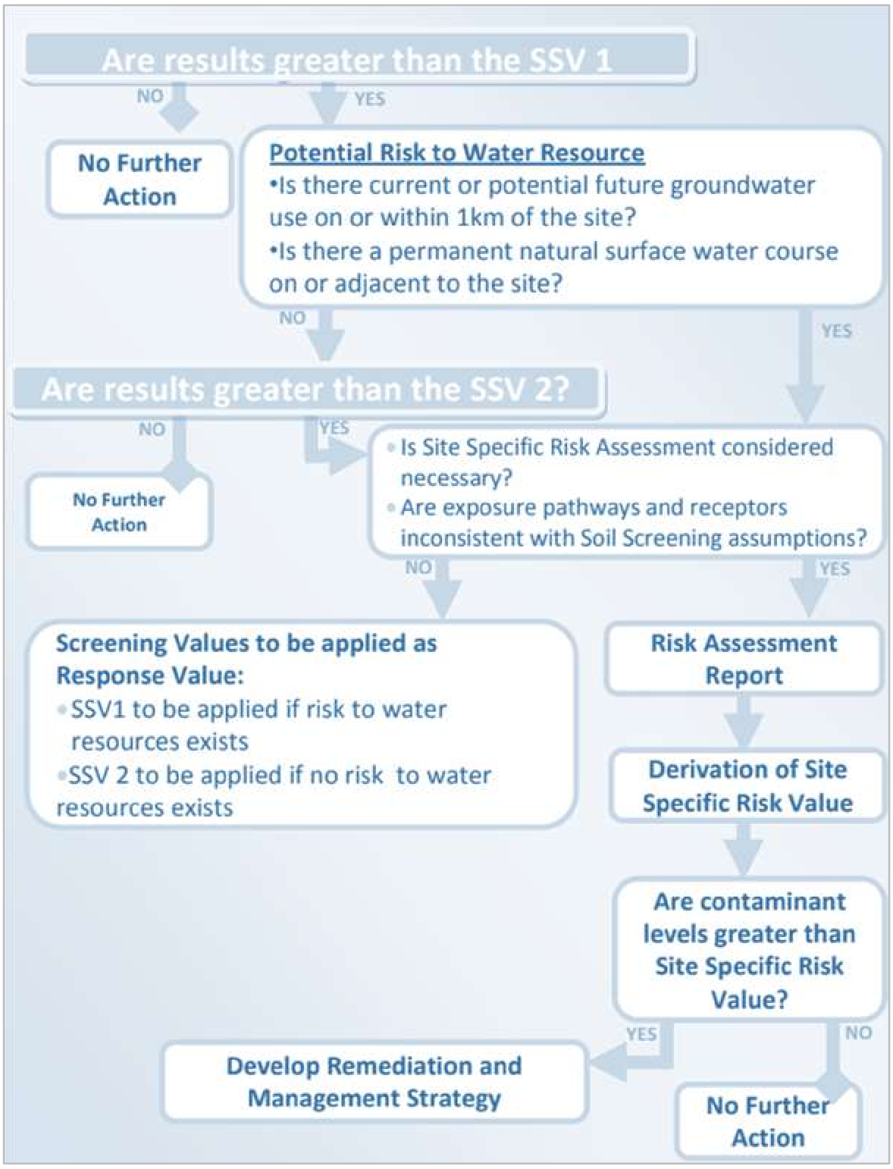


Figure 1: Diagrammatic decision-tree for assessment of contaminated land (DEA, 2010) (Soil Screening Value = SSV)

This Framework includes a reporting structure for contaminated land that consists of the following three distinct reporting phases (DEA, 2010):

1. Phase 1 - desktop study, initial investigations and preliminary risk assessment;
2. Phase 2 - detailed field investigations, site investigation report and risk quantification; and
3. Phase 3 – remediation design and implementation, control and monitoring as well as long-term stewardship.

Eskom compiled the Phase 1 assessment while Phase 2 will be compiled as part of the ESIA. The application of Part 8 of NEM:WA, including the possible issuing of a Remediation Order and implications for the EIA, will be confirmed in consultation with DFFE.

In terms of Category C of GN No. R. 921 of 29 November 2013 (as amended), the following activities will need to comply with the National Norms and Standards for the Storage of Waste (GN R. 926 of 29 November 2013):

- The storage of general waste at a facility that has the capacity to store in excess of 100m^3 of general waste at any one time, excluding the storage of waste in lagoons or temporary storage of such waste; and
- The storage of hazardous waste at a facility that has the capacity to store in excess of 80m^3 of hazardous waste at any one time, excluding the storage of hazardous waste in lagoons or temporary storage of such waste.

Waste generated during the dismantling of the facilities at KPS will need to be classified in terms of the Waste Classification and Management Regulations (GN R. 634 of 23 August 2013) ("Waste Classification and Management Regulations") (except if it is listed in Annexure 1) and analysed in terms the National Norms and Standards for the Assessment of Waste for Landfill Disposal (GN R. 635 of 23 August 2013).

Ash beneficiation refers to the process of ensuring that Eskom's ash is sold commercially and used productively as a resource and not disposed of as waste. Eskom was granted approval under the Waste Exclusion Regulations (GN No. 715 of 18 July 2018) for the following waste streams to be excluded from the definition of waste in terms of NEM:WA for various beneficial uses:

- Fresh and weathered ash; and
- Flue gas desulphurisation gypsum and run of station ash.

2.4.5.3 National Water Act

The DWS is the custodian of SA's water resources.

The purpose of the NWA is to ensure that SA's water resources are protected, used, developed, conserved, managed and controlled in ways which take into account amongst other factors:

- Meeting the basic human needs of present and future generations;
- Promoting equitable access to water;
- Redressing the results of past racial and gender discrimination;
- Promoting the efficient, sustainable and beneficial use of water in the public interest;
- Facilitating social and economic development;
- Providing for growing demand for water use; protecting aquatic and associated ecosystems and their biological diversity;
- Reducing and preventing pollution and degradation of water resources;
- Meeting international obligations;
- Promoting dam safety; and
- Managing floods and droughts.

Some key definitions from the NWA include:

- "Pollution" means the direct or indirect alteration of the physical, chemical or biological properties of a water resource so as to make it (a) less fit for any beneficial purpose for which it may reasonably be expected to be used; or (b) harmful or potentially harmful;
- "Waste" includes any solid material or material that is suspended, dissolved or transported in water (including sediment) and which is spilled or deposited on land or into a water resource in such volume, composition or manner as to cause, or to be reasonably likely to cause, the water resource to be polluted; and
- A "water resource" includes a watercourse, surface water, estuary, or aquifer.

The water uses that may be associated with the Project, in terms of Section 21 of the NWA, are listed in Table 7 below.

Table 7: Water uses associated with the Project in terms of Section 21 of the NWA

Water Use Type		Project-related Activities
Section 21(g)	Disposing of waste in a manner which may detrimentally impact on a water resource.	*The Project needs to determine the feasibility of establishing an on-site general waste disposal facility for the disposal of the inert and non-hazardous demolition waste generated by closure activities.*
Section 21(c)	Impeding or diverting the flow of water in a watercourse.	*Encroachments of closure activities into the regulated areas of watercourses.* *The regulated area of a watercourse for Section 21(c) and (i) water uses is defined as follows in Government Gazette No. 40229 of 26 August 2016:* • *The outer edge of the 1 in 100 year flood line and /or delineated riparian habitat, whichever is the greatest distance, measured from the middle of the watercourse of a river, spring, natural channel, lake or dam;* • *In the absence of a determined 1 in 100 year flood line or riparian area the area*
Section 21(i)	Altering the bed, banks, course or characteristics of a watercourse.	

Water Use Type		Project-related Activities
		within 100m from the edge of a watercourse where the edge of the watercourse is the first identifiable annual bank fill flood bench (subject to compliance to Section 144 of the NWA); or • *A 500 m radius from the delineated boundary (extent) of any wetland or pan.*

Although the team will not undertake any WULA's, they will be identified and acknowledged in the ESIA as an approval that will be required before the power station is shut down and dismantled.

The following water uses are already authorised at the KPS, with associated conditions that need to be adhered to (refer to Table 4 above):

- Section 21(a) (taking water from a water resource);
- Section 21(b) (storing water); and
- Section 21(g) (disposing of waste in a manner which may detrimentally impact on a water resource).

The following plans, as stipulated in condition 10.3 of the KPS' existing WUL (04/B11B/BCGI/1970), will be compiled as part of the Project:

- IWWMP;
- RSIP; and
- Closure Plan.

According to the Regulations regarding the Safety of Dams (Government Gazette No. 35062 of 24 February 2012), "decommission a dam with a safety risk" means "taking steps to ensure that the remaining structure will, without any further operational action, maintenance, inspection or safety evaluation, hold no danger or potential danger to human life or property, have no significant adverse impact on resource quality, or significant detrimental effect on the environment". Eskom will need to apply for a licence to decommission the dams at KPS from DWS in terms of the aforementioned regulations.

2.4.5.4 National Environmental Management: Air Quality Act

The purpose of the National Environmental Management: Air Quality Act (Act No. 39 of 2004) (NEM:AQA) is to reform the law regulating air quality by providing measures for the prevention of pollution and ecological degradation and for securing ecologically sustainable development. This Act aims to promote justifiable economic and social development; to provide for national norms and standards regulating air quality monitoring, management and control by all spheres of government, and for specific air quality measures.

Some key definitions from this Act include:

- "Air pollution" means any change in the composition of the air caused by smoke, soot, dust (including fly ash), cinders, solid particles of any kind, gases, fumes, aerosols and odorous substances;
- "Atmospheric emission" or "emission" means any emission or entrainment process emanating from a point, non-point or mobile source that results in air pollution;
- A "non-point source" is a source of atmospheric emissions which cannot be identified as having emanated from a single identifiable source or fixed location, and includes veld, forest and open fires, mining activities, agricultural activities and stockpiles; and
- A "Point source" is a single identifiable source and fixed location of atmospheric emission, and includes smoke stacks and residential chimneys.

The NEM:AQA provides for the listing of activities which result in atmospheric emissions that pose a threat to health or the environment. No person may conduct any such listed activity without an AEL. The NDM issued an AEL (NDM/AEL/MP313/12/12) to KPS in April 2015. In order to comply with conditions in the AEL, the NDM needs to be notified of the proposed closure of the power station. Any additional requirements of NDM also need to be adhered to.

National Dust Control Regulations (GN No. R. 827 of 1 November 2013), as amended, were gazetted in terms of NEM:AQA. The purpose of the regulations is to prescribe general measures for the control of dust in all areas. There Regulations prescribe acceptable dust fallout rates.

Provision will be made in the Environmental and Social Management Plan (ESMP) (in terms of the WBG ESF) and Environmental Management Programme (EMPr) (EIA Regulations) to manage impacts to air quality as a result of the Project during closure.

2.4.5.5 National Environmental Management: Biodiversity Act

The purpose of the National Environmental Management: Biodiversity Act (Act No. 10 of 2004) (NEM:BA) is to provide for the management and conservation of SA's biodiversity within the framework of NEMA.

The Act allows for the publication of provincial and national lists of ecosystems that are threatened and in need of protection. The list should include:

- Critically Endangered Ecosystems, which are ecosystems that have undergone severe ecological degradation as a result of human activity and are at extremely high risk of irreversible transformation.
- Endangered Ecosystems, which are ecosystems that, although they are not critically endangered, have undergone ecological degradation due to human activity.
- Vulnerable Ecosystems, which are ecosystems that have a high risk of undergoing significant ecological degradation.

- Protected Ecosystems, which are ecosystems that are of a high conservation value or contain indigenous species at high risk of extinction in the wild in the near future.

Similarly, the Act allows for the listing of endangered species, including critically endangered species, endangered species, vulnerable species and protected species. A person may not carry out a restricted activity (including trade) involving listed threatened or protected species without a permit.

The Regulations on the management of Listed Alien and Invasive Species were promulgated on 1 August 2014. The Listed Invasive Species were also published on this date and were subsequently amended.

Some key definitions from this Act include:

- "Alien species" –
  - A species that is not an indigenous species; or
  - An indigenous species translocated or intended to be translocated to a place outside its natural distribution range in nature, but not an indigenous species that has extended its natural distribution range by natural means of migration or dispersal without human intervention.
- "Biological diversity" or "biodiversity" – the variability among living organisms from all sources including, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part and also includes diversity within species, between species, and of ecosystems.
- "Indigenous species" – a species that occurs, or has historically occurred, naturally in a free state in nature within the borders of the Republic, but excludes a species that has been introduced in the Republic as a result of human activity.
- "Invasive species" – any species whose establishment and spread outside of its natural distribution range -
- Threaten ecosystems, habitats or other species or have demonstrable potential; and
- May result in economic or environmental harm or harm to human health.
- "Species" – a kind of animal, plant or other organism that does not normally interbreed with individuals of another kind, and includes any sub-species, cultivar, variety, geographic race, strain, hybrid or geographically separate population.

The implications of NEM:BA for the Project *inter alia* include the requirements for managing invasive and alien species, protecting threatened ecosystems and species, as well as for rehabilitating the areas affected by the Project.

Terrestrial and Aquatic Ecological Impact Assessments will be undertaken for the Project, which will be included in the ESIA Report.

2.4.5.6 Mineral and Petroleum Resources Development Act

The purpose of the Mineral and Petroleum Resources Development Act (Act No. 28 of 2002) (MPRDA) is to make provision for equitable access to and sustainable development of SA's mineral and petroleum resources and to provide for matters related thereto. This Act defines mining as "any operation or activity for the purposes of winning any mineral on, in or under the earth, water or any residue deposit, whether by underground or open working or otherwise and includes any operation or activity incidental thereto".

In terms of the MPRDA, as amended, a mining permit applies when the mineral in question can be mined in 2 years and the area does not exceed 5 ha. For larger areas a mining right will need to be applied for.

A borrow pit may be required to source construction material for the Project, such as providing soil to fill, level and re-vegetate areas where infrastructure had been removed at KPS.

2.4.5.7 National Heritage Resources Act

The purpose of the National Heritage Resources Act (Act No. 25 of 1999) (NHRA) is to protect and promote good management of SA's heritage resources, and to encourage and enable communities to nurture and conserve their legacy so it is available to future generations.

In terms of Section 34(1) of the NHRA, no person may alter or demolish any structure or part of a structure which is older than 60 years without a permit issued by the relevant provincial heritage resources authority. The NHRA defines a "structure'' as meaning "any building, works, device or other facility made by people and which is fixed to land, and includes any fixtures, fittings and equipment associated therewith". The heritage authorities, which include SAHRA (national) and MPHRA (provincial), will be engaged with during the course of the ESIA. An application will also be made to MPHRA to demolish structures older than 60 years. The ESMP will also include a chance find procedure.

In terms of Section 38 of the NHRA, certain listed activities require authorisation from provincial agencies, which include:

- The construction of a road, wall, powerline, pipeline, canal or other similar form of linear development or barrier exceeding 300m in length;
- The construction of a bridge or similar structure exceeding 50m in length;
- Any development or other activity which will change the character of a site -
  - Exceeding 5 000m^2 in extent; or
  - Involving three or more existing erven or subdivisions thereof; and
- The re-zoning of a site exceeding 10 000m^2 in extent.

A Heritage Impact Assessment will be undertaken for the Project, which will be included in the ESIA Report.

2.4.5.8 Traditional Leadership and Governance Framework Amendment Act

The Traditional Leadership and Governance Framework Amendment Act (Act No. 23 of 2009) amended the Traditional Leadership and Governance Framework Act (Act 41 of 2003) and provides for communities to decide for themselves if they want to be regarded as a traditional community in terms of their customs and to observe a system of customary law.

The implications of this Act are that it describes the roles and powers of traditional leaders and the manner in which communication with traditional communities should occur. The Act also prescribes the power held by the traditional authorities within the project area in terms of acting on behalf of communities within their area of jurisdiction. This is relevant in respect of land acquisition negotiations and granting access to the construction workforce.

2.4.5.9 Development Facilitation Act

The relevance of the Development Facilitation Act (Act No. 67 of 1995) is associated with its main purpose which is to prescribe land development procedures in respect of land use that both includes and excludes small scale farming. Different procedures for the two different circumstances are prescribed through the Act. Although the principles in the Act are specifically aimed at land development, the close integration between the use of land and water as resources means that the principles should be applied in the use of water as well. The Act also deals with land tenure matters and promotes both the establishment of viable communities and sustainable environments.

2.5 Legislative Gap Analysis

The key requirements of the ESS and related provisions in SA legislation are captured in Table 8 below.

Table 8: Key requirements of ESS and related provisions in national legislation

Key Requirements of WBG ESS	Related Provisions in SA Legislation	Gaps
ESS1: • Assess, manage, and monitor the environmental and social risks and impacts of the project throughout the project life cycle so as to meet the requirements of the ESSs in a manner and within a time frame acceptable to the Bank. • Content requirements for ESIA Report and ESMP.	Chapter 24 of NEMA caters for the procedures for the investigation, assessment and communication of the potential consequences or impacts of activities on the environment. Related provisions in the EIA Regulations: • Prescribe the regulatory process necessary to apply for environmental authorisation in terms of NEMA and a WML in terms of NEM:WA. • Provide the requirements of the EIA process, which include the assessment and mitigation of detrimental impacts on the environment. • Prescribe the content of the following – o Basic Assessment Report / Scoping and EIA Reports; o EMPr; o Closure Plan; and o Environmental Audit Report.	No significant gaps identified between the referenced SA legislation and the requirements of ESS1.

Key Requirements of WBG ESS	Related Provisions in SA Legislation	Gaps

ESS2:
• Promotes the implementation of a systematic approach to improving the management of risks and impacts related to labor and working conditions in projects.
	SA legislation pertaining to the management of risks and impacts related to labour and working conditions include:
	• BCEA –
	  o Gives effect to the right to fair labour practices referred to in section 23(1) of the Constitution by establishing and making provision for the regulation of basic conditions of employment.
	• LRA –
	  o Gives effect to section 27 of the Constitution;
	  o Promote and facilitate collective bargaining at the workplace and at sectoral level;
	  o Regulates the right to strike and the recourse to lockout in conformity with the Constitution;
	  o Promotes employee participation in decision-making through the establishment of workplace forums;
	  o Provides simple procedures for the resolution of labour disputes.
	• OHSA –
	  o Provides for the health and safety of persons at work and for the health and safety of persons in connection with the activities of persons at work.
	  o An OHS management system will need to be implemented for the Project, which will include measures during the design phase, as well as the procurement, and management of the Contractor for construction activities, in terms of the Construction Regulations (GN No. R. 84 of 7 February 2014) under the OHSA.
	• COIDA –
	  o Provides for compensation for disablement caused by occupational injuries or diseases sustained or contracted by employees in the course of their employment, or for death resulting from such injuries or diseases.
		No significant gaps identified between the referenced SA legislation and the requirements of ESS2.

ESS3: • The Borrower will consider ambient conditions and apply technically and financially feasible resource efficiency and pollution prevention measures in accordance with the mitigation hierarchy.	The following SA legislation deals with environmental pollution that may be caused by the Project: • NEMA and EIA Regulations; • NWA; • NEM:WA; • NEM:AQA; • MPRDA; and • Hazardous Substances Act (No 15 of 1973) Measures related to resource efficiency (including use of energy, water and raw material) are inherently catered for in the above legislation.	The referenced SA legislation partially satisfies the requirements of ESS3. Hence, ESS3 will be followed for the Project, over-and-above compliance with the national legislation.
ESS4: Community Health and Safety	The OHSA and associated Regulations make provision for managing health and safety hazards to public safety that are created as a result of work or work-related activities.	The referenced SA legislation partially satisfies the requirements of ESS4. Hence, ESS4 will be followed for the Project, over-and-above compliance with the national legislation.
ESS5: Land Acquisition, Restrictions on Land Use and Involuntary Resettlement	Section 25 of the Constitution deals with matters of property rights and lays ground for just expropriation of property.	The referenced SA legislation partially satisfies the requirements of

Key Requirements of WBG ESS	Related Provisions in SA Legislation	Gaps
	ESTA caters for the following: • Provides for measures with State assistance to facilitate long-term security of land tenure; • Regulates the conditions of residence on certain land; • Regulates the conditions on and circumstances under which the right of persons to reside on land may be terminated; and • Regulates the conditions and circumstances under which persons, whose right of residence has been terminated, may be evicted from land.	ESS5. Hence, ESS5 will be followed for the Project, over-and-above compliance with the national legislation.
ESS6: Biodiversity Conservation and Sustainable Management of Living Natural Resources	The following SA legislation directly deals with conserving biodiversity: • NEMA; • NWA; • NEM:BA and Regulations; • National Environmental Management: Protected Areas Act (Act No. 57 of 2003); and • National Forests Act (Act No. 84 of 1998).	No significant gaps identified between the referenced SA legislation and the requirements of ESS6.
ESS8: Cultural Heritage	The NHRA serves to protect and promote good management of SA's heritage resources.	The referenced SA legislation partially satisfies the requirements of ESS8. Hence, ESS8 will be followed for the Project, over-and-above compliance with the national legislation.
ESS10: Stakeholder Engagement and Information Disclosure	Chapter 6 of the EIA Regulations makes the following provisions in terms of public participation under a EIA process: • Seeking consent for an activity on land owned by person other than proponent; • Explaining the purpose of public participation; • Prescribing the public participation process; and • Prescribing the registration of Interested and Affected Parties (I&APs) and their rights to comment on reports and plans.	The referenced SA legislation partially satisfies the requirements of ESS10. Hence, ESS10 will be followed for the Project, over-and-above compliance with the national legislation.

As seen in the above table, the objectives and requirements of the World Bank ESS are primarily included in provisions of the full suite of SA legislation governing the environmental sector. The most stringent thresholds/measures will apply to the Project, whether it's the World Bank's requirements or the national legislation.

In addition, where no SA screening values are provided for surface water, groundwater and land contamination, then internationally accepted guideline values will be used including United States Environmental Protection Agency (USEPA) and the World Health Organisation (WHO).

Chapter 3: Project Description

3 Project Description

3.1 Introduction

This section provides a detailed description of the situational setting of the KPS and describes the proposed shutdown and dismantling activities, as outlined in the reports compiled by Golder Associates (2017) and VPC GmbH (2021).

3.2 Study Area

3.2.1 Geographical Context

The KPS is situated approximately 37km south of the town of Middelburg next to the R35 in the Mpumalanga Province of SA. It falls within the Steve Tshwete Local Municipality (STLM) and Nkangala District Municipality (NDM) (see Figure 2 below). The GPS coordinates for the power station are 26°05'24.77"S, 29°28'20.39"E. The locality maps are presented below.

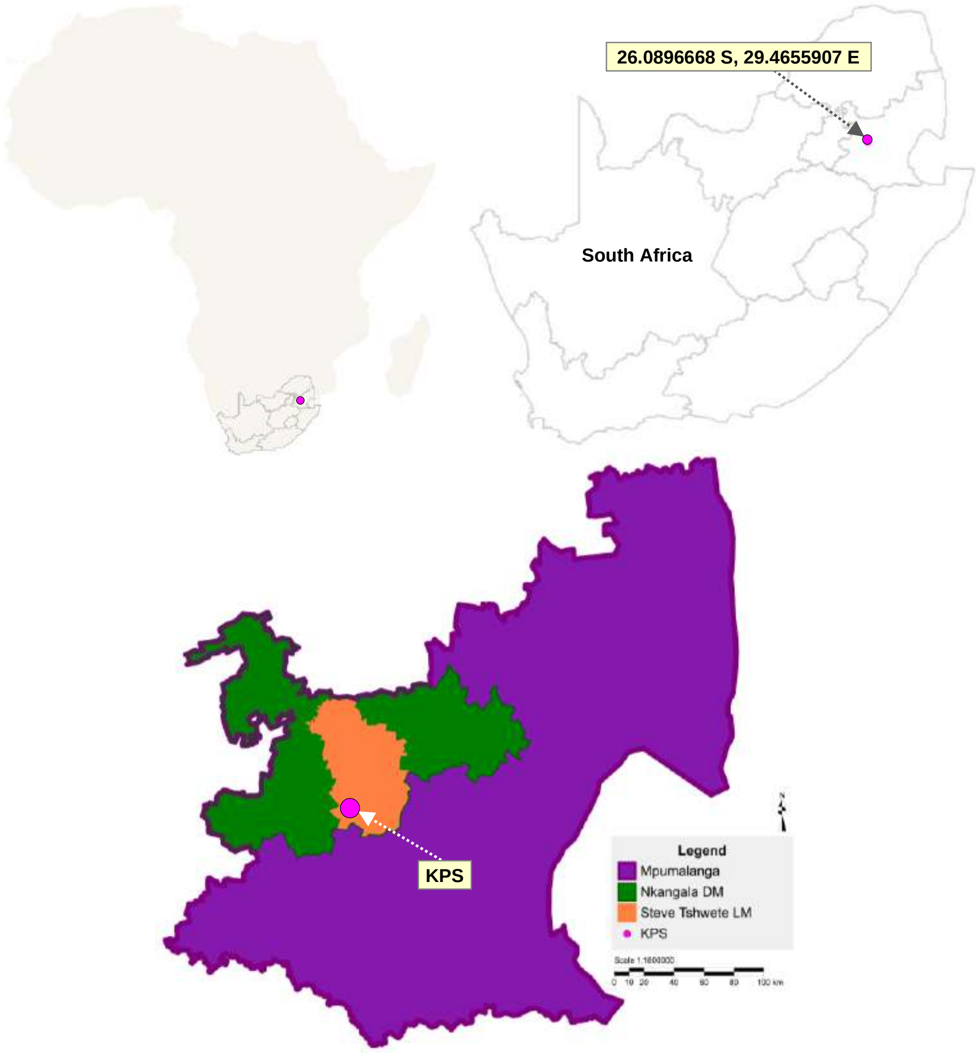


Figure 2: KPS national, provincial and local geographical context

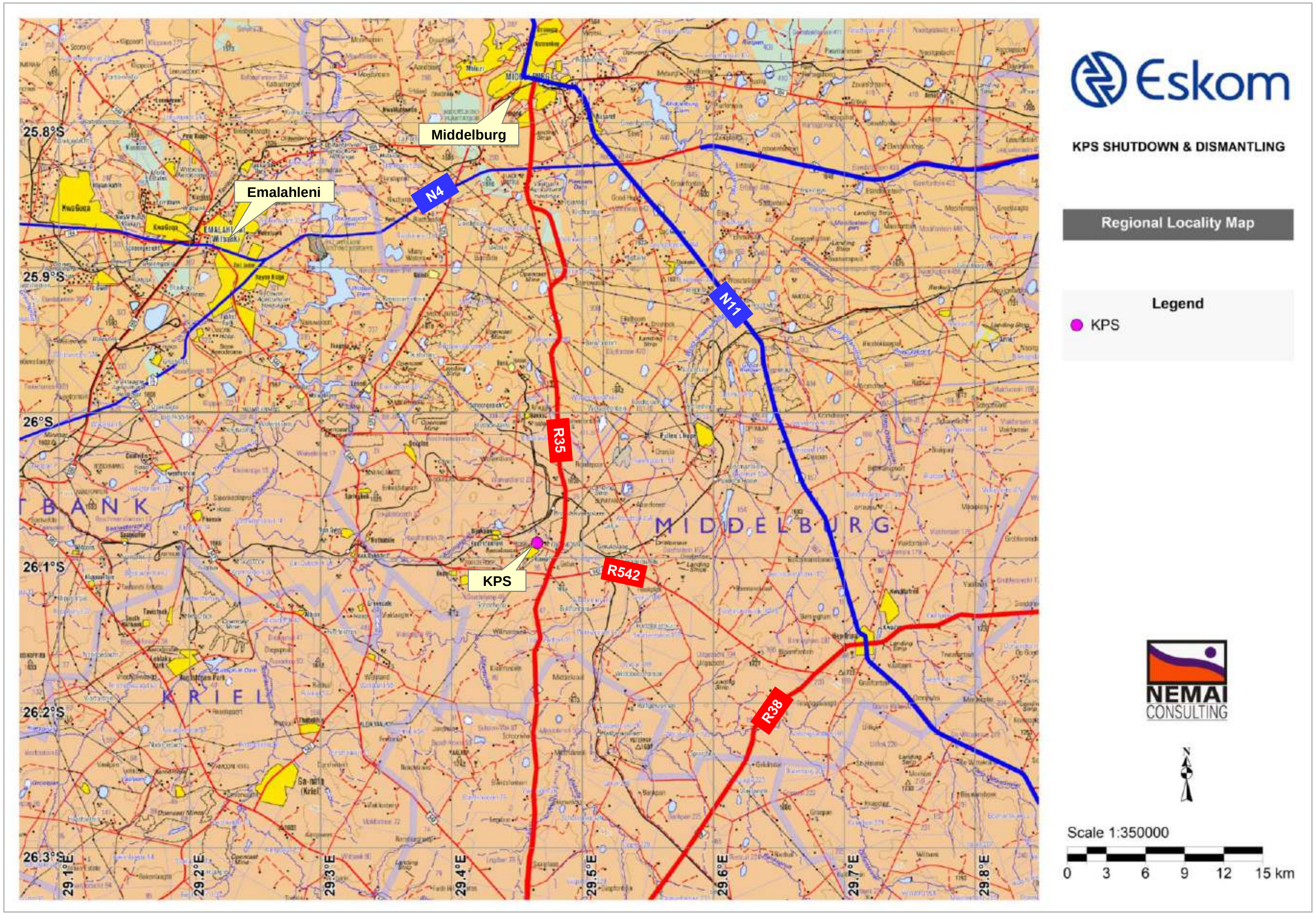


Figure 3: KPS regional locality map

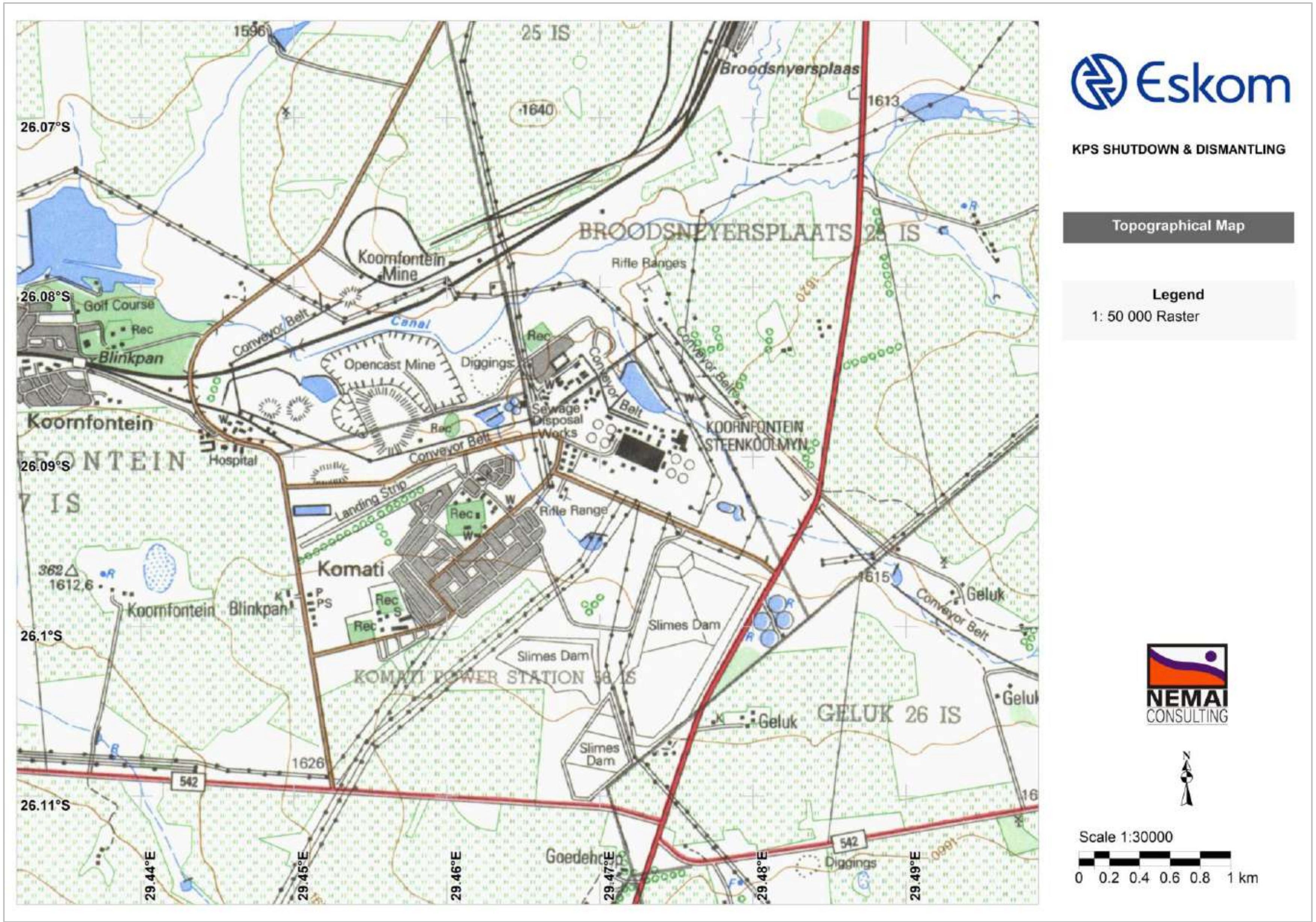


Figure 4: KPS locality map (topographical map)

3.2.2 Property Details & Cadastral Boundaries

The extent of the consolidated land belonging to Eskom on which the KPS with associated services is situated is 686.95 hectares, accordance to Land Title Deeds T24999 (1975) (contained in **Appendix A**) and T334766 (2007). The station is located on the Farm Komati Power Station 56 IS. A map showing cadastral boundaries is provided in Figure 5 below.

A coal storage area is located on the north-western part of the cadastral boundary. This area, which forms part of the adjoining mine and which is separated from the KPS property by a road, does not form part of the Project footprint. According to feedback from Eskom (Holl pers. comm., 2022), this area falls under Portion 4 of the Farm Komati Power Station 56 IS and it is owned by South32.

3.3 Overview of KPS

3.3.1 Historical Context

Planning of KPS commenced in June 1957. The power station has an installed capacity of 1 000 MW generated by four 125 MW units and five 100 MW units. The first generator was commissioned at the end of 1961, and the last unit in 1966. The station was built next to the Koornfontein and Blinkpan Collieries, to supply coal to the station.

In 1987 a decision was taken for the entire power station to be mothballed. The first unit to be mothballed was Turbine 5 on 15 December 1987 followed by Boiler 3. The rest of the plant was mothballed at various intervals thereafter with the last unit mothballed in December 1990. Eskom decided in the early 2000’s to return KPS to service to meet the growing demand of electricity. The units were returned to service starting with unit 9, which was declared fit for commercial operation in December 2008. The full station was brought online in 2011.

3.3.2 Layout

The general layout of KPS is shown in Figure 6 below and contained in Appendix B. The two distinct parts of the overall site include the power station complex and the ash dam area.

3.3.3 Current Operations

The station has a total of 9 units, five 100MW units on the east (Units 1 to 5) and four 125 MW units on the west (Units 6 to 9), with a total installed capacity of 1000 MW. Its units operated on a simple Rankine Cycle without reheat and with a low superheat pressure, resulting in a lower thermodynamic efficiency (efficiency up to 27%). KPS’ Units are small and have a higher operating and maintenance cost per MW generated compared to modern newer stations. KPS will reach its end-of-life expectancy in September 2022 when Unit 9 will have reached its dead stop date (DSD). Units 1 to 8 have already reached their DSD.

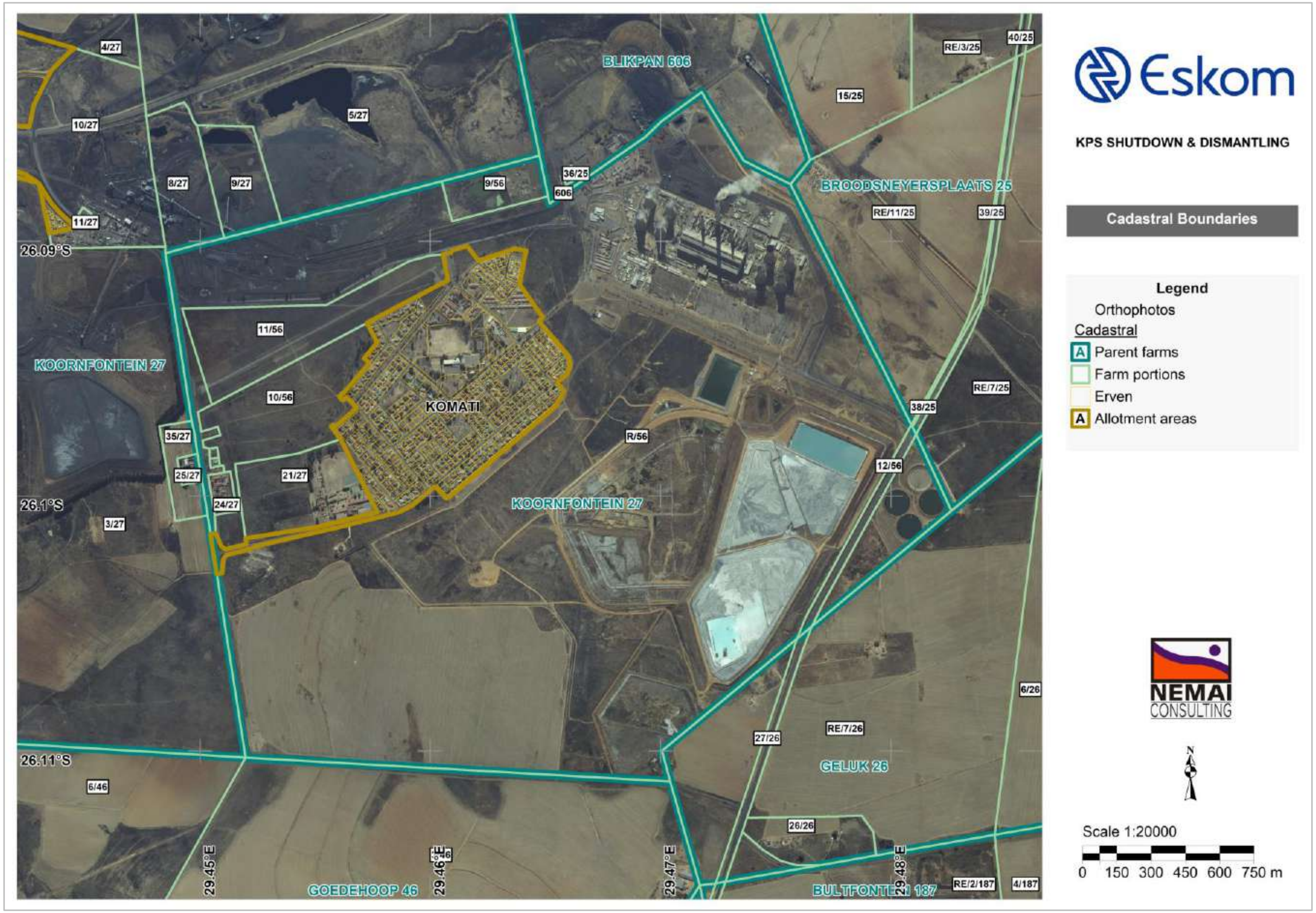


Figure 5: Map showing cadastral boundaries (orthophotograph)

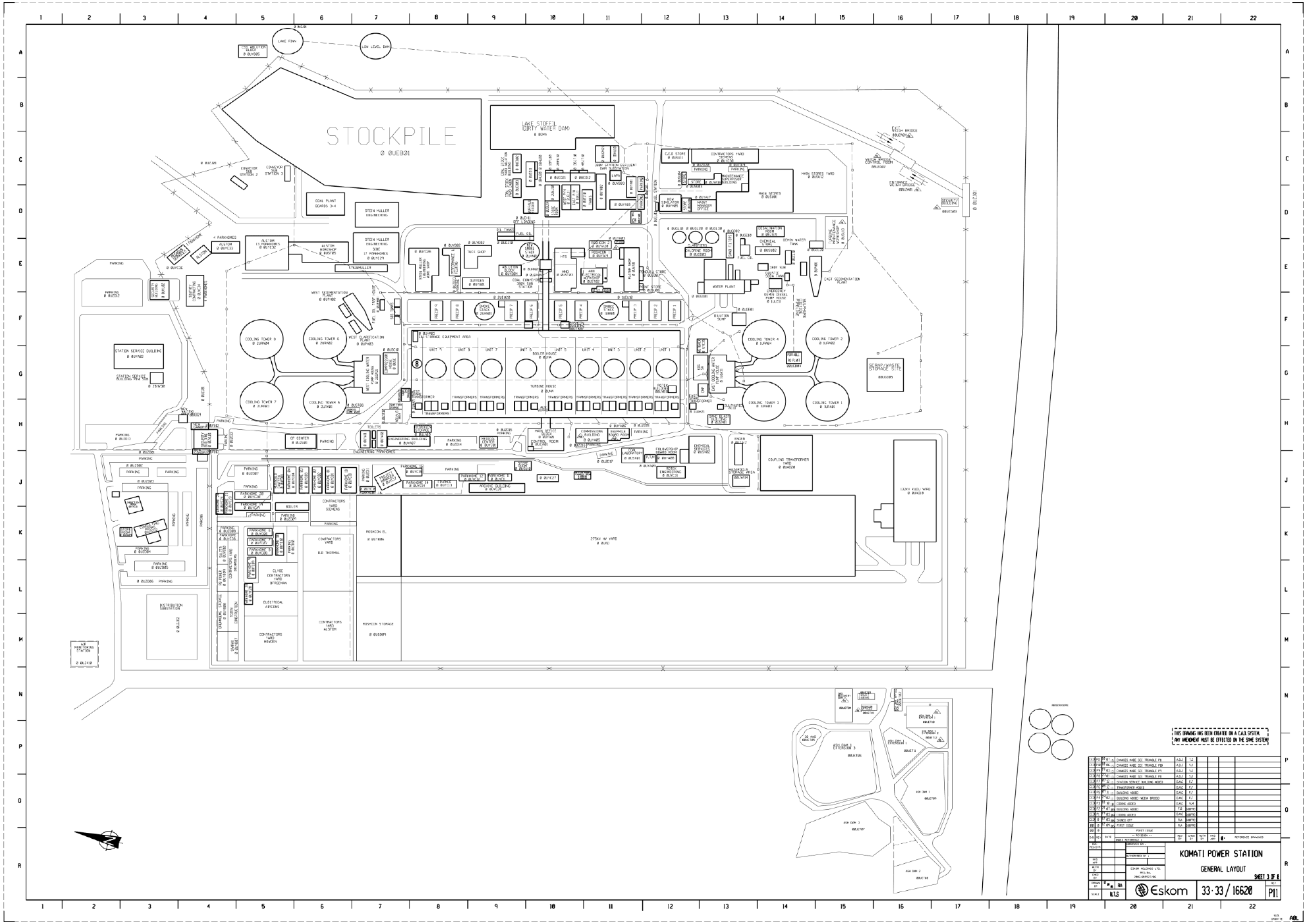


Figure 6: General layout of KPS

3.4 Proposed Project

3.4.1 Information Sources

The following sources of information were used to gain an understanding of the scope of the proposed closure and repurposing of KPS:

- ToR from Eskom –
  - ToR for KPS Shutdown and Dismantling ESIA (March 2022); and
  - ToR for KPS Solar PV and Battery Energy Storage System (BESS) ESIA (March 2022).
- Existing reports –
  - Review and Update of the Decommissioning and Closure Costs for KPS (Golder Associates, 2017);
  - Komati Thermal Power Plant Technical Analysis on retiring and repurposing four coal plants, SA (VPC GmbH, 2021); and
  - Komati Thermal Power Plant Decommissioning and Repurposing: Project Scoping Report (WBG, 2022).
- Information received from Eskom relating to the decommissioning scope;
- Meetings held to date with Eskom and WSP;
- Targeted interviews with Eskom; and
- Site visit conducted on 14 June 2022.

3.4.2 Decommissioning & Repurposing

Table 9 below lists the areas which are proposed to be kept or removed as part of the retiring and repurposing of KPS, based on the VPC GmbH (2021) Report. These areas are also represented spatially in Figure 7 and Figure 8 below.

Figure 9 below shows the temporary structures, plant and buildings to be demolished and structures to be retained, based on the Project Scoping Report (WBG, 2022). The drawing is also contained in Appendix B. All the unhighlighted buildings and plant in Figure 9 will be demolished and the area rehabilitated. The buildings and plant highlighted in green in Figure 9 are to be retained.

Table 9: Areas to be decommissioned for retiring (removal) vs repurposing (VPC GmbH, 2021)

No.	Area	Keep for Retiring	Keep for Repurposing	Remove
	Main Power Station Complex			
1.	Parking and induction area			✗
2.	Pilot PV project	✓	✓	
3.	Main service building		✓	
4.	CED and other offices			✗
5.	HV Yard and switching stations	✓	✓	
6.	Main office block, engineering offices and medical centre		✓	
7.	West cooling towers, workshops, and water pump house			✗
8.	Boiler house, stacks and precipitators			✗
9.	Turbine house		✓	
10.	Plater shop, Roshcon, offices, fuel off-loading and other workshops			✗
11.	Rotek offices, ops training centre and other offices			✗
12.	Main stores, contractor yard and fuel station			✗
13.	East cooling towers and east cooling water pump house			✗
14.	Water treatment plant	✓	✓	
	Ash dam and related infrastructure			
15.	Lake Stoffel			✗
16.	Lake Fin			✗
17.	Existing ash dam	✓	✓	
18.	Old asbestos disposal facility	✓	✓	
19.	Old Ash dam	✓	✓	
20.	New 3D Ash dam	✓	✓	
21.	Wetland/Fish dam		✓	
22.	Ash water return dam			✗
23.	Old ash water return dams			✗
24.	Third water recovery dam			✗
25.	Reservoirs	✓	✓	

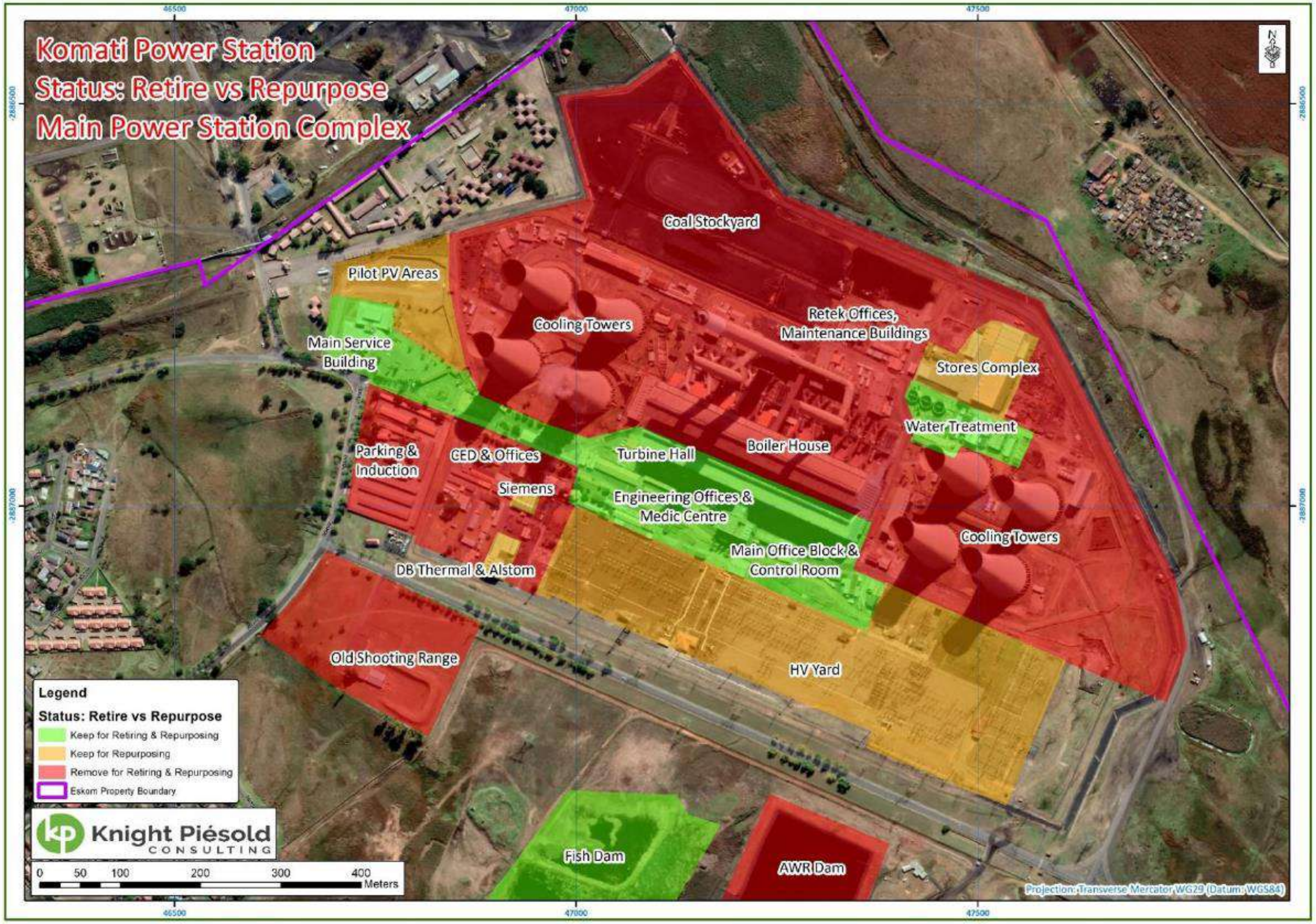


Figure 7: Power Station Area (Retire vs Repurpose) (VPC GmbH, 2021)

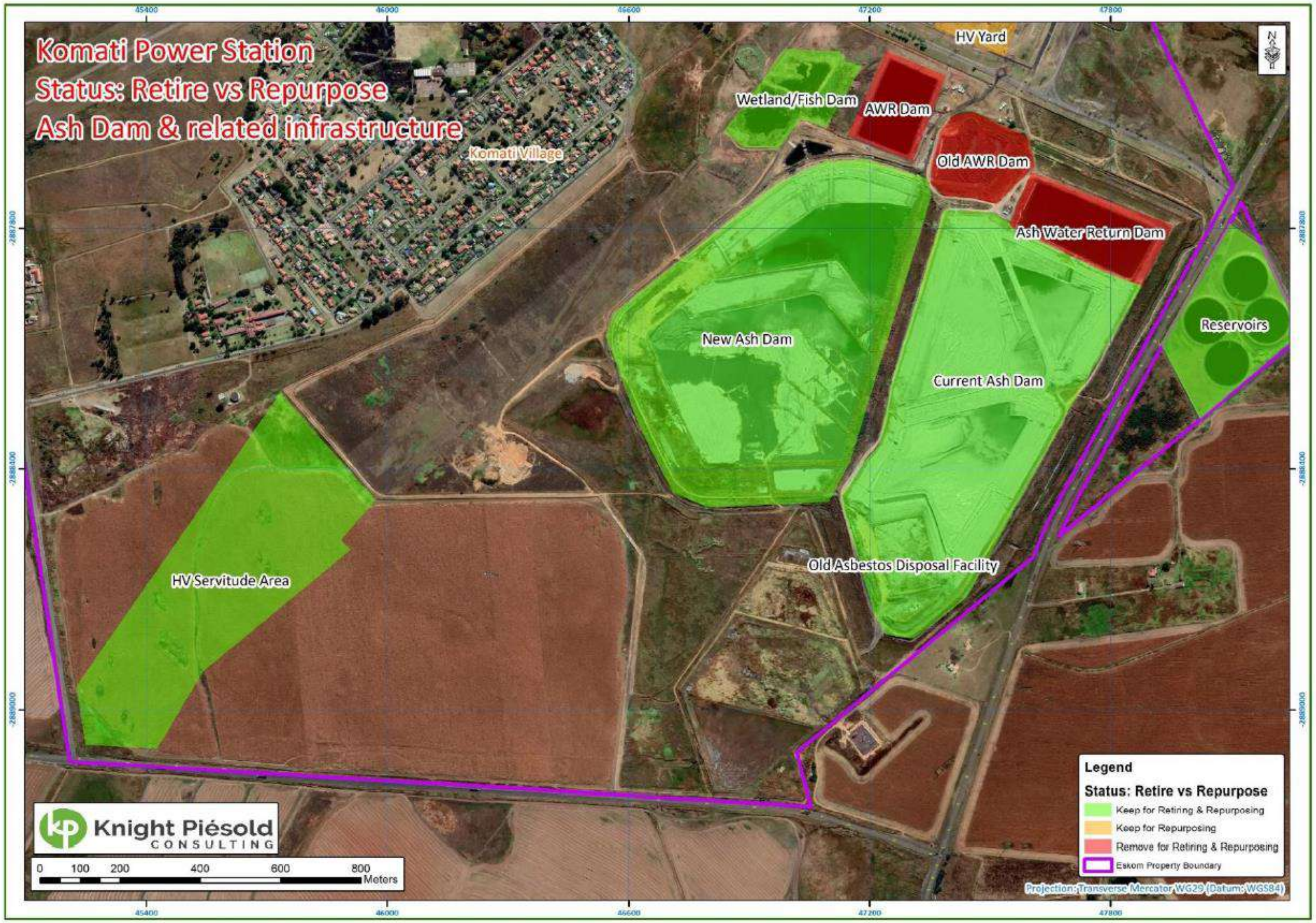


Figure 8: Ash Dam Area (Retire vs Repurpose) (VPC GmbH, 2021)

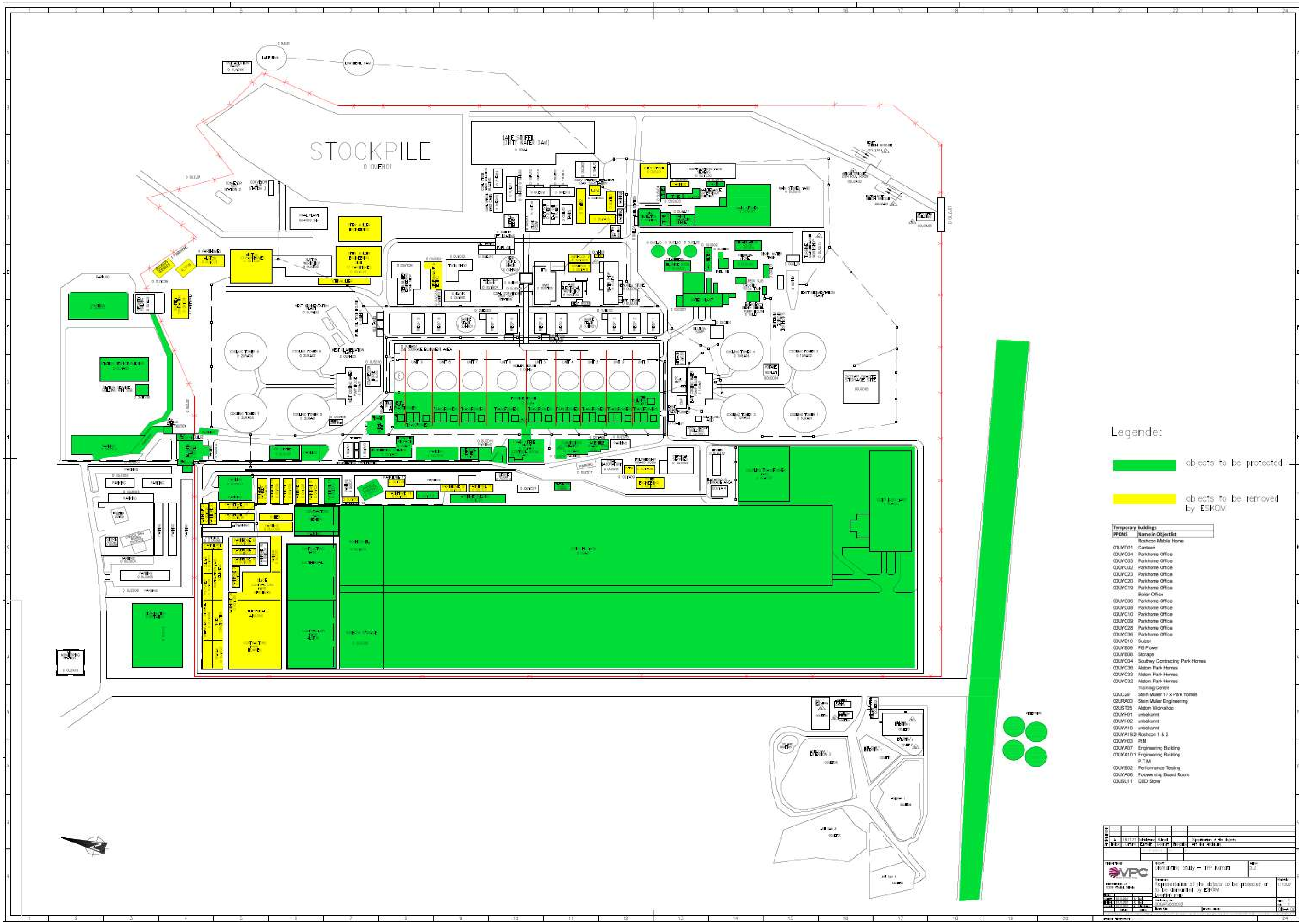


Figure 9: Temporary Structures, Plant and Buildings to demolish and structures to be retained (WBG, 2022)

3.4.3 Decommissioning Activities

3.4.3.1 High-Level Overview

The overall high-level programme for the decommissioning of KPS includes the following activities:

- Pre-closure planning (current phase of Project) –
  - Preparing a detailed Decommissioning Plan;
  - Complying with exiting environmental approvals;
  - Undertaking the ESIA and seeking environmental approvals;
  - Preparing decommissioning arrangements and programme; and
  - Planning Occupational Health and Safety measures for closure.
- Management and operation of the shutdown of the power station.
- Decommissioning of all plant, equipment, buildings and facilities, in accordance with the Decommissioning Plan and legal obligations.
- Management of all waste generated during decommissioning, including interim handling, storage, processing, transport and disposal.
- Remediation and return of the site to an agreed end state.

The decommissioning activities are summarised in Table 10 below.

Table 10: Decommissioning activities applicable to retiring and repurposing (VPC GmbH, 2021)

Area	Retiring	Repurposing
Main Power Station Complex		
Decontaminate, dismantle, then salvage, demolish or dispose waste at new on-site waste facility (Class C/D depending on classification). Shape footprint and rehabilitate area.	✓	✓
Linear infrastructure (roads, fences, pipes and conveyors). Remove that which will not be required for next land use. Shape footprint and rehabilitate area.	✓	✓
Sort and screen waste produced, crush concrete, dispose on-site facility (Class C), and hazardous waste to a hazardous disposal facility. Shape footprint and rehabilitate area.	✓	✓
Coal stockyard: Dismantle and remove infrastructure and dispose inert waste at on-site facility. Shape footprint and rehabilitate area.	✓	✓
Ash dam and related infrastructure		
Recovery dams (Lake Stoffel, Lake Fin), return water dams, and third recovery dam. Evaporate water, remove equipment, remove and dispose High Density Poly-Ethylene (HDPE) liner, excavate and dispose contaminated sediment to ADF, infill cavity, revegetate.	✓	✓
Existing ash dam - shape upper surface and side slopes, add 1m cover to prevent ingress of rainfall, establish vegetation, storm-water management	✓	✓
Old asbestos facility. Shape upper surface, install cover (design by Jones & Wagener Consulting Engineers), revegetate	✓	✓

Area	Retiring	Repurposing
Reservoirs: Will be upgraded and handed over to the local municipality to ensure continued provision of essential services	✓	×
Borrow pit for infilling requirements (from outside property)	✓	✓
Water monitoring		
Allowance for monthly monitoring for five years[1]	✓	✓
Allowance for quarterly monitoring for five years	✓	✓
Reinstatement of drainage lines	✓	✓
Rehabilitation monitoring		
Monitor progress of rehabilitated areas for five years	✓	✓
Care and Maintenance		
Care and maintenance of the rehabilitated areas until rehabilitation objective is achieved.	✓	✓
Water Treatment		
Intercept contaminated groundwater plume with well field (in-formed by the plume behaviour)	✓	✓
Active water treatment for treatment of scavenger borehole water	✓	✓

1 *Although allowance is made for five years of monitoring post-closure, there are other requirements such as the WML of the asbestos site, which require Eskom to undertake monitoring for 30 years after the closure of the site. The WUL also specifies monitoring requirements.*

3.4.3.2 Decommissioning Plan

A detailed Decommissioning Strategy and Plan is to be provided by Eskom to provide information necessary for the undertaking of the ESIA and for compiling the associated documentation (including a Closure Plan in terms of Appendix 5 of the EIA Regulations).

The Decommissioning Plan will include the following (amongst others):

- Decommissioning objectives;
- Phasing of the closure of KPS;
- Timing and sequencing of decommissioning activities;
- Execution activities for areas to be decommissioned;
- Engineering designs and measures necessary for the decommissioning and rehabilitation of facilities at KPS;
- Desired end-states (including technical criteria) for the areas to be decommissioned, which also links to the proposed repurposing of KPS (as relevant); and
- Financial provisions for executing decommissioning and rehabilitation.

3.4.3.3 Temporary Facilities

The following temporary facilities will be required to undertake the decommissioning activities at KPS:

- Site offices;
- Laydown area;

- Waste management facilities (e.g., concrete crushing facility, decontamination bay, salvage yard, non-hazardous and hazardous waste storage areas); and
- Medical facilities.

All environmental and social impacts associated with the temporary facilities will be managed through control measures to be contained in the ESMP. This will include provisions for security, essential services (including water and sanitation), pollution prevention, protecting women, code of conduct, etc.

Consideration will be given to using existing facilities at KPS if they have sufficient capacity and will satisfy all regulatory requirements and adhere to control measures, or if they can be upgraded to be compliant. There are various areas at the power station complex that may be suitable for temporary facilities required for the Project, such as the various contractors' yards and stores areas. The benefits of locating temporary facilities within the complex include the existing security measures, services, pollution management systems, access roads, and parking areas that are available.

At this stage, it is assumed that onsite accommodation will not be provided to the project workers undertaking decommissioning, apart from site security personnel.

Following decommissioning, the temporary facilities will be dismantled and removed. The waste generated from the dismantling of these facilities will be reuses, recycled, or disposed of as general or hazardous waste at licenced disposal facilities. Alternatively, the temporary facilities may be retained for use during the construction phase of Component B.

3.4.4 ADF Options

3.4.4.1 Introduction

Komati operates a wet ash system. The ash is pumped as a slurry from the power station, situated north-west of the site, through several large diameter discharge pipes. The slurry settles over time with the coarser ash particles usually deposited near the points of discharge (which are also used to raise the walls), whilst the lighter ash form downslope alluvial pans developing the beach and pools.

The ash dam area includes the existing ash dam, old asbestos disposal facility, old ash dam, new partially constructed 3D ash dam, ash water return (AWR) dams and a third water recovery dam (see Figure 10 below).

Figure 10: KPS ash dam area (Google Earth™)

Several options exist for the repurposing and decommissioning of the ADF, which are discussed in the sub-sections to follow.

3.4.4.2 Default Option: Keep ADF

The rehabilitation of the ash system dams includes the following (Golder Associates, 2017):

- Existing ash dam –
  - Shape upper surface of the ash dam to be free-draining, using the created beach during operations as far as possible;
  - Shape side slopes of the ash dam to an angle of 1:5;
  - Place a store and release cover of 1000 mm thickness to reduce water recharge and to prevent ingress of rainfall into the underlying ash;
  - Reshape area to be free draining;
  - Establish vegetation; and
  - Undertake storm water routing along the outer slopes/upper surface of the dam;
- Old asbestos disposal facility situated on top of the existing ash dam –

  - This is an existing facility which was authorised for closure in 2018, however, the closure process did not occur. An allowance was made to install a dedicated cover as per the Closure Plan.
- Old ash dam –
  - Excavate and transport contaminated sediment/soil to nearby Ash dam prior to final rehabilitation;
  - Breach dam wall and reshape to 1:5;
  - Reshape area to be free draining; and
  - Establish vegetation.
- New 3D ash dam –
  - Remove ash/sediment on top of liner and deposit onto the existing ash dam prior to final rehabilitation;
  - Remove and dispose HDPE liner;
  - Excavate and transport contaminated soil underneath liner to nearby ash dam prior to final rehabilitation;
  - Reshape area to be free draining; and
  - Establish vegetation.
- AWR dam –
  - Allow surface water in the dam to evaporate;
  - Excavate and transport contaminated sediment to nearby ash dam prior to final rehabilitation;
  - Remove and dispose HDPE liner;
  - Breach dam wall and reshape to 1:5;
  - Reshape area to be free draining;
  - Rip the underlying footprint to alleviate compaction; and
  - Establish vegetation.
- Old AWR dams –
  - Allow surface water in the dams to evaporate;
  - Remove reeds/sediment from dams and deposit onto the existing ash dam prior to final rehabilitation;
  - Doze embankments and spread this material over the basin to conduct final levelling to integrate with surroundings;
  - Reshape area to be free draining; and
  - Establish vegetation.
- Third water recovery dam –
  - Allow surface water in the dam to evaporate;
  - Excavate and transport contaminated sediment to nearby ash dam prior to final rehabilitation;

- Remove and dispose HDPE liner;
- Breach dam wall and reshape to 1:5;
- Reshape area to be free draining;
- Rip the underlying footprint to alleviate compaction; and
- Establish vegetation.

As part of the future repurposing of KPS, one of the proposed plans is to construct a solar PV plant on top of the ADF. This development can only proceed if the ADF is to be rehabilitated and capped, as discussed above. The proposed solar PV or any future use of the ADF will form part of another ESIA.

3.4.4.3 Ash Beneficiation

Ash beneficiation refers to the process of ensuring that the ash is sold commercially and used productively as a resource and not disposed of as waste. It was for this reason that Eskom was granted an exemption from DFFE on classifying the ash as waste. As part of a circular economy approach, DFFE has emphasised the need to convert waste products into resources.

"Weathered ash, "Flue gas desulphurisation gypsum" and "run of station ash" generated at the KPS may be used for permitted uses as specified in GN 85/2020 without requiring a WML, provided these uses adhere to the approved Risk Management Plan.

The ash uses exempted in this regard include cement, bricks and block making; geopolymers; filler applications; zeolites production; metal and mineral extraction; mineral fibre production; road construction; mine backfilling; treatment of acid mine drainage and soil amelioration.

From Eskom's perspective, KPS is not one of the most favourable stations for ash beneficiation. There is a lower market for ash beneficiation at Komati than at other stations. This is related to the location of KPS as well as the quality (age) of the ash. However, based on previous consultations, the local municipality has expressed interest in the use of the ash to construct bricks.

Should it be determined that a percentage of ash at KPS can be beneficiated, the removal thereof should be carefully guided by the stability assessments undertaken on an annual basis. Furthermore, the section of the ADF containing the old asbestos dumpsite, should not be beneficiated and should be closed as per its approved closure plan.

The option of ash beneficiation would prevent the development of solar PV plant on top of the ash dam. However, once the land has been reclaimed following beneficiation it can be used for other purposes, such a renewable energy development.

3.4.4.4 Treatment

Another re-use option to be considered is the treatment of the ash to remove harmful chemicals prior to selling the decontaminated ash. This option would require a WML as it falls outside the exempted activities.

3.4.5 Interrelatedness between Components A & B

While the repurposing of the KPS falls outside of the shutdown and dismantling ESIA application, the intention is to ensure that the decommissioned infrastructure is fit for re-use.

The following facilities occur on the areas earmarked for the proposed renewable energy development at KPS (Component B), as shown in Figure 11 below:

- Solar PV Area A – rehabilitated ash dam 2 (south-eastern part of earmarked site), water management system for ADF, and gravel access roads;
- Solar PV Area B – rehabilitated coal dump (north-western part of earmarked site), landing strip and helipad;
- BESS Area A – CED and other offices, as well as tarred access roads,
- BESS Area B – old shooting range;
- BESS Area C – waste storage site and water management system; and
- BESS Area D – Coal Stockyard (full extent of earmarked site).

It is noted that the layout for Component B was updated during the compilation of this updated draft ESIA Report. One of the significant changes included discarding BESS Area D at the Coal Stockyard.

The end-states for the above facilities that need to be achieved though closure will ensure that the affected areas are cleared and safe to enable the repurposing, with no significant residual environmental and social risks. Component A will not assess the impacts of the repurposing of the areas earmarked for Component B to ensure the integrity of the respective EIA processes for these projects.

From a regulatory perspective, DFFE will expect the shutdown and dismantling application to be authorised before the repurposing application is considered. The Department will not undertake incremental decision-making. It also highlights the close collaboration required between the project teams involved with closure and repurposing in terms of understanding the state of the receiving environment and managing the environmental and social risks.

The project team will work closely with the solar PV plant and BESS ESIA team to ensure that stakeholders are informed in a transparent manner and have complete knowledge of both projects. Similarly, the specialist on both projects will be briefed to ensure integration and interrogation of data so that the cumulative impacts of the projects are fully understood.

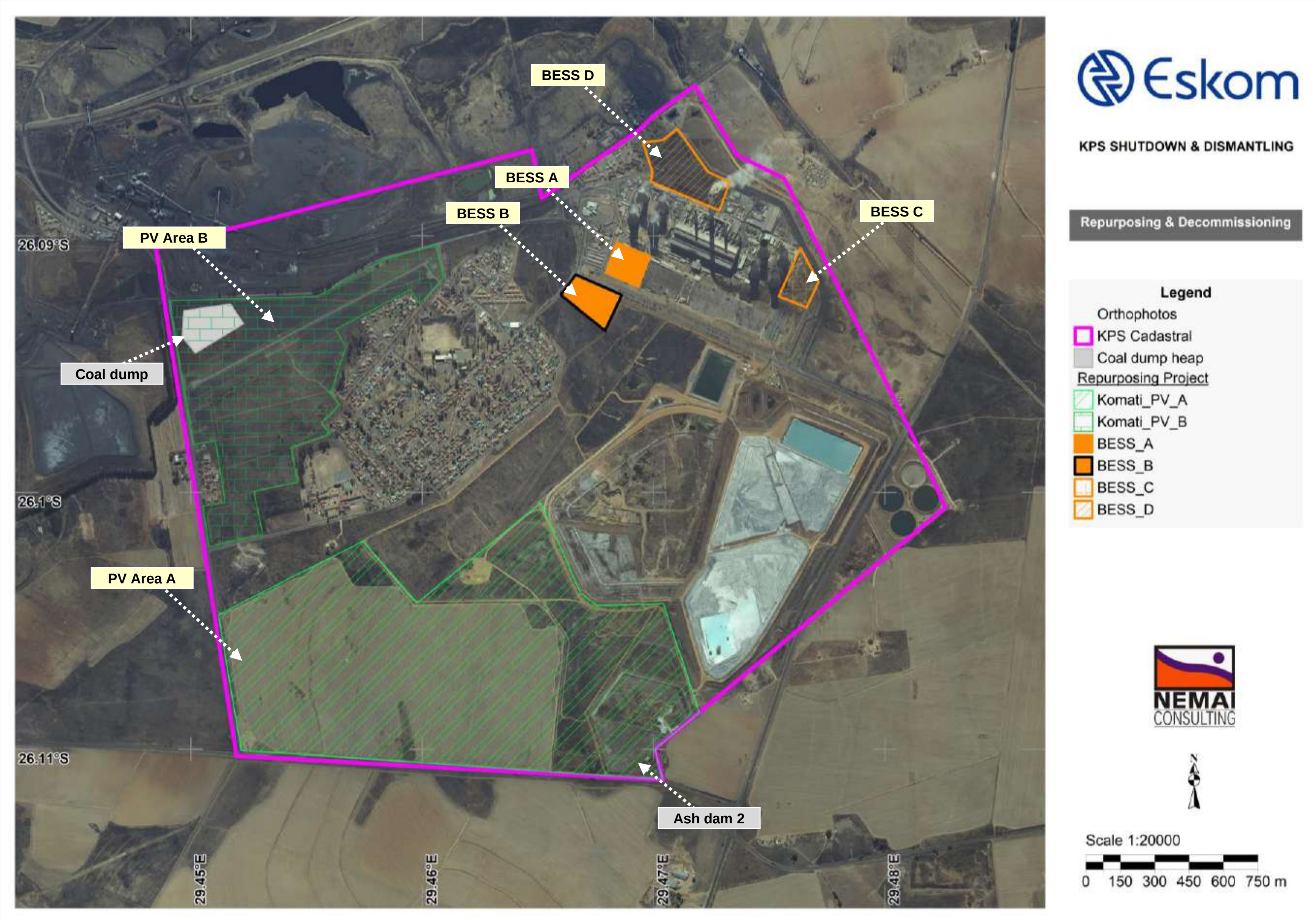


Figure 11: Areas identified for PV and BESS installation at KPS

CHAPTER 4: ENVIRONMENTAL & SOCIAL CONTEXT

4 ENVIRONMENTAL & SOCIAL CONTEXT

4.1 Introduction

This section describes the status quo of the Project's physical, biological, and socio-economic environment. The baseline serves to provide the environmental context within which the draft ESIA was conducted. It also allows for an appreciation of sensitive environmental and social features and possible receptors of the effects of the proposed Project. The baseline provides the standard against which impacts can be benchmarked.

As mentioned, the draft ESIA was largely informed by environmental and social baseline data extracted from existing literature and studies conducted for KPS. The study area for the draft ESIA varied, based on the features and attributes assessed. The regional context was first considered, whereafter the local site conditions at KPS were evaluated. The assessment was also guided by the potential receptors of impacts that may be caused by the Project.

The ESIA Report will include a comprehensive description of the receiving environment, based on the findings of detailed specialist studies yet to be undertaken and the outcomes of thorough stakeholder engagement.

4.2 Climate

KPS falls within an area with typical Highveld conditions. According to Hemming (2013), climatic conditions at KPS are as follows:

- Temperature –
  - The summers are moderate and wet while the winters are harsh, cold and dry. Minimum long-term temperatures have been recorded from -1.8°C to 13.7°C with maximum temperatures ranging between 18.4°C and 27.1°C, Average daily temperatures are in the middle 20°C range in summer (October to March) and are lower than 15°C in winter (April to September). Winter minima fall below 0°C in June, July and August.
- Precipitation –
  - The average total annual rainfall is approximately 735 mm with the rain falling mostly in the summer months (October to April). Peak rainfall occurs in January.
- Wind direction –
  - The prevailing wind directions are from the north-east and north, with frequencies of up to 10% and strong wind speeds of up to 15m/s. During the daytime the predominant winds are from the north-westerly, northerly and easterly sectors, with an increase in frequency of winds from the north-westerly sector. Night-time conditions are characterised by winds from the north-easterly and south-easterly sectors. In the summer months, winds from the easterly, south easterly and

northerly sectors dominate, and stronger winds of up to 15m/s occur from these directions. The winter months reflect winds from the northerly, south-easterly and westerly sectors, with a decrease in the frequency of winds from the northerly sector.

- The air quality monitoring station at KPS records meteorological parameters of wind velocity, wind direction and ambient temperature, humidity, ambient pressure and rainfall (Moatshe, 2022). Figure 12 and Figure 13 below show the wind roses for January 2017 until October 2021 for all hours, as well as day hours and night hours, respectively. The dominant winds for all hours are from north and north-east, with winds generally blowing from north-west to north-east at the monitoring station.

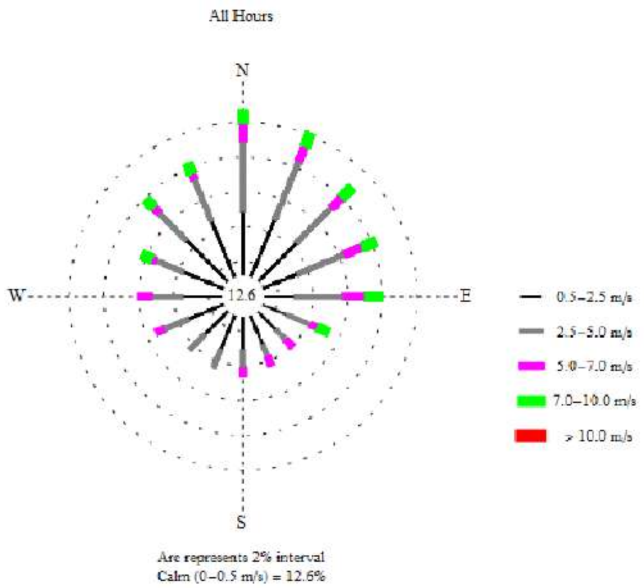
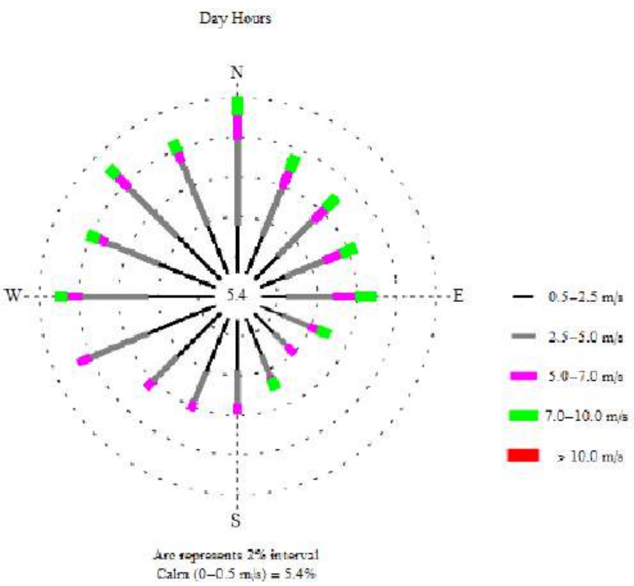


Figure 12: Wind rose at KPS monitoring site for all hours



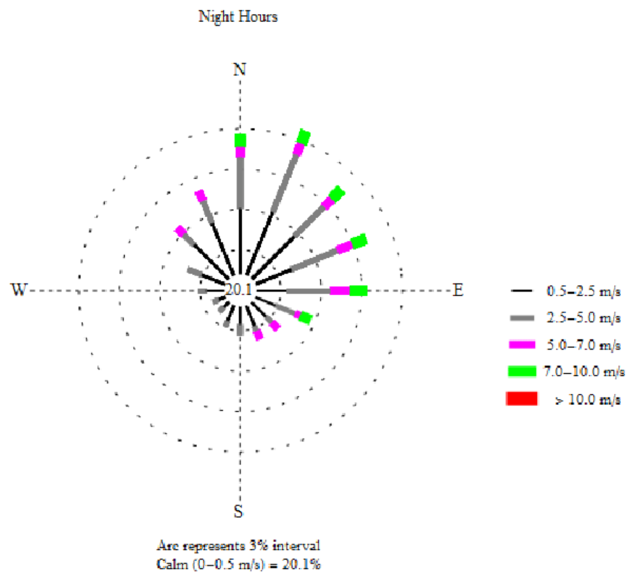


Figure 13: Wind rose at KPS monitoring site for day hours (left) and night hours (right)

4.3 Geology

A map of the geological conditions is provided in Figure 14 below. Although this map was sourced from a report that focused on the geotechnical conditions at the ash dam, it also shows that geology for the entire KPS.

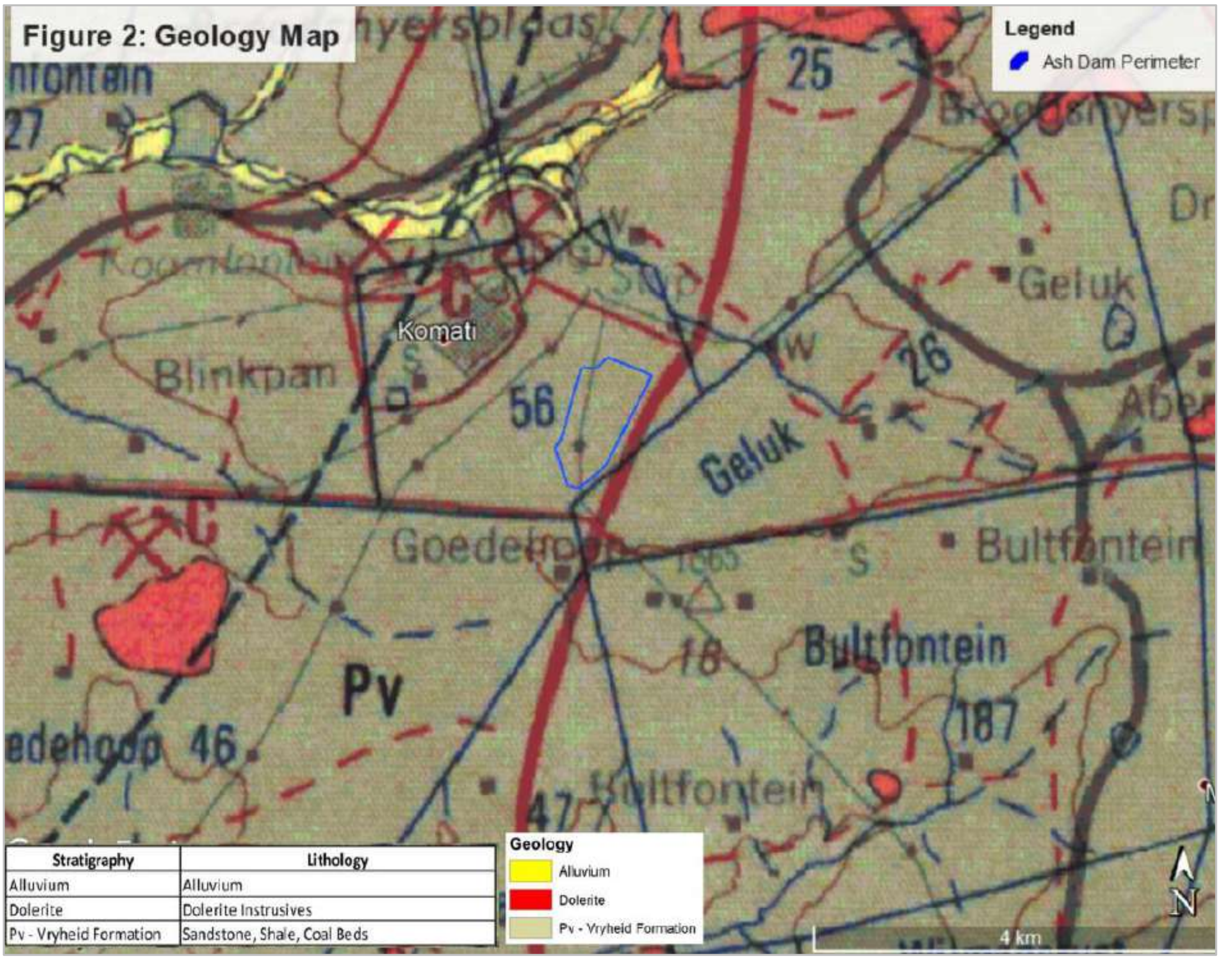


Figure 14: Geology Map (Cilliers, 2021) (ash dam perimeter highlighted)

The KPS site forms part of the Highveld Coalfield and falls within the Carboniferous to early Jurassic aged Karoo Basin, a geological feature that covers much of SA. The most relevant Karoo Supergroup relevant to the KPS site is the Permian aged Ecca Group. Although the Ecca Group is defined by 16 formations, only one dominates the immediate study area, namely the Vryheid Formation. The lower Vryheid Formation is described as upward coarsening shale and sandstone cycles, which represent prograding deltaic environments. This in turn is overlain by upward fining sandstone and shale cycles, which are of a fluvial origin. The coal beds, which were deposited in the back swamps of meandering river systems, cap the Lower Vryheid lithologies. The depositional environment is believed to be a dendritic channel system that resulted in the deposition of more arenaceous material in the active channels and mud and coal deposited on their floodplains.

Channel closure led to the filling of channels by mud, the establishment of swamps and the deposition of coal beds within them. Similar deltaic and fluvial processes characterise the sediments overlying the coal seams, consisting mainly of alternating sequences of shale and sandstone.

Although the Vryheid Formation dominant in the area, the Dwyka Formation makes up the other Two sedimentary unit of interest in the area. The Dwyka Formation is essentially comprised of a succession of glacial deposits characterised by angular to rounded clasts of the basement within a silt and clay matrix that were emplaced from the Late Permian, although varved shales, sandstone, and conglomerates typical of a fluvioglacial environment also occur (Mathetsa & Swartz, 2019).

4.4 Topography

The surface topography of the area is typical of the Mpumalanga Highveld, consisting mostly of a gently undulating plateau. In terms of the Soil and Terrain Digital Database (SOTER), the landform encountered at KPS is described as a "plain at high level" (shown in Figure 15 below).

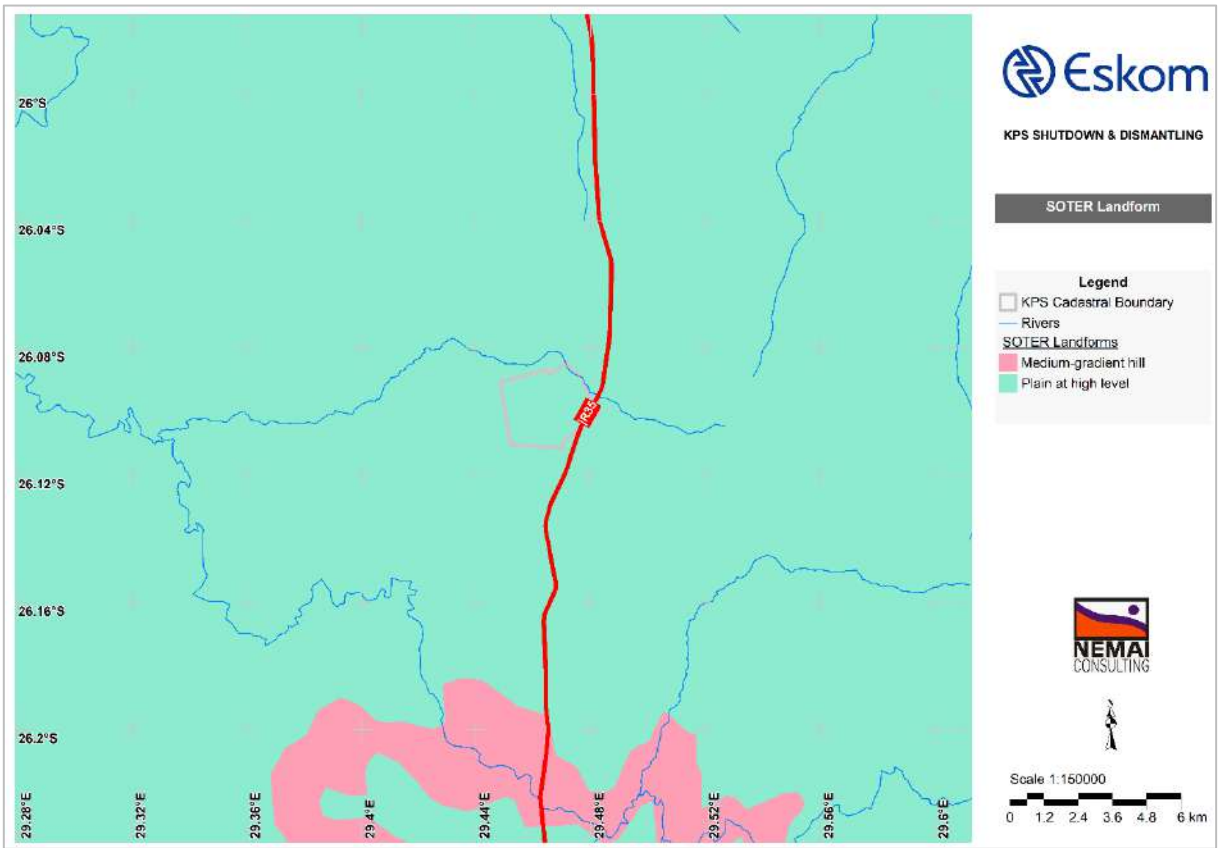


Figure 15: SOTER Landforms

According to van Niekerk & Staats, (2008), altitudes vary from ±1650 meters above mean sea level (mamsl) at the higher parts south of the ashing facility to ±1595 mamsl which defines the base of the Koring Spruit to the north of the KPS, while the power plant and coal stockyard is situated on a topographic flat ±1605 mamsl with a poor drainage pattern (see Figure 16 below).

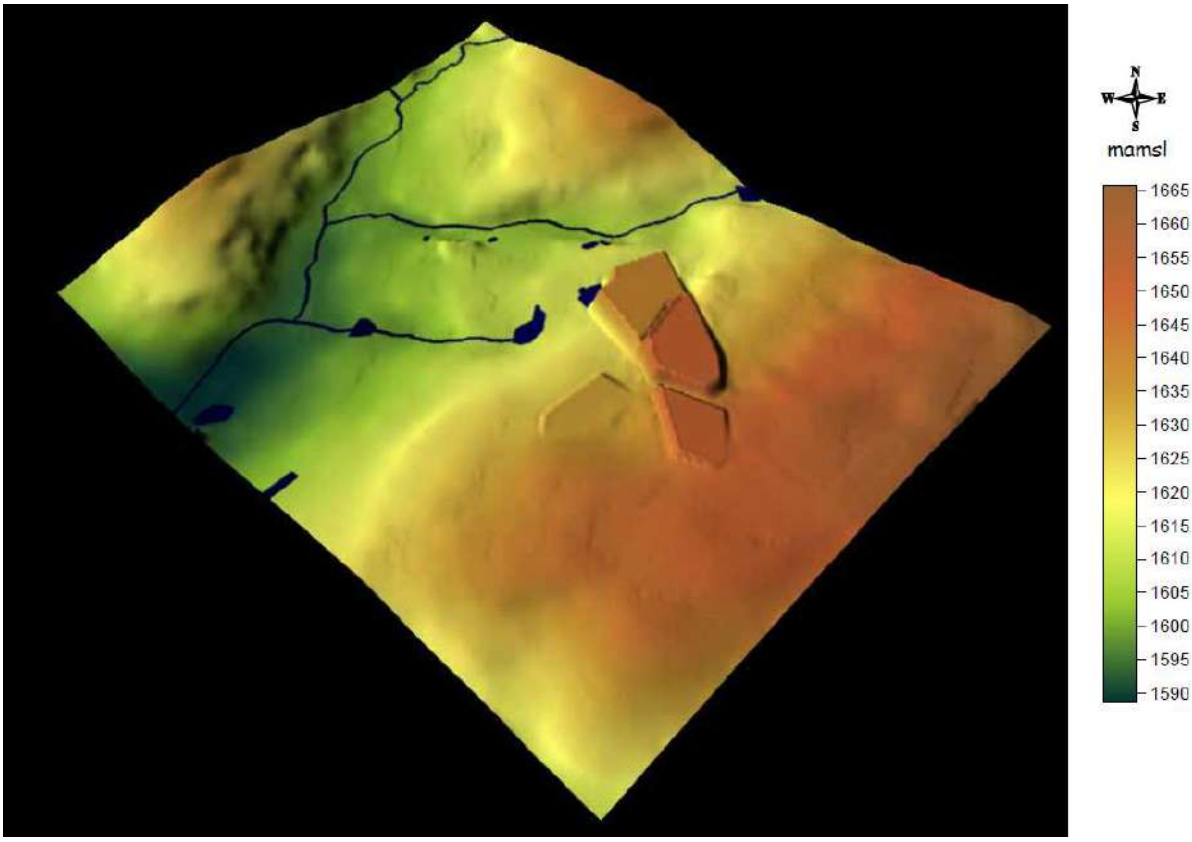


Figure 16: Current Topography of KPS (van Niekerk & Staats, 2008)

4.5 Groundwater

The following information was largely sourced from the numerical modelling and geochemistry assessment was undertaken at KPS in 2019 by Kimopax (Halenyane, 2019) and from the Rison Groundwater Consulting (2007) study. The two studies confirm the movement of subterranean water at KPS.

4.5.1 Geohydrological Setting

The Karoo rocks are not known for the development of economic aquifers but occasional high yielding boreholes may occur. Generally, these rock types can be divided into two distinct aquifers, namely a shallow weathered aquifer and a deeper fractured aquifer. According to Kimopax (Halenyane, 2019), the main water bearing aquifers in the vicinity of the KPS are fractured rock aquifers. Fracture refers to cracks, fissures, joints and faults, which are caused by (i) geological and environmental processes, e.g., tectonic movement; secondary stresses; release fractures; shrinkage cracks; weathering; chemical action; thermal action and (ii) petrological factors like mineral composition, internal pressure, grain size, etc.

From a geohydrological point of view, a fractured rock mass can be considered a multi-porous medium, conceptually consisting of two major components: matrix rock blocks and fractures. Fractures serve as higher conductivity conduits for flow if the apertures are large enough, whereas the matrix blocks may be permeable or impermeable, with most of the storage usually contained within the matrix. A rock mass may contain many fractures of different scales. The permeability of the matrix blocks is in most cases of practical interest a function of the presence of micro-fractures. A rock mass which consists only of large fractures and some matrix blocks with no micro-fissures (or smaller fractures) lead to a term called purely fractured rocks. In this case, the domain takes the form of an interconnected network of fractures and the rock matrix, comprising the blocks surrounded by fractures, is impervious to flow. However, there may still be porosity. In the case where the domain is a porous medium (or a micro-scaled fractured medium) intersected by a network of interconnected fractures, the rock is termed a fractured porous rock and the domain is therefore characterised by at least two subsystems, each having a different scale of inhomogeneity (called scale effect).

4.5.2 Aquifer Characteristics

Drilling data and work undertaken during previous investigations suggests that multiple aquifer types are represented at the KPS site, which include:

1. Unconfined aquifers present within soil horizons that have developed within colluvial and alluvial environments and the weathered upper levels of Ecca Formation sediments. These aquifers are generally perched on less permeable underlying in situ sediments.
2. Unconfined aquifers along the trend of dolerite dykes. These may also act as recharge points for confined aquifers within the Ecca Formation at depth.
3. Semi-confined aquifers within the Ecca Formation. These aquifers are commonly confined along essentially horizontal bedding interfaces between different lithologies but can be locally unconfined along the trend of fractures zones, which allows the aquifers to recharge seasonally. The aquifers can, therefore, be regarded as a semi-confined, or leaky confined, aquifer on a regional scale.
4. Deeper confined aquifers within basement lithologies.

According to Rison Groundwater Consulting (2007) the depth of weathering in the weathered aquifer is relatively deep in places. The general weathered aquifer extends to approximately 10 - 15m below surface. This aquifer, which is recharged by rainfall, is often perched and due to the impermeable shale horizons may even be artesian in places, hence the many natural springs. The largest accumulation of water is normally confined to the contact between the weathered and “fresh” bedrock. The borehole yields in this aquifer are generally low due to the very low aquifer parameters of the aquifer material. This aquifer is, however, more likely to be affected by contaminant sources situated on surface. Often the perched aquifer is not laterally extensive and is therefore not considered to be a significant aquifer. However, it often makes a contribution to the base flow of streams. This suggests that the two aquifers are interconnected and that groundwater seeps from the perched aquifer into the fractured rock aquifer.

From a pollution management viewpoint, the presence of a perched shallow aquifer is problematic due to resulting localised decreases in the bearing capacity of site profiles, and the increased potential for pollutant transport. In this instance, shallow aquifers are generally seasonal, which suggests that they either drain quickly (i.e., they are relatively permeable), have a low storage potential, or that stored water can be lost via evapo-transpiration processes.

While seasonally influenced, the perched aquifer is also artificially recharged by the different structure associated with the power generation activities, the relatively impermeable Karoo sediments which act as aquifer base in some areas of the shallow perched aquifer encouraging lateral migration through the unsaturated zone in these areas. In comparison, recharge to regional aquifers occurs via preferential pathways, such as fractures, dykes, bedding planes and highly weathered bedrock areas. The regional aquifers are therefore classified as fractured rock aquifers. In general, aquifers appear unconfined to semi-confined in character.

According to the conceptual model developed by Rison Groundwater Consulting (2007) (see Figure 17 below), a water divide to the south of the existing ash dams forms the upper groundwater flow boundary, whilst the tributary of the Koringspruit forms the lower groundwater boundary. Both the perched and fractured rock aquifers are heterogeneous in nature.

The findings from Rison Groundwater Consulting (2007) are supported by the 2019 study undertaken by Kimopax (Halenyane, 2019), which found that the subsurface around KPS is envisaged to consist of the following hydrogeological units:

1. The upper few metres (8 to 10m) below surface consist of completely weathered material. This layer is anticipated to have a reasonably high hydraulic conductivity but in general unsaturated. However, a seasonal aquifer perched on the bedrock probably does form in this layer, especially after high rainfall events. Flow in this perched aquifer is expected to follow the surface contours closely and emerge as fountains or seepage at lower elevations.
2. The next few tens of metres are comprised of slightly weathered, highly fractured sedimentary bedrock with low hydraulic conductivity. The permanent groundwater level resides in this unit and is about 1 to 10 metres below ground level. The groundwater flow direction in this unit is influenced by regional topography and for the site flow would be in general from high lying areas to the Koring Spruit, for the fractured bedrock.
3. Below a few tens of metres, the fracturing of the aquifer is less frequent and fractures less significant due to increased pressure. This results in an aquifer of lower hydraulic conductivity and very slow groundwater flow velocities. The cross-sectional model is presented in Figure 18 and Figure 19 below.

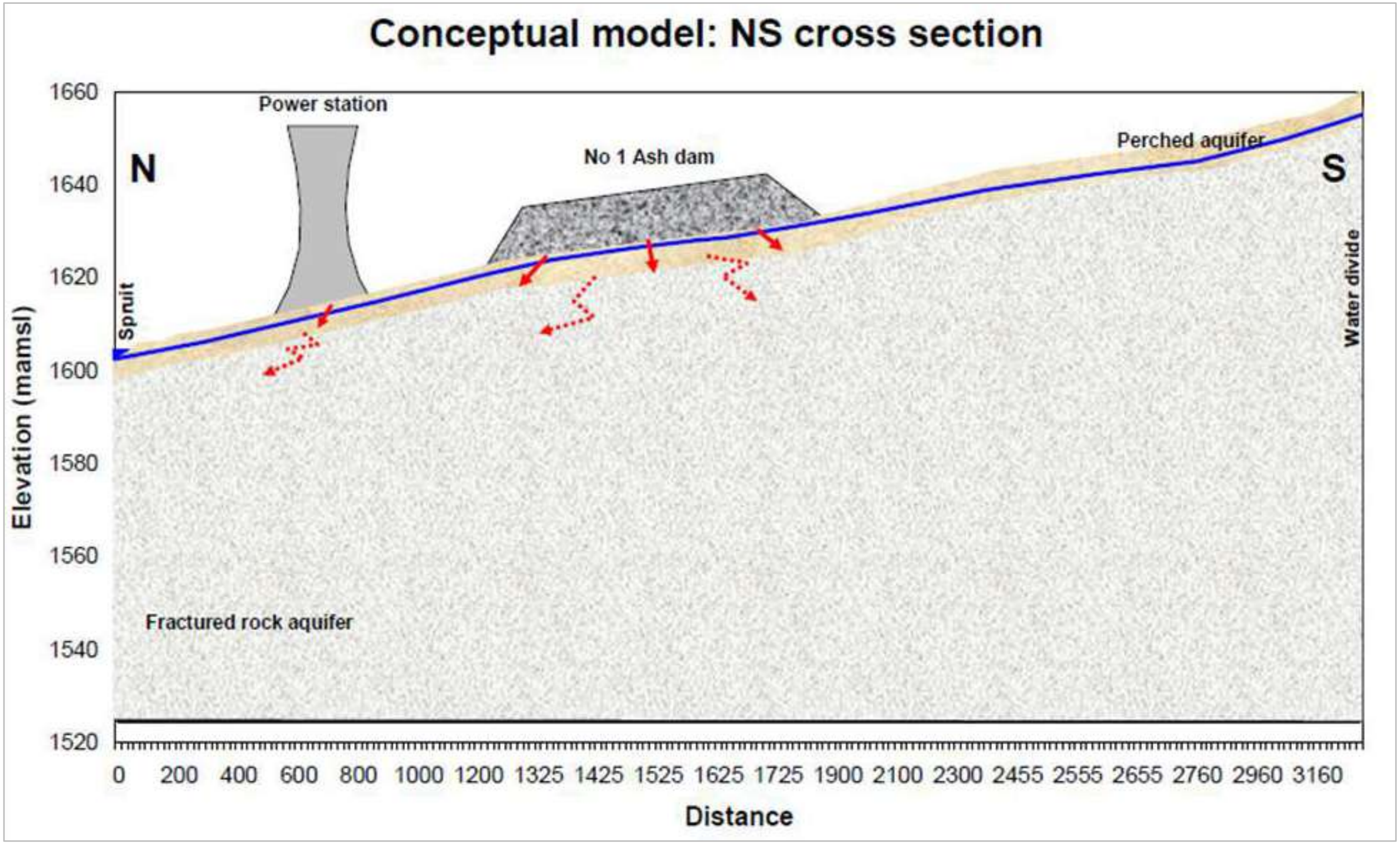


Figure 17: Cross sectional Conceptual Model (Rison Groundwater Consulting, 2007)

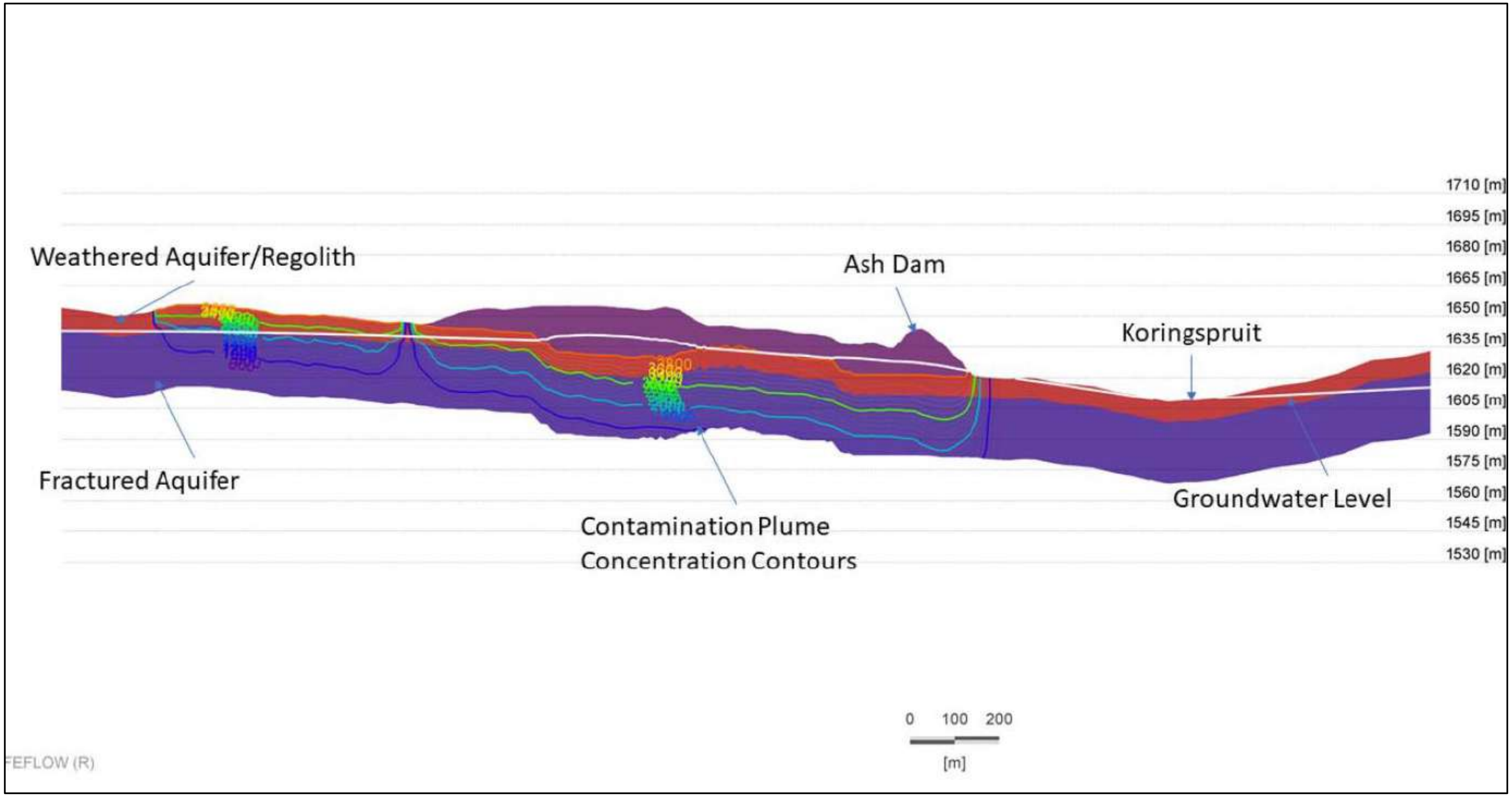


Figure 18: Cross sectional Conceptual Model (Halenyane, 2019)

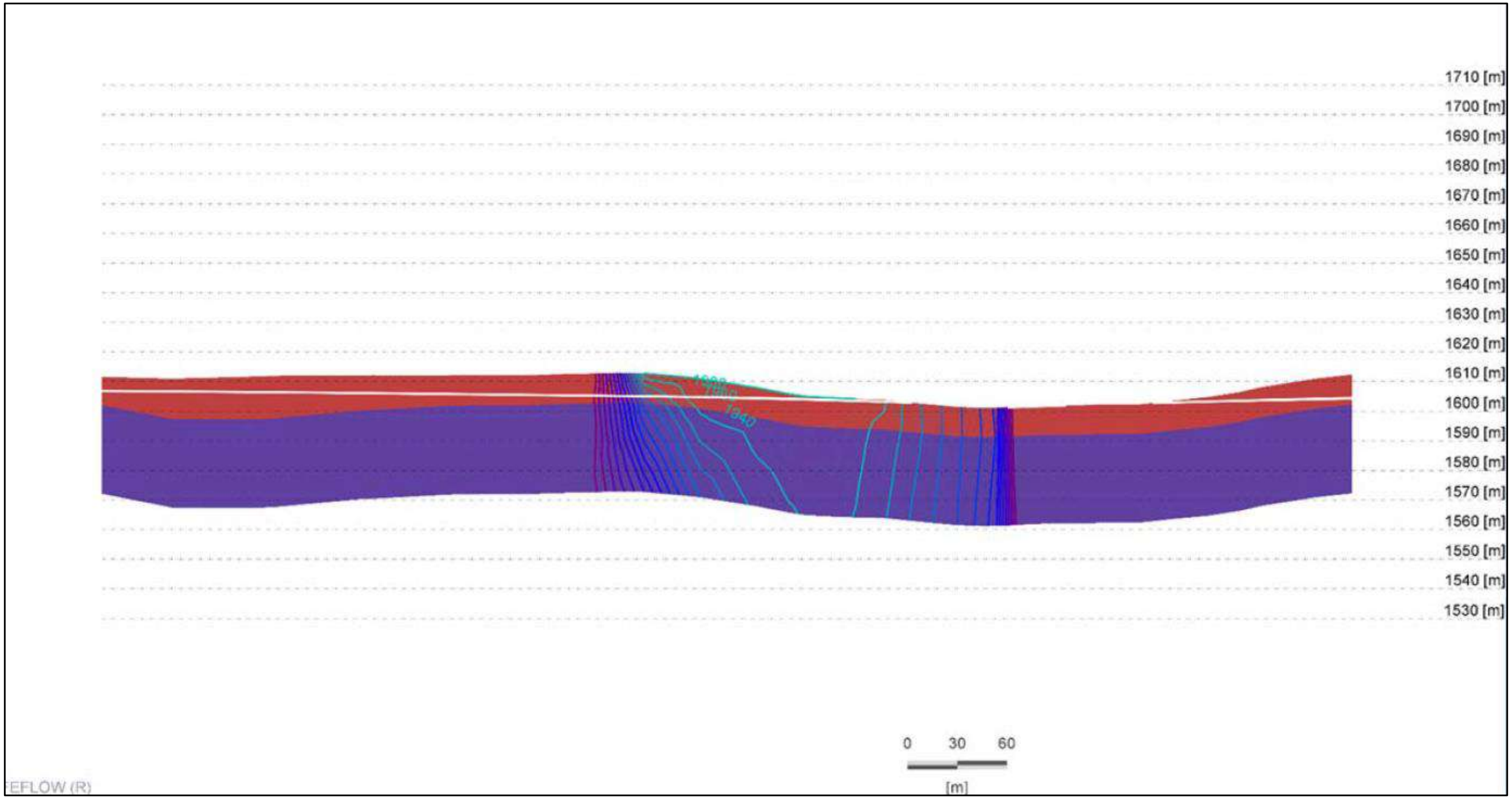


Figure 19:Cross-Section (South to North through Coal Stockpile) Illustrating Contaminant Transport (Halenyane, 2019)

A 99% correlation exists between groundwater levels and topography, as shown in Figure 20 below. The perched and fractured rock aquifers therefore discharge to the Koringspruit and its tributary. According to Rison Groundwater Consulting (2007), groundwater flows in a northerly direction towards the Koringspruit and its tributary at a gradient of approximately 1:70.

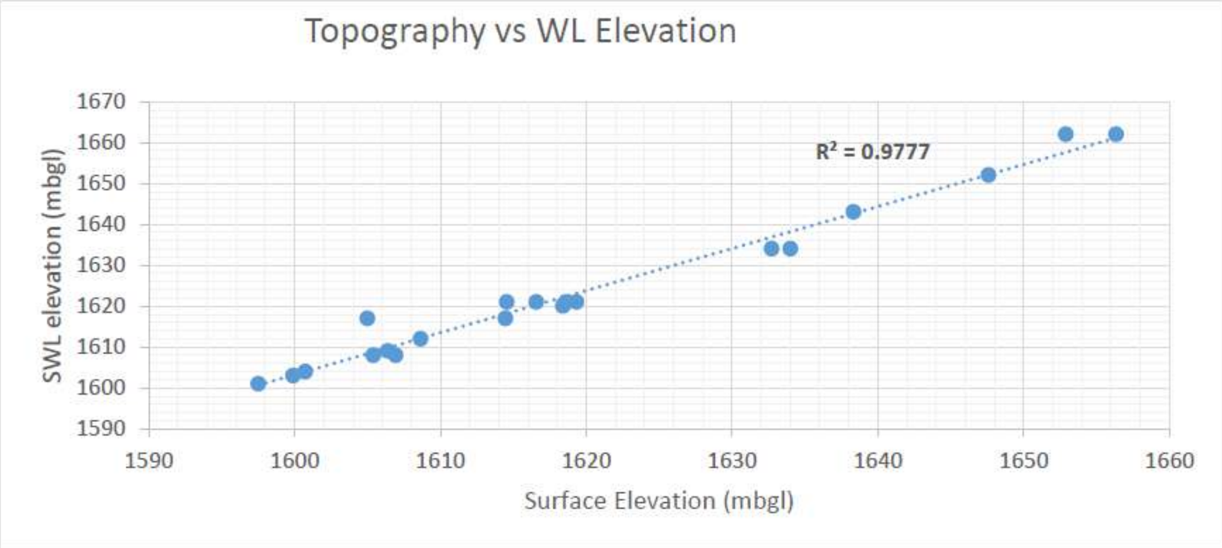


Figure 20: Correlation between Surface Topography and the Water Table (Rison Groundwater Consulting, 2007)

4.5.3 Groundwater Monitoring System at KPS

According to Mathoho *et al.* (2017) the return to service of KPS involved inter alia the upgrading and extension of certain facilities and infrastructure, as well as the installation of new facilities to bring the station into compliance with Eskom's Zero Liquid Effluent Discharge Policy and to meet its obligations in terms of the various WUL's issued for the operation of the power station. A ground water monitoring system was developed as the first line of deterrence of any potential groundwater contamination and for the early identification and mitigation of any potential sources of contamination. The groundwater monitoring programme focused on the main sources of pollution namely the (1) the ashing area, (2) the coal stockyard, (3) the power station area and (4) the sewerage treatment works which has since been handed over to the STLM.

Contamination of surface and groundwater occurs due to the various localised point sources and from activities over a wide area at KPS, which act as non-point or diffusive pollution sources. Examples of point sources may include hydrocarbon spills and sewage discharges, where possible non-point source may include the seepage and leachate emanating from the ash dump and coal stockyard.

The station currently conducts monitoring on a quarterly basis at various sites comprising of both surface and groundwater. The groundwater sites are situated upgradient and downgradient of the main pollution sources. The groundwater monitoring sites are reflected in in Figure 21 below. A description of the monitoring sites is included in Table 11 below. The station's monitoring network covers an area of approximately 10km^2, with monitoring points around the main pollution sources.

Table 11: Eskom's groundwater monitoring points at KPS

Site Name	Site Description	Latitude (ºS)	Longitude (ºE)
AB01	Monitoring borehole north and downstream of old rehabilitated domestic waste site.	-26.10885	29.46653
AB02	Monitoring borehole downstream and north of small ash dam as well as west of large ash dams.	-26.10053	29.46809
AB03	Monitoring borehole downstream and north of small ash dam as well as west of large ash dams.	-26.09855	29.46826
AB04	Monitoring borehole north-west of ash dams and south of dam AP02.	-26.09615	29.46831
AB05	Monitoring borehole next to Komati Spruit west of power station.	-26.08999	29.46438
AB06	Monitoring borehole north and downstream of ash dams.	-26.09551	29.47715
AB07	Monitoring borehole north and downstream of seepage recovery dam AP03.	-26.09225	29.47787
AB47	Monitoring borehole close to Komati Spruit, west of power station.	-26.8096	29.464304
AB53	New Deep monitoring borehole Ash Area, west of ash dam below dam PD04. In town area.	-26.09439	29.46588
AB54	New Shallow monitoring borehole Ash Area. west of ash dam below dam PD04, next to AB53.	-26.09439	29.46588
AB55	New Deep monitoring borehole Ash Area. North of ash dam. Next to tar road at entrance road to PS.	-26.09697	29.48057
AB56	New Shallow monitoring borehole Ash Area. North of ash dam. Next to tar road at entrance road to PS.	-26.09697	29.48057
AB57	New monitoring borehole Ash Area. west of ash dam below dam PD04. Close to entrance gate to ash dam from the town area.	-26.09553	29.46569
AB58	New monitoring borehole Ash Area. South of ash dam T junction - Witbank road.	-26.11205	29.47342
AB59	New Shallow monitoring borehole Ash Area South of ash dam. T junction - Witbank road.	-26.11205	29.47642
AB61	New Deep monitoring borehole Ash Area. East of ash dam. Next to Middelburg road.	-26.10081	29.47881
AB62	New Shallow monitoring borehole Ash Area. East of ash dam. Next to Middelburg road.	-26.10081	29.47881
AB63	New monitoring borehole Ash Area. South west of ash dam. Below farmer's land.	-26.104	29.46485
CB09	Monitoring borehole north and downstream of Coal Stockyard dirty water dam CP06.	-26.08481	29.4711
CB49	Deep borehole west of Coal Stockyard.	-26.08414	2946645
CB50	Shallow borehole west of Coal Stockyard.	-26.08422	29.46652

Site Name	Site Description	Latitude (ºS)	Longitude (ºE)
CB51	New monitoring borehole Coal Stockyard Area.	-26.08678	29.4711
CB52	New monitoring borehole Coal Stockyard Area.	-26.08496	29.46517
PB08	Monitoring borehole north and downstream of power station dirty water dams PP05.	-26.0878	29.47429
PB48	Monitoring borehole north of sewage plant.	-26.08713	29.46177
PB60	New monitoring borehole Power Station Area.	-26.08799	29.47389
BB13	Koornfontein 27/6	-26.06403	29.44845
BB14	Broodsnyersplaas 25/10	-26.05469	29.48485
BB15	Broodsnyersplaas 25/28	-26.05852	29.49044
BB16	Broodsnyersplaas 25/1	-26.07076	29.50683
BB17	Broodsnyersplaas 25/5	-26.07593	29.49821
BB18	Broodsnyersplaas 25/5	-26.07736	29.49867
BB19	Broodsnyersplaas 25/5	-26.07693	29.49741
BB21	Geluk 26/7	-26.10598	29.47954
BB22	Geluk 26/7	-26.10586	29.47907
BB23	Geluk 26/7	-26.10632	29.47905
BB38	Middelkraal 50/1	-26.17902	29.48366
BB39	Middelkraal 50/1	-26.17877	29.48336
BB40	Middelkraal 50/1	-26.17864	29.48339

In May 2022, WSP installed 10 additional boreholes within KPS as part of the solar PV and BESS ESIA (Component B). The location of the additional boreholes is shown in Figure 22 below.

Based on the topography and geohydrological description of the Project area, the combined groundwater monitoring points, which are shown in Figure 23 below, provide reasonable coverage of the known and potentially contaminating pollution sources.

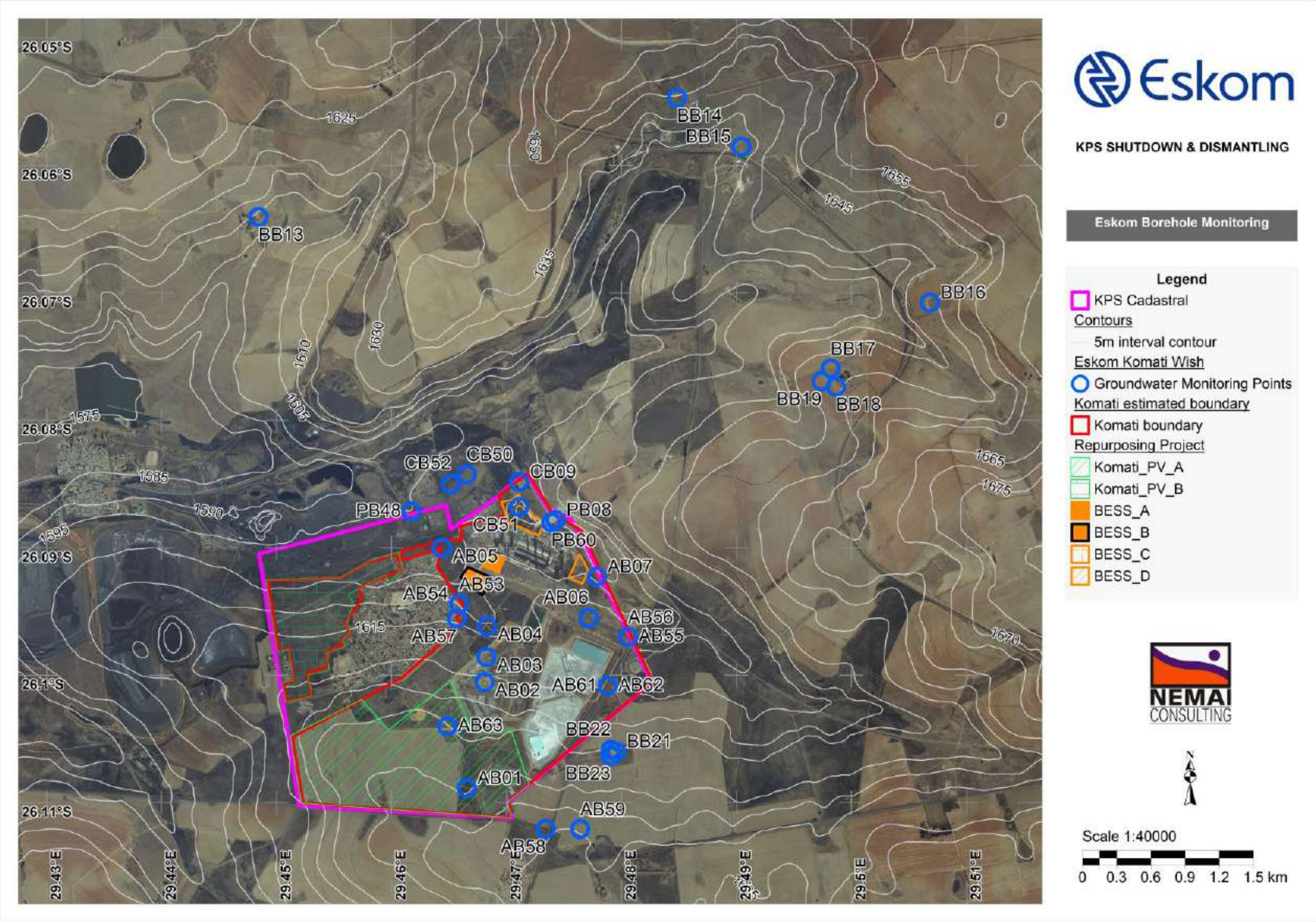


Figure 21: Eskom's Groundwater Monitoring Points

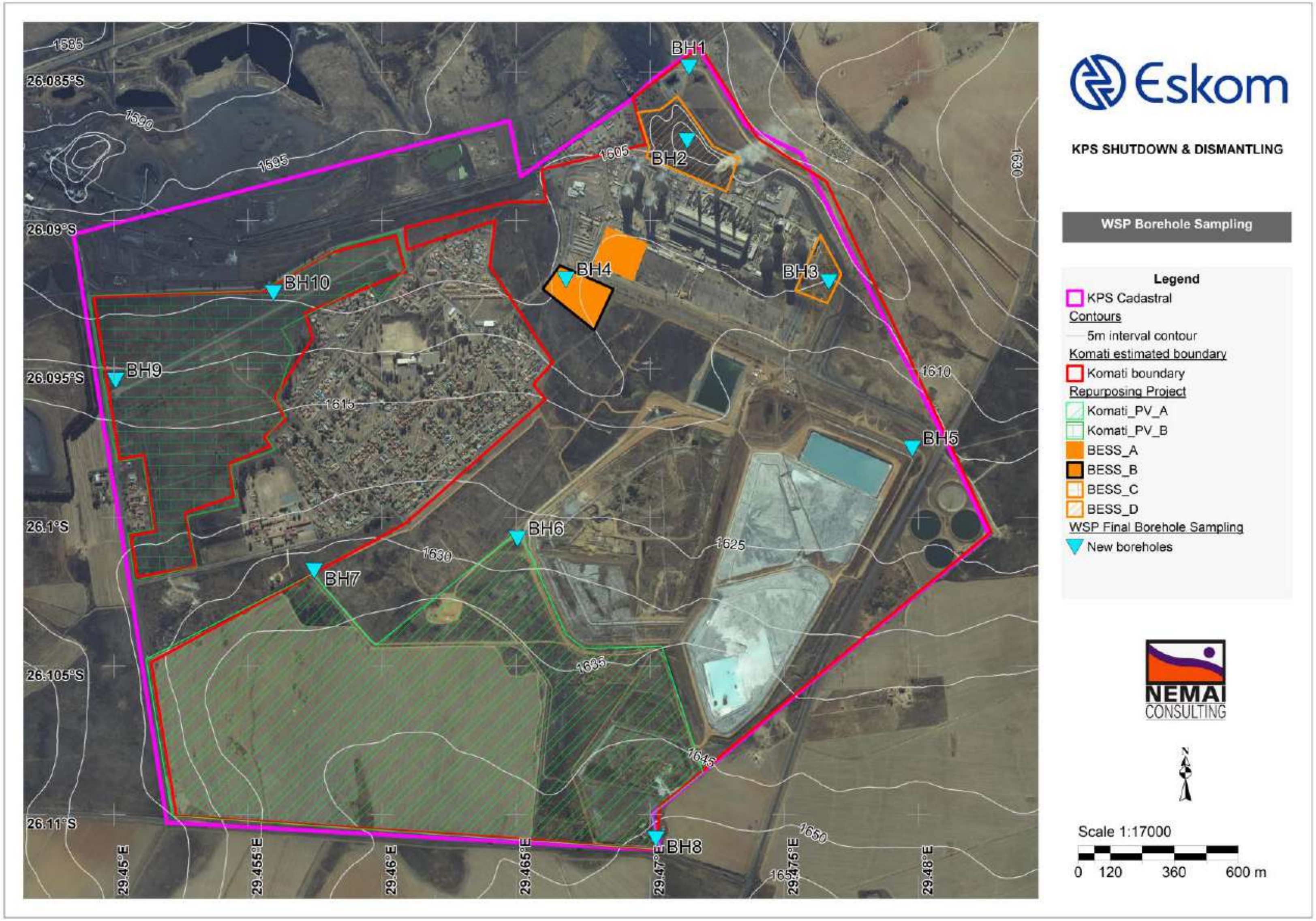


Figure 22: 10 Additional Groundwater Monitoring Points (WSP, 2022)

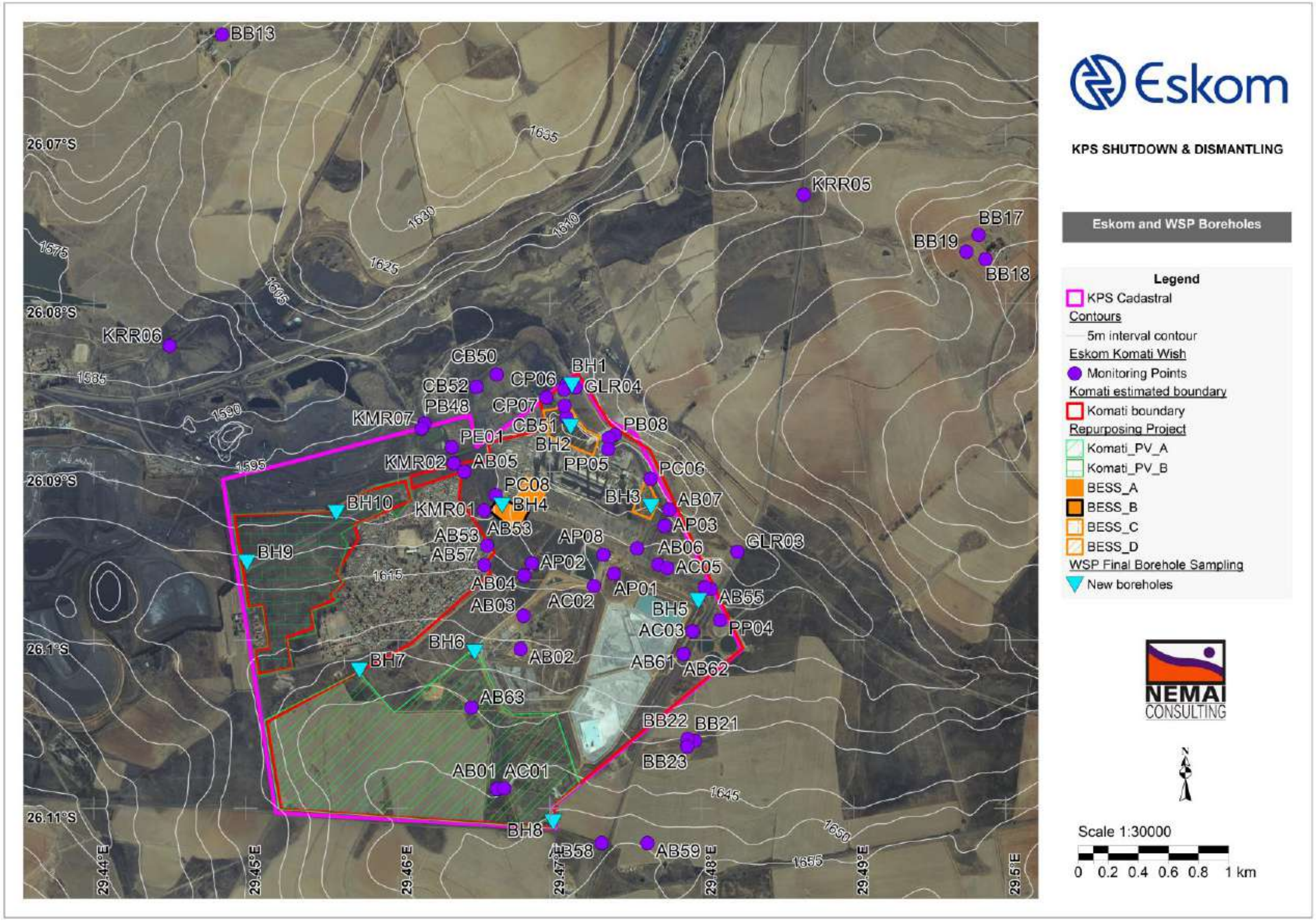


Figure 23: Combined Eskom and WSP Groundwater Monitoring Points

4.5.4 Groundwater Quality

4.5.4.1 KPS WUL Water Quality Parameters

The water quality parameters listed in KPS's existing WUL (WUL No. 04/B11B/BCGI/1970) are shown in Table 12 below.

Table 12: Water quality parameters listed within WUL 04/B11B/BCGI/1970 (VPC GmbH, 2021)

Parameter	Limit
pH	6.0 – 8.0
Electrical Conductivity (mS/m)	<100
Suspended Solids (mg/l)	<25
Dissolved Oxygen (mg/l)	≥6.0
Turbidity	≤3.0
Alkalinity (mg $CaCO_3$/l)	≤150
Calcium (mg/l)	≤130
Magnesium (mg/l)	≤50
Sodium (mg/l)	≤70
Potassium (mg/l)	≤25
Chloride (mg/l)	≤25
Sulphate (mg/l)	≤380
Fluoride (mg/l)	≤1.0
Silica (mg/l)	≤3.0
Aluminium (mg/l)	≤0.02
Boron (mg/l)	≤0.5
Chromium-VI (mg/l)	≤0.05
Iron (mg/l)	≤1.0
Manganese (mg/l)	≤0.4
Phosphate (mg/l)	≤0.05
Nitrates (NO_3/NO_2) (mg/l)	≤1.0
Ammonia (NH_3)	≤0.007
BTEX, TPH (mg/l)	≤0.1

4.5.4.2 Historical Data and Trend Analysis

Eskom has been monitoring groundwater since 1990 as outlined in Figure 21 above. Groundwater monitoring has largely been undertaken to satisfy WUL conditions for the recommissioning of the power station. The parameters monitored include pH, electrical conductivity (EC), chloride, fluoride, nitrate, sulphate, calcium, magnesium and sodium.

Given the time constraints to compile the draft ESIA Report for the shutdown and dismantling of KPS, only a few constituents, using a risk-based approach, were analysed to identify groundwater pollution trends since the recommissioning of KPS.

From a risk perspective, selected monitoring points downstream of the ash dams, the coal stockyard and around Komati Village were used in the trend analysis to observe the risks to human and animal health. Using these criteria as a guide, the first monitoring points that were selected for analysis include the following:

- AB04 – borehole north-west of ash dams and south of dam; and
- AB06 – borehole next to Komati Spruit west of power station.

These monitoring points form an arc downstream of the ashing facilities for the power station, as shown in Figure 24 below.

Figure 24: Sampled Groundwater Monitoring Points for the Ash Dams

The second set of monitoring points form an arc downstream of the coal stockyard, as shown in Figure 25 below:

- CB09 – borehole north and downstream of coal stockyard dirty water dam; and
- PB08 – borehole north and downstream of power station dirty water dams.

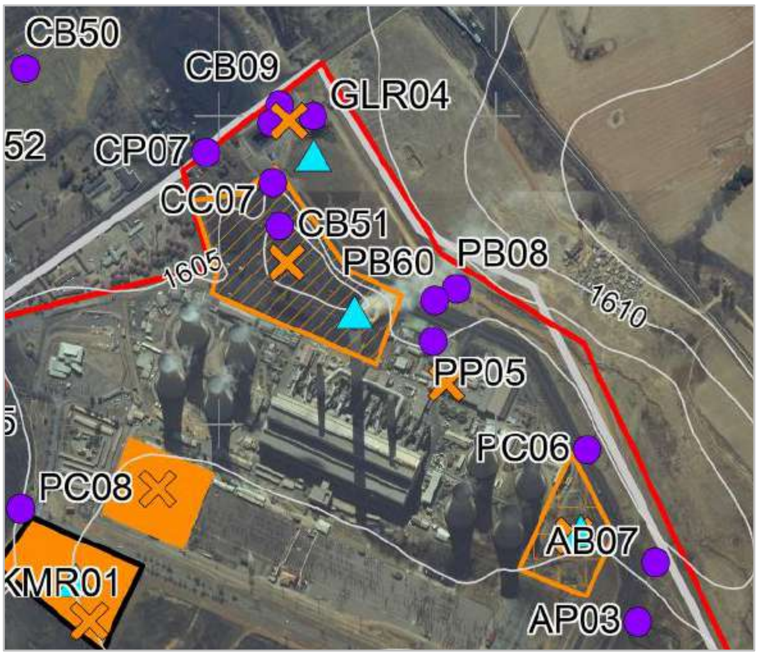


Figure 25: Sampled Groundwater Monitoring Points for the Coal Stockyard

The third set of monitoring points are located adjacent to the nearest large population centre (i.e. Komati Village), as shown in Figure 26 below:

- AB53 – new deep monitoring borehole, west of ash dam, on the eastern edge of Komati Village; and
- AB57 - new monitoring borehole Ash Area, west of ash dam, close to entrance gate to ash dam from the Komati Village town area.

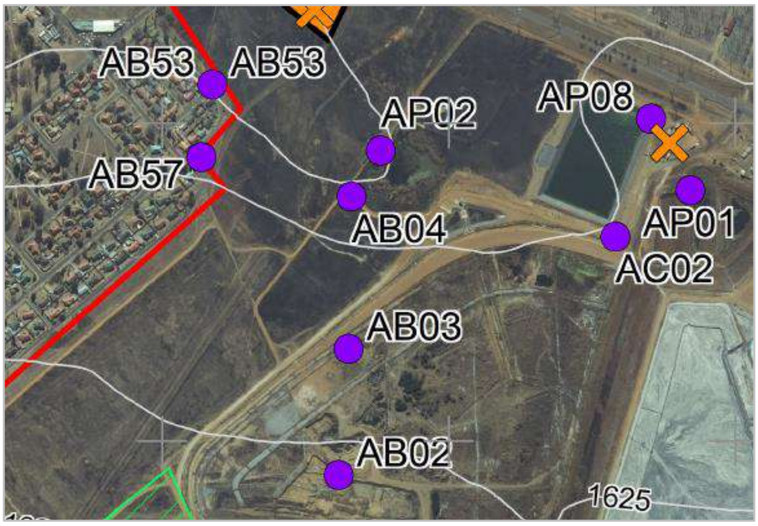


Figure 26: Sampled Groundwater Monitoring Points for Komati Village

Both are located just inside Komati Village, on the eastern-most edge of the village and at the points closest to the ash dams.

Only water quality indicators with the most complete data sets were selected for analysis. It is emphasised that this is a high-level analysis to identify trends over the 30-year time span. The data was analysed against the limits set in WUL 04/B11B/BCGI/1970.

A total of 1 677 observations were made in the period between 1990 and 2022. Only the following indicators had the most complete data sets:

- pH – limit 6.60;
- EC – Electrical Conductivity, limit 112 mS/m;
- Ca – Calcium, limit 95.92mg/l;
- Mg - Magnesium, limit 37.95mg/l;
- Na - Sodium, limit 0mg/l;
- Cl - Chloride, limit 30.80mg/l; and
- SO_4 - Sulphate, limit 0mg/l.

The limits of 0mg/l for Na and SO_4 are considered unrealistic when these constituents are naturally occurring in groundwater. Hence, comparable thresholds of 6.81mg/l for Na and 3.37mg/l for SO_4, used in other power stations within a 100km radius of KPS, were used in the high level trend analysis.

The sampling frequency for constituents varies widely across the individual monitoring points between 1990 and 2022. For instance, in some points, a constituent may be sampled once annually, whilst another constituent might be sampled 6 times annually. The norm appears to be two sampling events per year.

4.5.4.2.1 Komati Village

At monitoring borehole AB57 (see Figure 27 below) the average value for Ca, Mg and Cl was 28.7, 13.9 and 8.0 mg/l respectively which did not exceed the WUL limits of 95.9, 37.9 and 30.8 mg/l, respectively between 2011 and 2022.

However, the average value of Na and SO_4, of 30.6mg/l and 6.3 mg/l respectively, did significantly exceeded the WUL limits of 0 mg/l over the time period. In addition, KPS also exceeded the limits of 6.81 mg/l for Na and 3.37 mg/l for SO_4, set at other power stations in the vicinity.

The average pH value over the period was 8.3, which did not exceed the WUL range for pH. The average EC over the period was 35.4 mS/m which is below the WUL limits.

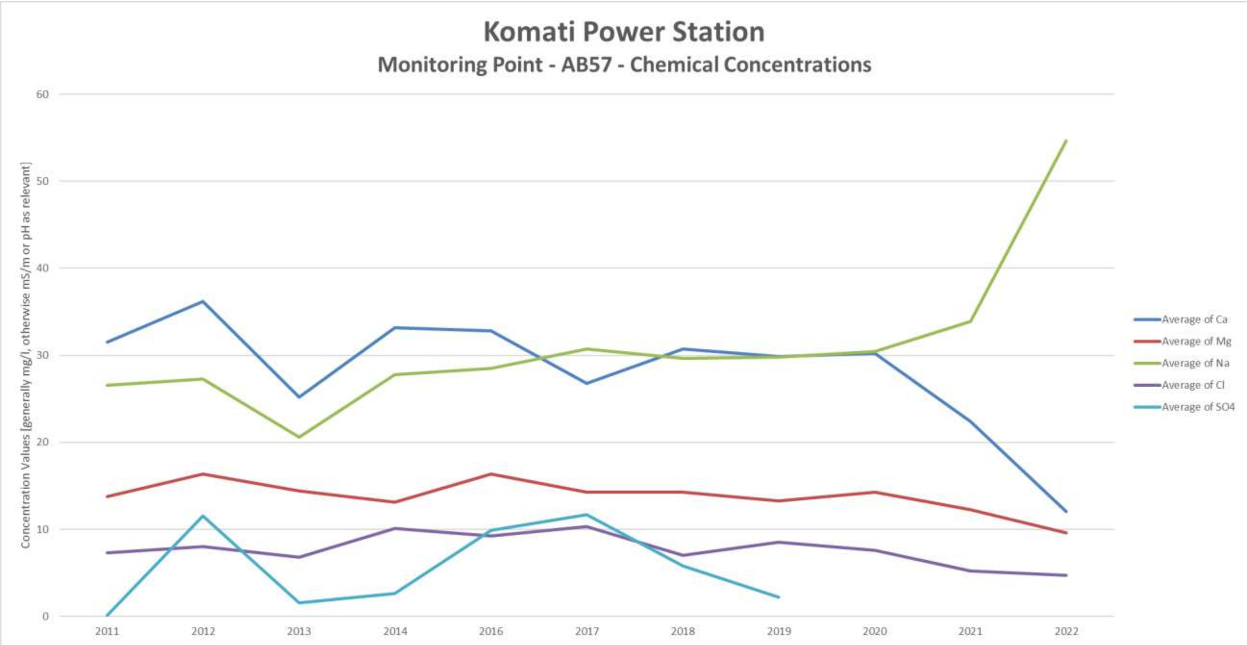


Figure 27: Chemical Results Summary – AB57

At monitoring borehole AB53 (see Figure 28 below) the average value for Ca, and Mg was 31.7mg/l, and 15.5 respectively which did not exceed the WUL limits between 2011 and 2022.

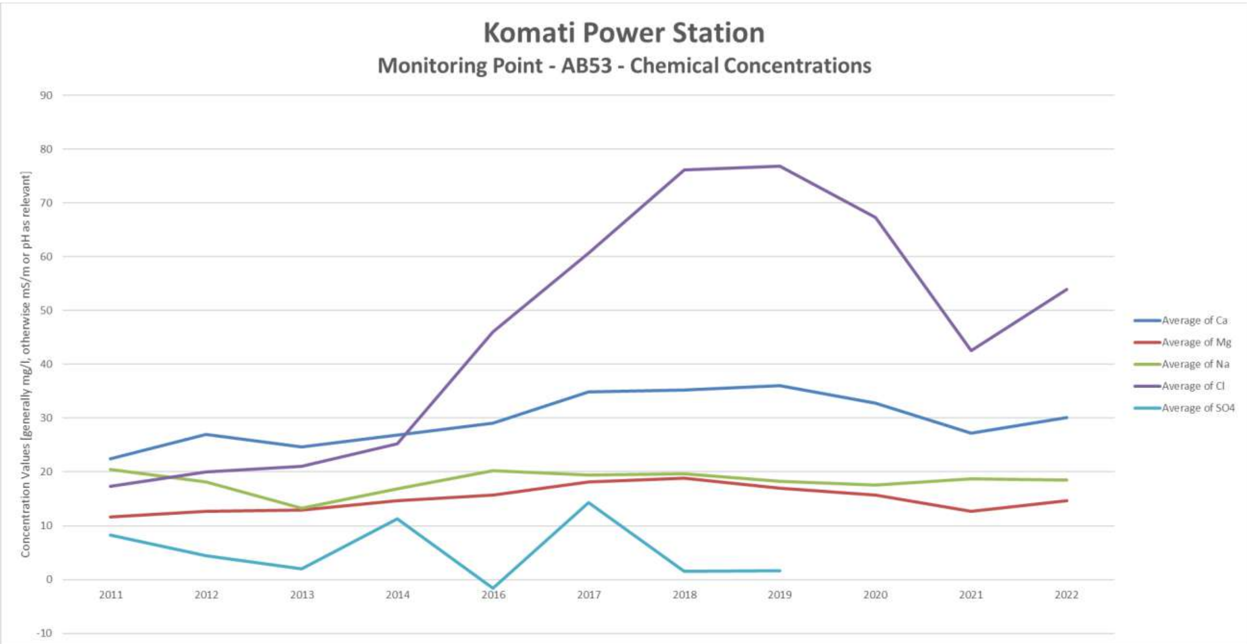


Figure 28: Chemical Results Summary – AB53

The average value for Cl was 54.7 mg/l which is in exceedance of the limit and has showed an upward trend since 2014.

The average value of Na and SO_4, was 18.3mg/l and 4.4 mg/l respectively between 2011 and 2019. Both constituents exceeded the WUL limits and the values set at other power stations in the vicinity. Although the data set for SO_4 is incomplete, there is a general decreasing trend of sulphate concentrations in the groundwater at monitoring point AB53.

The average pH value over the period was 8.03, which is in exceedance of the WUL limit.

The average electrical conductivity over the period is 37.5 mS/m, which is below the WUL limits.

KPS was fully recommissioned in 2011 while in late 2020 the power station stated to scale down activities. During this period, groundwater pollution upstream of Komati Village showed elevated levels of pollution of Na and SO_4. In the main, monitoring point AB53 shows greater signs of pollution than AB57. Values for Na and SO_4 exceeded limits found at other power stations by up to four times which poses a health risk to the village and the environment.

The groundwater pollution trends upstream of Komati Village were influenced by the operations of KPS.

4.5.4.2.2 Coal Stockyard

The sampling frequency at both boreholes CB09 and PB08 was generally twice annually in the period between 1990 and 2004. The frequency increased to 3 times annually between 2011 and 2019 inline the recommissioning of KPS.

For monitoring point CB09 (see Figure 29 below), a complete set of monitoring data existed between 1990 to January 2008. Monitoring data between 2008 and 2011 are considered flawed and were therefore not factored in the trend analysis.

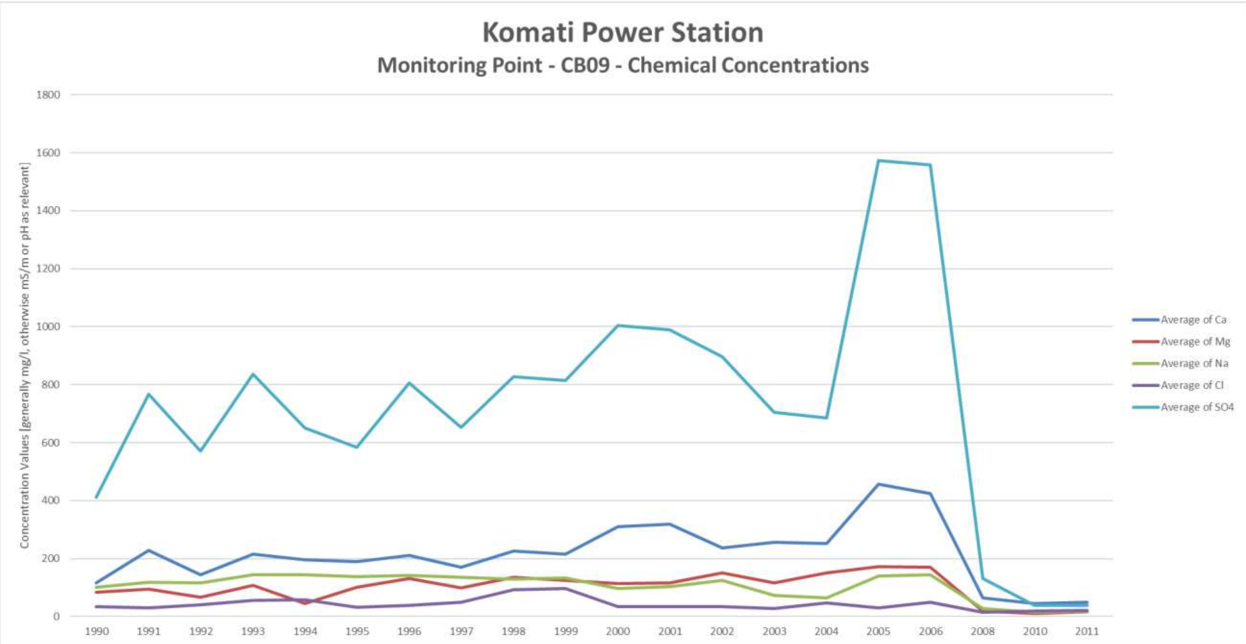


Figure 29 Chemical Results Summary – CB09

The results show that the average concentration of Ca, Mg, Cl, Na and SO_4 was 207.5, 98.1, 108.3, 42.5, and 701.8 mg/l respectively which grossly exceeds the WUL limits.

The average pH value was 7.36 over the period which is outside the WUL limit.

Electrical conductivity was 188.6 mS/m also in noncompliance with the WUL.

Monitoring data for PB08 (see Figure 30 below) was available from 1990 to mid-2019, the data thereafter is incomplete.

The results show that the average concentration of Ca and Mg was 53.4 and 36.9 mg/l respectively which did not exceed the WUL limits.

The average value for Cl was 79.1 mg/l which exceeded the WUL limit.

Th average Na and SO_4 values of 143.8 and 270.8 mg/l respectively were grossly above the WUL limit and the pollution control limits for other power stations in the area.

The average pH value was 8.12 over the period which did not exceed the WUL limit.

The average electrical conductivity was 113.2 mS/m which only slightly exceeded the WUL limit of 112 mS/m.

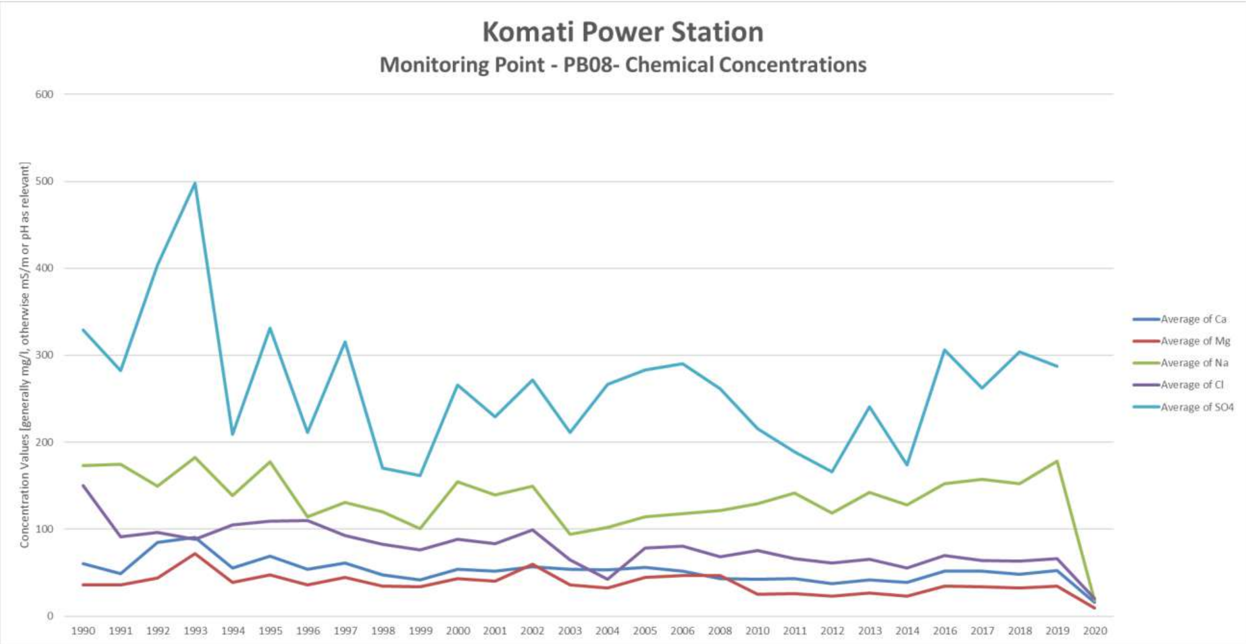


Figure 30 Chemical Results Summary – PB08

Although KPS was mothballed between 1990 and 2008, there are signs of groundwater pollution in both boreholes with elevated concentration levels of Na and SO_4. This is either from other pollution sources in the area or leachate from the dirty water dams or pollution from the ash dam area making it way to the coal stockyard area.

After the full recommissioning of KPS in 2011, the groundwater pollution levels especially with regard to Na and SO_4 increased significantly with instances in which the SO_4 levels exceeded the WUL limit by as much as 80%.

4.5.4.2.3 Ash Dams

Monitoring data for AB04 (see Figure 31 below) was available from 1990 to 2022.

The results show that the average concentration of Ca, Mg and Cl was 98.1, 91.8 and 103.4 mg/l respectively. While Ca only marginally exceeded the WUL limit both Mg and Cl significantly exceeded the limits.

The average Na concentration in the period was 94mg/l and the average SO_4 concentration was 358mg/l. Both of which far exceed the WUL limits.

The average value for pH was 7.83 over the period, and the value for electrical conductivity was 141.5 mS/m. The electrical conductivity value exceeds the limit of 112 mS/m.

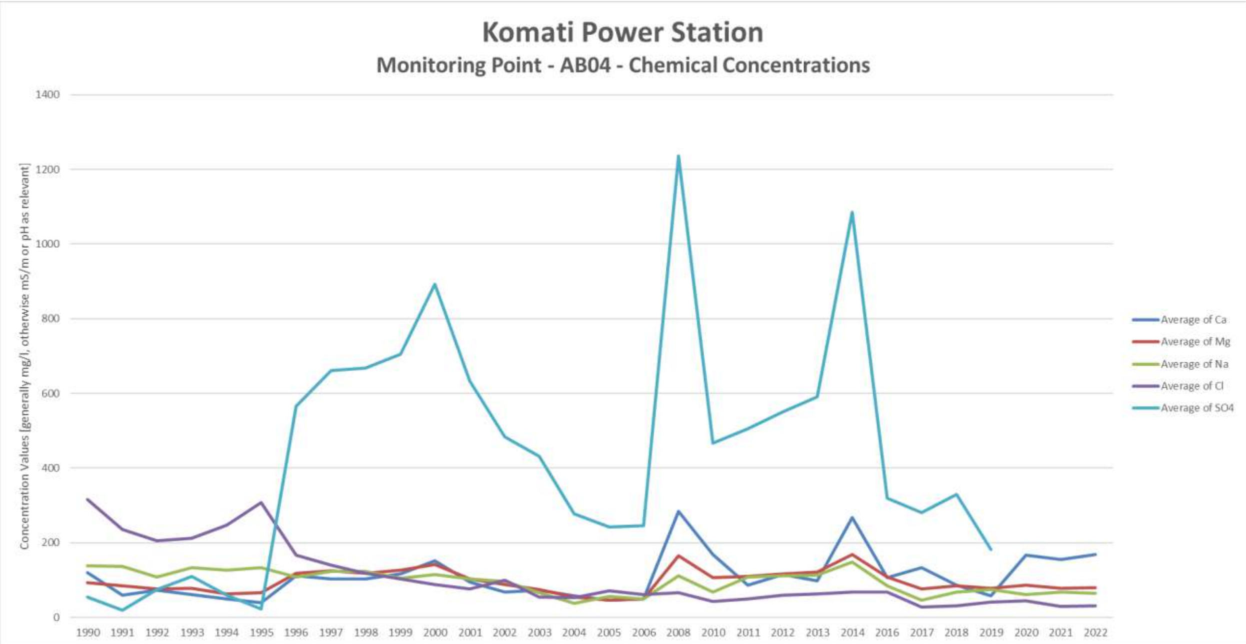


Figure 31: Chemical Results Summary – AB04

Monitoring data for AB06 (see Figure 32 below) was available from 1990 to 2022.

The results show that the average concentration of Ca and Mg was 44.9 and 29.8 mg/l respectively which did not exceed the WUL.

The average Cl concentration was 44.7 mg/l which was just above the WUL limit.

Both Na and SO_4 at average concentrations of 63.9 and 112.5 mg/l respectively, exceeded the WUL limits and the tolerated levels at the other power stations.

The average pH value was 7.67 over the period, and the value for electrical conductivity was 68.6 mS/m.

From the analysis of both monitoring boreholes, it is clear that the contamination levels downstream of the ash dams demonstrate high levels of exceedance.

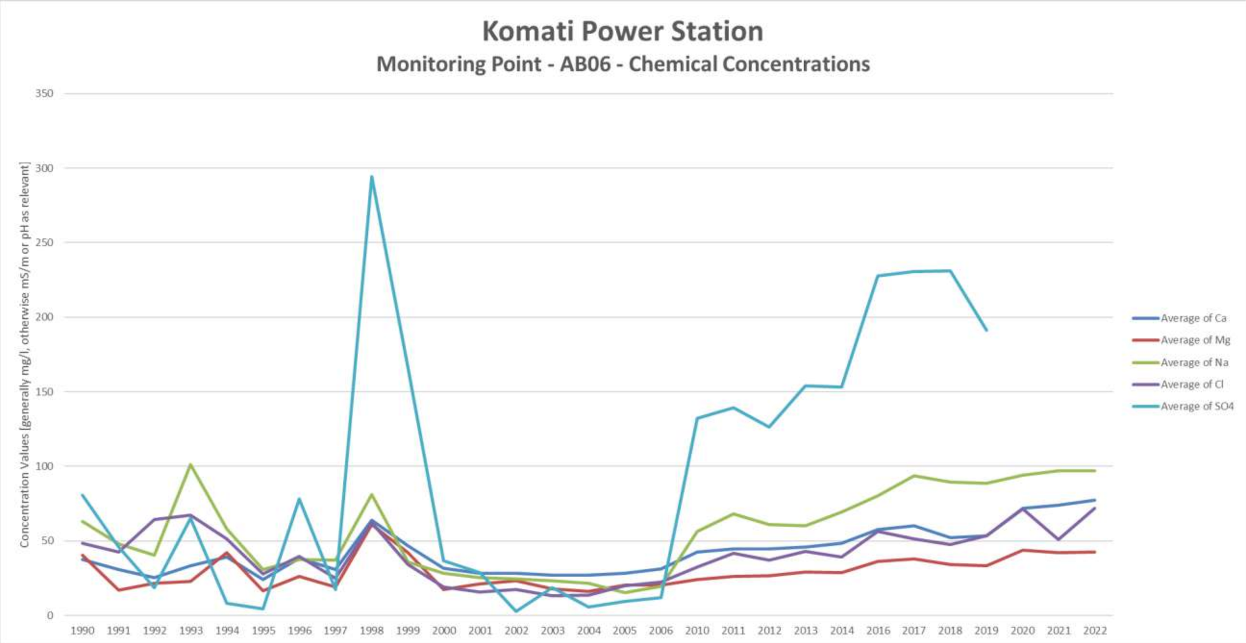


Figure 32: Chemical Results Summary – AB06

Between 1995 and 1999 the SO_4 concentration spiked significantly. During this period KPS was decommissioned hence no ashing activities were taking place. This must relate to a localised incident of the failure of the ash dam pollution containment system. Then again between 2000 and 2006 the concentration values steadily decrease. After 2006 the SO_4 level increase again in line with the recommissioning of KPS with a steady increase from 2011 onwards when all units were commissioned. From 2019 activities at KPS were being scaled back resulting in a downward trend in the average SO_4 concentration.

The levels of pollution around the ashing facility are mirrored by the operational history of the power station, leaving no doubt that the groundwater around KPS is polluted.

4.5.4.3 Current Data Analysis

4.5.4.3.1 Eskom Data

The latest Eskom groundwater quality data is from January 2022. The monitoring was undertaken in compliance with WUL (04/B11B/BCGI/1970) to assess the impact of KPS on water resources, WML's for the ash disposal facility (12/9/11/L1010/6) and for decommissioning of the asbestos disposal site (12/9/11/L73467/6). The pollution indicator parameters related to the coal fired power station environment was informed by the Minimum

Requirements for Water Monitoring at Waste Management Facilities (DWAF, 1998). The results were compared to the quality thresholds stipulated in the WUL and the Drinking Water Quality Standard, South African National Standards (SANS) 241:2015. It is noted in the reports generated by Eskom that several WUL limits are more stringent than the requirements set in the Drinking Water Quality Standards (SANS 241:2015), hence these standards are also used to screen monitoring results.

According to Sinthumule (2022), all monitoring points exceeded the pH limit of 6.60, except at sites AB07, AB54, and PB48. The Electrical conductivity (EC) was found to be higher than the threshold of 112,31 mS/m at several sites (including AB04, AB07, AB55, AB56, AWR, AB07 and AB62). These sites with exceedances are within the vicinity of the ashing area.

The results for sodium (Na) and chloride (Cl) from most of the boreholes surrounding the coal stockyard and ashing areas exceeded the thresholds of 0.00 mg/l and 30.80 mg/l respectively.

The fluoride (F) thresholds were exceeded around the ashing area. While most of the monitored sites comply with the threshold for calcium (Ca) of 95,92 mg/l, AB04, AB07, AB51, AB56 and AB62 exceeded the limits. These monitoring points are around the ashing facility except for AB51 which is not part of the groundwater monitoring system.

Finally, the sulphate (SO_4) limit was exceeded at all the monitoring sites. Coal fired power stations have a legacy of sulphate pollution of the groundwater resources and KPS is no exception.

Refer to Table 13 and Table 14 below for the full groundwater quality data.

It is clear from the Eskom monitoring data that there are signs of significant pollution of groundwater resources emanating from the operations of KPS. These findings are in line with historical pollution trends from the power station.

Table 13: Ground and Surface Water Hydrochemistry Results Screened against Station's WUL

Site ID.			EC	pH	Ca	Mg	Na	K	MAlk	F	Cl	NH4	NO3-N	PO4	SO4	Al	Fe	Mn	Si	B	TDS-cal	Cr6+	Cu	Zn	TSS	NTU
			112.31	6.60	95.92	37.95	0,00	NS	NS	0.44	30.80	NS	10.93	NS	0,00	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
			mS/m	Unit	Mg/l	Mg/l	Mg/l	Mg/l	Mg/l	Mg/l	Mg/l	Mg/l	Mg/l	Mg/l	Mg/l	Mg/l	Mg/l	Mg/l	Mg/l	Mg/l	Mg/l	Mg/l	Mg/l	Mg/l	Mg/l	Mg/l
AB04	AA	Surface and Groundwater	157	7,25	222	84,9	61,5	11,2	568	0,321	30,3	0,702	-0,194	0,014	503	-0,002	-0,004	0,211	10,3	0,029	1316	-0,004	0,008	-0,002	17	72,4
AB05	AA		100	6,82	74,6	42	95,9	7,51	137	-0,263	67,4	0,045	-0,194	0,013	298	-0,002	-0,004	0,396	11,5	-0,013	744	-0,004	0,003	-0,002	38	160
AB07	AA		218	6,32	264	117	139	10,1	131	0,607	72,4	0,194	-0,194	-0,005	1080	-0,002	7,38	6,63	14,1	0,086	1882	-0,004	0,009	-0,002	25	64,3
AB51	AA		170	7,04	269	93	57,9	11,5	503	0,536	15,6	0,089	-0,194	0,017	730	-0,002	-0,004	0,827	8,97	0,119	1524	-0,004	0,009	-0,002	12	10,7
AB08	AA		106	8,52	17,7	109	82,2	1,64	276	0,355	47,3	0,761	-0,194	0,015	281	-0,002	-0,004	0,134	1,61	0,021	824	-0,004	0,011	-0,002	54	67,3
AB53	KRA		33	7,54	29,6	14,2	17,3	7,64	104	0,373	53,9	0,106	-0,194	0,013	2,64	-0,002	-0,004	0,113	2,15	-0,013	252	-0,004	-0,002	-0,002	44	106
CB08	CSYA		61,8	8,36	34	23,4	80,2	9,79	240	0,347	25,5	0,079	-0,194	0,013	72,2	0,011	-0,004	-0,001	1,85	0,014	400	-0,004	0,002	-0,002	45	6,74
CB60	CSYA		21,7	8,81	14,4	9,02	22,7	4,2	97,5	0,352	19,5	0,025	-0,194	0,013	5,51	-0,002	-0,004	0,015	1,52	-0,013	152	-0,004	-0,002	-0,002	6	4,83
AB56	AA		221	7,38	163	172	163	3,87	199	-0,263	68,1	0,134	-0,194	0,013	1036	-0,002	-0,004	0,968	1,64	0,043	1848	-0,004	0,013	-0,002	35	136
AB52	KRA		34,3	8,71	6,25	11	54,1	13,4	187	-0,263	5,07	0,161	2,65	0,017	2,27	-0,002	-0,004	0,004	6,54	-0,013	230	-0,004	-0,002	-0,002	8	6,88
AB58	AA		21	6,58	8,38	9,46	14,4	7,78	40,1	-0,263	8,05	0,1	2,69	0,013	31,6	-0,002	-0,004	0,069	12,7	-0,013	152	-0,004	-0,002	-0,002	15	31,7
AB54	KRA		14,6	8,5	6,71	3,69	14,9	8,91	74,6	-0,263	5,18	0,645	-0,194	0,014	-0,141	-0,002	-0,004	0,002	-0,026	-0,013	96	-0,004	-0,002	-0,002	-4,5	1,66
AB55	AA		178	7,5	83,5	85,1	225	4,06	279	-0,263	58,9	0,174	0,253	0,022	639	-0,002	-0,004	0,242	3,3	-0,013	1378	-0,004	0,009	-0,002	23	126
AB61	AA		37,2	8,7	15,8	17,7	37,8	7,95	135	-0,263	18,7	0,114	-0,194	0,013	50,2	-0,002	-0,004	0,003	1,35	-0,013	222	-0,004	-0,002	-0,002	-4,5	25,4
AB57	AA		41,9	7,33	40,1	19,9	22,5	6,78	192	-0,263	29,4	0,019	-0,194	0,018	14,1	-0,002	-0,004	0,009	27,3	-0,013	288	-0,004	-0,002	-0,002	39	54,9
AB63	AA		18	8,83	6,33	7,26	17,1	5,9	32,7	-0,263	22,1	1,02	-0,194	0,013	22,7	-0,002	-0,004	0,004	0,087	-0,013	92	-0,004	-0,002	-0,002	-4,5	8,81
AB06	AA		64	7,59	57,6	31,6	56,2	2,7	274	0,721	19,9	0,032	-0,194	0,017	69,8	-0,002	-0,004	0,002	5,75	-0,013	462	-0,004	0,003	-0,002	9	4,93
AWR	AA		133	6,71	70,6	46,8	185	5,51	244	0,664	65,7	0,335	-0,194	0,015	405	-0,002	-0,004	0,551	16,7	-0,013	1002	-0,004	0,004	-0,002	39	190
PB47	PSA		27,2	8,38	4,42	4,74	47,2	4,06	53,6	-0,263	48,5	0,5	-0,194	0,014	7,17	-0,002	-0,004	-0,001	0,427	-0,013	182	-0,004	-0,002	-0,002	7	2,2
AB59	AA		73,9	7,66	71,3	22,6	57	15,8	146	0,393	41,4	0,308	-0,194	0,027	180	-0,002	-0,004	0,011	4,48	0,32	502	-0,004	-0,002	-0,002	87	132
KMR01	KSA		42,5	7,83	39	22,7	29,1	3,13	199	0,542	10,5	0,032	-0,194	0,014	43,4	-0,002	-0,004	-0,001	6,92	-0,013	292	-0,004	-0,002	-0,002	5	128
AB62	AA		151	8,06	185	39,3	129	23,1	234	0,855	80,8	0,031	-0,194	0,014	506	-0,002	0,019	0,092	5,92	0,856	1202	-0,004	0,004	-0,002	8	2,51
KMR07	AA		133	7,52	128	63,9	104	12,1	263	0,754	64,6	0,036	2,43	0,043	415	-0,002	-0,004	4,3	7,01	0,123	1096	-0,004	0,007	-0,002	23	7,1
PB48	SA		85,4	6	74,6	37,5	53,8	13,2	15	0,636	34,6	0,08	0,966	0,014	358	0,259	0,075	0,258	10,6	0,08	600	-0,004	0,033	0,094	-4,5	3,92
KMR08	AA		106	8,46	83,4	14,4	107	27,1	44,3	0,477	69,7	0,054	-0,194	0,016	383	0,042	-0,004	0,013	6,56	0,957	778	-0,004	-0,002	-0,002	8	1,19
Ash Dam	SA		108	7	71,4	1,41	132	45,1	116	-0,263	93,7	0,026	-0,194	0,011	276	-0,002	0,006	0,219	6,32	0,581	782	-0,004	-0,002	-0,002	44	5,44
3rd Recovery Dam	AA		80,2	7,91	74,2	35,9	52,7	12,5	87,4	0,613	33,1	0,044	0,563	0,014	281	-0,002	-0,004	-0,001	6,2	0,104	630	-0,004	0,01	0,009	22	10,2

Monitoring site exceeds the WUL limit of the parameter (Exceeds)

Monitoring site satisfies the WUL limit of the paramter (Satisfy)

NS: No Standard

AA - Ashing Area

YA - Coal Stock Yard Area

ver Station Area

KRA - K

SA - Sewage A

AWRD - Ash Water Re

Negative values (e.g. -0.1) in the table denote "smaller than (<)" values (e.g. <0.1). ONLY applicable to chemical results.

Table 14: Ground and Surface Water Hydrochemistry Results Screened against Drinking Water Quality Standards (SANS 241:2015)

Site ID.			EC	pH	Ca	Mg	Na	K	MAlk	F	Cl	NH4	NO3-N	PO4	SO4	Al	Fe	Mn	Si	B	TDS-cal	Cr6+	Cu	Zn	TSS	NTU
			<170	5-9,7	NS	NS	<200	NS	NS	<1,5	<300	NS	<11	NS	<250	<0,02	<0,3	<0,1	NS	<2,4	<1200	NS	<2	<5	NS	<5
			mS/m	Unit	Mg/l	Mg/l	Mg/l	Mg/l	Mg/l	Mg/l	Mg/l	Mg/l	Mg/l	Mg/l	Mg/l	Mg/l	Mg/l	Mg/l	Mg/l	Mg/l	Mg/l	Mg/l	Mg/l	Mg/l	Mg/l	Mg/l
AB04	AA	Surface and Groundwater	157	7,25	222	84,9	61,5	11,2	568	0,321	30,3	0,702	-0,194	0,014	503	-0,002	-0,004	0,211	10,3	0,029	1316	-0,004	0,008	-0,002	17	72,4
AB05	AA		100	6,82	74,6	42	95,9	7,51	137	-0,263	67,4	0,045	-0,194	0,013	298	-0,002	-0,004	0,396	11,5	-0,013	744	-0,004	0,003	-0,002	38	160
AB07	AA		218	6,32	264	117	139	10,1	131	0,607	72,4	0,194	-0,194	-0,005	1080	-0,002	7,38	6,63	14,1	0,086	1882	-0,004	0,009	-0,002	25	64,3
AB51	AA		170	7,04	269	93	57,9	11,5	503	0,536	15,6	0,089	-0,194	0,017	730	-0,002	-0,004	0,827	8,97	0,119	1524	-0,004	0,009	-0,002	12	10,7
AB08	AA		106	8,52	17,7	109	82,2	1,64	276	0,355	47,3	0,761	-0,194	0,015	281	-0,002	-0,004	0,134	1,61	0,021	824	-0,004	0,011	-0,002	54	67,3
AB53	KRA		33	7,54	29,6	14,2	17,3	7,64	104	0,373	53,9	0,106	-0,194	0,013	2,64	-0,002	-0,004	0,113	2,15	-0,013	252	-0,004	-0,002	-0,002	44	106
CB08	CSYA		61,8	8,36	34	23,4	80,2	9,79	240	0,347	25,5	0,079	-0,194	0,013	72,2	0,011	-0,004	-0,001	1,85	0,014	400	-0,004	0,002	-0,002	45	6,74
CB60	CSYA		21,7	8,81	14,4	9,02	22,7	4,2	97,5	0,352	19,5	0,025	-0,194	0,013	5,51	-0,002	-0,004	0,015	1,52	-0,013	152	-0,004	-0,002	-0,002	6	4,83
AB56	AA		221	7,38	163	172	163	3,87	199	-0,263	68,1	0,134	-0,194	0,013	1036	-0,002	-0,004	0,968	1,64	0,043	1848	-0,004	0,013	-0,002	35	136
AB52	KRA		34,3	8,71	6,25	11	54,1	13,4	187	-0,263	5,07	0,161	2,65	0,017	2,27	-0,002	-0,004	0,004	6,54	-0,013	230	-0,004	-0,002	-0,002	8	6,88
AB58	AA		21	6,58	8,38	9,46	14,4	7,78	40,1	-0,263	8,05	0,1	2,69	0,013	31,6	-0,002	-0,004	0,069	12,7	-0,013	152	-0,004	-0,002	-0,002	15	31,7
AB54	KRA		14,6	8,5	6,71	3,69	14,9	8,91	74,6	-0,263	5,18	0,645	-0,194	0,014	-0,141	-0,002	-0,004	0,002	-0,026	-0,013	96	-0,004	-0,002	-0,002	-4,5	1,66
AB55	AA		178	7,5	83,5	85,1	225	4,06	279	-0,263	58,9	0,174	0,253	0,022	639	-0,002	-0,004	0,242	3,3	-0,013	1378	-0,004	0,009	-0,002	23	126
AB61	AA		37,2	8,7	15,8	17,7	37,8	7,95	135	-0,263	18,7	0,114	-0,194	0,013	50,2	-0,002	-0,004	0,003	1,35	-0,013	222	-0,004	-0,002	-0,002	-4,5	25,4
AB57	AA		41,9	7,33	40,1	19,9	22,5	6,78	192	-0,263	29,4	0,019	-0,194	0,018	14,1	-0,002	-0,004	0,009	27,3	-0,013	288	-0,004	-0,002	-0,002	39	54,9
AB63	AA		18	8,83	6,33	7,26	17,1	5,9	32,7	-0,263	22,1	1,02	-0,194	0,013	22,7	-0,002	-0,004	0,004	0,087	-0,013	92	-0,004	-0,002	-0,002	-4,5	8,81
AB06	AA		64	7,59	57,6	31,6	56,2	2,7	274	0,721	19,9	0,032	-0,194	0,017	69,8	-0,002	-0,004	0,002	5,75	-0,013	462	-0,004	0,003	-0,002	9	4,93
AWR	AA		133	6,71	70,6	46,8	185	5,51	244	0,664	65,7	0,335	-0,194	0,015	405	-0,002	-0,004	0,551	16,7	-0,013	1002	-0,004	0,004	-0,002	39	190
PB47	PSA		27,2	8,38	4,42	4,74	47,2	4,06	53,6	-0,263	48,5	0,5	-0,194	0,014	7,17	-0,002	-0,004	-0,001	0,427	-0,013	182	-0,004	-0,002	-0,002	7	2,2
AB59	AA		73,9	7,66	71,3	22,6	57	15,8	146	0,393	41,4	0,308	-0,194	0,027	180	-0,002	-0,004	0,011	4,48	0,32	502	-0,004	-0,002	-0,002	87	132
KMR01	KSA		42,5	7,83	39	22,7	29,1	3,13	199	0,542	10,5	0,032	-0,194	0,014	43,4	-0,002	-0,004	-0,001	6,92	-0,013	292	-0,004	-0,002	-0,002	5	128
AB62	AA		151	8,06	185	39,3	129	23,1	234	0,855	80,8	0,031	-0,194	0,014	506	-0,002	0,019	0,092	5,92	0,856	1202	-0,004	0,004	-0,002	8	2,51
KMR07	AA		133	7,52	128	63,9	104	12,1	263	0,754	64,6	0,036	2,43	0,043	415	-0,002	-0,004	4,3	7,01	0,123	1096	-0,004	0,007	-0,002	23	7,1
PB48	SA		85,4	6	74,6	37,5	53,8	13,2	15	0,636	34,6	0,08	0,966	0,014	358	0,259	0,075	0,258	10,6	0,08	600	-0,004	0,033	0,094	-4,5	3,92
KMR08	AA		106	8,46	83,4	14,4	107	27,1	44,3	0,477	69,7	0,054	-0,194	0,016	383	0,042	-0,004	0,013	6,56	0,957	778	-0,004	-0,002	-0,002	8	1,19
Ash Dam	SA		108	7	71,4	1,41	132	45,1	116	-0,263	93,7	0,026	-0,194	0,011	276	-0,002	0,006	0,219	6,32	0,581	782	-0,004	-0,002	-0,002	44	5,44
3rd Recovery Dam	AA		80,2	7,91	74,2	35,9	52,7	12,5	87,4	0,613	33,1	0,044	0,563	0,014	281	-0,002	-0,004	-0,001	6,2	0,104	630	-0,004	0,01	0,009	22	10,2

Monitoring site exceeds the SANS 241:2015 limit of the parameter (Exceeds)

Monitoring site satisfies the SANS 241:2015 limit of the paramter (Satisfy)

NS: No Standard

Negative values (e.g. -0.1) in the table denote "smaller than (<)" values (e.g. <0.1), ONLY applicable to chemical results.

rea KRA - Komati Residential Are

YA - Coal Stock Yard Area SA - Sewage A

er Station Area AWRD - Ash Water Re

4.5.4.4 GCS Groundwater Analysis

RSK GCS Environment (Pty) Ltd was appointed by Nemai Consulting to undertake a review of the available groundwater laboratory results for KPS. An extract from the Groundwater Laboratory Results Review Report (Lourens, 2022) follows. The full report is contained in Appendix F.

Groundwater laboratory results were obtained from the following sources:

- WSP's groundwater monitoring results of 10 newly installed groundwater monitoring wells (BH01-BH10) (refer to Section 4.5.4.5 below); and
- Aquatico (laboratory), which included groundwater monitoring results of 24 Eskom groundwater monitoring wells (Ab#, CB#, PB#, MW6 and KMR07). These wells were sampled during August 2022 and analysed for the following parameters –
  - Metals;
  - BTEX & TPH Aliphatic C7 – C46; and
  - PCBs (lab results not received).

As part of the current review, the available groundwater monitoring chemistry data was summarised and screened against the following adopted screening criteria:

- KPS's existing WUL (WUL No. 04/B11B/BCGI/1970) groundwater quality reserve limits;
- SANS for Drinking Water, SANS241-1:2015;
- South African Water Quality Guidelines (SAWQG) Volume 1, Domestic Use, Second Edition, 1996; and
- SAWQG Volume 7, Aquatic Ecosystems, Second Edition, 1996.

The aim of the review was to highlight the following: (a) contaminants of potential concern; (b) groundwater monitoring locations which exceeded the adopted screening criteria; and (c) identify areas where groundwater quality data gaps exist with regards to the existing groundwater monitoring well network and groundwater chemistry data received for review.

From the groundwater laboratory results it is noted that most of the groundwater samples collected from the WSP wells contained multiple compounds exceeding the adopted WUL, SANS and SAWQG Aquatic Target Water Quality Range (TWQR), whereas the groundwater samples collected by Aquatico from the Eskom monitoring wells only exceeded some of the adopted screening criteria. Most of the Aquatico sampled groundwater monitoring wells were only analyzed for a limited number of compounds whereas the WSP wells were analysed for an extensive suite, including inorganics. Inorganic results for only two Aquatico sampled wells (MW6 and KMR07) were received, which presents a significant data gap in the evaluation of the groundwater results.

Of the sampled wells, the wells which contained the most compounds exceeding the WUL limits include BH3 (9 exceedances), KMR07 (7 exceedances), BH1 and BH8 (5 exceedances), BH5 (4 exceedances). BH3 is located within BESS_C (currently scrap yard) and contained elevated sulphate, magnesium, sodium, and manganese concentrations. KMR07 is located to the north-west of the municipal sewerage works and indicated multiple exceedances but none which were significantly elevated above the WUL limits. BH1 is located to north and down-gradient of BESS_D (currently coal stockyard) and Lake Finn and near the Gelukspruit stream, this well contained highly elevated dissolved manganese, ammonia, and Total Alkalinity. BH8, is located near the southern border of the PV_A border close to the rehabilitated domestic waste site and historical ash dam footprint. BH8 also contained multiple compounds exceeding the WUL limits. Monitoring well BH5 is located to the north-east and down-gradient of the old ash dams and to the north and down-gradient of the raw water dams, and like KMR07 and BH8, monitoring well BH5 reported multiple WUL exceedances but none that were significantly elevated above the WUL limits.

Of the 34 sampled groundwater monitoring wells, 13 of the wells contained compounds exceeding the SANS241 drinking water standards. Of these 13 wells, the dissolved lead and manganese were the two most prevalent compounds exceeding the SANS screening values. Groundwater monitoring wells BH6, BH7 and BH8 contained the most elevated lead concentrations and are all located near the borders of the PV_A parcel of land. According to the WSP report (Report ref: 41103965) The PV_A parcel of land has mostly been used as farmland, with historical ash/slimes dam located near the east of the of the parcel and rehabilitated domestic waste site near the south-eastern border of the parcel. Once more, groundwater monitoring well BH3 was the most impacted with 4 SANS exceedances reported, followed by BH1 and BH6 with 2 exceedances. BH1 is located to the north of BESS_D (currently coals stock yard); and BH6 is located near the northern border of the PV_A parcel of land, to the west and cross-gradient of the ash dams.

19 of the 34 samples groundwater monitoring wells exceeded the SAWQG Aquatic TWQR. The aquatic target quality ranges are more conservative compared to the SANS drinking water and WUL values. Of the compounds analysed manganese and zinc followed closely by lead were the three most predominant compounds detected which exceeded the adopted aquatic screening values. The two highest dissolved zinc concentrations were detected at BH8 and BH6. As mentioned previously, both wells are located on the planned PV_A parcel. BH5 also contained an elevated zinc concentration with respect to the aquatic screening value and is located to the north-east and down-gradient of the ash dam and raw water dams. Of the sampled wells, the well which contained the most compounds exceeding aquatic screening criteria was BH2 (5 exceedances), followed by BH1, BH3, BH5 and BH6 (4 exceedances each).

Based on the received groundwater monitoring laboratory results, most of the sampled wells exceeded the adopted screening criteria, however, the most highly impacted locations include the areas in the vicinity of the following:

- BH3 & AB07 – Power Station Scrapyard;
- BH2 – Power Station Coal Stock Yard;
- BH1 – Area north of Lake Finn;
- KMR07 – Area north of the municipal sewerage works;
- BH5 – Area north of the ash dams;
- BH8 – Area near the south-east border of PV_A; and
- BH6 – Area near the northern border of PV_A.

It should be noted that there would most probably be additional highly impacted areas which aren't currently highlighted due to the lack of inorganic data for the Aquatico sampled wells.

Based on the review of the groundwater monitoring results, the following data gaps currently exist:

- The locality of multiple sampled Aquatico wells are not known.
- The two data sets from WSP and Aquatico are not directly comparable as the WSP dataset contains a wider range of analytes and which are not reported under the Aquatico dataset.
- The review was undertaken on data as received and the sampling methodologies, sample preservation, quality assurance and quality control measures employed by the two respective companies while sampling are not known.
- Except for the 24 existing Eskom wells sampled by Aquatico, there are multiple additional groundwater monitoring wells which were not sampled and did not form part of the current review.
- A discrepancy between the detection limits and compounds detected by the Aquatico and WSP datasets have been identified. For example, Iron was detected in all WSP sample results whereas only three of the Aquatico sampled contained detectable Iron concentrations.
- There is currently a lack of groundwater monitoring data inside the KPS at the following areas:
  - BESS_A;
  - Generator area;
  - Garage area;
  - Hazardous waste storage area;
  - Fuel storage area; and
  - Cooling towers.

4.5.4.5 WSP Groundwater Analysis

WSP was appointed by Eskom to undertake a preliminary contamination assessment for targeted portions of KPS, which forms part of the ESIA and WULA processes for the Solar PV and Battery Energy Storage System (BESS) Project (Component B). An extract from the Preliminary Contaminated Land Study Report (Skinner, 2022), focusing on the groundwater analysis, follows. The full report is contained in Appendix E.

The objective of the preliminary contamination assessment included the following:

- Establish the environmental setting/s of the relevant development areas at KPS based on a review of existing information in conjunction with site reconnaissance, targeted intrusive investigations and laboratory analysis of selected samples;
- Prepare a Conceptual Site Model (CSM) utilising the supplementary information to conceptualise the hydrological, geological and hydrogeological conditions in respect to possible contamination concerns;
- Interpret the significance of recorded contamination impacts in broad accordance with Part 8 of the NEM:WA to ascertain the requirement for additional works and/or remediation.

It is noted that the report does not constitute a Site Assessment Report described under Part 8 of NEM:WA.

Eskom identified the Contaminants of Potential Concern (CoPC) to include arsenic, cadmium, chromium, iron, lead, mercury, nickel, selenium, manganese, and zinc from the ash and coal storage areas; polychlorinated biphenyls (PCB), polycyclic aromatic hydrocarbon (PAH), benzene, toluene, ethylbenzene, and xylene (BTEX), and other petroleum hydrocarbons from oil storage and mechanical and electrical equipment; and copper, iron, nickel, chromium and zinc from metal cleaning and cooling tower blowdown wastewaters.

Ten monitoring wells (BH01–BH10) were advanced at targeted safely-accessible locations to depths of up to 10m bgl (see Figure 22 above). These were generally positioned in areas where coverage from the existing monitoring network was limited.

The groundwater samples were submitted to a South African National Accreditation System (SANAS) accredited laboratory (Facility No T0729) for analyses broadly consistent with the priority contaminants listed in the National Norms and Standards for the Remediation of Contaminated Land and Soil Quality (GN R.331 of 2014), which was supplemented with the following determinants requested by Eskom:

- Metals/metalloids: antimony, arsenic, cadmium, calcium, chromium (total and hexavalent), cobalt, copper, iron, lead, magnesium, manganese, mercury, nickel, potassium, selenium, silicon, sodium, vanadium and zinc;
- Inorganics: ammoniacal nitrogen, chloride, fluoride, nitrate, ortho-phosphate and sulphate;

- Aliphatic petroleum hydrocarbons (C_7–C_9, C_{10}–C_{14} and C_{15}–C_{36});
- Volatile Organic Compounds (VOC) including BTEX and Tentatively Identified Compounds (TIC);
- Semi-Volatile Organic Compounds (SVOC) including PAH and TIC;
- PCB; and
- Physiochemical: alkalinity (total), electrical conductivity, pH, Total Dissolved Solids (TDS) and Total Organic Carbon (TOC).

Some of the key findings of the groundwater results are as follows:

- In terms of pH, the shallow groundwater is generally near neutral (6.62–7.54) and satisfies the lower pH limit (6.6) specified within the WUL (04/B11B/BCGI/1970).
- The other determinants provided for within the WUL are also seen as being broadly compliant; however, exceptions are noted as follows –
  - A high salt content is recorded at BH03 where, together with elevated concentrations of sodium and sulphate, electrical conductivity, calcium, magnesium and chloride were above their respective reserve limits. This is expected due to the known groundwater plume extending from the up-gradient Ashing Area and concentrations decrease further down-gradient of the KPS (BH02) to below the reserve limits. However, increases in the concentrations of a number of determinants are noted at the further downgradient position (BH01), with magnesium and chloride again above the reserve criteria, albeit at far lower concentrations than BH03.
  - Electrical conductivity and magnesium are above their reserve limits at BH08. This is located up-gradient of KPS activities on the southern boundary of PV Site A but slightly down-gradient of the background borehole (AB58).
  - Chloride was above its reserve limit at both BH05 (northeast of the Ashing Area and north of Raw Water Dams) and BH04.
- The known plume associated with the Ashing Area expectedly dominates the signature of downgradient groundwater quality with manganese at a concentration (1,718.3 µg/l) above both the drinking water chronic health standard (400 µg/l) and freshwater aquatic guideline (180 µg/l). While this plume has been shown to extend off-site to the north, seemingly additional contributions from the KPS and particularly the Coal Stockyard are also observed with a doubling in the concentration of manganese recorded at BH01 (3,269.5 µg/l). The likely lateral dispersivity of this plume is also apparent at BH05 to the northeast and BH06 to the west where manganese concentrations of 809.5 µg/l and 496.8 µg/l were respectively recorded. Manganese was not otherwise recorded above either its freshwater aquatic guideline or chronic health standard for drinking water; although was noted to be above its aesthetic drinking water standard at BH04.
- Compared to the background range (6.2–10 µg/l) concentrations of zinc appear elevated within the shallow groundwater across the entire property (16.2–59 µg/l). While far below the drinking water standard of 2 000 µg/l, these are above both the

TWQR and Chronic Effect Value (CEV) of 2 µg/l and 3.6 µg/l, respectively for aquatic ecosystems, and also above the Acute Effect Value (AEV) of 36 µg/l in four of ten boreholes (40%) sampled under the current scope. This includes positions both up- and down-gradient and the source of zinc remains uncertain.

- While absent in the background, lead has been detected within all shallow groundwater samples obtained. Notably, however, this is an approximate order of magnitude greater, and above the drinking water standard, within the west of the property (BH06, BH07, BH08 and BH09). While the combustion of fossil fuels (i.e., coal) is a recognised source of environmental lead, the reason for the noted distribution is uncertain and therefore remains unconfirmed; however, appears to correlate with typically higher concentrations of lead in soils in the west of the premises

Exceedances of the adopted standards/guidelines does not necessarily confirm the presence of an unacceptable risk but provides a conservative indication of where the shallow groundwater may represent a source of impact for the identified receptors. It is understood (VPC GmbH, 2021) that rehabilitation and management is planned for the plume associated with the Ashing Area and, as such, long term improvements in the quality of shallow groundwater would be expected once this process is implemented. While the sources of lead and zinc cannot be categorically confirmed these are almost certainly related to the activities at both KPS and the neighbouring colliery, and more detailed assessment/s would be recommended to ensure appropriate protection of any potential receptors.

Based on the outcomes of the targeted investigatory works, a number of contaminants largely consisting of metals and nutrients/salts together with localised PAHs were identified within both soils and/or shallow groundwater that are indicative of impacts related to activities at KPS, and particularly associated with the Ashing Area.

4.5.4.6 Hydrocensus Study

Eskom undertook a hydrocensus study at KPS in 2019. According to Mathetsa and Swartz (2019), water users and uses within the identified sub-catchment areas, within a 15km radius of the station were identified. Groundwater levels were recorded and water samples were taken from the boreholes listed in Table 15 and shown in Figure 33 below. These hydrocensus boreholes were identified based on the geological, hydrogeological and land-use settings in the area. Most of the boreholes sampled are used for domestic and irrigation purposes.

Six (6) parameters were used as indicators of contamination, namely EC, the major ions Ca, Na, Cl, and SO_4 and the minor ion Iron (Fe).

Table 15: Hydrocensus boreholes and their characteristics (Mathetsa & Swartz, 2019)

Site ID.	Longitude (ºE)	Latitude (ºS)	Farm Name	Farm Owner	Equipment	Use	Comments
BB13	29.44845	-26.06403	Koornfontein 27/6	G.F. Grobler	Pump	Domestic	Blackish water. Supply to the house
BB14	29.48485	-26.05469	Broodsnyersplaas 25/10	Siyavuma Vervoer	Pump	Domestic	Clear water. Supply to the house
BB15	29.49044	-26.05852	Broodsnyersplaas 25/28	H De Beer	Manual Pump	Domestic	Clear water. Supply to the house
BB16	29.50683	-26.07076	Broodsnyersplaas 25/1	P Storm	Pump	Domestic	Clear water. Supply to the house
BB17	29.49821	-26.07593	Broodsnyersplaas 25/5	P Storm	Pump	Domestic	Clear water. Supply to the house
BB18	29.49867	-26.07736	Broodsnyersplaas 25/5	P Storm	Pump	Domestic	Clear water. Supply to the house
BB19	29.49741	-26.07693	Broodsnyersplaas 25/5	P Storm	Pump	Domestic	Clear water. Supply to the house
BB21	29.47954	-26.10598	Geluk 26/7	MCL Dippenaar	Windmill	Domestic	Clear water. Supply to the house
BB22	29.47907	-26.10586	Geluk 26/7	MCL Dippenaar	Pump	Domestic	Clear water. Supply to the house
BB23	29.47905	-26.10632	Geluk 26/7	MCL Dippenaar	Pimp	Domestic	Clear water. Supply to the house
BB38	29.48366	-26.17902	Middelkraal 50/1	BJ Grobler	Windmill	Domestic	Clear water. Supply to house
BB39	29.48336	-26.17877	Middelkraal 50/1	BJ Grobler	Pump	Domestic-occasional	Clear. Supply to house
BB40	29.48339	-26.17864	Middelkraal 50/1	BJ Grobler	No Equipment	Not in use	Clear water.

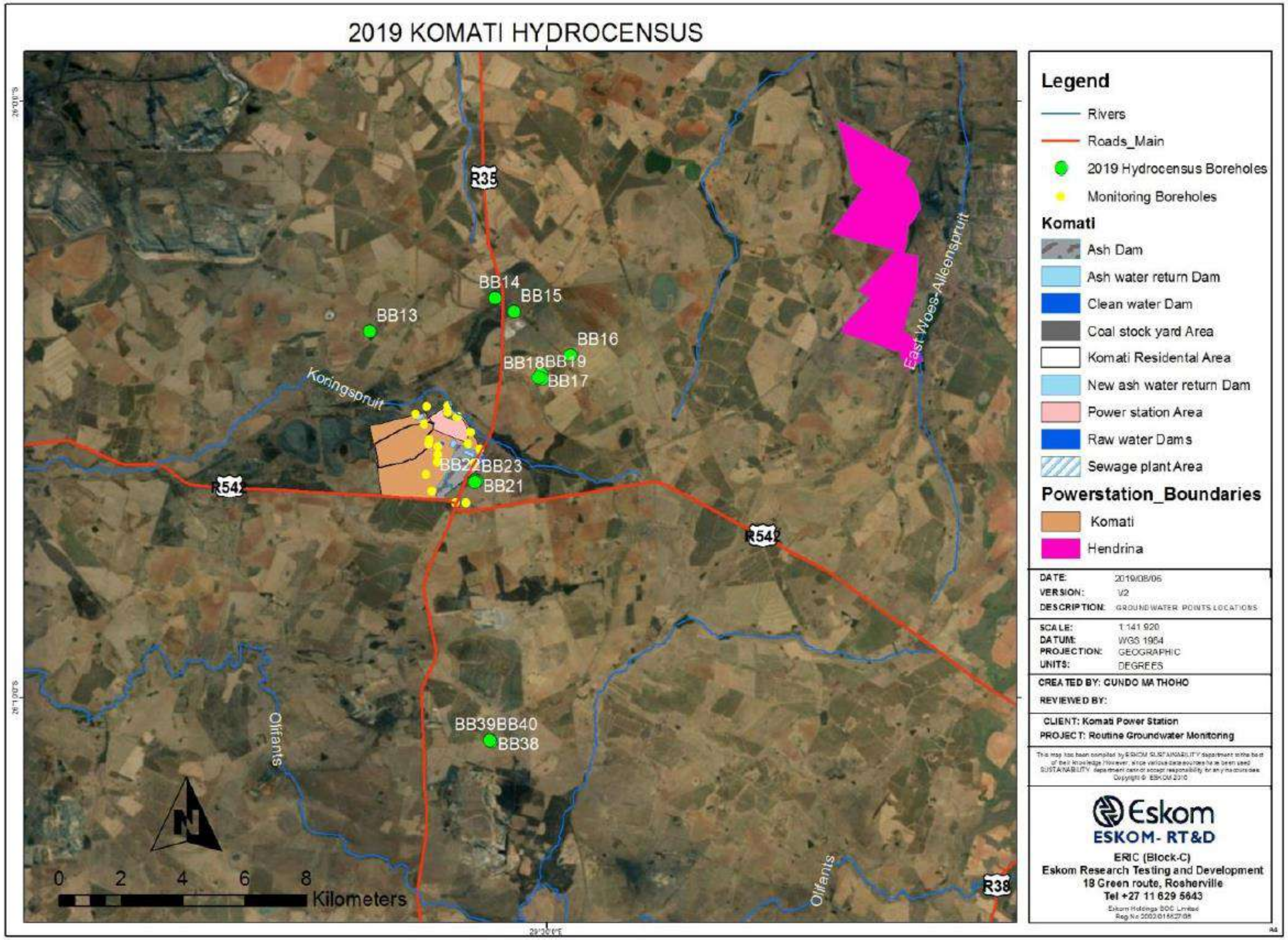


Figure 33: Location of KPS Hydrocensus Boreholes (Mathetsa & Swartz, 2019)

The sampled boreholes conformed to the SANS 241:2015 Drinking Water Quality Standards for most of the parameters, except for NH_3 and turbidity. It appears the power station activities do not have an impact on the sampled sites implying that pollution from the power station is being contained to the boundaries of the station and that the pollution control measure are working.

4.6 Surface Water

4.6.1 Hydrological Setting

KPS is situated in the Olifants Water Management Area (WMA), in quaternary catchment B11B (see Figure 34 below). The KPS drains towards the Koring Spruit which is located to the north of the site, and which flows in a predominantly east-to-west direction towards to Olifants River (see Figure 35 below).

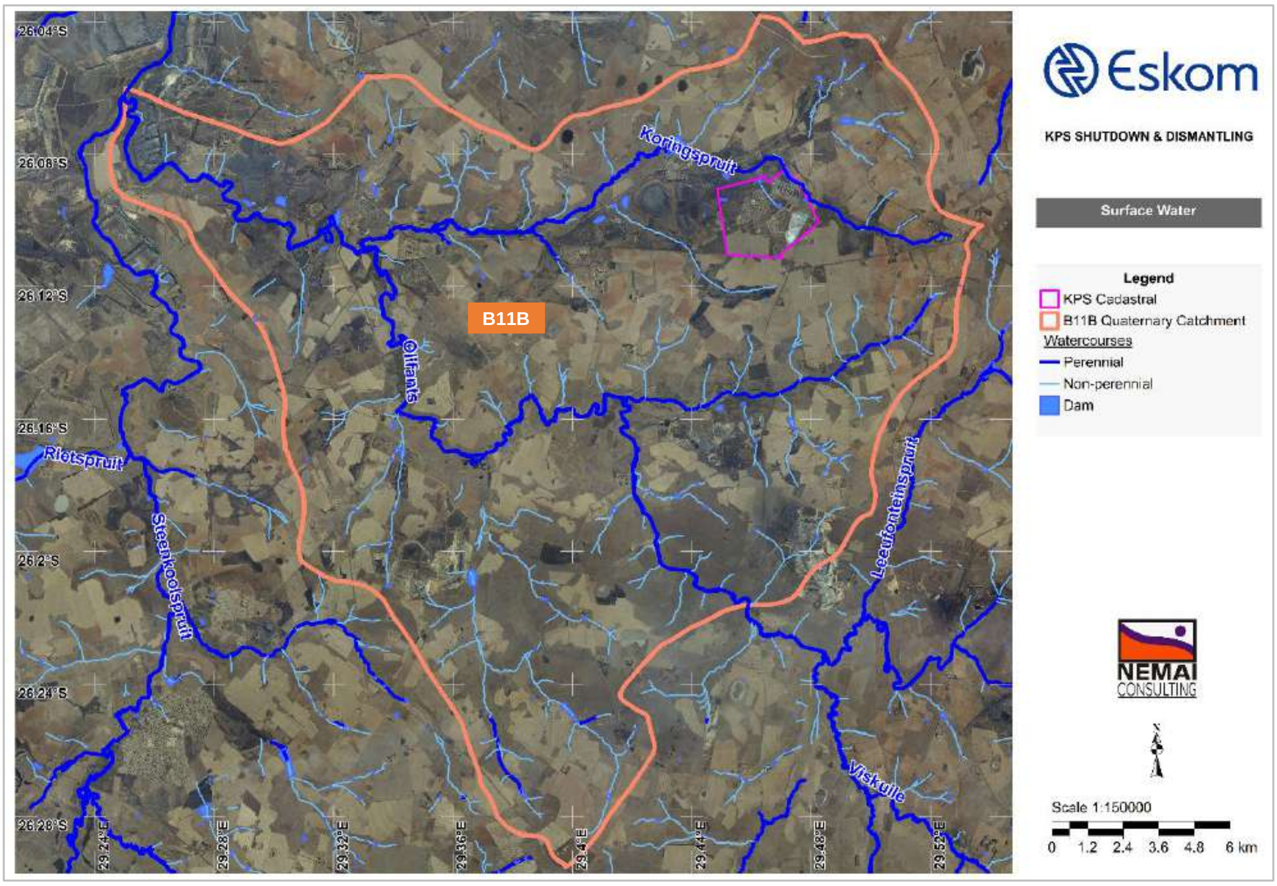


Figure 34: Quaternary catchment B11B and watercourses in relation to KPS

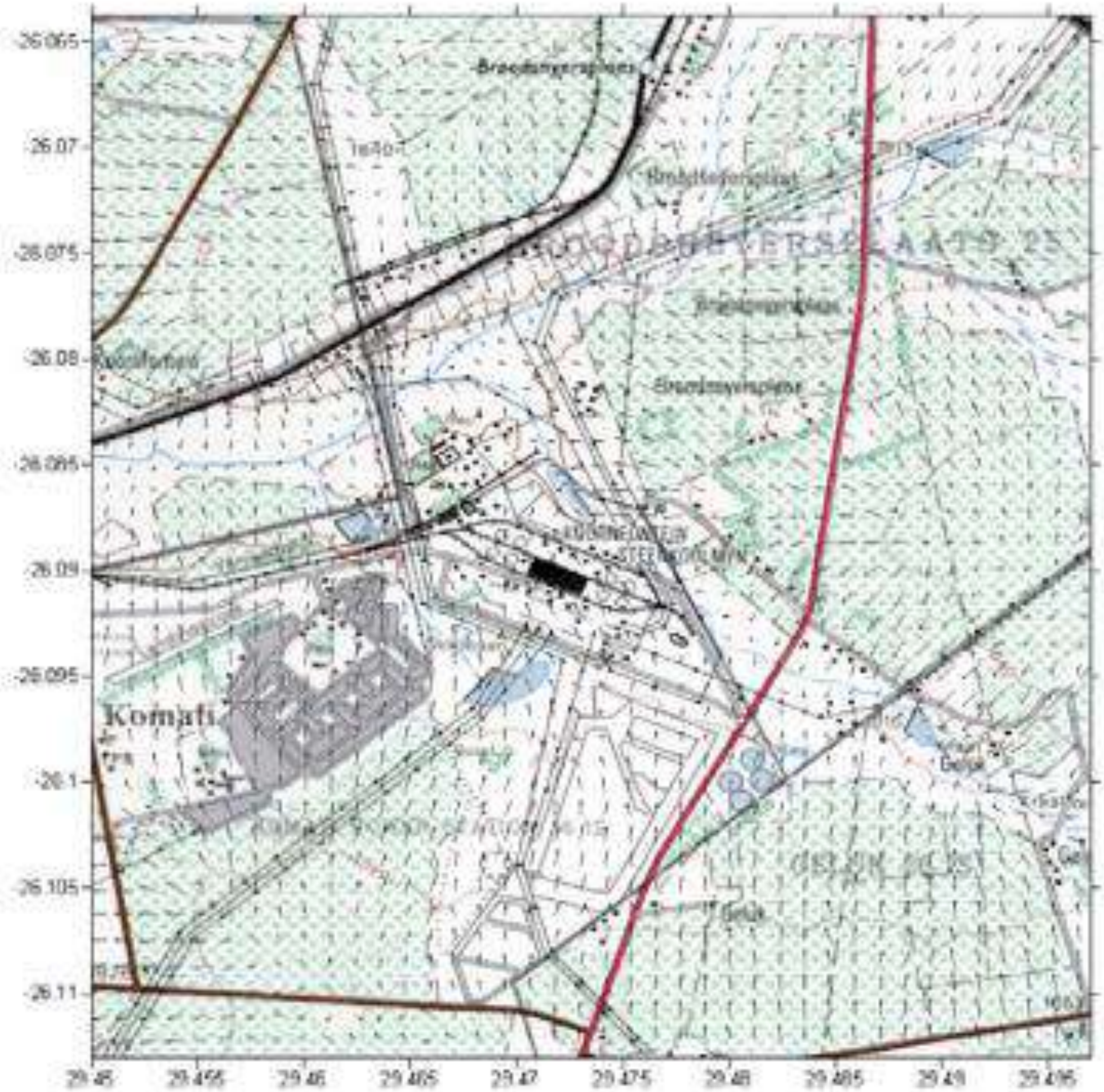


Figure 35: Surface drainage indicating flow directions (van Niekerk & Staats, 2008)

The following tributaries of the Koring Spruit occur in the Project Area (see Figure 36 below):

- The southeast-northwest orientated Komati Spruit, which drains the area west of the ash dams towards the Koring Spruit; and
- The southeast-northwest orientated Geluk Spruit, which drains the area east and north towards the Koring Spruit.

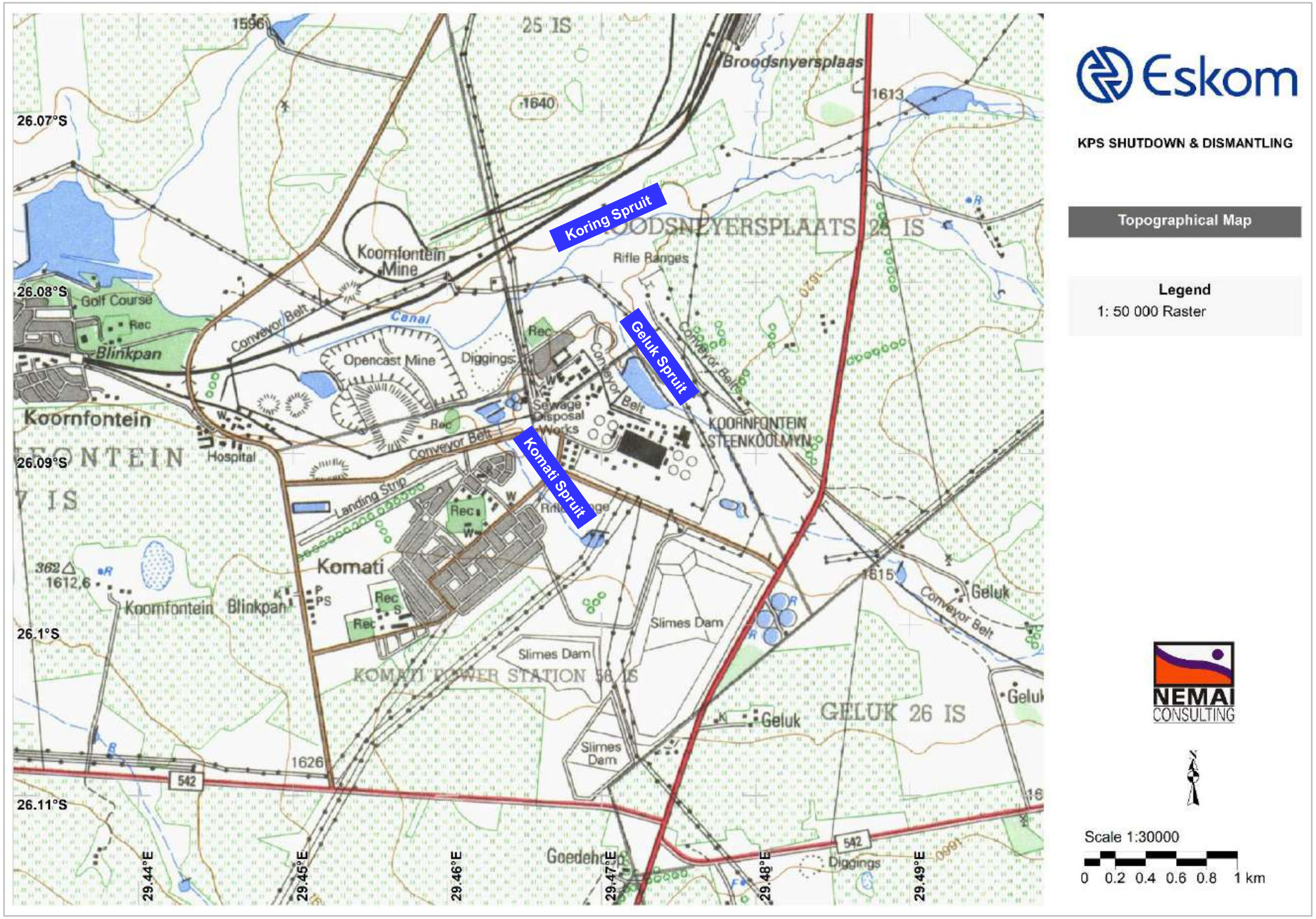


Figure 36: Topographical map showing watercourses in relation to KPS

4.6.2 River Class

The Present Ecological State (PES) of the Koring Spruit is a class D (largely modified) (DWS, 2019).

4.6.3 Wetlands

The wetland types that occur in the Project area according to the National Wetland Map 5 (Van Deventer et al., 2018) are shown in Figure 37 below. Channel valley bottom wetlands are evident along the Koring Spruit and Geluk Spruit, with a seep wetland along the Komati Spruit.

According to VPC GmbH (2021), a wetland assessment was undertaken in 2019 at the KPS. The wetland types identified in the Project area included channel valley bottom wetlands along the Koring Spruit (north of power station), Geluk Spruit (east of power station) and part of the Komati Spruit (west of power station), a channel valley wetland (upstream part of Komati Spruit and the area to the west and north-west of Ash Dam 3), a depression (west of Ash Dam 3) as well as artificial wetlands (see Figure 38 below). As part of the assessment, only the PES and Ecological Importance and Sensitivity (EIS) of the northern channel valley bottom wetland could be evaluated. The PES and EIS were determined to be class C (modified) and category C, respectively. Wetland ecosystems in this class are not considered to be ecologically sensitive and important on a provincial or local scale. In addition, the biodiversity of this wetland is not usually sensitive to flow and habitat modifications (VPC GmbH, 2021). It is anticipated that the haul road along the north-eastern boundary of the power station and the stockpile may encroach into the buffer zone of this wetland.

4.6.4 DFFE Screening Tool

According to GN 960 of 5 July 2019, an application for Environmental Authorisation must be accompanied by the report generated by the National Web Based Environmental Screening Tool, as contemplated in Regulation 16(1)(b)(v) of the EIA Regulations. The tool is a geographically based web-enabled application which allows a proponent to screen a proposed site for environmental sensitivity (https://screening.environment.gov.za/screeningtool/#/pages/welcome). It is noted that the tool is often based on desktop sensitivity mapping, which provides a 'red flag' that requires confirmation of site conditions by the relevant specialists.

According to the screening tool, the aquatic biodiversity combined sensitivity is high for the wetlands associated with the Koring Spruit, Komati Spruit and Geluk Spruit. It is noted that the wetland assessment that was undertaken at KPS in 2019 (refer to Section 4.6.3 above), which ground-truthed the sensitivity, the PES of the northern channel valley bottom wetland was determined to be class C (modified).

The status of the abovementioned wetlands will be confirmed during the Aquatic Impact Assessment and Delineation (refer to ToR in Section 8.5.2.3 below) that will be undertaken as part of the ESIA for the Project.

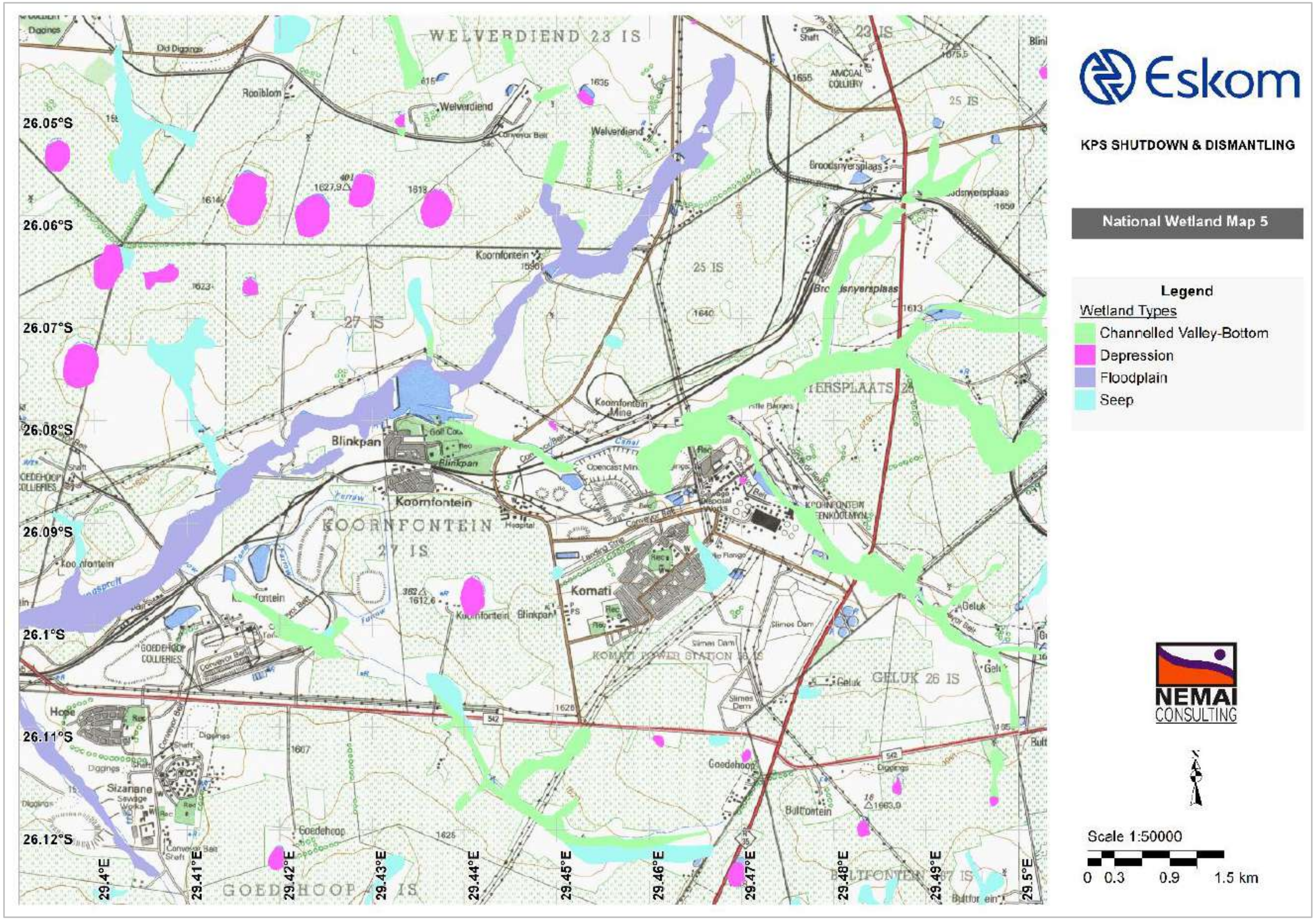


Figure 37:Wetland types in relation to KPS (National Wetland Map 5)

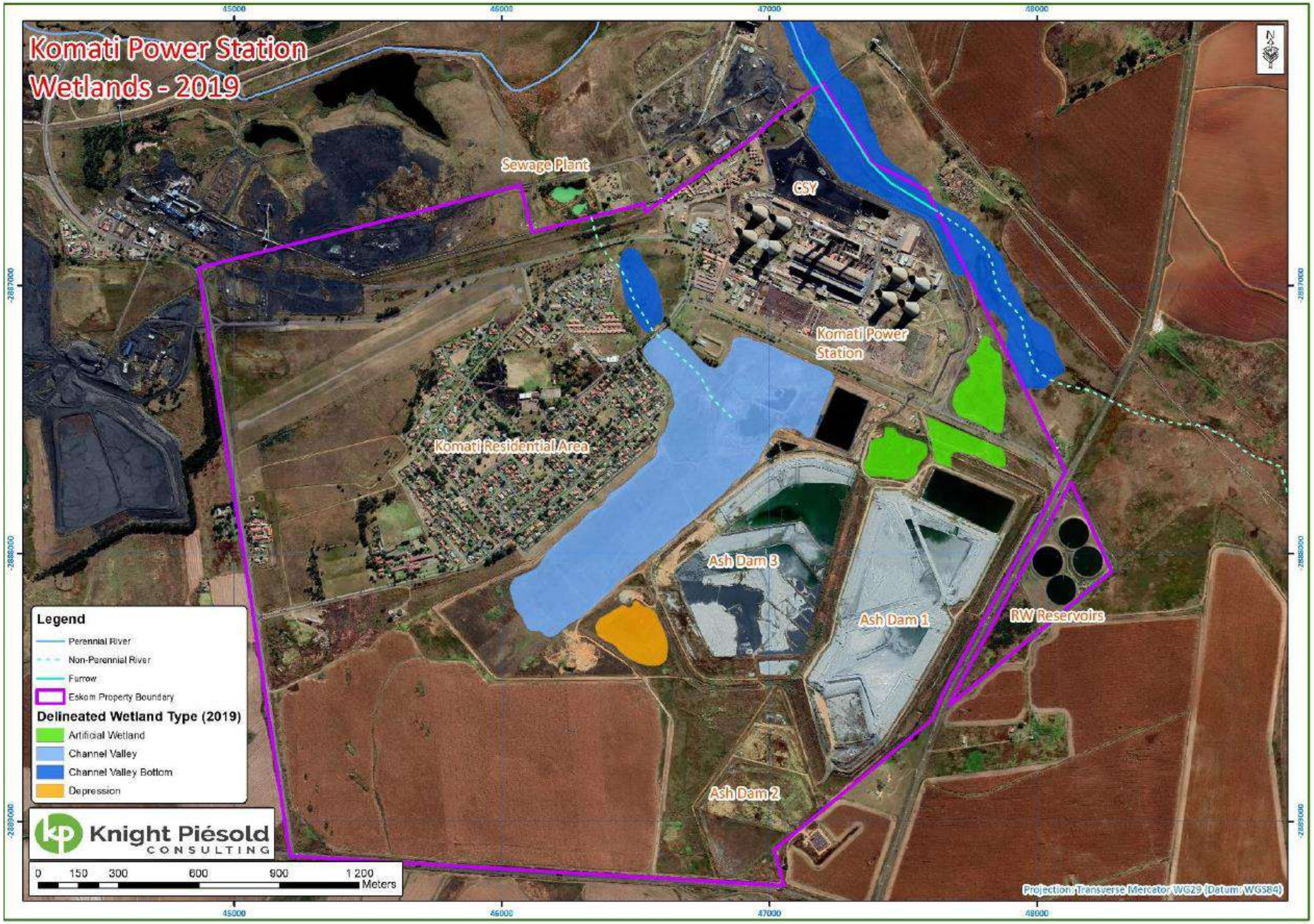


Figure 38: Hydrogeomorphic types of wetlands observed on site (VPC GmbH, 2021)

4.6.5 Biomonitoring

Biomonitoring is undertaken at KPS to comply with the condition in the WUL (04/B11B/BCGI/1970) which requires that a monitoring programme be implemented at the power station to determine the impact, change, deterioration and improvement of the aquatic systems. The details of the biomonitoring sites on the Koring Spruit are provided in Table 16 and shown in Figure 39 below.

Table 16: Details of biomonitoring sampling points at KPS (adapted from Maliba, 2016)

Monitoring Site	Description	Coordinates	Photographs
KM-K-US	Koringspruit upstream of KPS	26.0949 S, 29.4828 E	 View of site KM-K-US (Nov 2015)
KM-K-DS	Koringspruit downstream of KPS	26.0860 S, 29.4157 E	 View of site KM-K-DS (Nov 2015)

Figure 39: Biomonitoring sites for KPS (Google Earth™)

The last biomonitoring results, including *in-situ* water quality, SASS5 (macro-invertebrates) and toxicity assessments, that are available for KPS are from a survey that was undertaken in July 2021. According to Durgapersad (2021), the findings from this survey are as follows:

- The SASS5 score improved on a spatial scale at the downstream site compared to the upstream site. Similarly, the Average Score Per Taxon (ASPT) showed an increase at the downstream site compared to the upstream site. This suggests that the biotic integrity improved on spatial scale in July 2021.
- The toxicity hazard increased on a spatial scale during July 2021. The upstream site showed a hazard category of Class II (slight acute hazard) while the downstream site showed a hazard category of Class IV (high acute hazard) indicating some concern which is indicative of sustained impact/s to the biotic integrity, in terms of poor water quality, originating between the sites.

The above results are contradictory, as it would be expected that a higher SASS5 score at the downstream site would be linked to a lower toxicity hazard rating, which was not the case. The ecological status of the receiving aquatic environment will be determined through appropriate techniques (including biomonitoring) during the Aquatic Impact Assessment (refer to ToR in Section 8.5.2.3 below) that will be undertaken for the Project as part of the ESIA.

4.6.6 Water Consumption

The Komati Water Scheme (KWS) consists of Nooitgedacht and Vygeboom Dams on the Komati River. Vygeboom Dam is supplemented with water from the adjacent Gladdespruit, where a weir diverts water into a canal, from where it flows into the Vygeboom Dam (Pocock & Joubert, 2021). The KWS supplies water to KPS.

Eskom has a WUL in terms of the NWA to use water from a water resource for power generation purposes. KPS makes use of wet recirculation cooling.

KPS reported a Year to Date (YTD) consumption of 3 698.81 ML from 1 April 2020 to 31 March 2021. This comprises water consumed by the power station as well as those supplied to third parties. A summary of water consumed at KPS in 2020/21 is provided Table 17 below.

Table 17: Summary of water consumption at KPS in 2020/21 (VPC GmbH, 2021)

Komati	Total YTD
Total third parties Ml	1801.184
Nett used at Power Station	1897.623
Energy sent out MWh	709771.054
Gross litre per kWh sent out	5.174
Nett litre per kWh sent out	2.674

4.6.7 *Storm Water Management & Water Reticulation*

KPS was not originally designed as a Zero Liquid Effluent Discharge (ZLED) station but on return to service it was required to comply with Eskom's ZLED philosophy (ILISO Consulting, 2012).

According to VPC GmbH (2021), the power station terrace consists of coal handling facilities, dirty water management infrastructure, power generating infrastructure and associated infrastructure. The terrace can be considered as a dirty area. All storm water generated within the area is contained and recycled. Storm water generated outside of the power station terrace is diverted around the terrace.

The power station has both over ground and underground water management systems. The underground water management system conveys both process and storm water to Lake Stoffel. The over ground water management system diverts clean storm water around the power station terrace and routes dirty storm water to Lake Finn and to Lake Stoffel (see Figure 40 below). Excess water in Lake Stoffel is pumped to 3rd Recovery Dam, which is also shown in Figure 40 below. Excess water in Lake Finn is pumped to the ashing system. Lake Stoffel and Lake Finn employ oil traps to remove hydrocarbons from collected process and storm water.

Figure 40: Location of Lake Finn and to Lake Stoffel at KPS (Google Earth™)

Storm water contained in the 3rd Recovery Dam is transferred back into the process via a demineralization plant. When a cooling circuit is filled, or emptied for maintenance purposes, the water comes from or flows into the 3rd Recovery Dam. The brine from the demineralization plant is mixed into the ashing system.

In the ashing system, ash from the boilers is mixed with water to form a slurry. This slurry is pumped to the ash dams where it is deposited for drying. Supernatant water bleeds from the deposited ash and is collected via a penstock and recycled back into the ashing system via the AWR dams. The ash dams are constructed using a day-wall method. Shallow seepage water is collected and pumped back into the AWR dams.

The following four (4) distinct storm water systems are in operation at the power station terrace (see Figure 41 below):

1. Clean storm water system: Storm water in the area flows generally in a north easterly direction towards a tributary of the Koring Spruit (named the Geluk Spruit). The tributary flows past the northern edge of the power station terrace via a stream diversion.
2. Lake Stoffel system: Most of the power station terrace drains towards Lake Stoffel. This area includes the cooling towers, the boiler house and the adjacent infrastructure.
3. Lake Finn system: The coal handling area drains towards Lake Finn.
4. Road system: The road where coal is brought onto site.

The water reticulation system at the time when KPS was returned to service is shown in Figure 42 below.

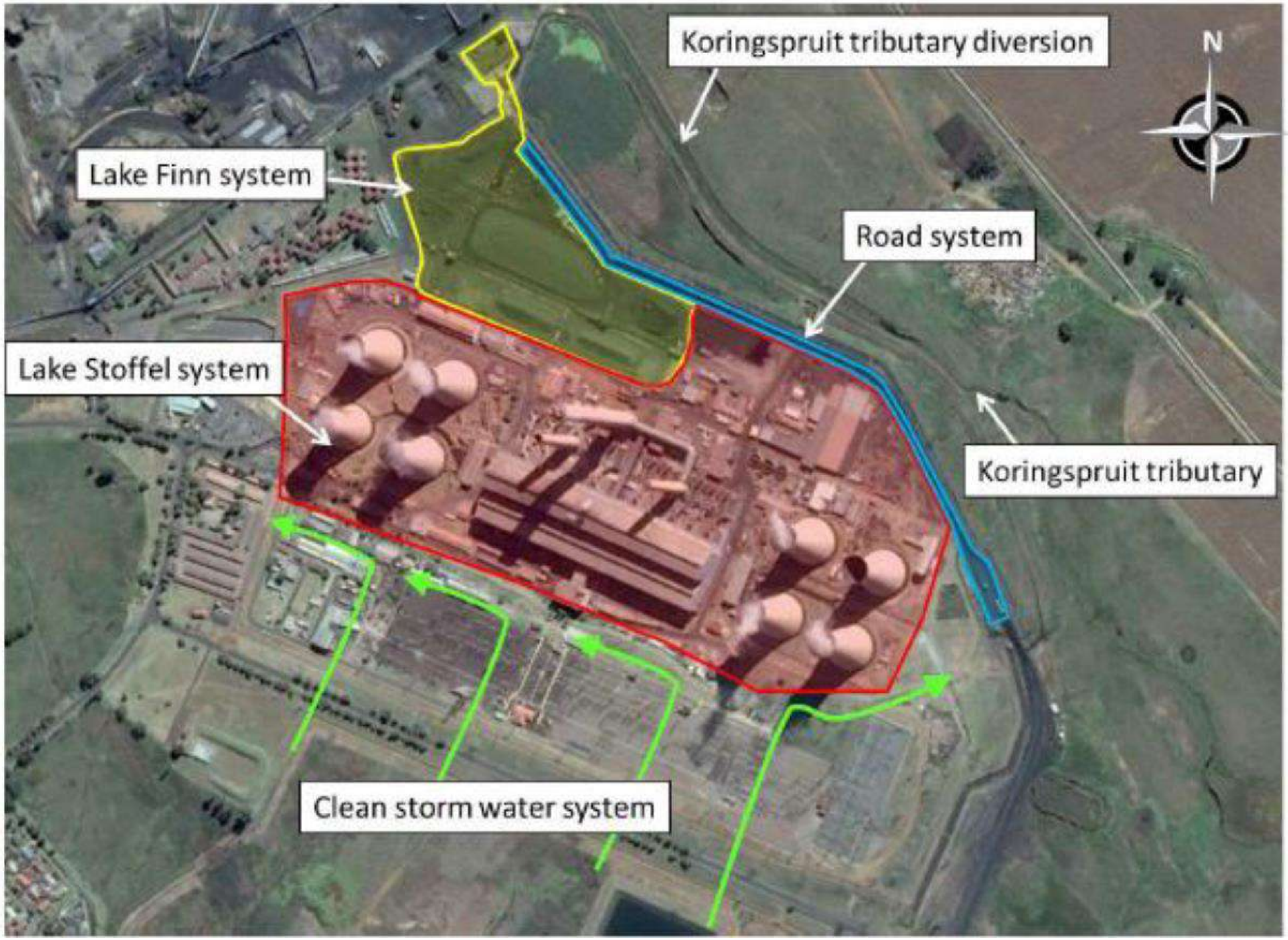


Figure 41: Storm water management systems at KPS (VPC GmbH, 2021)

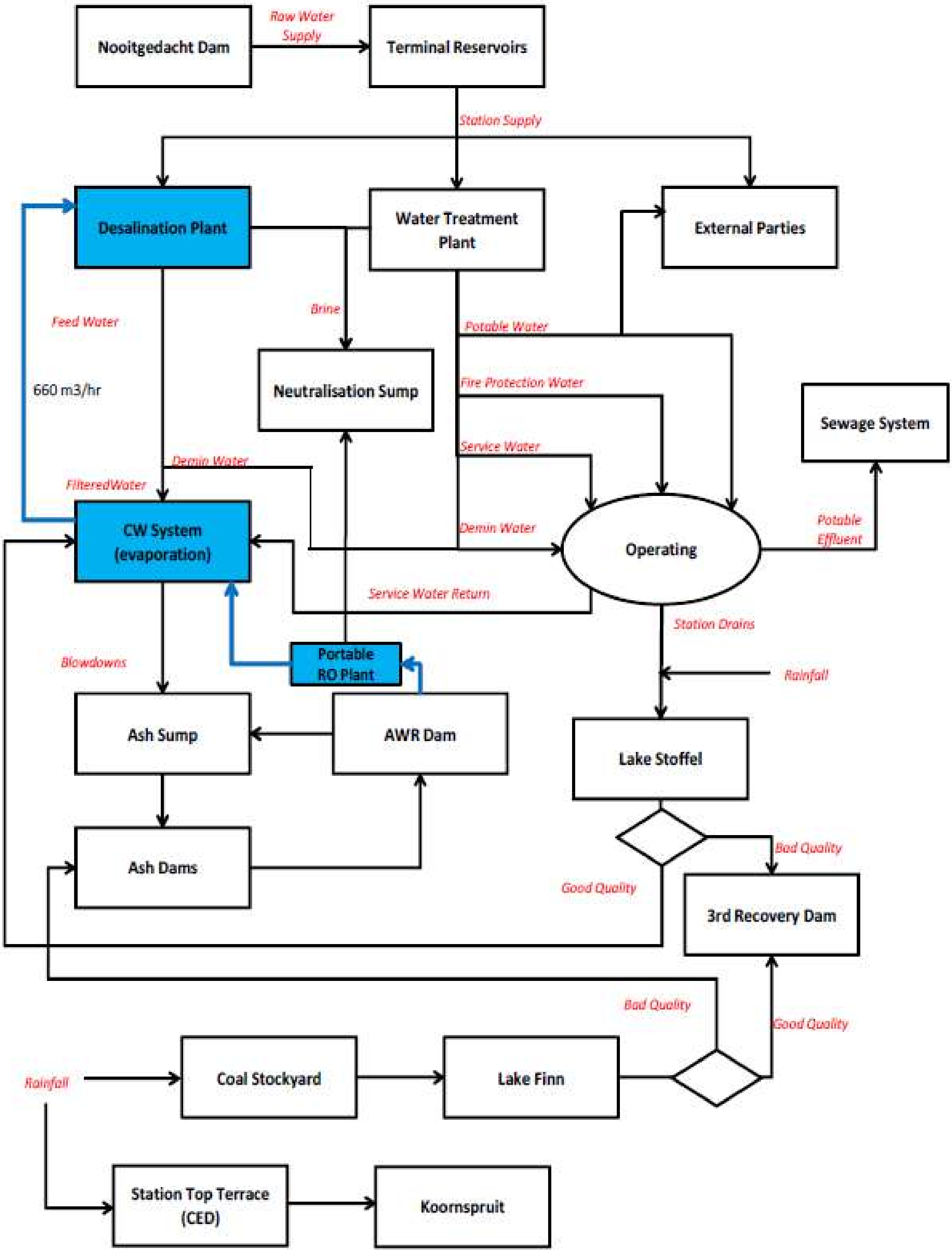


Figure 42: KPS water reticulation system (ILISO Consulting, 2012)

4.6.8 Surface Water Monitoring System at KPS

Since the recommissioning of KPS, a surface water monitoring system was implemented. Various surface water sampling sites are located in the Koringspruit, Komatispruit, Gelukspruit as well as at the power station's water-holding dams (i.e., return water dams and pollution control dams), The locations are listed in Table 18 below and shown in Figure 43 below).

Table 18: Eskom's surface water monitoring points at KPS

Site Name	Site Description	X coord	Y coord
AC01	Clean water cut off canal between ash dam and old rehabilitated waste site.	29.467	-26.10879
AC02	Marshy area south of new ash water return dam AP08.	29.47291	-26.09678
AC03	Dirty ash water return canal on eastern side of ash dam.	29.47941	-26.09947
AC04	Clean water canal north-eastern corner of ash dam. Sample at culvert underneath sealed road.	29.4802	-26.09685
AC05	Dirty water canal north of ash dam. Sample at culvert underneath sealed road.	29.47773	-26.09571
AC09	Small canal running parallel with new ash transfer pipes. Sample at culvert underneath sealed road.	29.47575	-26.09454
AP01	Pool areas and dams on top of north-western part of ash dams.	29.47422	-26.09605
AP02	Clean water dam where Komati Spruit originates west of ash water return dam.	29.46882	-26.09543
AP03	Seepage recovery dam north of ash dam complex & east of power station.	29.47755	-26.09321
AP08	New ash water return dam.	29.47353	-26.09493
CC07	Coal Stockyard dirty water run-off canal. Sample at security fence.	29.47098	-26.08608
CP06	Coal Stockyard settling pond and dirty water run-off dam.	29.47096	-26.0851
CP07	Old Coal Stockyard settling and dirty water run-off dam.	29.46977	-26.08558
PC06	North-eastern power station clean water run-off outlet.	29.47664	-26.09042
PC08	South-western power station clean water run-off outlet. Sample at culvert underneath sealed road.	29.46644	-26.09138
PE01	Purified sewage effluent discharge into natural dam.	29.46354	-26.08853
PP04	Raw water dam east of Bethel Middelburg road.	29.48122	-26.09881
PP05	Power station dirty water dams and oil skimmers north of power station.	29.47386	-26.08865

Site Name	Site Description	X coord	Y coord
GLR03	Gluck Spruit. Sample at culvert underneath sealed Bethel Middelburg road.	29.482348	-26.09474
GLR04	Gluck Spruit. Sample at culvert underneath conveyer.	29.471697	-26.084995
KMR01	Komati Spruit downstream form dam AP02. Sample at culvert underneath sealed road.	29.465684	-26.0923
KMR02	Komati Spruit downstream form dam KMR01. Sample at culvert underneath sealed road.	29.46368	-26.0895
KMR07	Komati Spruit downstream form dam KMR02 and dam receiving purified sewage effluent. Sample at culvert underneath dirt road.	29.46159	-26.08743
KRR05	Koring Spruit upstream of power generation activities. Sample at culvert underneath sealed Bethel Middelburg road.	29.48671	-26.07354
KRR06	Koring Spruit downstream of KRR05. Sample at culvert underneath sealed road.	29.44499	-26.08252

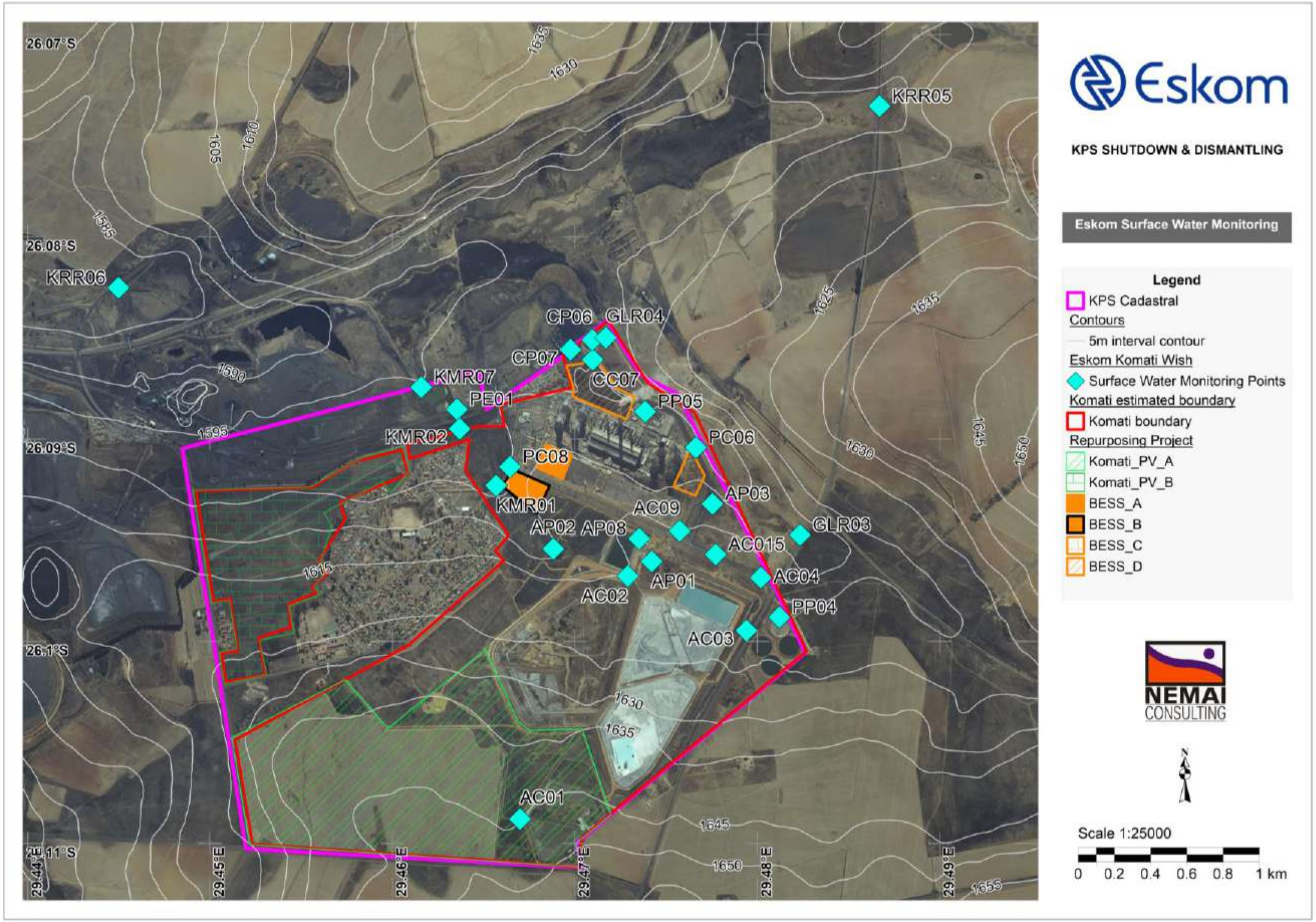


Figure 43: Eskom Surface Water Monitoring Points (Google Earth™)

4.6.9 Surface Water Quality

4.6.9.1 Historical Data and Trend Analysis

Surface water monitoring data exists from 1990 to 2022, however, the data is sporadic and the dataset is incomplete. The sampling frequencies are inconsistence and for reasons of data paucity, no meaningful analysis could be done at all points to create a pollution trend over the last 30 years Hence, only a few monitoring points with adequate data were assessed. The data was analysed against the limits set in WUL 04/B11B/BCGI/1970 and the SANS 241:2015 Drinking Water Standard.

Monitoring points with the most complete data downstream, upstream and just outside KPS were selected to provide insight into the impact of the power station on the surface water in the area (see locations in Figure 44 below):

- AP02 - Clean water dam where Komati Spruit originates west of ash water return dam;
- KMR02 - Komati Spruit downstream from dam KMR01. Sample at culvert underneath sealed road;
- GLR03 - Geluk Spruit. Sample at culvert underneath sealed Bethel Middelburg Road;
- GLR04 - Geluk Spruit. Sample at culvert underneath conveyer.

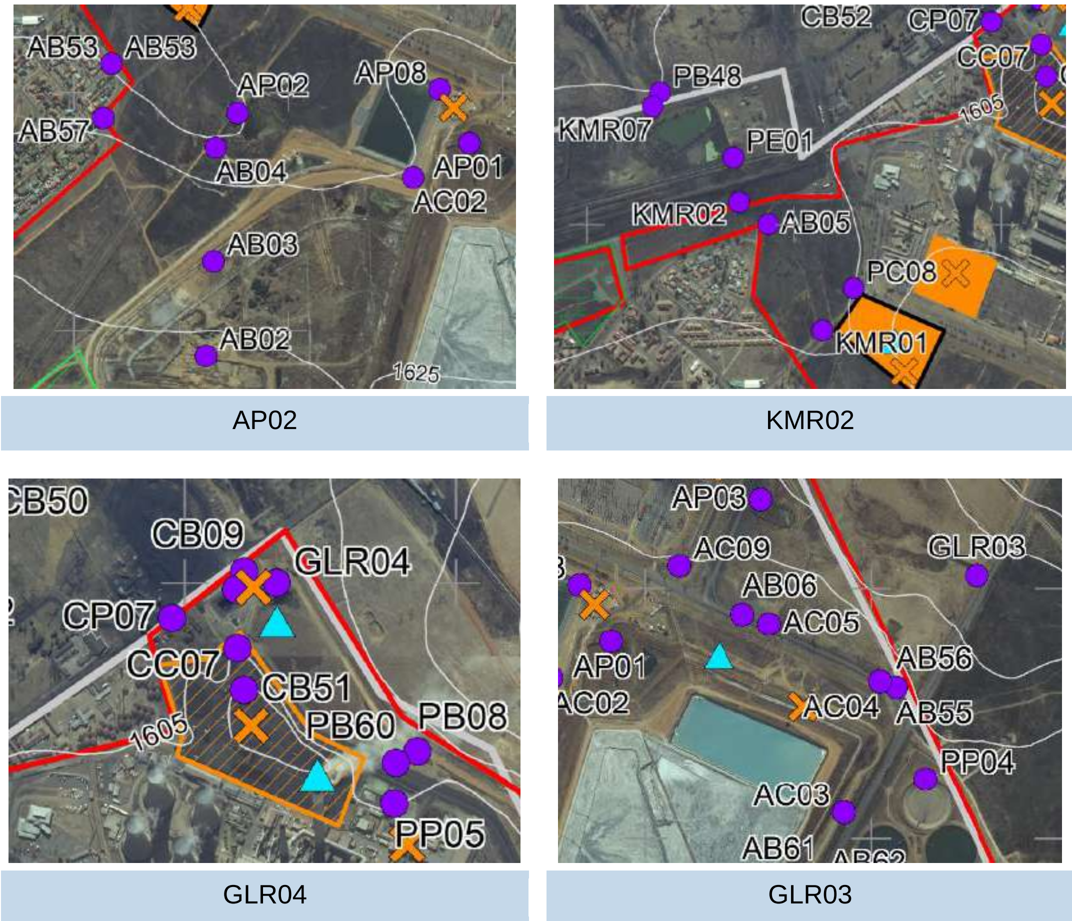


Figure 44: Location of monitoring points for surface water analysis

The total time series of the data spanned from 25 July 1990 to 13 April 2022, a period of 32 years. The longest time span applies to the monitoring points that were established in 1990, other monitoring points were established after 1990 and these have shorter timescales. These differences are reflected in the analysis.

The water quality indicators selected for analysis were those with the most complete datasets.

A total of 1 677 observations were made in the period between 1990 and 2022. Only the following indicators had the most complete data sets:

- pH – WUL limit 6.60;
- EC – Electrical Conductivity, WUL limit 112 mS/m;
- TDS – Total Dissolved Solids, WUL limit 1 200mg/l;
- Mn – Manganese, SANS 241 :2015 Drinking Water Standard, limit 0.4 mg/l;
- Fe – Iron, SANS 241 :2015 SANS 241 :2015 Drinking Water Standard, limit 2 mg/l;
- SO_4 – Sulphate, WUL limit 0mg/l;
- Cr^{3+} – Chromium, SANS 241 :2015 Drinking Water Standard, limit 0.05 mg/l; and
- Cr^{6+} – Hexavalent Chromium, WUL limit 30.80mg/l.

The number of times per year that each constituent was sampled varies widely across the individual points and across the years. For some points, a constituent may be sampled once annually, whilst another constituent might be sampled 6 times annually. The norm appears to be two or three sampling events per year. The analysis uses average values for each constituent, and low number of sampling events in a year would cast doubt on the result. However, taken over long time-scales, these results are considered to be indicative of the concentration levels found for each chemical constituent.

A. Monitoring Point AP02

The dataset runs from 2008 to 2018. Each constituent discussed below was sampled at least annually, however TDS values were not available for 2010 to 2014 and Cr^{6+} values were only sampled twice, once in 2017 once in 2018.

The findings for the contaminant levels at this monitoring point are shown in the Figure 45 below.

The average EC and TDS values were 176.1 mg/l and 1221 mg/l, respectively. Both levels exceeded the WUL limits. The average Na and SO_4 concentrations of 148.2 and 792.31 mg/l, respectively, overwhelmingly exceeded the WUL limits. The SO_4 concentration spiked between 2010 and 2013 when the power station was recommissioned but has since shown a downward trend.

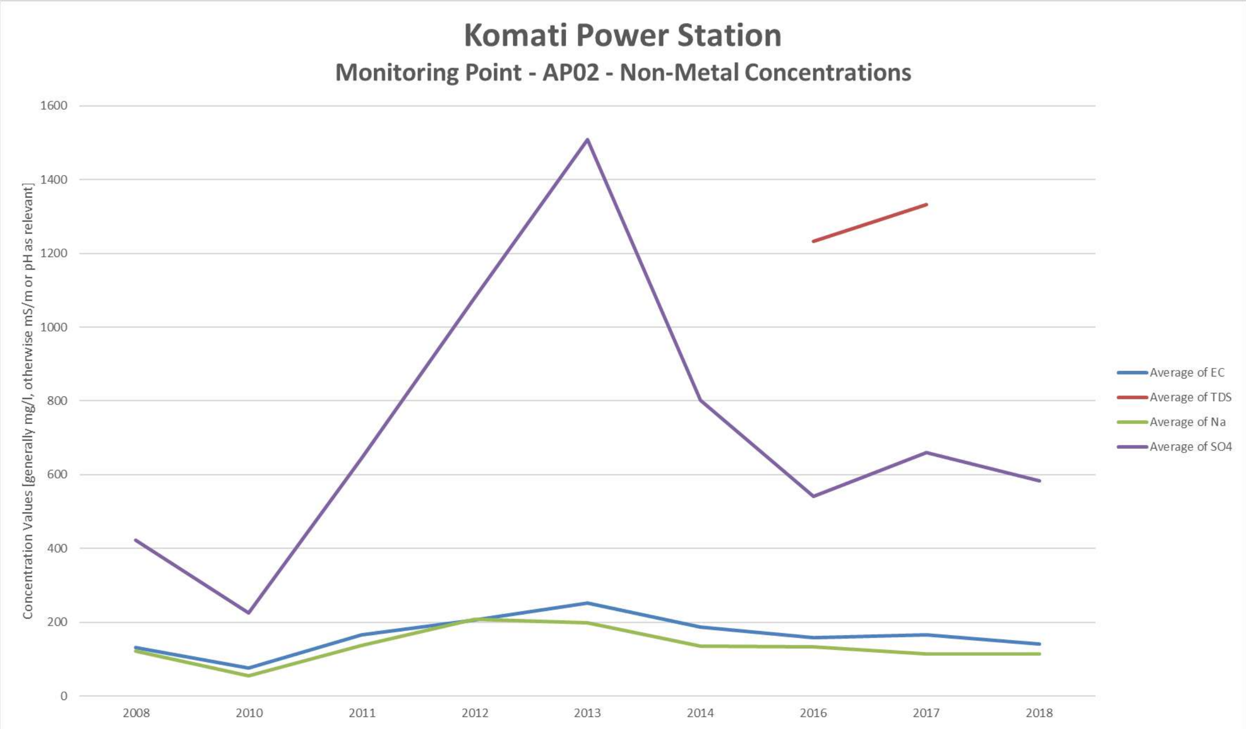


Figure 45 Non-Metals Chemical Results Summary – AP02

The concentration of the metals in the monitoring period is shown in Table 19 below.

Table 19: Metals Chemical Results Summary – AP02

Years	Annual Averages [mg/l]				
	pH	Mn	Fe	Cr^{3+}	Cr^{6+}
Limits [mg/l] :	6.6	0.4	2	0.05	0
2008	7.3	0.000	0.010		
2010	7.1	0.002	0.070	0.006	
2011	7.9	0.014	0.006	0.002	
2012	7.5	0.380	0.006	0.002	
2013	5.4	2.530	0.003	0.001	
2014	7.2	0.116	0.003	0.003	
2016	7.7	2.600	0.030	0.006	
2017	8.5	-0.001	-0.004	0.003	-0.002
2018	8.2	-0.001	-0.004	-0.003	-0.002

The pH results for pH did not exceed the limit of 6.6 for most years in the dataset however in 2014 the pH was 5.4, which was in non-compliance with WUL. The values of Fe and Cr^{3+} did not exceed the limits for any of the years in the dataset. The Mn concentrations were in range for all years except 2013 and 2016 where the limits were grossly exceeded.

B. Monitoring Point KMR02

The dataset runs from 2008 to 2014, over that period 14 samples were taken. Each constituent discussed below was sampled at least annually, however TDS values were only available in 2008. There was no testing for Cr^{6+}. Each constituent was typically sampled three times a year, although there was only one sample taken in 2008 and in 2014.

The findings for the contaminant levels at this monitoring point are shown in the Figure 46 below.

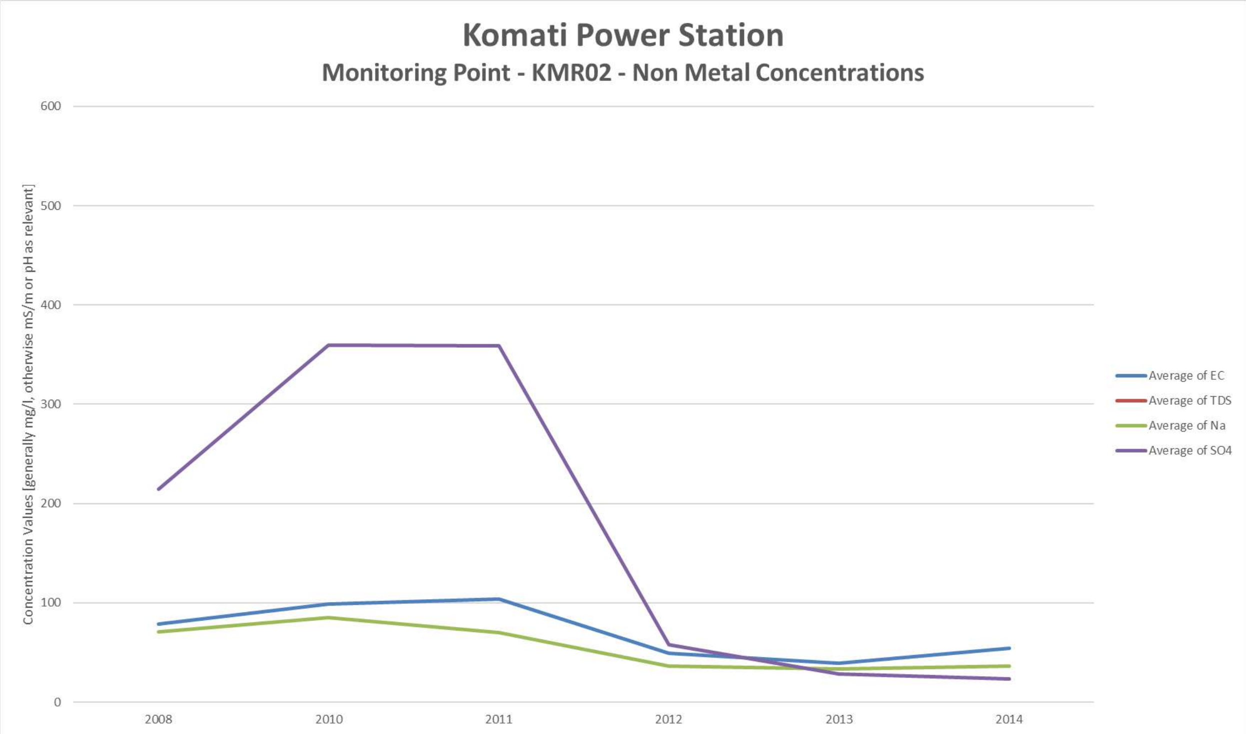


Figure 46 Non-Metals Chemical Results Summary – KMR02

The average value of EC was 72.7 mg/l which is within the WUL limits. TDS was measured once in the dataset, and the value of 485 mg/l did not exceed the WUL limit. The average Na and SO_4 concentration of 55.9 and 191.6 mg/l respectively, were in exceedance of the WUL limit. However, SO_4 has shown a steady downward trend.

The concentration of the metals at this monitoring point is shown in the Table 20 below.

Table 20: Metals Chemical Results Summary – KMR02

Years	Annual Averages [mg/l]				
	pH	Mn	Fe	Cr^{3+}	Cr^{6+}
Limits [mg/l] :	6.6	0.4	2	0.05	0
2008	7.5	0.024	0.030		
2010	7.6	0.011	0.039	0.006	

Years	Annual Averages [mg/l]				
	pH	Mn	Fe	Cr^{3+}	Cr^{6+}
Limits [mg/l] :	6.6	0.4	2	0.05	0
2011	7.5	3.532	0.704	0.004	
2012	7.7	1.600	0.006	0.002	
2013	8.0	0.001	0.003	0.001	
2014	7.5	0.005	0.003	0.004	

The results for pH did not exceed the limit of 6.6 and are within the SANS 241 :2015 Drinking Water Standard range for the entire monitoring period. The Fe and Cr^{3+} concentrations did not exceed the WUL limits. The Mn concentration exceeded the WUL limit in 2011 and 2012.

C. Monitoring Point GLR03

The dataset runs from 2008 to 2019 and during this period 29 samples were taken. Each constituent discussed below was sampled at least annually, however TDS values were not available in 2010 to 2014, and again in 2018. Samples for Cr^{6+} were taken only in 2017, 2018 and 2019. Each constituent was typically sampled twice times a year, although in some years three samples were taken annually.

The concentration of constituents at the monitoring point is shown in Figure 47 below.

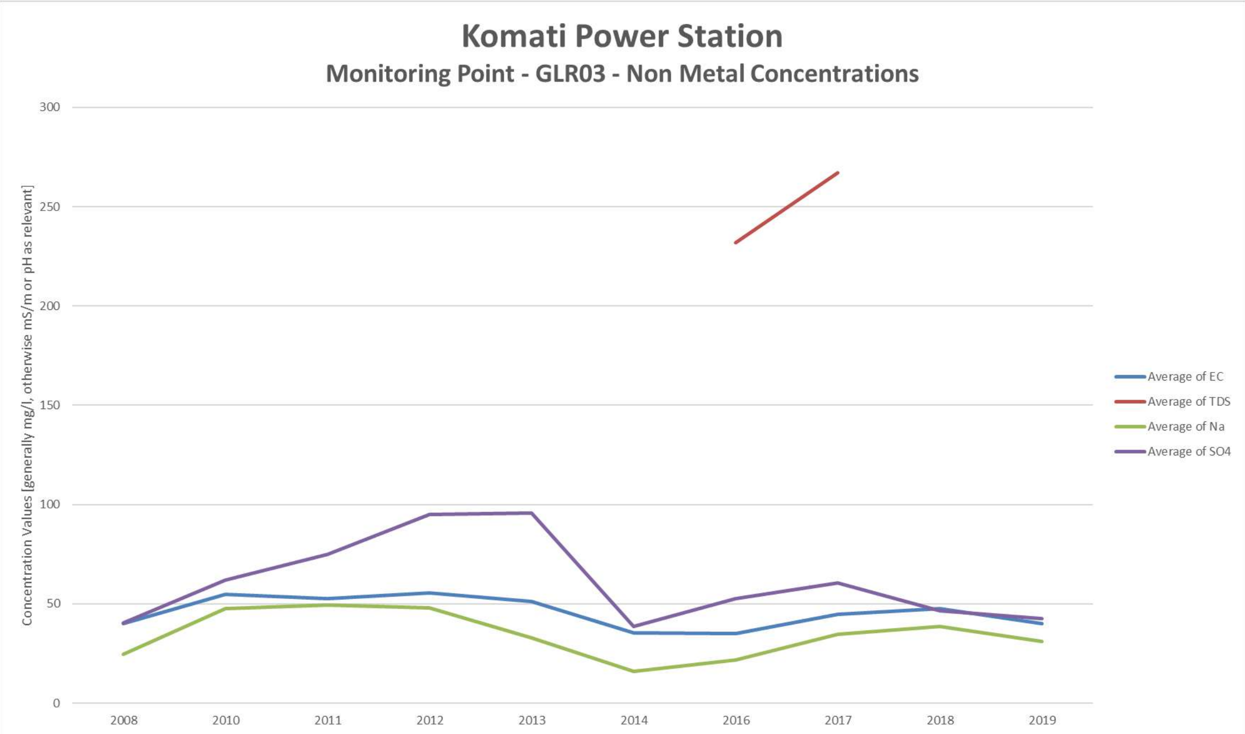


Figure 47 Non-Metals Chemical Results Summary – GLR03

The average value for EC in the period was 46.5 mg/l, while the average TDS level was 244.6 mg/l, both of which were within the WUL limits. The average Na and SO_4 concentrations, of 36.8 and 62.2 mg/l respectively, exceeded the WUL limits. The SO_4 concentration has shown a downward trend however Na has gently fluctuated over the period.

The concentration of the metals at this monitoring point is shown in the Table 21 below.

Table 21: Metals Chemical Results Summary – GLR03

Years	Annual Averages [mg/l]				
	pH	Mn	Fe	Cr^{3+}	Cr^{6+}
Limits [mg/l] :	6.6	0.4	2	0.05	0
2008	7.5	0.137	0.230		
2010	7.8	0.024	0.041	0.006	
2011	7.7	0.047	0.036	0.004	
2012	7.9	0.602	0.006	0.002	
2013	7.9	0.001	0.003	0.001	
2014	8.0	0.001	0.003	0.004	
2016	8.1	0.005	0.003	0.004	-0.002
2017	8.5	-0.001	-0.004	-0.003	-0.002
2018	8.4	-0.001	-0.004	-0.003	-0.002
2019	8.1	10.671	-0.004	-0.004	-0.002

In the period, the average pH value was more alkaline than the WUL limit but was within the SANS 241 :2015 Drinking Water Standard range. In 2012, Mn was marginally higher than the SANS 241 :2015 Drinking Water Standard however in 2019 the limit was significantly exceeded. This could be due to a localised incident.

The Fe, Cr^{3+} and Cr^{6+} concentrations were never exceeded in the monitoring period.

D. Monitoring Point GLR04

The dataset runs from 1990 to 2019 and during this period 54 samples were taken. Each constituent discussed below was sampled at least annually, except 2007 when no samples were taken. TDS values were not available in 1998 to 2006 and again in 2010 to 2014. There were samples taken for Cr^{6+} in 2017, 2018 and 2019. Cr^{3+} was only tested from 2010 and Iron and Mn from 2005. Each constituent was typically sampled twice a year, although many years featured three samples. One sample was taken in 1996, 2005, 2006 and 2008.

The concentration of constituents at the monitoring point is shown in Figure 48 below.

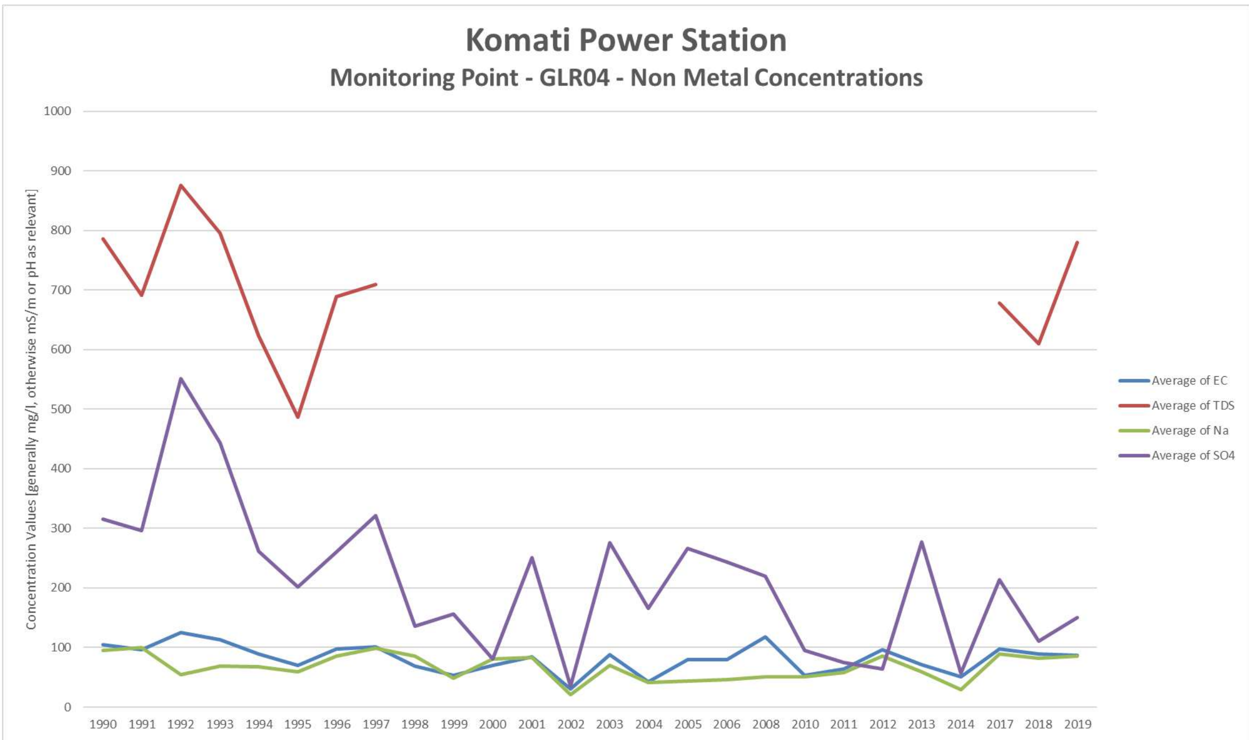


Figure 48 Non-Metals Chemical Results Summary – GLR04

The average EC and TDS values of 82.9 mg/l and 713.6 mg/l respectively, did not exceed the WUL limits. In all samples the Na and SO_4 concentrations exceeded the WUL limits. The SO_4 concentration has shown a downward trend since KPS was mothballed however since the recommissioning of the station, the concentration levels have been gradually increasing but are contained to below the pre1990 levels.

The concentration of the metals at this monitoring point is shown in Table 22 below.

Table 22: Metals Chemical Results Summary – GLR04

Years	Annual Averages [mg/l]				
	pH	Mn	Fe	Cr^{3+}	Cr^{6+}
Limits [mg/l] :	6.6	0.4	2	0.05	0
1990	7.6				
1991	8.2		0.200		
1992	7.2				
1993	7.9				
1994	8.2				
1995	7.9				
1996	8.4	0.160			
1997	8.1				
1998	7.9				

Years	Annual Averages [mg/l]				
	pH	Mn	Fe	Cr^{3+}	Cr^{6+}
Limits [mg/l] :	6.6	0.4	2	0.05	0
1999	8.0				
2000	8.2				
2001	8.2				
2002	7.6				
2003	8.4				
2004	7.3				
2005	7.9	0.080	0.050		
2006	7.7	0.100	0.100		
2008	7.1	0.027	0.030		
2010	7.4	0.267	0.069	0.006	
2011	7.5	0.613	0.126	0.004	
2012	7.5	1.299	0.007	0.002	
2013	6.6	0.233	0.003	0.001	
2014	7.9	0.001	0.003	0.001	
2017	8.5	-0.001	-0.004	-0.003	-0.002
2018	8.1	0.177	-0.004	-0.003	-0.002
2019	7.9	0.115	-0.004		-0.002

In the period, the average pH value was more alkaline than the WUL limit but was within the SANS 241 :2015 Drinking Water Standard range. In 2011 and 2012, Mn concentrations at the monitoring point exceeded the SANS 241 :2015 Drinking Water Standard.

The Fe, Cr^{3+} and Cr^{6+} concentrations were never exceeded in the monitoring period.

SO_4 and Na generally exceeded the limits for the duration of the dataset. Fe, Cr^{3+} and Mn were generally within the limits.

The historical data across all four (4) monitoring point shows the surface water is polluted due to KPS.

4.6.9.2 Current Data Analysis

The latest results available for surface water quality are from monitoring that was undertaken in January 2022. The monitoring was undertaken to comply with the related condition in the WUL (04/B11B/BCGI/1970) to assess the impact of KPS on surface water resources.

Only monitoring points KMR01, KMR07, Ash Dam and 3rd Recovery Dam were sampled in January 2022.

In all samples, pH, Na, F and SO_4 concentrations exceeded the WUL limits. In monitoring points KMR07, the Ash Dam and the 3rd Recovery Dam the Cl concentrations exceeded the WUL limits.

When compared to Drinking Water Standards, all sampling points exceed the Nephelometric Turbidity Units (NTU) and SO_4 limits. The Mn levels were exceeded in KMR07 and the Ash Dam.

While the full extent of surface water contamination cannot be reliably confirmed from the Eskom data, there is sufficient evidence to conclude that surface water is being polluted due operations at KPS.

4.7 Soil

Soils of the area are fine to medium sand and are reasonably deep (ILISO Consulting, 2012). Land in the region is generally classified as arable and dryland agriculture is extensively practiced.

4.7.1 Soil Types

The following information regarding soil properties at KPS was sourced from Eskom's Geotechnical Desktop Study (Leseka, 2022) that was undertaken as part of the Project's pre-feasibility investigation.

The area predominantly consists of sandstone, shale and coal beds, sedimentary rock origin. Sandstone can be hard and form a strong hanging wall however in the presence of intercalation with mudrock, it could result in slope stability issues and rock falls in cases when the mudrock disintegrates or slake resulting in the exposure of the sandstone layers. Sandstone intercalating with siltstone in the Vryheid Formation are notorious for porewater pressures in the interfaces, which may result in sliding of the rock.

The engineering properties of coal are not significant in conventional civil engineering applications of engineering geology. It is however important to assess the stability of underground workings and rehabilitation of the area. It is imperative to know the underground mining methods/quality of work or planned mining methods in areas deemed for surface development to not compromise the surface structures during pillar extractions with controlled goafing of the strata, in board and pillars mining method, for example. It is also important to know the rehabilitation strategy once the Life of Mine has been reached, to avoid underground fires, which will result in surface subsidence, dolines and sinkholes which are prominent in the Mpumalanga area, a danger for surface developments.

Dolerite, a basic igneous rock origin, which often results in onion skin weathering. This makes the area susceptible to producing problematic soils such as clay (turf); silty clay changing to sandy clay with depth; corestones; gravel, cobbles and boulders. The engineering impacts associated with this weathered material are expansive clays; low shear strength semi- to impervious soils; poor compaction and workability; unstable slopes and uneven bedrock surface.

The findings of the pending detailed Geotechnical Study, including problematic soil types (e.g., prone to wind and water erosion), will be included in the ESIA Report.

4.7.2 Soils Contamination

4.7.2.1 Eskom Analysis

Eskom undertook a soil analysis at KPS in November 2020 to comply with a related condition in the WUL. The field investigation was conducted at sites around the coal stockyard, ADF, and power station area (see list of sampling sites in Table 23 below). The selection of these sites was based on the dust suppression related activities being conducted on the sites and compared to a relatively pristine site where no dust suppression is practiced.

Table 23: Soil sampling sites

Site ID.	Site Description	Latitude (ºS)	Longitude (ºE)	Date of Sample
DSL01	Gravel road next to the ashing area	26°05'49"	29°27'41"	04-Oct-20
DSL02	Gravel road towards coal stock-yard	26°05'30"	29°28'38"	04-Oct-20
DSL03	Grass area next to the water treatment facilities	26°05'29"	29°28'22"	04-Oct-20
DSL04	Coal Stockyard area	26°05'15"	29°28'21"	04-Oct-20

The results of the analysis are presented in Table 24 below. Several parameters were assessed as indicators of soil pollution emanating from the dust suppression related activities. The suitability of these parameters to act as indicator elements in the evaluation of soil contamination from dust suppression activities was determined by the WUL.

Table 24: Soil analysis results

Site	EC (mS/m)	pH	Ca (mg/l)	Mg (mg/l)	Na (mg/l)	K (mg/l)	Cl (mg/l)	NO3-N (mg/l)	Al (mg/l)	Mn (mg/l)	Fe (mg/l)
DLS 03	6,34	8,73	3549	4066	383,2	3809,6	14,75	11	44621	640,8	35641,1
DLS 01	19,05	7,81	1206	972	378,5	1619,2	49,60	17,53	23679	783,8	46173,3
DLS 02	13,61	8,48	1424,4	2086	863,3	4416	95,00	88,5	14191	665	1374,1
DLS 04	31,6	7,99	1225	3866	1211	2941	82,10	44,8	39408	1740	34943

Although the objective of this soil study was to determine the impact of dust suppression, it may also provide some indication of the level of soil contamination on the site (if any). Of the analyses conducted only Mn, Nitrate (NO_3) and Cl have parameters that correlate with those required for a contaminated land screening assessment (VPC GmbH, 2021). The screening values for Mn (740 mg/kg), Cl (12 000 mg/kg), and NO_3 (120 mg/kg) are only slightly exceeded in Mn (as shown in the grey shaded cells).

4.7.2.2 Asbestos Assessment

According to VPC GmbH (2021), an assessment was undertaken in 2013 by Ergosaf Environmental and Occupational Health Services to establish if the disposal and storage of asbestos at the ADF poses a risk of environmental contamination. This included sampling of soils, surface and groundwater. Analysis of three soil samples potentially containing asbestos fibres revealed that none of the samples contained asbestos. The samples were taken from the topsoil and ash at depths of between 200mm and 300mm. The site was covered with a layer of approximately 3m – 5m of ash from the ash dams.

4.7.2.3 WSP Soil Analysis

As mentioned in Section 4.5.4.4 above, WSP was appointed by Eskom to undertake a preliminary contamination assessment for targeted portions of KPS, which forms part of the ESIA and WULA processes for the Solar PV and BESS Project (Component B). An extract from the Preliminary Contaminated Land Study Report (Skinner, 2022), focusing on the soil analysis, follows. The full report is contained in Appendix E.

Twenty-five auger holes (AH01–AH25) were manually advanced to depths ranging from 0.3–1.7 mbgl (see Figure 49 below).

The soil samples were submitted to a SANAS accredited laboratory (Facility No T0729) for analyses broadly consistent with the priority contaminants listed in the National Norms and Standards for the Remediation of Contaminated Land and Soil Quality (GN R.331 of 2014). This was supplemented with the following selected determinants at the request of Eskom:

- Metals/metalloids: antimony, arsenic, cadmium, chromium (total and hexavalent), cobalt, copper, iron, lead, manganese, mercury, nickel, selenium, vanadium and zinc;
- Inorganics: ammoniacal nitrogen, chloride, cyanide, fluoride, nitrate, nitrite and sulphate;
- Aliphatic petroleum hydrocarbons (C_7–C_9, C_{10}–C_{14} and C_{15}–C_{36});
- VOC including benzene, toluene, ethylbenzene and xylenes (BTEX);
- SVOC including PAH;
- PCB; and
- Physiochemical: pH and electrical conductivity.

It is noted that asbestos was specifically excluded from the current assessment given the outcomes contained in the report compiled by VPC GmbH (2021).

The 2010 Framework for the Management of Contaminated Land, which was compiled in support of Part 8 of NEM:WA (see Section 2.4.5.2 above), outlines the methodology for the screening of potentially contaminated sites to provide a risk-based decision support protocol for their assessment. Further, the then Department of Environmental Affairs (DEA) gazetted GN R.331 in May 2014, with these being promulgated under Section 7(2)(d) of the NEM:WA by the then Minister of Water and Environmental Affairs. GN R.331 provides Soil Screening Values (SSVs), a tiered system of priority soil contaminants, to facilitate the determination of sensitivity of the relevant receptor which may be subject to exposure. These are defined as follows:

- SSV1 represents the lowest value calculated for each parameter from both the human health and water resource protection pathways. SSV1 values are not land-use specific.
- SSV2 represents the land-use specific soil concentration and are appropriate for screening level site assessment in cases where protection of water resources is not an applicable pathway for consideration.

Separately, GN R.331 provides Soil Screening Levels (SSLs) for a number of anions; however, it is notable that these are not related to potential risks to human health via direct exposure. These are specifically investigation values that are relevant only to provide guidance on potentially excessive levels of salts, which can represent a major cause of deterioration of soil or water quality from an ecological perspective.

Recognising the general approach prescribed by the above-mentioned Framework, the analytical results for the analysed contaminants of concern was first compared to the SSV1s published in GN R.331. Where SSV1s are not available reference has been made to the USEPA Regional Screening Levels (RSLs) for Residential Soil (May 2022) as a reasonable alternative while recognising the different paradigm behind their derivation. Whilst conservative under many potential exposure scenarios, such screening allows justified rationalisation of potential contaminants that may require further assessment and/or management, and discounts those potential exposure pathways that do not pose a significant risk.

Cadmium, hexavalent chromium, cyanide and PCBs as well as the majority of the VOCs and SVOCs were recorded below their respective laboratory detection limits and, therefore, are not seen as contaminants of concern for further consideration. Otherwise, the following is noted:

- Arsenic, lead, and manganese were above their respective SSV1s within shallow soils across most of the proposed development areas with the exception of BESS A and BESS B. Similar is noted for vanadium although this was also below its SSV1 at BESS D and the fuel depot, as well as down-gradient;
- Excluding samples from BH02, BH06 and AH10 copper was ubiquitously above its SSV1;
- Iron was above its USEPA RSL within various samples, and largely within ferruginised soils;
- Sulphate was above its SSL within those samples retrieved from AH01 (coal stockyard) and AH15 (historical ash dump at PV Site A);
- Pyrene and benzo(a)pyrene were above their respective SSV1s within the sample collected from AH06 at the fuel depot.

The pH of the samples collected ranged widely from 4.58–7.92. Although there are no SSVs published for the protection of human health under the NEM:WA, the SANS Globally Harmonised System of Classification and Labelling of Chemicals, SANS 10234:2019 recognises materials with a pH within a range of 2–11.5 as not being hazardous.

Where contaminants were recorded in excess of their respective initial assessment criteria and following the stepwise methodology described in the Framework, further screening was separately carried out to ascertain whether these could plausibly represent risks to either human health or aquatic systems based on site-specific considerations.

As indicated, the SSLs for anions (i.e., sulphate) are only relevant to provide guidance on potentially excessive levels of salts and, therefore, have not been carried forwards into the further screening exercise. Nonetheless, with the exception of localised instances of elevated sulphate within samples containing coal and ash these were consistently below their respective SSLs and so no concern is raised.

Recognising that Komati Village lies central to the overall proposed development areas for Component B, SSV2s relevant for formal residential use were conservatively adopted to ascertain whether soil contamination may represent a potential health risk. The following was noted in terms of risk to human health:

- With the exception of manganese AH20 (PV Site A), BH10 (PV Site B) and BH04 (BESS B) as well as vanadium at AH21 (PV Site A), metals were below their respective SSV2s. While these localised anomalies are noted, overall average concentrations of both manganese (~754 mg/kg) and vanadium (~124 mg/kg) were below their SSV2s for a formal residential setting. Therefore, in the wider context these are considered unlikely to represent a significant source of risk with respect to human health, especially when recognising that all were below their SSV2s relevant for the commercial/industrial land-use of the proposed development areas; and
- Benzo(a)pyrene was above both its formal residential and commercial/industrial SSV2s within AH06 at the fuel depot. This is indicative of potential risks to human health from ongoing operations and possibly symptomatic of more extensive impacts local to the fuel depot that will require consideration by Eskom during decommissioning.

With respect to soil-based contamination, potential risks to aquatic systems are defined based on the sensitivity of the surface water and groundwater resources. The Framework methodology recognises the adoption of SSV1 as generic criteria in the event that there is a current or potential future groundwater use on or within 1km of a site, or there is a permanent surface watercourse on or adjacent the site. Recognising the proximal surface water courses, including wetlands, as well as the abstractions within 500m of the premises boundary, these criteria are considered to be satisfied and therefore, with the exception of iron (USEPA RSL for human health only), the commentary above is relevant.

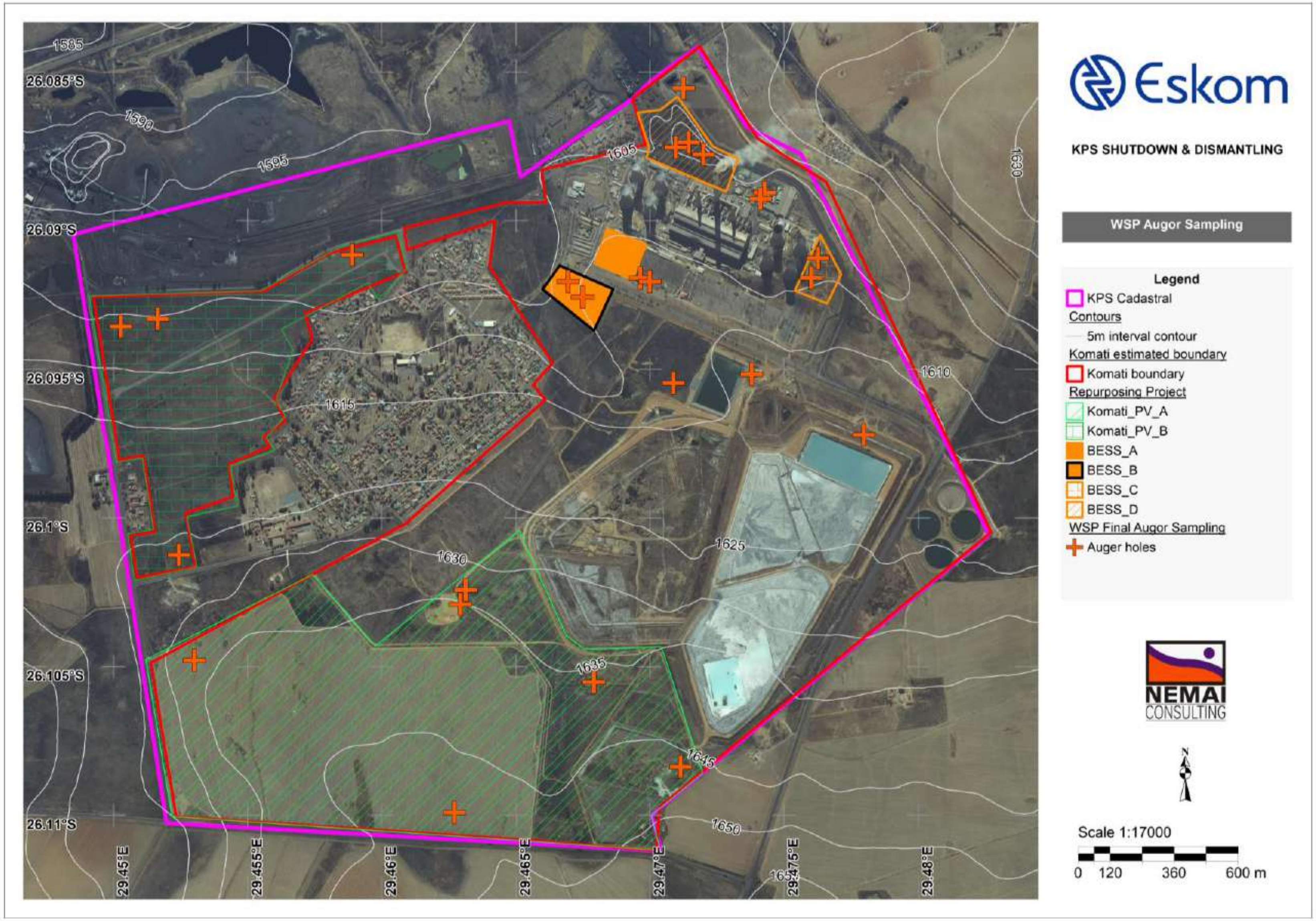


Figure 49: WSP Soil Contamination Monitoring Points (Google Earth™)

4.8 Land Use & Land Cover

The dominant land uses in the greater area include electricity generation and transmission facilities, coal mining and dryland agriculture. Pockets of residential areas supporting these activities also occur in the area, such as Komati Village, Pullens Hope, Blinkpan, KwaZamokuhle, Rethabile, and Vandyskdrif.

The land on which the KPS is situated has been transformed by the various facilities and activities associated with the operation of the power station. The land use of the KPS property comprises cultivated lands, rehabilitated areas, alien invasive tree clumps (mainly Eucalyptus trees), grassland (disturbed and natural) and moist grasslands (wetlands), as well as pans and dams (see Figure 50 below). Most of the grassland areas were grazed, historically cultivated or disturbed.

The Koornfontein Colliery lies to the immediate west of KPS followed by the Goedehoop Colliery. KPS previously sourced its coal from the Koornfontein Colliery, however, it is currently trucked in. According to Jeffrey (2021), the Goedehoop Colliery is an amalgamation of Bank Colliery (now known as Goedehoop North) and the original Goedehoop Colliery (now known as Goedehoop South) in 2006. Goedehoop South is closed, and no mining occurs in this area. The infrastructure at Goedehoop South remains and the environmental and water management at the site continues. It is noted that Goedehoop Colliery holds a Mining Right (MP 30/52/1/2/2/23 MR) for the Remaining Extent of the Farm Komati Power Station 56 IS, on which KPS is located. In the Environmental Impact Report (EIR) and EMPr for the Goedehoop Colliery, Hope No. 4 Seam Project (Shakwane, 2015) it is recorded that Eskom initially objected to the extension of the underground mining operations onto the KPS property. Thereafter, Anglo Operations (Pty) Ltd ("Anglo") had a meeting with the Eskom representative regarding undermining the ADF and it was agreed that Anglo may undermine the ash dump based on the safety factor that was presented to Eskom. The National Key Point at KPS was not included in the mining layout plan, only the area next to the ash dump facility. The status of undermining on the overall KPS property could not be confirmed during the compilation of the draft ESIA Report and is to be determined in consultation with the mine in question. Long-term monitoring of undermining risks may be required, depending on the extent to which KPS is affected by underground mining.

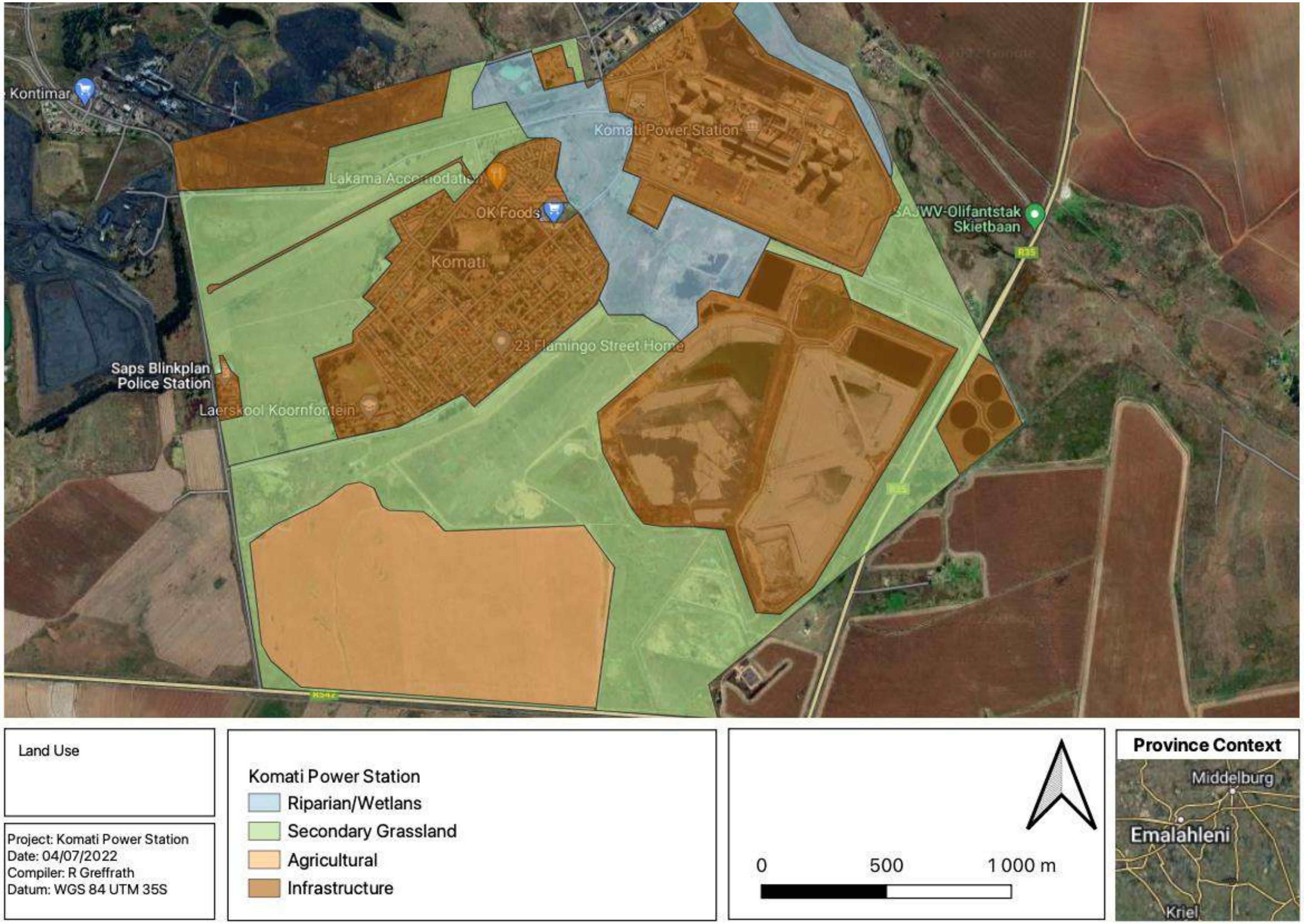


Figure 50: Land use at KPS site (The Biodiversity Company, 2022)

Informal settlements are located to the immediate north-east of the power station complex (see Figure 51 below) and north-east of the ADF (see Figure 52 below). There are also dwellings on the farms surrounding KPS, including to the south-east of the ADF (see Figure 53 below).

Figure 51: Photographs of Big House informal settlement north-east of the power station complex, viewed from inside (top) and outside (bottom) of the power station

Figure 52: Photograph of small informal settlement north-east of the ADF

Figure 53: Photographs of dwellings at Geluk Farm viewed from the ADF

4.9 Air Quality

4.9.1 General Description

The following information was extracted from the Air Quality Impact Assessment (Enslin-Liebenberg & Mudeme, 2008) that was undertaken for the proposed KPS Ash Dam Extension:

- The Mpumalanga Highveld has been noted to have increased air pollution concentrations and various elevated sources of emissions located in this region have been associated with the long-range transportation of pollutants and with the potential for impacting on the air quality of the adjacent and more distant regions. Criteria pollutants identified as of major concern in the region include particulates, sulphur dioxide (SO_2) and nitrogen oxides (NO_x);
- The Highveld Airshed Priority Area (HPA) was declared by the Minister of Environmental Affairs at the end of 2007, requiring the development of an Air Quality Management Plan for the area. The plan includes the establishment of emissions reduction strategies and intervention programs based on the findings of a baseline Characterisation of the area; and
- Sources of SO_2 and NO_x in the region include Eskom power stations, industrial emissions, blasting operations at mines and spontaneous combustion of discard at coal mines, veld burning, vehicle exhaust emissions and household fuel burning. Various local and far-a-field sources are expected to contribute to the suspended fine particulate concentrations in the region. Local sources include wind erosion from exposed areas, fugitive dust (agricultural and mining operations), particulate releases from industrial operations, vehicle entrainment from roadways and veld burning.

Seven (7) Eskom power stations occur in NDM, namely Hendrina, Arnot, Komati, Kriel, Matla, Kendal and Duvha Power Stations (see Figure 54 below). Eskom developed an Air Quality Offsets Implementation Plan (Matimolane, 2021) for the district, in accordance with the AEL's of these power stations, that aims to improve ambient air quality in several communities around these stations. It is noted in this Plan that with the imminent decommissioning of KPS, the settlements allocated to this power station for offsetting will be reallocated to Arnot Power Station.

According to Air Quality Offsets Implementation Plan (Matimolane, 2021), the areas impacted by emissions from KPS are as follows (in order of highest impact) (see Figure 55 below):

- Komati Village (village at KPS);
- Pullens Hope (Hendrina's power station village);
- Blinkpan (mining town);
- KwaZamokuhle;
- Hendrina;
- Rethabile; and
- Vandyskdrif.

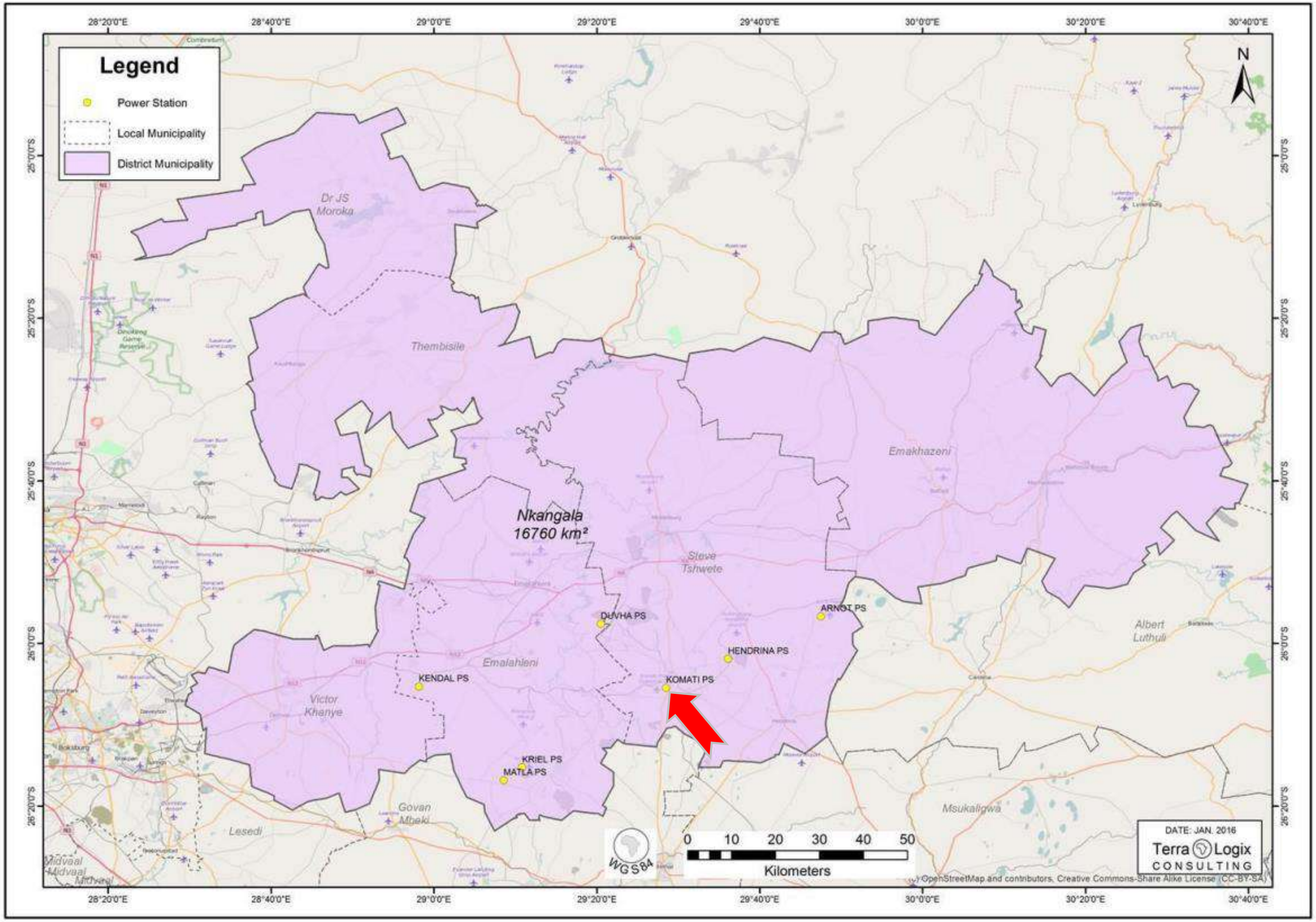
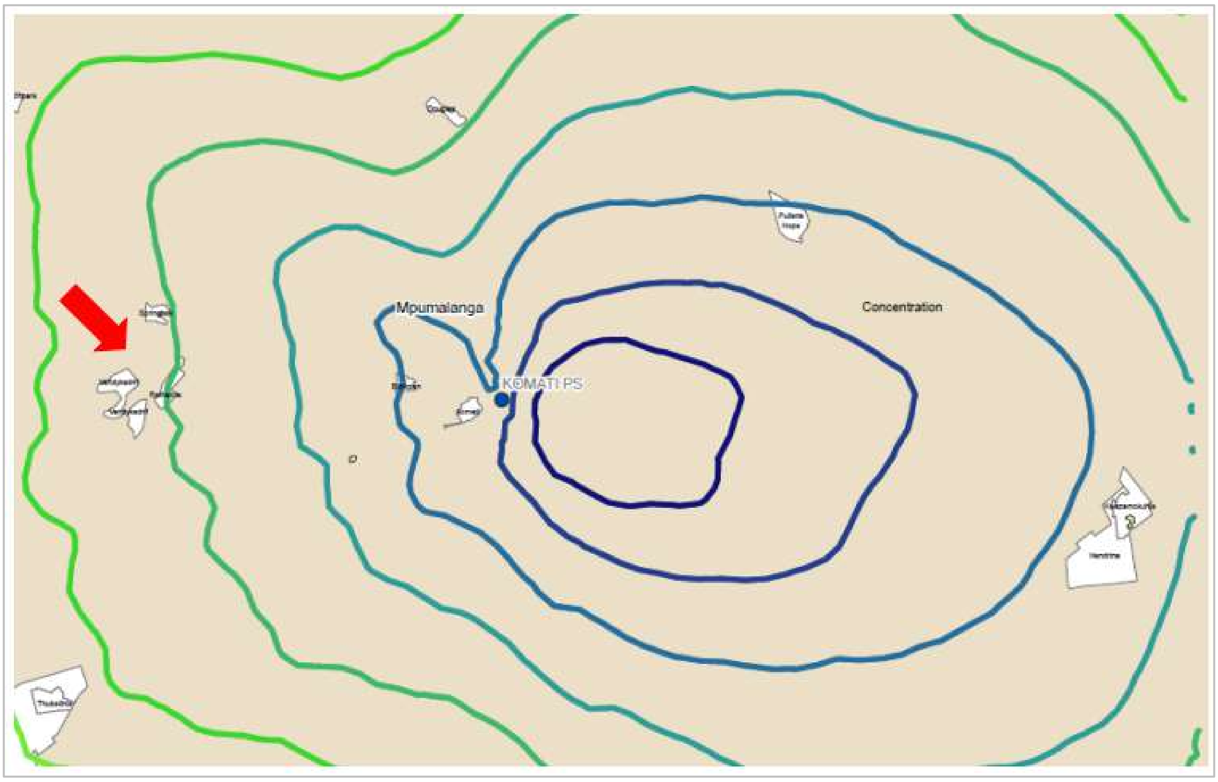


Figure 54: Power stations in NDM (Matimolane, 2021) (KPS pointed out)



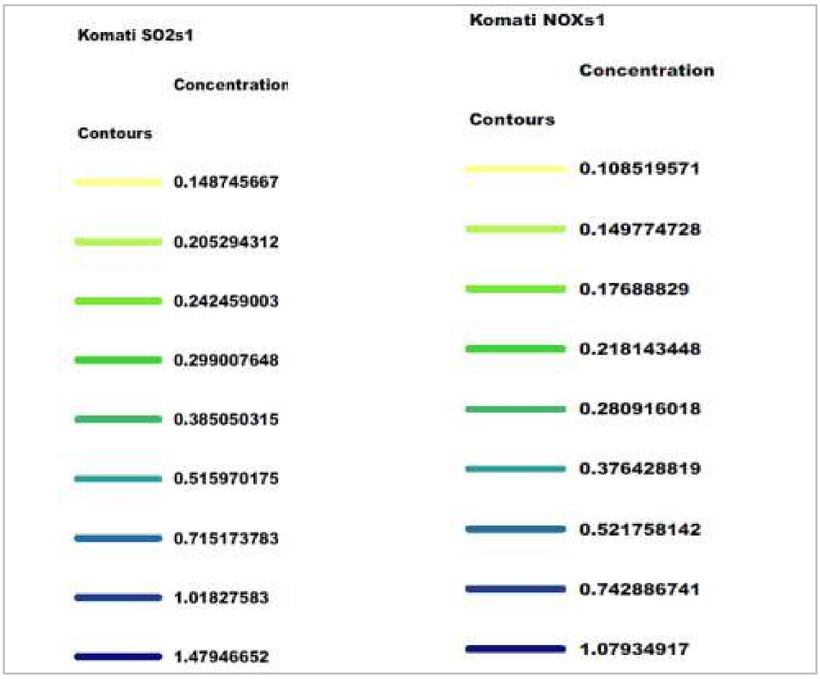


Figure 55: Area of impact of KPS' emissions (annual average concentrations in μg/m³ from uMoya-NILU, 2014), and locations of Rethabile and Vandyksdrif

Other receptors of air quality impacts include neighbouring farms (including Schoeman Farm - 500m away and Geluk Farm - 3km away), Big House informal settlement (to the immediate north-east of the power station complex), Emahlathini informal settlement (10km away) and Goedehoop informal settlement (15km away) (see Figure 56 below).

Figure 56: Examples of Receptors near KPS to Air Quality Impacts (Google Earth™)

Although the prevailing wind directions are from the north-east and north, varying wind directions are encountered during the daytime and night-time, as well as during the summer and winter months (refer to Section 4.2 above). The receptors mentioned above could thus be adversely affected by emissions from KPS.

The Highveld climate classification predicts warm wet summers and dry winters. Dust storms occur during periods of prolonged dry weather. Dust from the ADF could thus be a problem during the dry season.

4.9.2 Air Quality Monitoring

4.9.2.1 Monitoring Station

It is noted that during the return to service of KPS, its electrostatic precipitators were refurbished, SO_3 plants were installed on all the units to improve the performance of the electrostatic precipitators, and a taller stack was built to aid the dispersion of the emissions.

The air quality monitoring station at KPS is located 2.2km south-west of the power station (coordinates: 26°05'53.44"S, 29°27'01.95"E) (see Figure 57 below).

Figure 57: Air quality monitoring station at KPS (Google Earth™)

Monitoring at the KPS station commenced on 1 June 2006. According to (Moatshe, 2022), the station is equipped to continuously monitor ambient concentrations of SO_2, nitrogen dioxide (NO_2) and fine particulate matter of particulate size <10μm and particulate size <2.5μm in diameter (PM_{10} and $PM_{2.5}$). In addition, meteorological parameters of wind velocity, wind direction and ambient temperature, humidity, ambient pressure and rainfall, amongst others are also recorded.

The monitoring site is accredited by the SANAS. Sampling is carried out in accordance with SANAS TR07-03 and Eskom's Air Quality Monitoring Guideline (240-93863318) and the

Eskom's AQM sampling document (AQM-010-02). Results are screened against the National Ambient Air Quality Limits presented in Table 25 below. The ESIA Report will compare the air quality results with the WHO Air Quality Guidelines contained in the General EHS Guidelines.

Table 25: National Ambient Air Quality Limits (Moatshe, 2022)

Pollutant	Unit	Period	Limit	Number of annual exceedances allowed	Source
Carbon Monoxide	Ppm	1hr	26	88	DFFE
Carbon Monoxide	Ppm	8hr	8.7	11	DFFE
(PM10) by Beta gauge	µg/m³	24hr	75	4	DFFE
(PM10) by Beta gauge	µg/m³	1 year	40	0	DFFE
(PM2.5) by Beta gauge	µg/m³	24hr	40	4	DFFE
(PM2.5) by Beta gauge	µg/m³	1 year	20	0	DFFE
Nitrogen dioxide	Ppb	1 year	21	0	DFFE
Nitrogen dioxide	Ppb	1hr	106	88	DFFE
Ozone	Ppb	8hr	61	11	DFFE
Sulphur dioxide	Ppb	1hr	134	88	DFFE
Sulphur dioxide	Ppb	10min	191	526	DFFE
Sulphur dioxide	Ppb	24hr	48	4	DFFE
Sulphur dioxide	Ppb	1 year	19	0	DFFE

4.9.2.2 Historical Trends

This section includes information obtained from Eskom's Air Quality Report for May 2022 (Moatshe, 2022).

Figure 58 to Figure 63 below show the time series graphs for each parameter with respect to the National Ambient Air Quality Limits from the beginning of 2021 until May 2022, or since inception of the monitoring. NO_2 and SO_2 concentrations are lower in summer and higher in winter and spring (May 2021 – May 2022). PM_{10} and $PM_{2.5}$ levels are high during winter and lower during summer for both 2021 and 2022. Ozone (O_3) concentrations are low for both 2021 and 2022. Gaps in data are periods when the equipment was being repaired.

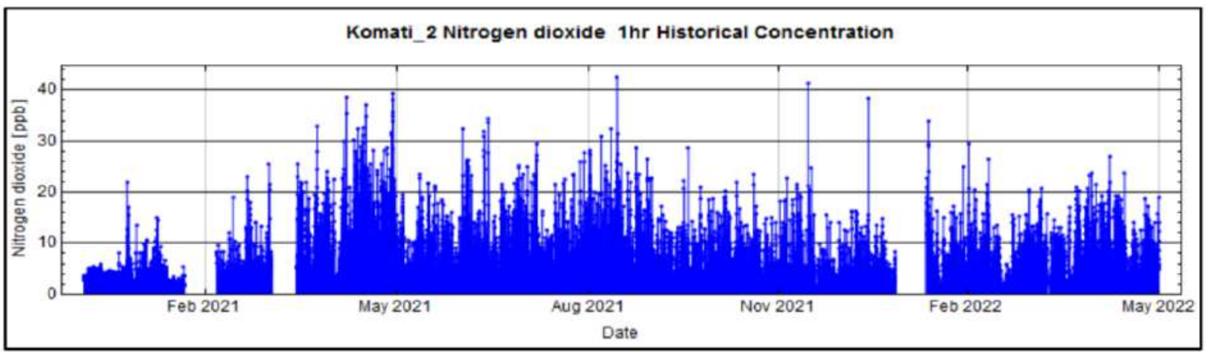


Figure 58: Historical trends of NO_2 hourly mean concentrations

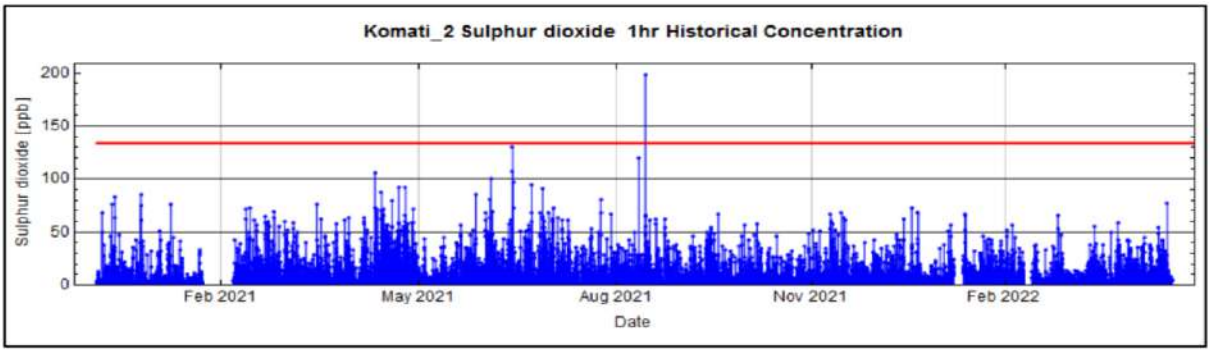


Figure 59: Historical trends of SO_2 hourly mean concentrations

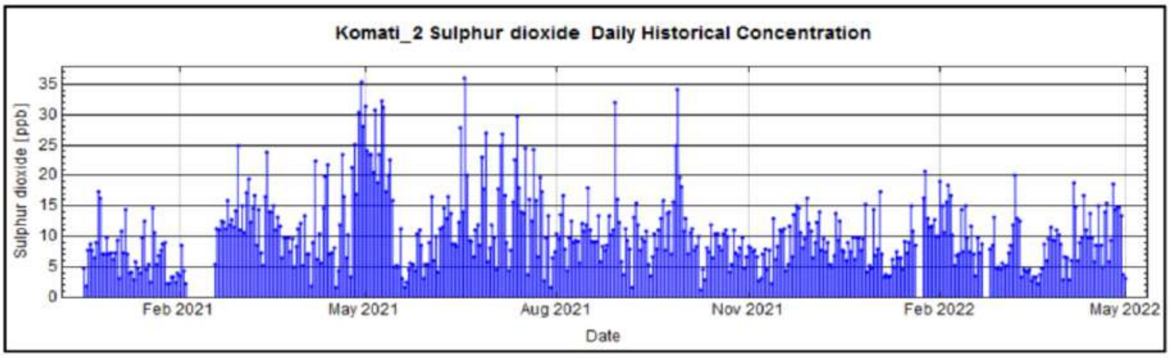


Figure 60: Historical trends of SO_2 daily mean concentrations

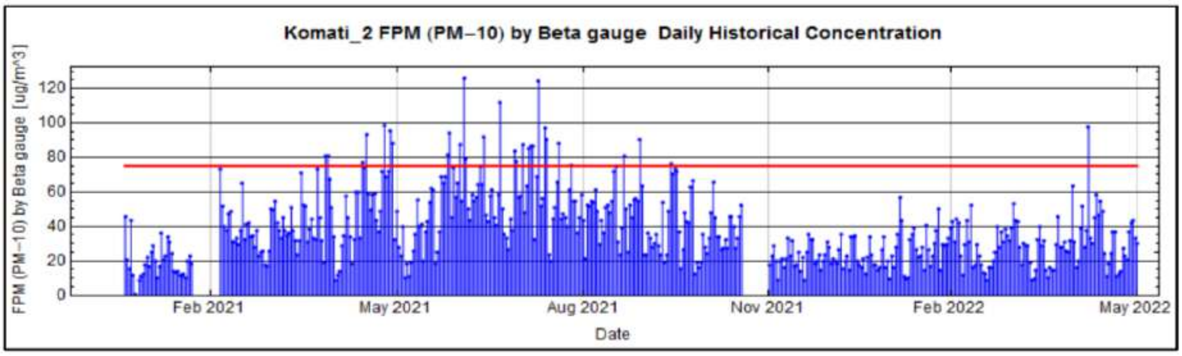


Figure 61: Historical trends of PM_{10} daily mean concentrations

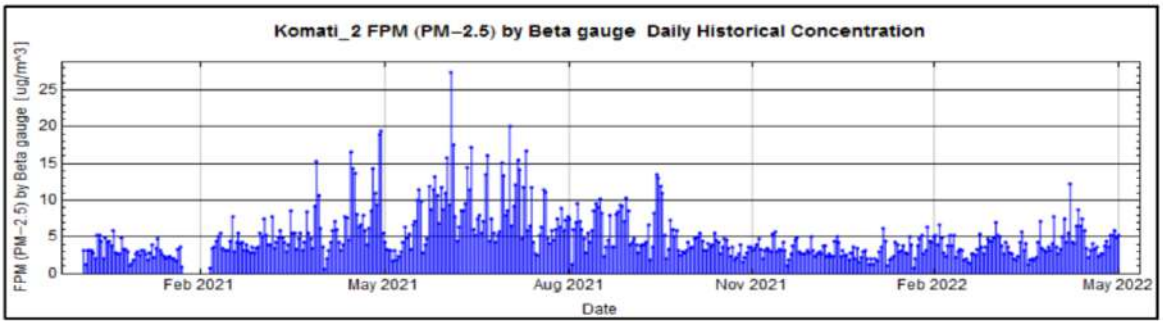


Figure 62: Historical trends of $PM_{2.5}$ daily mean concentrations

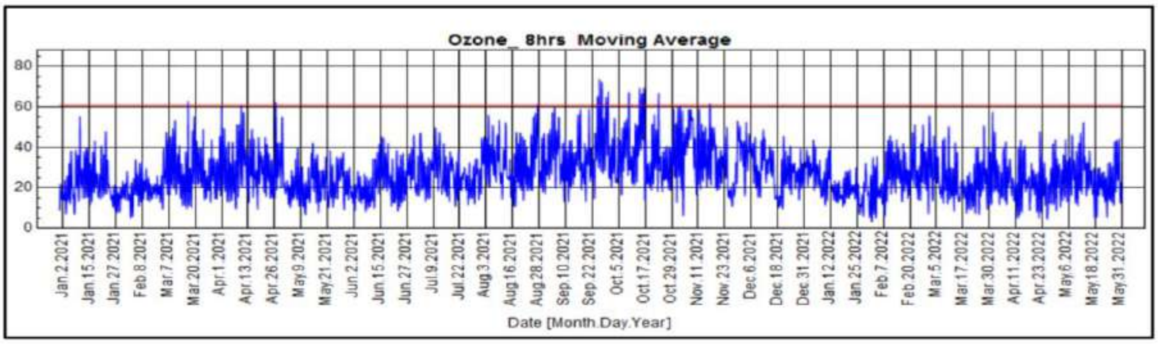


Figure 63: Historical trends of O3 8-hourly moving average concentrations

4.9.2.3 Emissions for 2020/21

Eskom submits an annual emissions report to the NDM as required in terms of the AEL (NDM/AEL/MP313/12/12). Table 26 below provides an overview of the emissions at KPS for the 2020/21 financial year.

Table 26: General overview of emissions at KPS 2020/2021

Coal-fired emissions (tons/annum)	Fuel-oil emissions (tons/annum)	Total (tons/annum)
CO_2: 881 246	CO_2: 2 083	CO_2: 883 329
NO_2: 5 178,1	NO_2: N/A	NO_2: 5178.1
PM: 189,42	PM: N/A	PM: 189.42
SO_2: 7712.8	SO_2: 163,4	SO_2: 7876.2
NO_x: 5178,1	NO_x: N/A	NO_x: 5178.1

Monthly emissions from KPS for 2021/2022 are shown in Figure 64 to Figure 67 below.

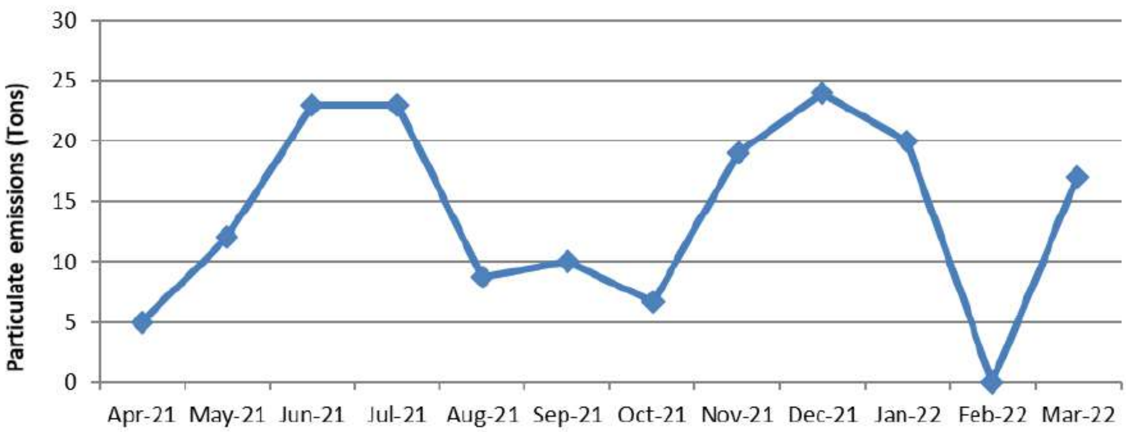


Figure 64: Monthly particulate emissions in tons from KPS for 2021/2022

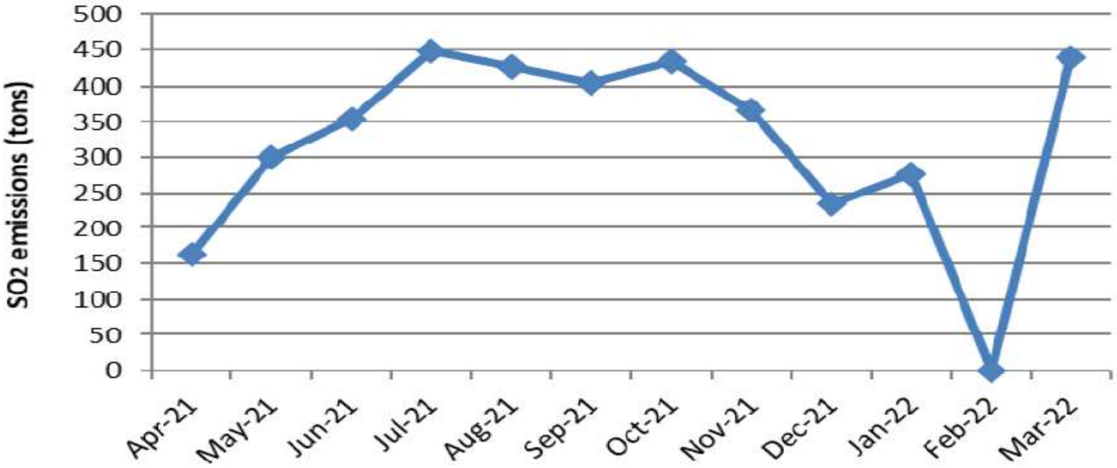


Figure 65: Monthly SO_2 emissions in tons from KPS for 2021/2022

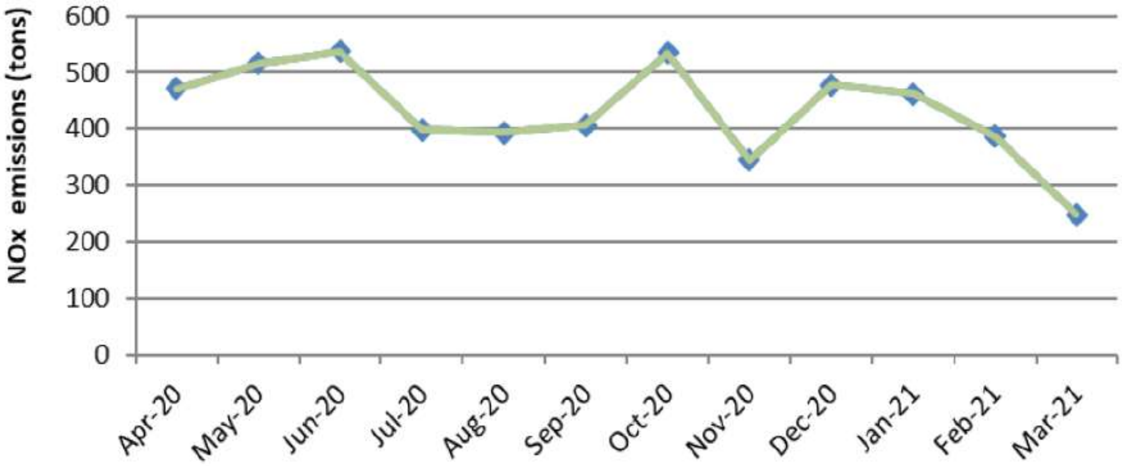


Figure 66: Monthly NO_2 emissions in tons from KPS for 2021/2022

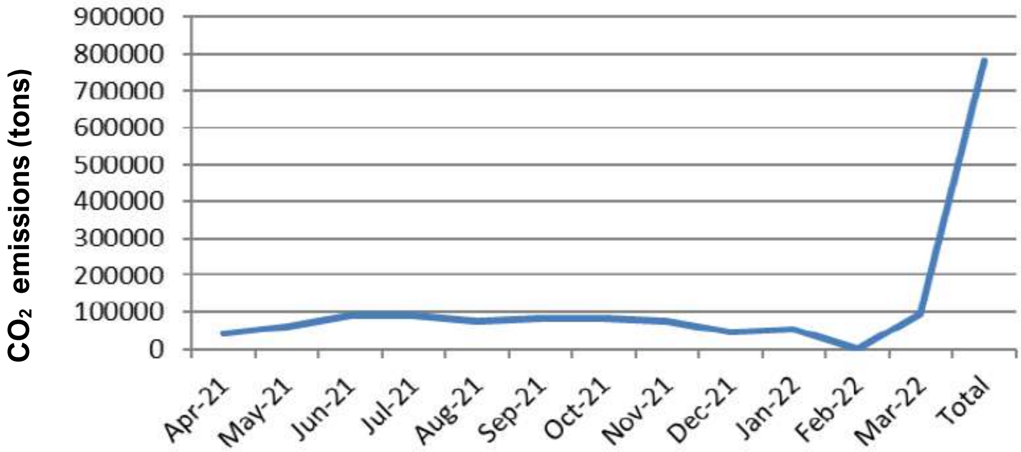


Figure 67: Monthly CO_2 emissions in tons from KPS for 2021/2022

According to Eskom (Muswubi pers. comm., 2022), reasons for the sharp increase in CO_2 emissions in March 2022 (see Figure 67 above) may have been caused by condensate on the monitor impulse lines and a lack of maintenance on the monitor.

There has been a downward trend in emissions from the power station, in keeping with scaling down of activities at KPS. However, in March 2022 there was significant increase in CO_2 and SO_2 emissions. The background to the increase will be discussed with the power station.

4.9.2.4 Emissions for 2022

Monitoring results for the months of January to May 2022 are presented in Table 27 below.

Table 27: Monthly means for the months of January- May 2022 (Moatshe, 2022)

Parameter measured	Jan	Feb	Mar	Apr	May
$PM_{2.5}$ (µg/m^3)	2.7	3.6	3.7	3.5	4.8
PM_{10} (µg/m^3)	21.7	28.8	29.0	27.0	33.8
NO_2 (ppb)	4.6	5.6	5.6	6.6	6.9
SO_2 (ppb)	7.5	12.6	7.6	8.3	10.8
O_3 (ppb)	21.4	26.1	24.1	22.4	24.3

The number of exceedances of the National Ambient Air Quality Limits in 2022 are presented in Table 28 below. There was one (1) exceedance of the PM_{10} daily limit of 75µg/m^3, which was in May 2022. There were no other exceedances during this period.

Table 28: Number of Exceedances of the National Ambient Air Quality Limits in 2022 (Moatshe, 2022)

Period	SO_2 hourly	SO_2 daily	SO_2 10-minutes	NO_2 hourly	PM_{10} daily	$PM_{2.5}$ daily	O_3 8-hourly
Jan	0	0	0	0	0	0	0
February	0	0	0	0	0	0	0
March	0	0	0	0	0	0	0
April	0	0	0	0	0	0	0
May	0	0	0	0	1	0	0
TOTAL	**0**	**0**	**0**	**0**	**1**	**0**	**0**
Allowed Number of Exceedances	88	4	526	88	4	4	11

4.10 Terrestrial Biodiversity

4.10.1 Biome and Vegetation Type

KPS is situated within the Grassland Biome (Rutherford & Westfall, 1994). High summer rainfall characteristic of the Grassland Biome combined with dry winters with night frost and marked diurnal temperature variations are unfavourable to tree growth. The Grassland Biome therefore comprises mainly of ‘sweet’ and ‘sour’ grasses and plants with perennial underground storage organs, for example bulbs and tubers, while trees are restricted to specialised habitats such as rocky outcrops or kloofs. Most Rare and Threatened plant species in the summer rainfall regions of SA are restricted to high-rainfall grasslands, making this the biome in most urgent need of conservation. It is not generally acknowledged that the majority of plant species in grasslands are non-grassy herbs (forbs), most of which are perennial plants with large underground storage structures. Rare and endangered species in grasslands are mostly small, very localised and visible for only a few weeks in the year when they flower (Ferrar & Lötter, 2007).

The Grassland Biome is divided into smaller units known as grassland vegetation units. According to Mucina & Rutherford (2006), the study area is situated within the Eastern Highveld Grassland vegetation unit (see Figure 68 below), which encloses Eastern Temperate Freshwater Wetland vegetation (wetlands). This grassland occurs in the Gauteng and Mpumalanga Provinces where its persistence is threatened by urban development, mining and agricultural activities.

The species composition of the Eastern Highveld Grassland unit comprises highveld grasses such as *Themeda triandra* (Red Grass), *Aristida congesta* (Tassel Three-awn), *Digitaria* species (Finger Grass) as well as *Tristachya leucothrix* (Hairy Trident Grass) and *T. rehmanni* (Mucina & Rutherford, 2006). The landscape usually includes undulating plains that support short, dense grassland, scattered rocky outcrops with sour grasses and tree species such as Acacia caffra (Sweet Thorn), *Celtis africana* (White Stinkwood) and *Diospyros lycioides subsp. lycioides* (Blue Bush).

Due to urban development and agricultural pressure within Gauteng and Mpumalanga, the extent of this vegetation unit is becoming limited. Only a small portion of Eastern Highveld Grassland is conserved in statutory reserves like the Nooitgedacht Dam or in private reserves. Almost half of this vegetation type has been transformed by cultivation, plantation, mining and the building of dams and it is therefore classified as an endangered vegetation type (Mucina & Rutherford, 2006). The Eastern Temperate Freshwater Wetlands occur in flat landscapes or shallow depressions filled with water. The water bodies contain aquatic zones and outer parts with hygrophilous vegetation of temporary flooded grasslands (Mucina & Rutherford, 2006). In addition to the larger areas classified as Eastern Temperate Freshwater numerous wetland systems and drainage lines are also present.

Both vegetation units are listed as Vulnerable Ecosystems in terms of Section 52 of NEM:BA. Eastern Highveld Grassland has undergone irreversible loss in its natural distribution with a maximum of 60% remaining.

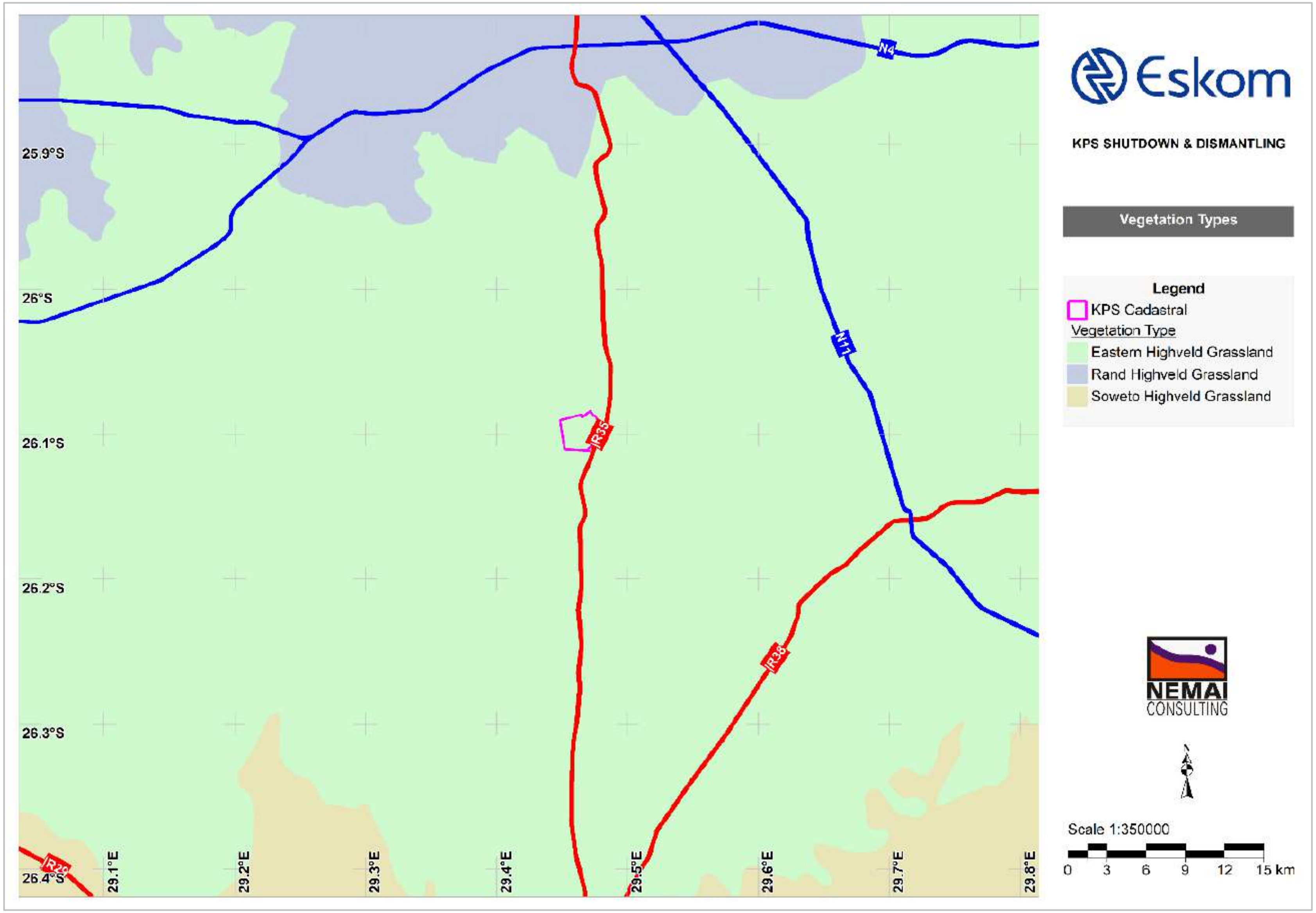


Figure 68: KPS site in relation to vegetation types (SANBI, 2018)

4.10.2 Mpumalanga Biodiversity Sector Plan & Nkangala Bioregional Plan

The Mpumalanga Biodiversity Sector Plan (MBSP) is a spatial tool that forms part of a broader set of national biodiversity planning tools and initiatives that are provided for in national legislation and policy. It comprises a set of maps of biodiversity priority areas accompanied by contextual information and land-use guidelines that make the most recent and best quality biodiversity information available for use in land-use and development planning, environmental assessment and regulation, and natural resource management (MTPA, 2014). The MBSP identifies a network of Critical Biodiversity Areas (CBAs), Ecological Support Areas (ESAs) and other biodiversity priority areas. Figure 69 below shows the KPS site in relation to the MBSP. It is noted that Nkangala Bioregional Plan, which is based on the MBSP, was compiled in 2019 and is still in draft formant.

According to the MBSP, most of the KPS site is heavily modified. An area that is moderately modified is located west of the ADF and south of Komati Village. Areas classified as CBA Optimal occur on the western part of the property, next to the Komati Village, as well as to the north of KPS (linked to Koring Spruit). Other natural areas occur in various parts of the site, including along the Geluk Spruit and Komati Spruit.

Figure 69: KPS site in relation to the MBSP

4.10.3 Site Conditions

Most of the natural environment at KPS has been transformed to cater for the infrastructure, buildings and activities associated with the construction and operation of the power station. Remaining natural areas at the power station have also been disturbed and vegetation is restricted to lawn grasses (see Figure 70 below), small shrubs and occasional trees. Reeds are common across the site in areas with a high groundwater table, or where surface water of shallow depth occur.

Figure 70: Photographs of grassed areas next to HV Yard (top) and eastern cooling towers (bottom)

Indigenous grasses are also encountered on the KPS property, but many of the species are typical of disturbed areas (e.g., *Hyparrhenia hirta*, *Cymbopogon validus*, *Sporobolus spp* and *Melenis repens*). In some places the grass sward has been extensively invaded by Kikuyu. There are a number of stands of exotic trees across the site, which include species such as the Black Wattle, Poplar, Willow and Bluegum. In addition, weed species also occur on the site. The drainage lines, wet areas and dams have extensive reed (*Arundo spp*) and bulrush stands. In the areas with damp soils there are numerous sedge species and hydrophilic grasses as well as extensive stands of *Imperata cylindrical*, which is used to vegetate the walls of the ash dam (Hemming, 2013) (see Figure 71 below).

Figure 71: Photographs of vegetation at ADF

4.10.4 Management of Invasive Alien Plants

Eskom developed an Alien Invasive Species Monitoring, Control and Eradication Plan (Muswubi, 2018) for KPS in 2018 in terms of NEM:BA. The site was broken up into management units, which are shown in Figure 72 and listed in Table 29 below.

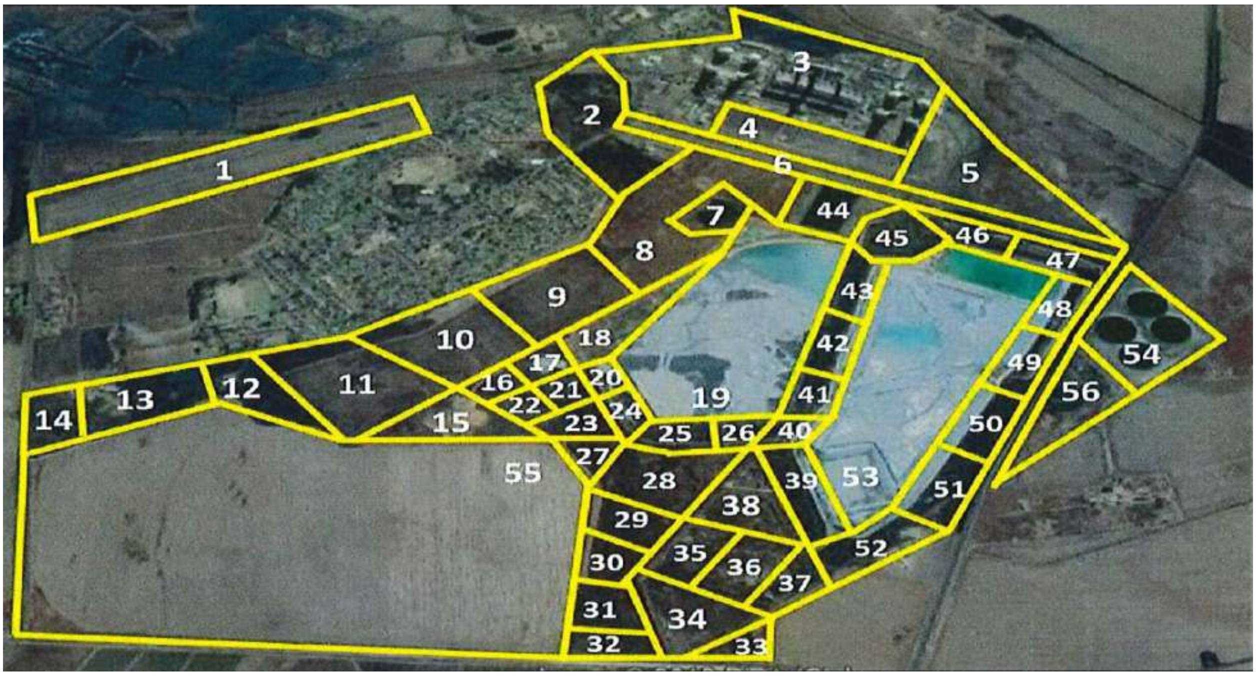


Figure 72: Map of management units on land under control of KPS (Muswubi, 2018)

Table 29: Details of management units (Muswubi, 2018)

Management Unit No.	Description
001	Air Strip
002	Open area to air strip
003	Station premises
004	HV Yard
005	Open area — along coal haul
006	Komati Road
007	Wetland area close to 3D ponds
008- 012	West of ash dam (excludes line servitude Tx and Dx)
013- 014	Open space behind Komati Village
015- 043	Ash dam area
044	3rd Recovery Dam at the ash dams
045	Old AWR ponds on the ash dam area
046- 052	North and East ash dam berms/walls and open areas
053	Decommissioned asbestos area on top of ash dam
054	Water reservoirs area
055	Maize field area – land falls under Eskom properties
056	Open area close to reservoirs – land falls under Eskom properties

The management units were prioritised as follows:

- High –
  - Priority 1: 028 – 034;
  - Priority 2: 035 – 039;
  - Priority 3: 023 – 027;
  - Priority 4: 015 – 018 and 020 – 22; and
  - Priority 10: 055 – 056.
- Medium –
  - Priority 5: 040 – 043;
  - Priority 6: 048 – 053;
  - Priority 7: 044 – 047 and 054;
  - Priority 8: 007 – 010; and
  - Priority 9: 011 – 014;
- Low –
  - Priority 11: 001 – 006.

Table 30 below provides the twenty-one (21) listed invasive species encountered in the management units on the KPS site. It was found that the plant invasion was less than 1% in all management units.

Table 30: Listed invasive species (as per AIS Lists of 29 July 2016) found on the KPS property (Muswubi, 2018)

Species	Common name	NEMBA Category
Acacia mearnsii	Black wattle	2 - Treat as 1b
Argemone mexicana	Yellow flowering Mexican poppy	1b
Argemone ochroleuca	White flowering Mexican poppy	1b
Callistemon viminalls	Weeping bottlebrush	1b
Canna indica	Indian shot	Ib
Cortaderia selloana	Pampas grass	lb
Convolvulus arvensis	Field Bindweed	lb
Datura ferox	Large thorn apple	Ib
Eucalyptus grandis	Saligna gum	2 - Treat as 1b
Hedera helix	English ivy	3
Ligustrum lucidum	Chinese wax-leaved privet	1b
Ligustrum ovalifolium	California privet	1b
Nerium oleander	Oleander	1b
Nicotiana glauca	Wild tobacco	1b
Pyracantha angustifolia	Yellow firethorn	1b
Sphagneticola trilobata	Singapore daisy	1b
Solanum mauritianum	Bugweed	1b
Solanum sisymbrilfolium	Dense-thorned bitter apple	1b

Species	Common name	NEMBA Category
Tamarix ramosissima	Pink tamarisk	1b
Verbena bonariensis	Wild verbena	1b
Xanthium strumarium	Large cocklebur	1b

The rehabilitation of the KPS site as part of the Project will consider Eskom's Alien Invasive Species Monitoring, Control and Eradication Plan further.

4.10.5 Protected Areas

There are no formally protected areas in terms of the National Environmental Management: Protected Areas Act (Act No. 57 of 2003) within a 10km radius of KPS.

According to the South Africa Protected Areas Database (SAPAD_OR_2021_Q4), the nearest protected area is the Heyns Private Nature Reserve, which is located approximately 12km to the north-west of the KPS site.

4.10.6 Avifauna

The nearest Important Bird and Biodiversity Areas (IBA) to KPS is the Amersfoort-Bethal-Carolina IBA (SA018), which is located approximately 20km to the south-east.

4.10.7 Screening Biodiversity Study

The Biodiversity Company (2022) undertook a biodiversity screening exercise of the KPS site for the draft ESIA Report. The findings follow below.

4.10.7.1 General Description

The study area was found to comprise largely of disturbed grasslands, moist grasslands and some alien invasive tree clumps. Most of the grassland areas assessed were impacted on by overgrazing, irrespective of being cultivated in the past or not. Some wetland areas were trampled and grazed and in areas where the grazing pressure was high. Based on the information collected during the field screening, the vegetation communities within the study area were classified into two broad vegetation communities: grassland and moist grassland. Transformed areas also occur in the form of the KPS and related infrastructure.

4.10.7.2 Vegetation Communities Identified

a) <u>Grassland Vegetation Community</u>

The grassland vegetation community was found to have three sub-communities based on past and current land uses, namely disturbed grassland, grazed grassland and secondary natural grassland.

- **Disturbed grasslands**:
  - This sub-community comprised areas where the soil structure was disturbed by mechanical means and although re-vegetation occurred or is possible, these grasslands are unlikely to revert to natural grasslands with high species diversity as is expected of Eastern Highveld Grassland.
  - The disturbed grasslands include rehabilitated and any other areas where the soil structure was observed to have been altered. Where the impact ceased, disturbed grasslands established, however, it is unlikely that these grasslands, especially when being overgrazed, will progress to primary grassland. The dominant grasses were *Eragrostis curvula, Hyparrhenia hirta, Cynodon dactylon*, and *Paspalum* species. The rehabilitated areas supported several weedy plant species such as *Datura inoxia, Plantago major* and *Tagetes minuta* with pioneer grasses such as *Eragrostis rigidor, E. chloromelas, Hyparrhenia hirta, Cynodon dactylon* and *Hyparrhenia tamba*.

- **Grazed grasslands:**

- This sub-community comprised areas where the grasslands were impacted or degraded by grazing. However, the soil structure was not disturbed which increases the likelihood of the presence of plant species of conservation concern as well as the potential to be restored to the higher species diversity and functionality expected of the Eastern Highveld Grassland. Some areas were found to be largely overgrazed and regular burning occurred. The grazed grasslands in proximity to watercourses (wetlands and drainage lines) were found to be more intensely grazed. However, these grasslands still provided a valuable service in preventing soil erosion and sedimentation of the proximate watercourses.

- **Secondary natural grasslands** (see Figure 73 below):
  - This grassland unit was identified as the original or primary vegetation type in the area. This vegetation type consists of grassland with a well-developed grass layer and developed herb / forb layer. Trees and shrubs are almost absent within this main vegetation type and only scattered individual trees or shrubs occur within this main vegetation type and its associated plant communities.
  - The effects of the anthropogenic activities, in the form of declining habitat, are a major threat to this grassland vegetation type.
  - This sub-community was observed where limited disturbances took place and was characterised by higher diversity than the other grassland sub-communities. Due to the lack of disturbances, the natural grasslands are expected to harbor plants species of conservation concern and provincially protected plant species. Furthermore, the endangered status of the Eastern

Highveld Grassland necessitates that all-natural grassland in a good condition are classified as sensitive vegetation.

- Secondary natural grassland is suitable habitat for several plants of conservation concern such as *Boophane disticha, Eucomis autumnalis* and *Hypoxis hemerocallidea*. Provincially protected plants could be present in this grassland including *Gladiolus crassifolius* and *Eulophia ovalis subsp bainesii*.

Figure 73: Photographs of the Secondary natural grassland vegetation type at KPS (The Biodiversity Company, 2022)

b) <u>Moist Grassland Vegetation Community</u> (see Figure 74 below)

The study area included numerous drainage lines and wetland areas. These areas, as with the grasslands, were in various degrees of disturbance. Cattle concentrated in these areas during the drier winter months resulted in trampled and degraded vegetation in and around most of the watercourses.

The identified wetland units are channelled valley wetlands associated with a larger ephemeral stream and site storm water management associated around the stockyard and ash dump.

Wetland Unit 1 is located Northeast of the new ash dumps and is characterised as a channelled valley wetland. Wetland Unit 2 is located with a dirt road which dissects the area and as a result the wetland has formed two streams on both sides of the road. The wetland flows from southeast to northwest direction. Where the road turns east, the water of the wetland flow is slowed down and an area of open water has occurred on the eastern part of the road. The wetland is also encroached on by agricultural and mining activities within this catchment. The road has also had a damming up effect to form a large area of open water. Erosion has taken place throughout various parts of the stream channels.

Figure 74:Photographs of the moist grassland vegetation type at KPS (The Biodiversity Company, 2022)

4.10.7.3 Plants of Conservation Concern

Plants of conservation concern are those plants that are important for SA's conservation decision making processes. A plant taxon is of conservation concern when it is threatened, or close to becoming threatened with extinction and therefore classified as Critically Endangered, Endangered, Vulnerable or Near Threatened. These plants are nationally protected by NEM:BA. Within the context of the screening study, plants that are Declining and Rare are also referenced under this heading.

Rare and endangered species in grasslands are mostly small, very localised and visible for only a few weeks in the year when they flower (Ferrar & Lötter, 2007). As these plants might not have been visible at the time of the field survey, the probabilities of occurrence for these plants were based on distribution data and information gathered concerning the area.

A minimum of nine (9) plant species of conservation concern could occur within the study area (Raimondo *et al*., 2009; POSA, 2011). These species are not threatened but due to their usage as medicinal plants, their numbers are dwindling and therefore are classified as "declining" species. Removal of these plants will require a permit and should be accompanied by either a rehabilitation plan where the plants will be re-established or the plants should be rescued and used as mother stock for medicinal plant cultivation programs if mining is going to impact on their habitat.

4.10.7.4 Provincially Protected Plants

Four plants can be expected within the study area are not threatened but are protected by Schedule 11 of the Mpumalanga Nature Conservation Act (Act No. 10 of 1998). These plants may not be removed, picked, pruned or destroyed without permission from the MTPA via a permit. The minimum number of protected plant species possible occurring in the study area include. Watsonia species, *Gladiolus crassifolius, Cyrthanthus tuckii, Eulophia ovalis subsp. Bainsii* and *Cyrthanthus tuckii*.

4.10.8 DFFE Screening Tool

The following is noted in terms of the sensitivity of the Project Area according to the National Web Based Environmental Screening Tool (refer to Section 4.6.4 above for a brief description of this tool):

- The animal species combined sensitivity is medium;
- The plant species combined sensitivity varies from low and medium; and
- The terrestrial biodiversity combined sensitivity is very high as the overall area falls within a threatened ecosystem (i.e., Eastern Highveld Grassland).

Refer to Section 4.10.7 above for the findings of the biodiversity screening exercise of the KPS site for the draft ESIA Report, which served to ground-truth the site sensitivity from the above screening tool. The ecological status of the receiving environment will further be assessed in detail during the Terrestrial Ecological Impact Assessment (refer to ToR in Section 8.5.2.3 below) as part of the ESIA.

4.11 Noise & Vibration

4.11.1 General Description

In terms of the regional acoustical environment, the background noise levels are expected to be typical of a rural area. Noise in the greater area emanates primarily from mining operations, farming operations (e.g., use of farming equipment), vehicles on the surrounding road network, human activities in surrounding settlements, trains passing on the railway and operations at KPS.

4.11.2 Noise Monitoring

An environmental noise survey was undertaken by Ergosaf Environmental and Occupational Health Services (Mphohle, 2013) to determine if noise levels from normal operations at KPS comply with the requirements of the Noise Control Regulations of Gauteng and if the sound may be a source of annoyance in terms of SANS 10103:2008.

Samples were taken at the northern, eastern, southern and western perimeters of KPS (see Figure 75 below).

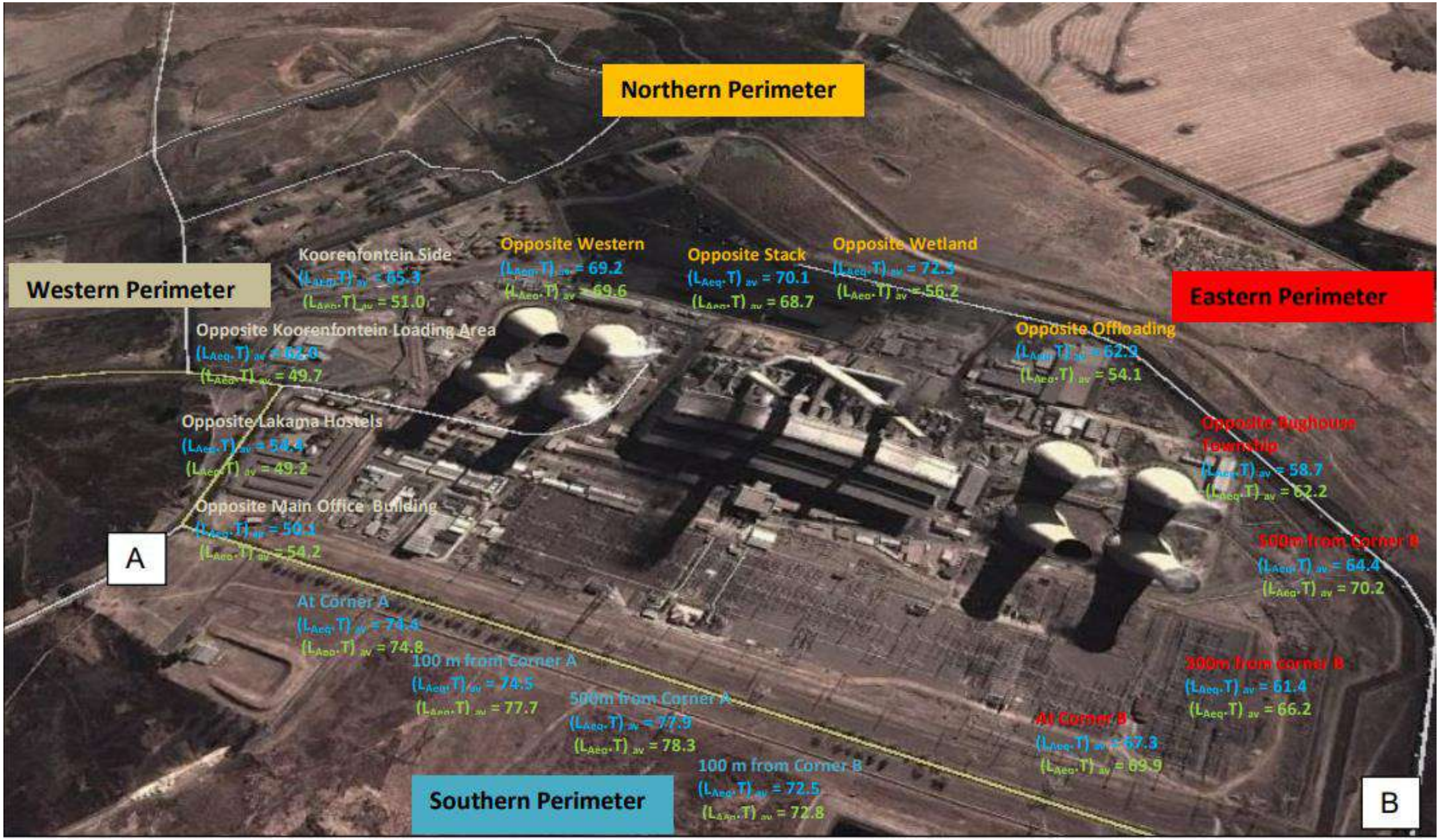


Figure 75: Results of noise measurements (dBA) (Mphohle, 2013)

(Ambient daytime noise rating levels (LAeq,T)av shown in blue; ambient night time noise rating levels (LAeq,T)av shown in green)

The study found the following:

- Northern Perimeter –
  - Daytime ambient noise rating levels ranged from 62.9 dBA to 72.3 dBA. The noise rating levels measured Opposite the Stack and Opposite the Wetland were 70.1 dBA and 72.3 dBA respectively during the daytime interval, which did not comply with the typical rating level for noise in industrial districts (70 dBA). These noise levels exceeded the acceptable noise rating level by 0.1 to 2.3 dBA, at which level sporadic complaints may be anticipated;
  - Night time ambient noise rating levels ranged from 54.1 dBA to 69.6 dBA, which were below the 70 dBA typical rating level for noise in industrial districts; and
  - The major noise sources that were identified included, engines and engine exhaust outlets of trucks, water cart operations, reverse alarms and Front End Loaders performing loading operations. A tonal noise character was identified Opposite the Western Gate during the daytime interval.
- Western Perimeter –
  - Noise rating levels measured at the Western Perimeter during the daytime and night time intervals, ranged from 49.2 dBA to 65.3dBA, which complied with the 70 dBA typical rating level for noise in industrial districts; and
  - A tonal noise character was identified at the Koornfontein Side during the daytime interval at a frequency of 63 Hz.
- Southern Perimeter –
  - Noise rating levels measured at the Southern Perimeter during the daytime and night time intervals, ranged from 72.5 dBA to 78.3 dBA. Therefore, all of the noise rating levels exceeded the typical rating level for noise in industrial districts. These noise levels exceeded the acceptable noise rating level by between 2.5 and 8.3 dBA, at which level sporadic complaints may be anticipated; and
  - The major noise source that was identified at the Southern Perimeter was the Boiler Safety Valve of Unit 8, where gaskets were blown to perform a sealing role. This unit was however, in the process of being shut down for maintenance for either replacement or repair of equipment. Tonal noise characters were identified at all of the measurement locations during both the daytime and night time intervals.
- Eastern Perimeter –
  - Noise rating levels measured at the Eastern Perimeter during the daytime and night time intervals, ranged from 58.7 dBA to 70.2 dBA. The noise rating level measured 500m from Corner A was 70.2 dBA during the night time interval, which did not comply with the 70 dBA typical rating level for noise in industrial districts. This noise level exceeded the acceptable noise rating level by 0.2 dBA at which sporadic complaints may be anticipated; and
  - The remaining noise rating levels measured during the daytime and night time intervals complied with the typical rating level for industrial districts. The major noise

sources that were identified included, engines and engine exhaust outlets of trucks during loading and off-loading activities, reverse sirens and general plant operations. A tonal noise character was identified 500m from Corner B during both daytime and night time intervals at frequencies of 31.5 Hz and 63 Hz respectively.

It is noted that the above survey was undertaken in 2013 and operations have scaled down considerably since then, with only one unit currently operating.

4.11.3 Vibration

No baseline information regarding vibration in the area was obtained. Existing sources of vibration in the Project Area include operations at KPS, mining operations and use of the surrounding transportation network.

4.12 Services

4.12.1 Water

The water reticulation system at the time when KPS was returned to service is shown in Figure 42 above. KPS operates a water treatment plant (see Figure 76 and Figure 77 below) which supplies water to certain communities. The facility's capacity is 4.3 ML/day for potable water and 5.7 ML/day for demineralized water (Urban-Econ Development Economists, 2020).

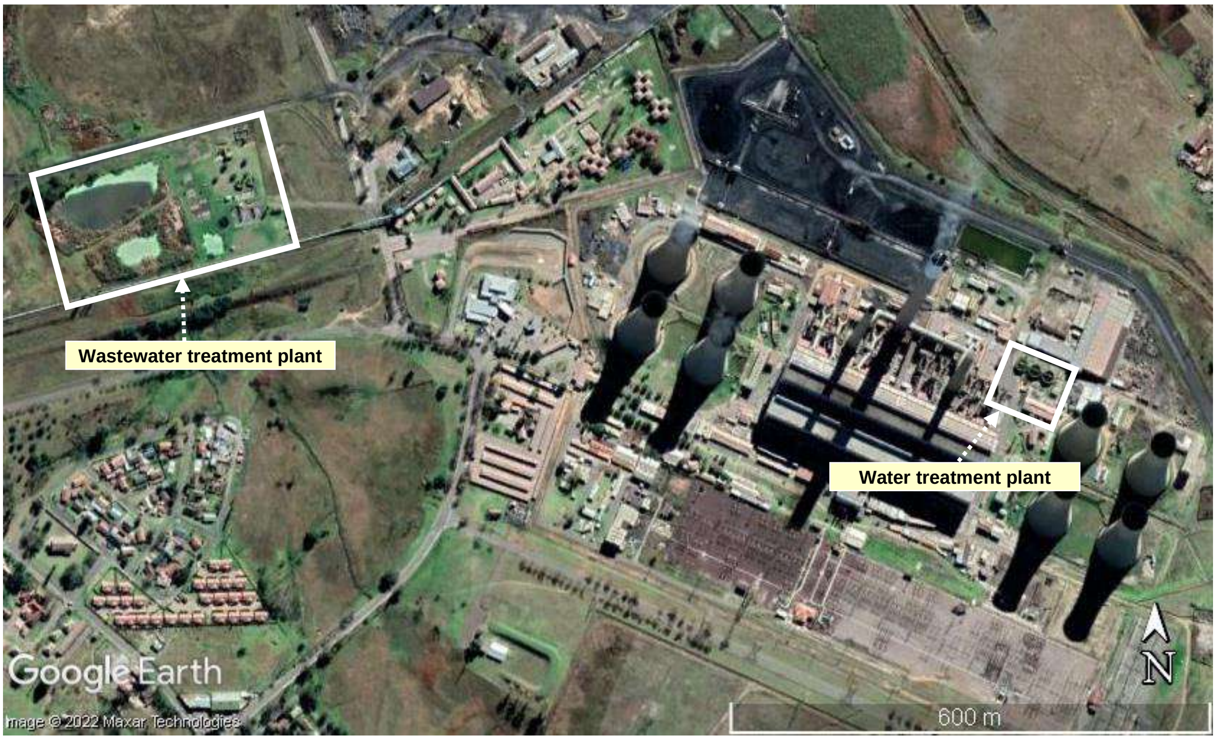


Figure 76: Wastewater treatment plant and water purification facility at KPS (Google Earth™)

Figure 77: View of water treatment plant at KPS

The following communities receive water directly from the power station:

- Komati Village – 45 ML/month;
- Lakama Guesthouse – 1.5 ML/month; and
- Koornfontein mine – 8 ML/month.

At closure the water transfer infrastructure, along with the potable water reservoirs and water treatment plant at the power station will be upgraded and handed over to the STLM to ensure continued provision of essential services (Golder Associates, 2017).

4.12.2 Sewer

There is a wastewater treatment plant to the north-west of the power station complex (shown in Figure 76 above), which has been transferred to the STLM to operate and manage.

4.12.3 Servitudes over KPS property

According to feedback from Eskom, there are no servitudes located on the power station property that belong to other infrastructure custodians.

4.13 Heritage & Palaeontology

4.13.1 General Description

Considering the nature of the Project Area, it is anticipated that the land on which KPS is situated was historically used for agricultural purposes.

A Heritage Survey was undertaken in 2007 at KPS as part of the EIA for the Ash Dam Extension (van Schalkwyk, 2007). The following findings were made in relation to the historical, cultural and archaeological characteristics of the study area:

- No sites, features or objects dating to the Stone Age, Iron Age or historic period were identified;
- Some informal farm cemeteries are located in the region, but none would be impacted on by the power station activities; and
- One historic event took place in the region. during the Anglo-Boer War, the British forces under Brigadier-General Beatson were attacked by the ZAR forces, led by General Muller. More than 50 British soldiers were killed. This battle took place on the farm Wilmansrust 47IS, just to the south of the power station. A monument to commemorate this event was erected on this farm, but during the early 1970s it was relocated to the town of Bethal.

Due to the age of the KPS, structures older than 60 years will need to be decommissioned. This will require a permit in terms of the NHRA.

4.13.2 DFFE Screening Tool

The following is noted in terms of the sensitivity of the Project Area according to the National Web Based Environmental Screening Tool (refer to Section 4.6.4 above for a brief description of this tool):

- The archaeological and cultural heritage combined sensitivity is low; and
- The palaeontology combined sensitivity is high, which is related to the PalaeoMap of the South African Heritage Resources Information System (SAHRIS).

A Heritage Impact Assessment will be undertaken for the Project (refer to ToR in Section 8.5.2.3 below) as part of the ESIA.

4.14 Visual Quality

According to Hemming (2013), the KPS, local coal mines (Koornfontein and Goedehoop) and associated infrastructure dominate the visual environment in the otherwise rural area. The broader surroundings are dominated by undulating ridges and valleys in all directions,

Potential sensitive receptors to visual impacts in the area include residents in the surrounding settlements and farms and motorists using the R35 and R542.

4.15 Socio-Economic Environment

4.15.1 Policy Review

Urban-Econ Development Economists was appointed by Eskom to undertake a Socio-Economic Impact Study for the shutdown of three power stations, namely Komati, Hendrina and Grootvlei (Urban-Econ Development Economists, 2020). Below are key findings of the study.

Various national, provincial and local government policies were reviewed as part of the study. Some of the key findings include the following:

- The review highlighted that the economy of Mpumalanga relies significantly on coal. In some municipalities, such as the STLM, the economy is not only largely reliant on coal-related activities, but it is also undiversified. The policy review further indicated that Mpumalanga has a high unemployment rate relative to the national average. This also indicated that the shutdown of power stations is likely to exacerbate the socio-economic challenges that are already hindering the development of communities.
- The policy review also revealed that it is vital to formulate interventions that not only create jobs but also address the needs of the affected communities while ensuring environmental sustainability.
- The policy review also concluded that the interventions should be coupled with skills development initiatives that empower affected persons to be gainfully employed and contribute meaningfully to developmental projects.
- The review of local development plans and strategies identified various priority areas and programs that present opportunities for promoting the local economy and job creation.

4.15.2 Baseline Profile

4.15.2.1 Socio-Economic Impact Study

Some key characteristics of the socio-economic baseline, as established during the Socio-Economic Impact Study (Urban-Econ Development Economists, 2020), include the following:

- **Mpumalanga Province** –
  - As Mpumalanga is the main supplier of coal in the country, its mining sector employs the largest share of persons across all sectors in the province. However, the shutdown project will (partially) decrease the local demand for coal burned at the local power stations. The decrease in demand for coal locally, coupled with the closure of mines that have reached the end of their lifespan, will exacerbate the need for job creation.
  - The majority of the population in the province is within the working-age segment, with youth constituting the largest share of the working-age population. However, a significant part of the working-age population (49%) is either not employed or do not have job security.

- The province has a railway network that serves a strategic role in economic development. Apart from the use of the railway for the transportation of coal, there is an opportunity to use this infrastructure to transport cement to other regions as part of the beneficiation initiative. This is in reference to the opportunity of manufacturing cement from coal ash damps, as part of the repurposing interventions that could be implemented.
- The province has a low share of households with access to piped water, basic sanitation and refuse removal.
- A significant share of individuals who enrolled for schooling proceeded towards secondary schooling—30.2% have some secondary schooling and 28.3% completed secondary schooling.

❑ **NDM and STLM –**

- Most of the populations are Working Age Population (WAP), of which over half of each are youth, implying that the area has a productive population. However, the municipalities experience low education completion levels and insufficient skills to exploit existing opportunities, which contribute to the unemployment rate and low income.
- Both NDM and STLM are economic hubs attracting labor from various areas, with STLM contributing significantly to NDM which in turn is responsible for almost half of the Gross Value Added (GVA) of the province. The mining and energy sectors have been key in the performance of the area, which is attributed to the fact that the area is coal-rich and hosts most of the coal-fired power stations in the province.
- Both municipalities are resource-based economies consisting not only of coal mining but also of other minerals, extensive farming and nature reserves, which allows for the diversification of the economy for sustainability purposes.
- Considering the financial positions of both municipalities, the local government will need to locate other sources to fund development projects that will be considered to sustain and grow the economy after the shutdown of power stations.

❑ **KPS Primary Study Area** (PSA) (shown in Figure 78 below) –

- The area is rich in natural resources. An analysis of the abundance of mineral resources showed that the area is rich in coal and has silver ore deposits.
- The area is characterised by moderate- to high-potential arable land, and there is evidence of commercial farming activities, though few land portions are under irrigated commercial agricultural operations.
- It is connected to economic nodes such as Emalahleni (previously Witbank), Middleburg, Nelspruit and Johannesburg through two regional roads that also provide a link to the national throughways.
- In 2011, just under 4 200 people lived in the KPS PSA, comprising 1 904 households. The size of the PSA is believed to have significantly reduced, however,

due to the closure of the Koornfontein Mine. This closure also led to the desertion of the Sizanane village and a sharp reduction in the population of the Banks settlement, which may have contributed to the dramatic increase in the average number of people living in a dwelling in the Blinkpan Village. The Komati Village, which forms part of the KPS Immediate Zone of Influence (IZOI), has largely remained the same.

- The level of education among the population in the KPS PSA is below-average with the majority of the people having no schooling or some schooling in 2011. The area is serviced only by two primary schools, the infrastructure of which is dilapidated.
- The community faces various health-related problems, the most common of which are Tuberculosis (TB), chronic illnesses linked to dietary issues, malnutrition, Sexually transmitted diseases (STDs), and HIV and AIDS. This is further exacerbated by limited access to medical facilities and a high prevalence of alcohol and drug abuse, especially among the youth.
- The analysis of human capital revealed that there is labour supply in the communities surrounding the power station. This has been illustrated by the dominant proportion of the working-age population, especially the youth, amongst the population groups in the area. Furthermore, employment concerns raised during engagements, as part of the primary data gathering process, demonstrated that there is a demand for jobs in the area.
- The Komati Village has the largest level of employment in the PSA. This is explained by its proximity to KPS, which directly absorbed some of the local labour and indirectly supported employment in the local tertiary services sector. KPS has been one of the largest employers in the area, together with the mining and agricultural sectors.
- The state of built infrastructure in KPS PSA is below-average. While most of the community members live in formal dwellings, access to basic services is sub-par, with only seven out of ten households enjoying a connection to electricity, refuse removal services, and sanitation. Access to water is particularly low, although most of households in the Komati Village are provided with potable water by KPS.
- The driving forces and hindering factors associated with KPS PSA are shown in Figure 79 below.

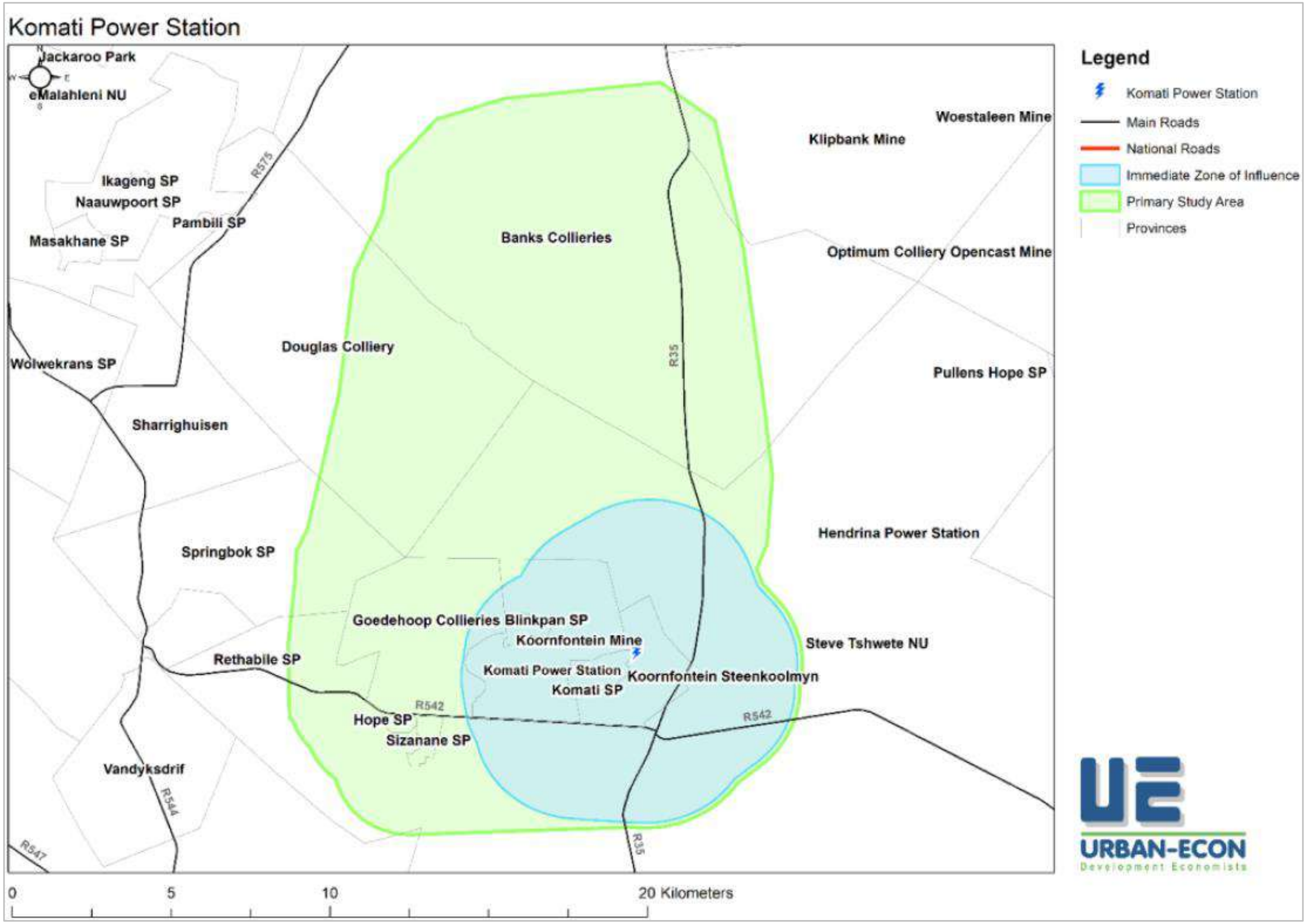


Figure 78: KPS IZOI and PSA (Urban-Econ Development Economists, 2020)

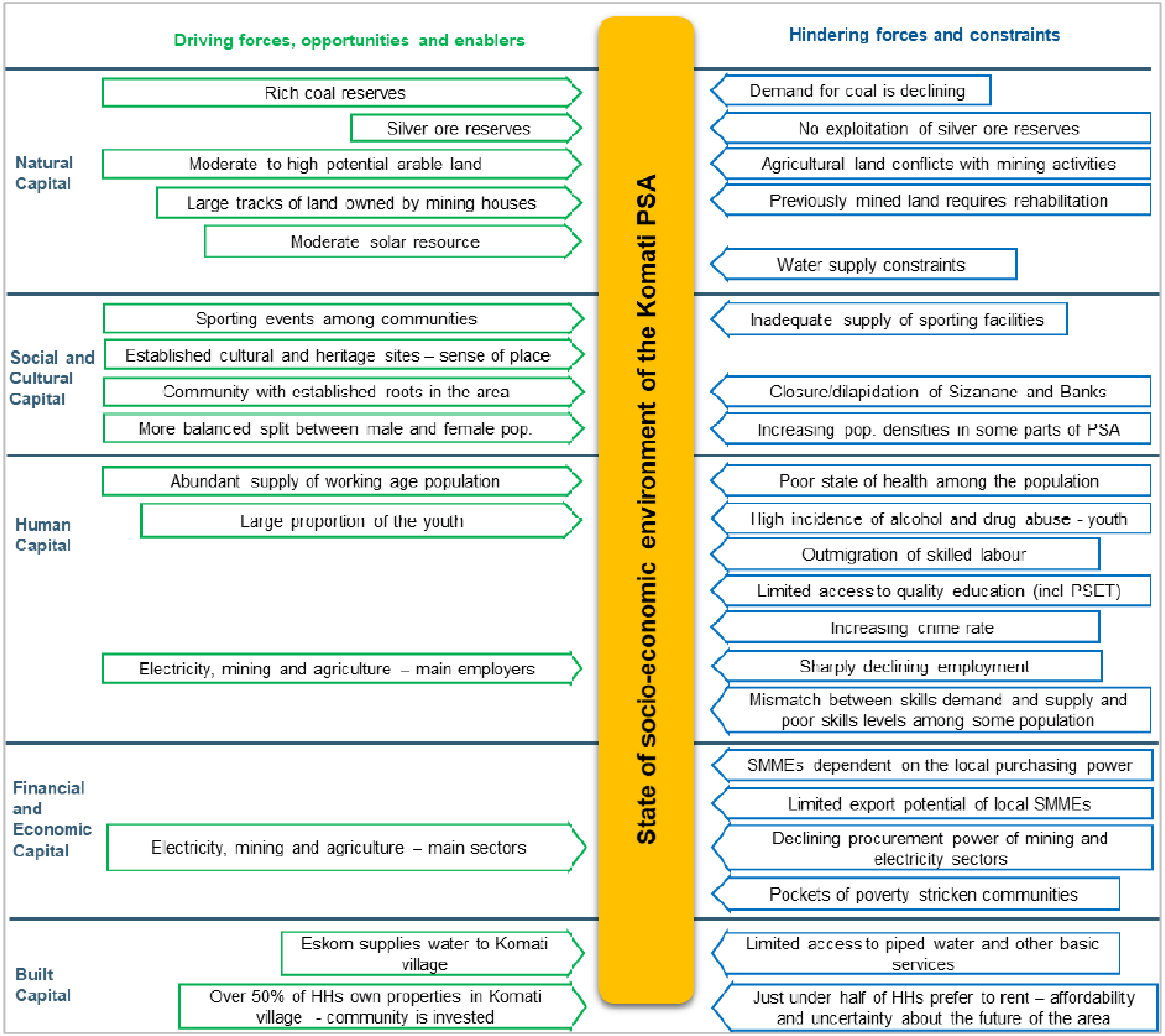


Figure 79: KPS PSA driving forces and hindering factors (Urban-Econ Development Economists, 2020)

4.15.2.2 Health

According to Socio-Economic Impact Study (Urban-Econ Development Economists, 2020), the community in the PSA faces various health-related problems, where TB, chronic illnesses linked to dietary issues, malnutrition, STDs, and HIV and AIDS are the most common. This is exacerbated by limited access to medical facilities and a high prevalence of alcohol and drug abuse, especially among the youth.

The following is noted in the municipal IDP (STLM, 2022) in terms of health aspects:

- Statistics show that the number of people with HIV has increased since 2010. HIV/AIDS has had a devastating effect on the social and economic development of the STLM's population;
- Many of the residents in the municipality complain about inhaling dust emanating mostly from power stations and mines, which cause respiratory problems; and
- The healthcare sector is developing through the expansion of both the public and private health facilities. Midmed Hospital has expanded to increase its capacity. A new regional public hospital is under construction and is scheduled to be completed by end of 2023. New clinics have been built in Sikhululiwe village and Rockdale and an additional one planned for Newtown.

Two mobile clinics serve the communities around KPS on a Wednesday at the municipal offices and on Thursday at the SASSA Paypoint.

4.15.2.3 Safety & Security

KPS falls with the precinct of the Blinkpan Police Station (location: 26° 5'57.62"S, 29°27'3.89"E). Crime statistics for this station for 2016/2017 to 2021/2021 are presented in

Table 31: Crime statistics for Blinkpan Police Station for 2016/2017 to 2021/2021 (https://www.saps.gov.za/services/crimestats.php)

Crime Category	2016/2017	2017/2018	2018/2019	2019/2020	2020/2021
Total contact crimes (crimes against the person)	80	78	81	67	62
Total sexual offences	6	7	0	5	2
Total contact-related crimes	9	7	5	9	9
Property-related crimes					
Total property-related crimes	75	71	81	36	17
Total other serious crimes	467	393	256	235	210
Total crime detected as a result of police action	64	50	64	31	6

4.15.2.4 Education

Laerskool Koornfontein is a public primary school located near Komati Village.

Other schools within a 20km radius of KPS include Springbok Colliery Primary School, Laerskool Kragveld, Impilo Primary School and Allendale Secondary School.

4.15.3 Local Communities

The KPS is surrounded by small formal and informal communities (see Figure 80 below). The communities are generally reliant on the mining, farming and/or energy sectors. Below, is an overview of the local communities within the immediate vicinity of the power station. Additional baseline data for these communities will be obtained during the Social Impact Assessment for the ESIA.

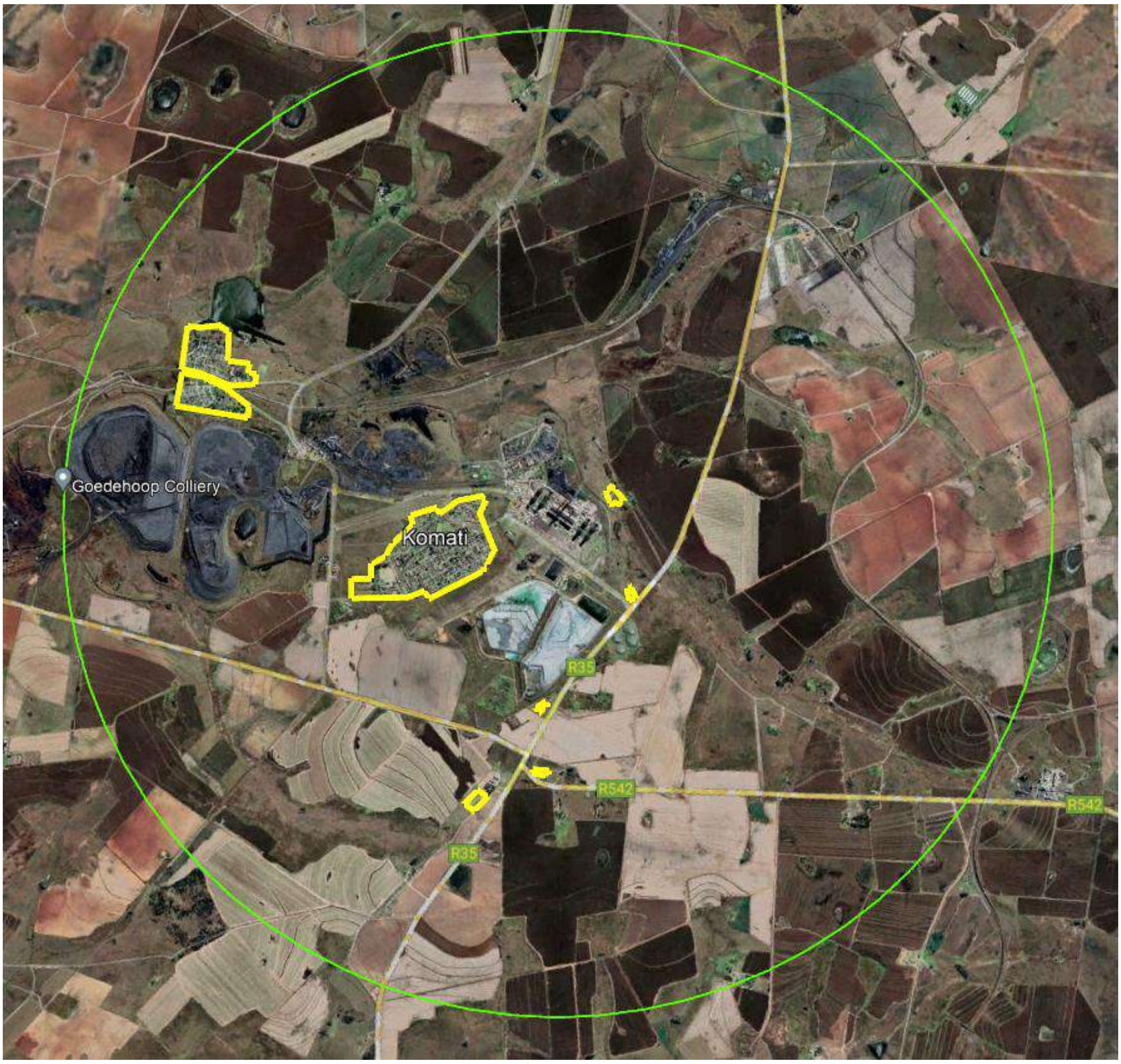


Figure 80: Population Centres in the Vicinity of the KPS (Google Earth™)

4.15.3.1 Komati Village

Komati Village is located to the north-west of the power station and is the main commercial and labour sending area for the power station and the adjacent mine (see Figure 81 below).

Figure 81: Komati village (26°06'07.56" S 29°27'14.53" E) (Google Earth™)

Table 32 below lists key statistics for Komati Area, based on Census 2011 data.

Table 32: Key statistics for Komati Area (Stats SA 2011)

Total population	1,821
Young (0-14)	16,7%
Working Age (15-64)	77,6%
Elderly (65+)	5,6%
Dependency ratio	28,8
Sex ratio	136,8
Population density	1049 persons/km^2
No schooling aged 20+	2,7%
Higher education aged 20+	12,1%
Matric aged 20+	41%
Number of households	642
Average household size	2,5
Female headed households	20,2%
Formal dwellings	92,4%
Housing owned/paying off	25,3%
Flush toilet connected to sewerage	99,1%
Weekly refuse removal	98,1%
Piped water inside dwelling	88,9%
Electricity for lighting	99,2%

The Komati Village is comprised largely of residential housing of varying plot size, a small shopping centre, and a primary school, the Laerskool Koornfontein. There are a total of 443 stands in the village, with the most common stand sizes being 770m^2 and 450m^2. The largest stands sizes are 2 500m^2 and the smallest are 350m^2. There is a small area, equivalent to two stands, of informal dwelling in the village, in the northern-most corner of the village.

According to the STLM 2022-2027 Integrated Development Plan (IDP), the village also has a community hall, a South African Police Service (SAPS) station, a clinic, a post office and a creche. The village is served by a 1.5Ml/day sewer treatment plant. The internal roads are asphalt surfaced and both they and the sewer treatment plant are in need of maintenance attention. There is a waste transfer station in the village, which is served by the STLM Waste Management Department.

The settlement has not expanded since 2009, as the following two images (see Table 33 below), along with the image dates attest.

Table 33: Komati Village Development Time-Lapse Imagery (Google Earth™)


May 2022

June 2009

The images in Table 33 above cover the period two years before the power station was recommissioned and an image taken in May 2022. The stability of the structure of the village indicates that the village form is not significantly affected by the operational status of the power station. There is no doubt that the village population and economic activity in the village will increase when the power station is operational since this is the closest residential area to the power station and a suitable housing area for power station staff.

The economic activities surrounding the village are the KPS, the Blinkpan, Koornfontein, Kleinfontein and Goedehoop Collieries and large scale, non-irrigated agriculture.

4.15.3.2 Big House Informal Settlement

This community is located to the northeast of the power station (see Figure 82 below). The community is adjacent to a large cereal crop farm and it is likely more closely associated with the farm than KPS.

Figure 82: Big House Informal Settlement (26°05'15.30" S 29°28'36.66" E) (Google Earth™)

This community comprises approximately 87 separate roofed structures, as of May 2022. This takes into account the fact that the structures are informal in nature and densely packed into an area approximately 19 000m^2 in extent. The community is unserved by centralised sewer networks and has no electricity supply. The community relies on pit latrines for their sanitation service. The internal roads are unsurfaced gravel. There is evidence of small livestock farming with the keeping of cattle, sheep, chickens, ducks, goats and pigs. The settlement is dominated by a large, old, shop, which is derelict.

The settlement has not expanded materially since 2009, as the following series of images (see Table 34 below), along with the image dates attest.

Table 34: Big House Informal Settlement Development Time-Lapse Imagery (Google Earth™)

	
May 2022	June 2017
	
June 2013	June 2009

The images in Table 34 above cover the period two years before the power station was recommissioned, two years after full re-commissioning, up to May 2022. The relative stability of the settlement indicates that the settlement may not be directly associated with KPS, but rather that it functions as an economic unit despite the power station being in operation. Sources of employment and economic activity in the immediate vicinity of the settlement include coal mining and agriculture.

Despite the recommissioning of KPS, the community remained stagnant in growth. This may attest to the homogenous and close-knit nature of this community. It is unusual for the size of an informal community to remain constant when there is an increase in economic activity in the area.

4.15.3.3 Broodesnyers Plaas Informal Settlement

This is a small informal settlement located on the corner of the entrance road to KPS and the R35. It is located to the east of the power station (see Figure 83 below).

Figure 83: Broodsnyers Plaas Informal Settlement (26°05'48.24" S 29°28'49.48" E) (Google Earth™)

As of May 2022, this community comprises two main homesteads with shacks located around these two houses. The layout of the structures indicates an extended family unit dwelling. The buildings are unserved by centralised sewer networks and have no electricity supply. The community relies on pit latrines for their sanitation service. There is evidence of small livestock farming with the keeping of cattle, chickens, goats, sheep and pigs. The settlement has arable areas suitable for planting of vegetables and cereal crops. The area of land tilled for production increased by 50% between 2009 and 2013, and between 2017 and 2022 the area being tilled reduced by 25%. This may indicate an increase and subsequent decrease in the number of people residing in the settlement.

The settlement has not expanded since 2009, as the following series of images (see Table 35 below), along with the image dates, attest.

The images in Table 35 below cover the period two years before the power station was recommissioned, two years after full re-commissioning, up to May 2022. The only change in the settlement has been the increase and subsequent decrease the area of land tilled for crop production. The images show a relatively stable community over the 13 years. There may have been a small increase in the population of the settlement, equivalent to one or two individuals. The relative stability indicates that the settlement is not dependent on KPS, BUT rather that it functions as economic support to the settlement function.

Table 35: Broodsnyers Plaas Informal Settlement Development Time-Lapse Imagery (Google Earth™)

<table>
<tr><td>
</td><td>
</td></tr>
<tr><td>May 2022</td><td>June 2017</td></tr>
<tr><td>
</td><td>
</td></tr>
<tr><td>June 2013</td><td>June 2009</td></tr>
</table>

4.15.3.4 Gelukplaas 1

Gelukplaas 1 is a small settlement housing two family units adjacent to one another (see Figure 84 below). The settlement is located to the south of the power station, immediately south-east of the ash dams. The name of the settlement is linked to the farm portion in which it is located.

As of May 2022, this community comprises two homesteads with associated buildings such as pit latrines and animal husbandry structures. The homesteads are unserved by centralised sewer networks and have no electricity supply. The two-family community relies on pit latrines for their sanitation service. The access road is unsurfaced gravel, with access directly off the R35.

Figure 84: Gelukplaas 1 (26°06'28.76" S 29°28'26.38" E) (Google Earth™)

The settlement has not expanded since 2009, as the following series of images (see Table 36 below), along with the image dates attest.

Table 36: Gelukplaas 1 Settlement Development Time-Lapse Imagery (Google Earth™)

	
May 2022	June 2017
	
June 2013	June 2009

The images in Table 36 above cover the period two years before KPS was recommissioned, two years after full re-commissioning, up to May 2022. The only change in the settlement has been the relocation of the larger homestead and buildings within the same site. This may have been done in response to a shock event such as a fire or a change within the occupying family. The images show a stable community over the 13 years. This stability indicates that the settlement is not directly associated with KPS, but rather that it functions as an economic unit despite the power station being in operation.

4.15.3.5 Gelukplaas 2

Gelukplaas 2 is a small settlement with two main homesteads and smaller family units around the main structures (see Figure 85 below). The settlement is located south of the power station, immediately south of the ash dams.

Figure 85: Gelukplaas 2 (26°06'48.83" S 29°28'31.30" E) (Google Earth™)

The families residing on the land are largely engaged in subsistence farming. The two homesteads keep various livestock. The access road to the houses is unsurfaced gravel, with access directly off the R35. The householders claim to rent the property but were unwilling to provide any details of the landlord.

The images in Table 37 below are for the period two years before the power station was recommissioned, two years after full re-commissioning, up to May 2022. The only changes to the settlement over the period was the addition of four dwelling structures between June 2009 and June 2013 around the time KPS was fully recommissioned.

Table 37: Gelukplaas 2 Settlement Development Time-Lapse Imagery (Google Earth™)

	
May 2022	June 2017
	
June 2013	June 2009

4.15.3.6 Blinkpan

Blinkpan is located to the west of the power station and is a coal mining town originally established by the mine owner to house staff (see Figure 86 below). Blinkpan and Koornfontein, are the main labour sending area for the adjacent mines.

Figure 86: Blinkpan (26°04'58.62" S 29°26'00.24" E) (Google Earth™)

Blinkpan is made up of a large area of residential housing of varying plot sizes, as well as a police station. There are a total of 100 stands in the town, with the most common stand sizes being 900m^2. The largest residential stand sizes are 1 500m^2 and the smallest are 500m^2.

According to the STLM 2022-2027 IDP, the town is supplied by electricity, sewer and waste management services by the local municipality. Blinkpan and Koornfontein are serviced by the same 0.25Ml/day sewer treatment plant, located in the north-western corner of Blinkpan. The internal roads are asphalt surfaced and both they and the sewer treatment plant are in need of maintenance attention.

The economic activities surrounding the town are the Blinkpan, Koornfontein, Kleinfontein and Goedehoop Collieries, KPS and large scale, non-irrigated agriculture.

The settlement has not expanded since 2009, as the following two images (see Table 38 below), along with the image dates attest.

Table 38: Blinkpan Development Time-Lapse Imagery (Google Earth™)

May 2022

June 2009

The images cover the period two years before the power station was recommissioned and an image taken in May 2022. The stability of the structure of the town indicates that the town form was not significantly affected by the operational status of the power station. Blinkpan is closest to the Blinkpan and Geodehoop Collieries. The economic status of these two operations will impact upon the town's well-being to a greater extent than that of KPS.

4.15.3.7 Koornfontein

Koornfontein is located to the north-west of the power station and is the main commercial and labour sending area for the power station and the adjacent mine (see Figure 87 below).

Figure 87: Koornfontein (26°05'10.45" S 29°26'02.83" E) (Google Earth™)

Koornfontein town comprises are large area of residential housing of varying plot size and two churches. There are a total of 50 stands in the town, with the most common stand sizes being 900m^2. The largest residential stands sizes are 1 500m^2 and the smallest are 500m^2.

According to the STLM 2022-2027 IDP, the town is supplied with electricity, sewer and waste management services by the local municipality. The internal roads are asphalt surfaced and both they and the sewer treatment plant are in need of maintenance attention.

The economic activities surrounding the town are the Blinkpan, Koornfontein, Kleinfontein and Goedehoop Collieries, KPS and large scale, non-irrigated agriculture.

The settlement has not expanded 2009, as the following two images (see Table 39 below), along with the image dates attest.

Table 39: Koornfontein Development Time-Lapse Imagery (Google Earth™)

May 2022

June 2009

The images cover the period two years before the power station was recommissioned and an image taken in May 2022. The stability of the structure of the town indicates that the town form does not change with the operational status of KPS. Koornfontein is closest to the Blinkpan and Geodehoop Collieries and thus the economic status of these two operations will impact upon the town's well-being to a greater extent than that of the KPS.

4.15.3.8 Snybroer Plaas

Snybroer Plaas is a small settlement housing four main homesteads arranged in block formation (see Figure 88 below). The settlement is located to the south of the power station, as is associated primarily with a farm in the area.

Figure 88: Snybroer Plaas (26°07'02.12" S 29°28'10.37" E) (Google Earth™)

As of May 2022, this community comprises four homesteads with associated buildings such as pit latrines and animal husbandry structures. The homesteads are unserved by centralised sewer networks and have no electricity supply. The access road is unsurfaced gravel, with access directly off the R35.

The settlement has not expanded since 2009, as the following series of images (see Table 40 below), along with the image dates attest.

In June 2018, a replacement dwelling was constructed in the south-west corner with the old structure being removed by April 2021. In the north-west corner, a new structure was built to replace the previous structure in the year leading up to June 2013. This process was repeated a between April 2019 and October 2020, with the dwelling in the north-west corner being rebuilt and replaced a further time.

Since the changes to these structures resulted in a dwelling of the same size and in approximately the same location, it is likely that they were replaced in response to the building's deterioration and not being weatherproof. The images show a stable community over the 13 years represented in the timescale. This stability indicates that the settlement is not directly associated with KPS, but rather that it functions as an economic unit despite the power station being in operation.

Table 40: Snybroer Plaas Settlement Development Time-Lapse Imagery (Google Earth™)

	
May 2022	June 2017
	
June 2013	June 2009

4.15.4 Vulnerable Groups

The communities surrounding the KPS who reside in the informal settlements and who do not have access to water, sewer and electricity are regarded as vulnerable and may be more likely to be adversely affected by the impacts of the Project. Special consideration will be given to these communities during stakeholder engagement and during the identification of suitable mitigation measures.

4.15.5 Outcomes of Preliminary Stakeholder Engagement

In order to understand the social concerns on the ground, stakeholders within a 5km radius (see Figure 89 below) of KPS were identified and consulted. This study area corresponds to the KPS IZOI considered in the Socio-Economic Impact Study (Urban-Econ Development Economists, 2020).

Figure 89: Communities Survey with a 5km Radius of KPS

As part of a preliminary investigation, a qualitative questionnaire was administered. The intention of the questionnaire was to determine the dependency of local communities on KPS, their social, economic and environmental concerns, and opportunities regarding the shutdown of the power station, opinions on the repurposing of infrastructure at the power station and an indication of the community's willingness to participate in the ESIA process.

Initially, a reconnaissance exercise was conducted to introduce the project and invite community members to be part of the survey. On agreement to be part of the study, the survey team thereafter visited each person to administer the questionnaire. The surveys with the local community members were conducted in their language of choice.

A total of 66 participations in the surrounding communities agreed to be part of the survey. Given the timeframe to compile the draft ESIA Report, only members of the community that were readily available were interviewed as outlined in Table 41 below. The remaining 14 parties who agreed to be part of the survey were only available after 05 July 2022 and will be interviewed later. The ESIA Report will be updated with the outcomes of these interviews, however, the social survey team is confident that the current findings are a reasonable representation of the surrounding communities, as a state of data saturation was reached after the first 28 questionnaires were administered.

Table 41: No of Households Surveyed

Community	No of Households Surveyed
Big House/ Komati	34
Geluk Plaas 1	3
Geluk Plaas 2	1
Schoeman Farm	1
Broeneier Farm	6
Snybroed Plaas/ Vlakplaas	1
Komati Village	6
Total	**52**

A thematic analysis was undertaken of all data collected. Below, is a summary of the key findings.

4.15.5.1 Communication

Only 23% of the respondents had directly heard about the shutdown of the power station through friends and family members who worked at KPS and are now working at other power stations. Most respondents (68%) heard about the shutdown through the mines, farmers and other means while the remaining 9% were unaware the power station was shutting down. Many were of the impression that the coal fired power generation would be replaced with solar power generation. People have heard various future plans for KPS.

One person confirmed that Eskom had a couple of meeting to discuss the shutdown, but no notice was posted in community. Most people found out through the grapevine.

In the main, respondents raised concerns about the communication of events at the KPS. Some felt betrayed by Eskom, and they expressed anger that they have endured the pollution from the power station for years. When a major event like shutting down the station is not communicated to them, it is as though they don't exist.

Almost all respondents were concerned that if people outside the immediate vicinity of KPS are aware of the shutting down, they will be in a better position to get work that may emanate from the process.

> ***"we don't like how Eskom is treating us……"they have forgotten us and the promises they made in the past"***

The community equates information with being in a better position to access future work opportunities.

Business owners in the area also expressed concern regarding the lack of transparency and information shared on the shutdown process. They feel that they are directly affected and that they do not receive sufficient information on processes and timeframes to plan accordingly.

4.15.5.2 Dependency on KPS

Only 20% of respondents directly work or have previously worked at KPS. Those that do work at the power station, mainly work during shutdown operations as labour.

> ***"We are having 10 people in our settlement working at the power plant and they are the sole providers to their families. Their monthly income comes from the plant"***

Most respondents (over 80%) are unemployed and engage in subsistence farming to earn a living and are largely dependent on social grants. Many have seasonal work on farms or are employed as labourers in the mines.

Even though many respondents are not directly or indirectly employed by KPS, they are dependent on KPS in other ways. They believe their water comes from the power station. The fact that the power station is operational creates a safer environment. The roads are also maintained by the power station. Some believe that their electricity comes directly from KPS and that the tariffs may go up if electricity is provided by the STLM. Communities have less faith in the municipality to continue with services than in KPS.

Businesses in the vicinity of KPS are more directly dependent on KPS, especially the hospitality industry. They have raised concerns about the loss of business and its impact on their and their employees' livelihoods. Some have said that they invested in their businesses because of the power station and now they do not know how and by when they will be affected. Many are trying to sell their businesses to limit the impact from the shutdown on them and their families.

4.15.5.3 Employment

The main concern for all communities is the lack of employment and economic activity in the area.

> ***"we already have high unemployment in the area, closing it down will make the situation worse"***

Respondents are concerned that the surrounding communities, and in particular the youth, will not be prioritised when jobs are created during the shutdown or when the solar PV plant is constructed.

Community members demanded to know the number of temporary and permanent jobs that will be created during the shutdown and during the construction and operation of the solar PV plant. People wanted to know how many jobs will be lost at KPS and how they will be compensated.

Respondents wanted to be part of the strategy to prioritise local labour for all activities in and around KPS. There is overwhelming support to prioritise the youth in the area.

There were concerns about the knock-on effect of KPS shutting down on the mining activity in the area. Many are employed at the mines and they are concerned that they too will lose their jobs.

Respondents employed in the agricultural sector are least affected by the shutdown. However, they also expressed concern about the loss of jobs in the area.

> ***"unemployment is high in the area, government cannot allow more job losses. The power station can only be allowed to shut down if the same number of jobs lost is created by others"***

One business owner mentioned that they will wait to see how they are impacted before they start retrenching staff. Another business owner confirmed that their business is already affected by the scaling back of activities at KPS and that they have already retrenched their staff.

4.15.5.4 Environment

While air and water pollution from KPS is of concern to many communities, respondents were hesitant to confirm if shutting down KPS will benefit the environment. They saw this as affirmation that shutting down the power station was good. Some reluctantly admitted that shutting down KPS will allow the environment (water, soil and air) to recover from years of pollution. However, the opinion was quickly qualified by adding:

> ***"we can have both the power station and a good environment if the government could control all the pollution"***

Many explained that they hunt and poach porcupines, guinea fowl and birds in the area. Therefore, according to them the environment is fine with the power station in operation.

Even though smog was a problem when all nine (9) units were in operation, the community is not concerned, as they would prefer to be employed.

Many respondents raised concerns about dust from the ash dams during windy periods.

Some raised concerns about drinking water quality, as they heard that KPS is polluting the groundwater.

Those respondents engaged in subsistence farming were interested in knowing if the soil is contaminated and if it would affect their crops.

Some believe that groundwater and surface water is contaminated from sewerage spills from the wastewater treatment plant, which was handed over to the STLM.

4.15.5.5 Health

Some respondents confirmed that asthma was a problem, especially with youth and the elderly. According to them, the mobile clinic that comes to the area deals mainly with respiratory problems.

> ***"during COVID many people died because their lungs were already damaged from ash and smog"***

Despite these health issues, community members confirm that they would rather be ill than unemployed. Therefore, communities are willing to accept the pollution if KPS can continue to operate and provide employment.

Some mentioned that children are often sick with diarrhoea, which could be caused by the water quality in the area or by a lack of sanitation services.

4.15.5.6 Repurposing of KPS

The community indicated that the land belonging to KPS should be developed to create more employment for the local people.

Currently, people in the area travel as far Secunda and Middelburg to attend training. Existing buildings at KPS should be converted into training centres for local people.

Almost everyone interviewed agreed that the solar PV plant and BESS project should proceed.

> ***"existing buildings within the power station should be used to trained people to work on the solar plant"***

The general feeling is that buildings should not be demolished if they can be repurposed for other purposes, such as clinics, recreational use and other facilities. Buildings are considered a resource in the area and communities would like to them repurposed instead of being demolished.

Many respondents suggested that the existing dams should not be decommissioned, but rather be cleaned and used for recreational purposes.

One suggestion was to use the dams for fish farming and aquaculture projects to support the local community, in conjunction with the socio-economic development unit of the STLM.

4.15.5.7 Safety and Security

There is general concern for personal safety and security in the area after KPS has closed down. People have a perceived sense of safety and security due to the very presence of the power station.

Members of the formal communities raised concerns about increased drug use and crime in the area, which is likely to get worse when KPS is shut down.

> ***"the town used to be wealthy and well developed, now it is run down and poor"***

Some respondents believe that the quality of schooling in the area has deteriorated, as people are moving out of the area.

Some respondents believe that taverns in the areas are busier, as people don't have much to do (especially the youth). This will ultimately create a safety and security issue.

In the informal settlements, respondents raised concerns about increased unemployment and it's impact on crime if people become desperate. Some community members mentioned that the informal settlements around KPS are safe and stable. There has not been much change in the community as people have been living there for many years. However, there is growing concern that people from outside the area will move to the settlements during the dismantling of KPS and the construction of solar PV plant and BESS. Community members are fearful that crime will become a problem in their communities. Some raised concerns about the housing of construction workers during the construction phase and the impact on existing settlements. Most respondents do not want to see the expansion of their existing settlements.

4.15.5.8 Access to Services and Maintenance of Existing Services

On respondent mentioned that the shutdown of KPS threatens the livelihoods of numerous employees and people are thus leaving the area. If the community is abandoned, then access to and maintenance of services will deteriorate.

Another respondent raised a concern about the lack of access to services in the informal communities. People had hoped that KPS would make their lives better during the operational phase, but they are still utilising two mobile clinics that come once a week, namely on Wednesday (municipal offices) and Thursday (SASSA Paypoint).

The majority of the informal communities still do not have access to piped water and instead the community draws water from JoJo tanks provided by the municipality.

Communities use coal and wood for energy.

Communities also do not have sanitation services and use pit latrines.

Some respondents claimed that the community was promised houses during the operation of the KPS, however, nothing happened.

Some members believe that Eskom maintains the road which will deteriorate after KPS is shut down.

There is a sense of growing frustration in the surrounding informal communities. The communities believe that they have endured the pollution caused by KPS for many years, yet they have not benefited from the power station. While the power station generates electricity, the community is dependent on coal and wood for energy. KPS operated the wastewater treatment works until very recently, yet the community is reliant on pit latrines. Finally, the power station provides water to the surrounding formal communities, yet the informal communities are dependent on JoJo tanks for their supply. Community members agree that Eskom should improve their access to services before KPS is shut down.

4.16 Transportation

4.16.1 Roads

The overall roads network around KPS is shown in Figure 94 below. KPS is situated within 3km of both the R35 (running north to south) (see Figure 90 below) linking Middleburg and Bethal and the R542 (running east to west) (see Figure 91 below) between Witbank and Hendrina. The R542 and R35 routes connect to the south of KPS.

Figure 90: South-western view along R35 (KPS visible on right-hand side) (Google Earth™)

Figure 91: Western view along R35 (KPS' western cooling towers visible on right-hand side) (Google Earth™)

The ash dams are accessed via a tar road that runs between the power station and the ADF (see Figure 92 below), which connects to the R35. The ADF components are accessed via gravel roads (see Figure 93 below).

Figure 92: South-eastern view along access road to ADF (KPS on left and ash dam on right) (Google Earth™)

Figure 93: View along gravel road at ADF with KPS in the background

4.16.2 Rail

Railway lines run to the north and east of KPS. A railway lines traverses the mining property to the immediate north of the power station, Figure 94.

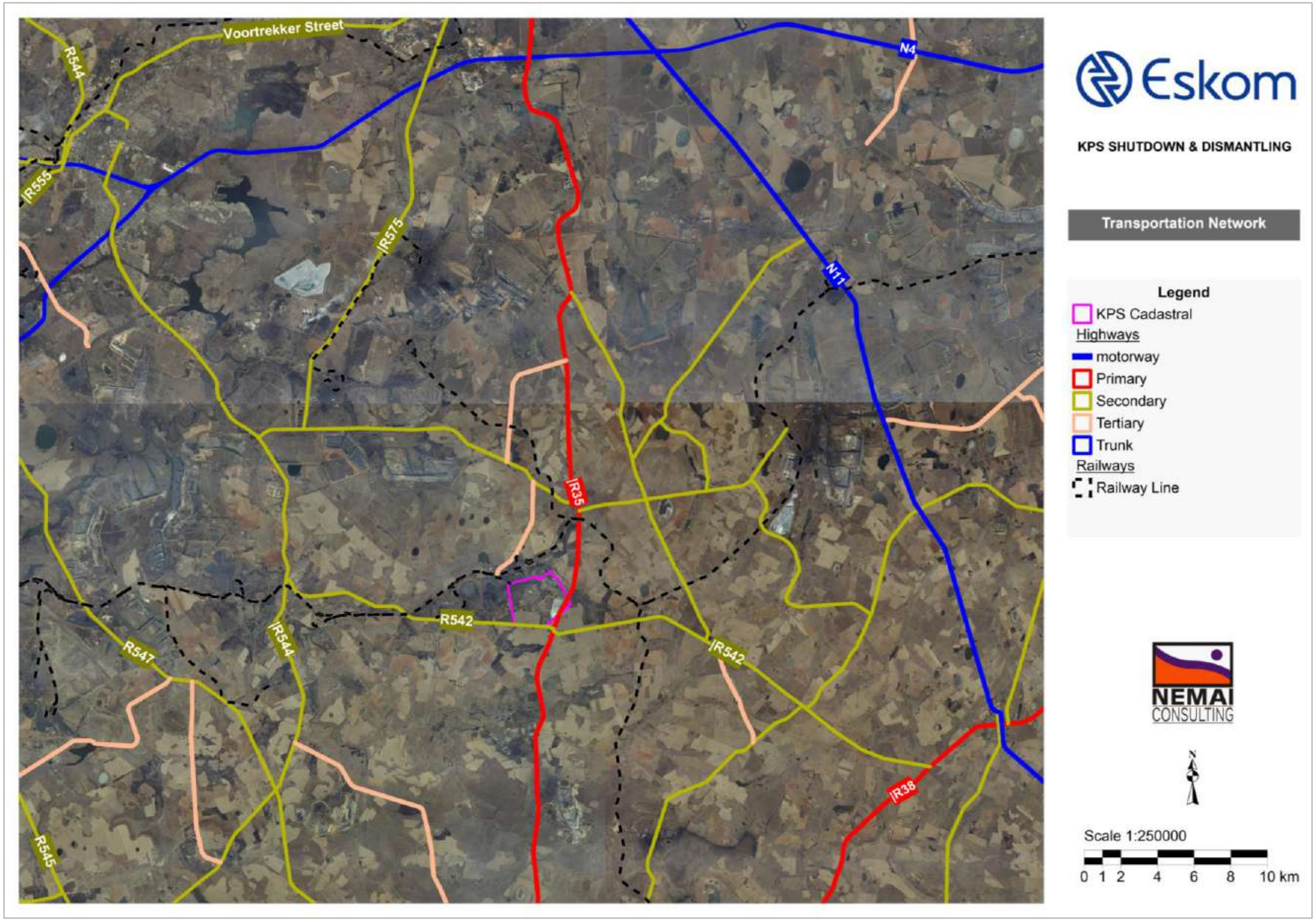


Figure 94: Transportation network

4.16.3 Air Transport

A light craft landing strip and helipad is located between Komati Village and the mine, south-west of the station (see Figure 95 below). The facilities are located on the KPS property and will be decommissioned to make way for the proposed PV plant as part of the repurposing project (Component B).

Figure 95: View of air strip at KPS (Google Earth™)

4.17 Waste

4.17.1 Waste Disposal Facilities

4.17.1.1 General Waste

The waste disposal facilities within STLM are listed in Table 42 below. According to the 2022/23 IDP (STLM, 2022), waste disposal in the municipality is centralised and all waste collected is transported to the permitted Middelburg Landfill for disposal. The lifespan of this landfill is projected to be 14 years.

There are nine (9) waste transfer stations in STLM, namely in Dennisig, Middelburg Extension 49, Rockdale, Doornkop, Somaphepha and Sikhululiwe Village, Hendrina, Rietkuil and Komati. There is one municipal owned buy-back centre and four private buy-back centres in STLM (STLM, 2022).

Table 42: Waste disposal facilities within STLM

Disposal facility	Location	Type of waste streams	Status
Middelburg Landfill Site	Middelburg	GMB-	Permitted
Dennesig Waste Transfer Station	Dennesig	General waste (recycling facility)	Comply with standards for waste

Disposal facility	Location	Type of waste streams	Status
Ext 49 Waste Transfer Station	Ext 49 industrial area	General waste (recycling facility)	Comply with standards for waste
Doornkop Waste Transfer Station	Doornkop	General waste	Permitted
Somaphepha WasteTransfer Station	Somaphepha village	General waste	Permitted
Rockdale Waste Transfer Station	Rockdale/Ext 24	General waste	Permitted
Sikhululiwe Waste Transfer Station	Sikhululiwe village	General waste (recycling facility)	Permitted
Komati Waste Transfer Station	Komati	General & garden waste	Permitted
Hendrina Waste Transfer Station	Kwazamokuhle/Hendrina	General & garden waste	Permitted
Rietkuil Waste Transfer Station	Rietkuil	General waste	Permitted

4.17.1.2 Hazardous Waste

During the start-up of the plant after the mothball period there was a removal of asbestos waste by a service provider, which was disposed at a hazardous waste disposal site (Muswubi pers. comm., 2022).

Hazardous waste from KPS is currently disposed of at the Holfontein Hazardous Waste Disposal Site ("Holfontein"), which is in Benoni, Gauteng Province. Holfontein is owned by Enviroserv Waste Management (Pty) Ltd ("Enviroserv"). KPS is situated approximately 120km (travelling along the N12 highway) from Holfontein. According to its licence (12/9/11/L975/3), Holfontein is a Class H:H (Class A) landfill.

According to a representative from Enviroserv (Malele pers. comm., 2022), Holfontein has approximately 10 years of airspace left, and the facility is also licenced to receive asbestos waste.

4.17.2 Waste Assessment

According to VPC GmbH (2021), a waste assessment was undertaken in 2019 by Nsovo Environmental Consulting on several waste types generated at KPS. The purpose of the study was to determine whether the wastes are defined under Schedule 3 of the NEM:WA and/or listed in Annexure 1 of GN R. 634, to determine possible disposal prohibitions in terms of GN R636, to profile in accordance with GN R. 635 and/or Waste Acceptance Criteria as detailed in GN R. 636 and quantitative classification in broad accordance with SANS 10234. Material Safety Data Sheets (MSDS) were also included for all identified waste in the report.

The findings of the study, as summarised by VPC GmbH (2021), are as follows:

- Used Pulverised Fuel (PF) –

  - PF is a dark grey silt-like waste material which was classified as Category A: hazardous waste. This waste is generated from the pulverized Fuel Boiler, thermal processes, and hazardous portion of wastes from power stations and other combustion plants. It was recorded with a Calorific Value (CV) of 15 MJ/kg and Total Organic Carbon (TOC) of 47.51% which would prohibit landfill disposal from August 2025.
- ❑ Used Oil –
  - The used oil has been qualitatively classified as hazardous in accordance with SANS 10234.
- ❑ Sulphur –
  - Sulphur is yellow-brown sand and silt-sized fraction waste material and has been classified as hazardous, displaying Hazard Statement Codes H315 (Causes Skin Irritation) and H318 (Causes Severe Eye Damage). These have been identified largely based on the concentration of sulphur.
- ❑ Silica Gel –
  - Silica gel is a white, pink, and blue, fine to medium gravel-sized granules of silica with no apparent odour. The mixed silica gel has been qualitatively classified as non-hazardous based on appraisal of the existing MSDS of the raw product. It is temporarily stored in a drum within KPS.
- ❑ Three Unknown Chemicals –
  - Three unknown chemicals were colourless and clear liquids which were collected from the Komati Laboratory. All these chemicals were found to be hazardous.
- ❑ Bottom and Fly Ash –
  - During coal combustion, large amounts of ash are created along with carbon dioxide and other gases. The fine particle ash that rises up with the flue gases is known as fly or flue ash while the heavier ash that does not rise is called bottom ash; collectively these are known as coal ash. Bottom ash is a grey dark ash, while fly ash is a pale grey fine ash which originate from on-site boiler. These two chemicals were found to be non-hazardous.
- ❑ Used Grease –
  - The degreaser has been qualitatively classified as hazardous and its chemical input entails the Marque Lubricants, Safe Solvent Degreaser.

A Waste Management Assessment (refer to ToR in Section 8.5.2.3 below) will be undertaken for the Project and the findings will be included in the ESIA Report.

4.17.3 KPS Waste Inventory

An inventory of materials and waste products associated with KPS, including on-site storage and/or disposal locations, is provided in Table 43 below.

Table 43: KPS Waste Inventory (VPC GmbH, 2021)

Waste description	Activity / Process generating waste	Physical properties of waste	Type of waste	Rationale for hazardous designation	Types of Waste Stream for Reporting to SAWIS as per the National WIS Regulations, 2012	Waste Classification, SANS 0228/SANS 10234/ Waste Assessments as per GNR 635 & GNR 636	Disposal method	Responsible department on site for disposing	Name of waste disposal facility
HAZARDOUS WASTE									
HYDROCARBON RELATED WASTE									
Soil and sorb dust contaminated with hydrocarbons (oil/petrol/diesel)	Hydrocarbon spillages	Solid	Hazardous	Waste contains petroleum H/Cs	HW11(02)	Class 9	Treatment followed by disposal	Environment	Holfontein
Water contaminated with hydrocarbons (oily water)	Emptying drip tray / secondary containment	Liquid	Hazardous	Waste contains petroleum H/Cs	HW99	Class 9		Environment	Holfontein
Oil contaminated material (rags, oil/fuel filters, PPE)	Maintaining / servicing plant/equipment	Solid	Hazardous	Waste contains petroleum H/Cs	HW99	Class 4		Environment	Holfontein
Used oil	Maintaining / servicing plant / equipment	Liquid	Hazardous	Waste contains petroleum H/Cs	HW07	Class 6		Environment	Holfontein
PAINT RELATED WASTE									
Empty aerosol cans / spray paint tins / Used Paint Brushes/Empty paint containers / Paint rags	Painting and marking the structures	Solid	Hazardous	Paint residues / waste contains toxic / inorganic / carcinogenic chemicals / waste contaminated with solvent	HW99	Class 4	Treatment followed by disposal	Environment	Holfontein
Spent degreasing solvent / Paint washings / Used thinners	Painting / washing of paint brushes using thinners	Liquid	Hazardous	Waste contaminated with solvent	HW08/HW10	Class 3		Environment	Holfontein
WASTE OF ELECTRONIC AND ELECTRONIC EQUIPMENT (WEEE)									
Empty Ink and Toner Cartridges	Printing	Solid	Hazardous	Waste contains toxic chemicals	HW99	Class 9			Holfontein

Waste description	Activity / Process generating waste	Physical properties of waste	Type of waste	Rationale for hazardous designation	Types of Waste Stream for Reporting to SAWIS as per the National WIS Regulations, 2012	Waste Classification, SANS 0228/SANS 10234/ Waste Assessments as per GNR 635 & GNR 636	Disposal method	Responsible department on site for disposing	Name of waste disposal facility
Office, Information, and communication equipment (old computers, air conditions)	Report writing and data management	Solid	Hazardous	Waste contains hazardous components / substances	HW18(03)	Class 9	Treatment followed by disposal		Holfontein
Lead Acid Batteries	Driving vehicles / machinery	Solid containing liquid	Hazardous	Waste Contains lead or other heavy metals	HW03	Class 8			Holfontein
AA & AAA Batteries	Used inside the remotes control / cameras	Solid	Hazardous	Waste contains heavy metals	HW03(07)	Class 9			Holfontein
Fluorescent tubes	Exchanging worn-out lights	Solid	Hazardous	Waste contains mercury	HW18(05)	Class 9			Holfontein
OTHER HAZARDOUS WASTE (MISCELLANIOUS WASTE)									
Health Care Risk Waste (HCRW) - Infectious waste /sanitary waste / sharps	Consultation at the Clinic	Solid	Hazardous	Waste contains pathogens	HW19(02)	HW19(02)	Treatment followed by disposal		ClinX
SHE Waste	Waste from she bins	solid	Hazardous	Waste contains pathogens	HW19(02)	HW19(02)			DÉCOR Alied technologies
GENERATION WASTE									
Ash	Burning of coal	Solid	Hazardous	Waste contains inorganic metals/ high Sulphur content	HW14/HW13	Type 3	Landfilling		Komati Ash dams
LABORATORY WASTE									
Chemical Waste (includes expired chemicals)	Laboratory analysis / Water treatment	Solid / Liquid	Hazardous	Waste contains toxic / inorganic / carcinogenic chemicals		Class 6	Landfilling		Holfontein
GENERAL WASTE									
COMPACTABLE WASTE									
Food waste and packaging materials	Food leftovers / foam containers	Solid	General	N/A	GW10	N/A	Landfilling		Middelburg Landfill site

Waste description	Activity / Process generating waste	Physical properties of waste	Type of waste	Rationale for hazardous designation	Types of Waste Stream for Reporting to SAWIS as per the National WIS Regulations, 2012	Waste Classification, SANS 0228/SANS 10234/ Waste Assessments as per GNR 635 & GNR 636	Disposal method	Responsible department on site for disposing	Name of waste disposal facility
Garden waste	Maintaining garden / pruning trees	Solid	General	N/A	GW20(01)	N/A	Landfilling		Middelburg Landfill site
Plastics	Packaging materials	Solid	General	N/A	GW10	N/A	Landfilling		Middelburg Landfill site
Insulation material (Rockwool)	Insulation	Solid	General	N/A	GW10	N/A	Landfilling		Middelburg Landfill site
Legging	Used for insulation in the plant	Solid	General	N/A	GW10	N/A	landfilling		Middelburg Landfill site
UNCOMPACTABLE WASTE									
Ferrous and Non-ferrous Metals (scrap metals)	Erecting Steel / plant maintenance	Solid	General	N/A	GW53(01/02)	N/A	Recycling		Sold on site
Spoil material / rubble /concrete waste	Demolishing the concrete structures	Solid	General	N/A	GW30	N/A	Recycling		Middelburg Landfill site
OFFICE WASTE									
Office Wastepaper	Printing	Solid	General	N/A	GW50(01)	N/A	Recycling		Nampak
OTHER GENERAL WASTE									
Used Conveyor Belts (Rubber)	Plant / conveyor maintenance	Solid	General / hazardous	Contaminated by Ash	HW99	Class 4	Sold to individuals	Stores	Sold to individuals

4.17.4 Asbestos

An asbestos disposal site was established on a part of the existing ADF (specifically within Ash Dam 1) for the disposal of asbestos and asbestos containing waste, generated during the refurbishment of KPS (see Figure 96 below). The permitted asbestos site was used once for the disposal of 4 050kg of asbestos and asbestos containing waste in 2008. In accordance with the site's permit conditions, a 1m thick layer of ash was placed over the asbestos, the site was fenced off and clearly demarcated. Subsequently, the site has received two layers of ash and re-fenced with the correct demarcation. The current height of the facility is approximately 1 650 metres above mamsl and is no longer used for the disposal of asbestos waste. After the 2008 disposal, all asbestos waste generated at KPS was removed off-site by a licenced operator to an approved asbestos disposal facility.

An assessment was undertaken by Ergosaf Environmental and Occupational Health Services in 2013 to establish if the disposal and storage of asbestos at the ADF poses a risk of environmental contamination. This included sampling of soils, surface, and groundwater. The study concluded that there was no environmental pollution risk of the disposed asbestos.

In January 2018 a WML was issued for the closure and rehabilitation of the site with a designed cover. This closure process has not yet started (VPC GmbH, 2021).

4.18 Pollution Sources

The preliminary list of pollution sources identified at KPS include the following (see Figure 96 to Figure 101 and selected photographs below):

- Coal Stockyard;
- Lake Stoffel;
- Lake Finn;
- Ash dams;
- Asbestos disposal area;
- Hazardous substances storage area;
- Hazardous waste temporary storage;
- Bulk fuel storage areas;
- Bulk chemical store; and
- Fuel station.

The above list is not regarded as exhaustive at this stage, and it will be updated based on the detailed findings of the specialist studies that are underway for the decontamination and repurposing projects, including the Soil and Groundwater Assessments.

The wastewater treatment works, although transferred to STLM, is also a source of environmental pollution in the Project Area.

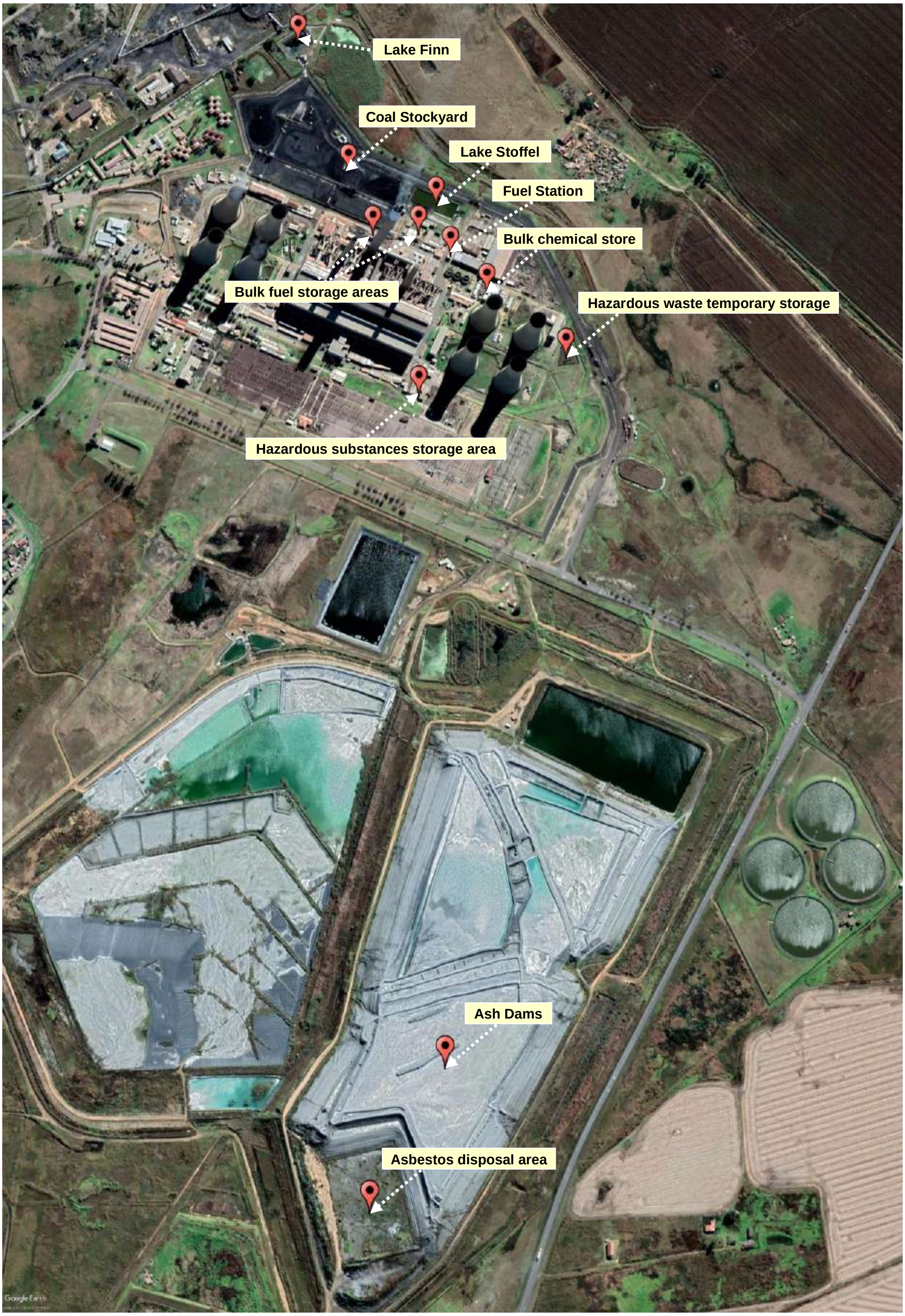


Figure 96: Pollution sources identified at KPS (Google Earth™)

Figure 97: Coal Stockyard

Figure 98: Hazardous substances storage area

Figure 99: Lake Stoffel

Figure 100: Hazardous waste temporary storage (VPC GmbH, 2021)

Figure 101: Fuel station

4.19 Land Capability

Field crop boundaries surrounding KPS are shown in Figure 102 below.

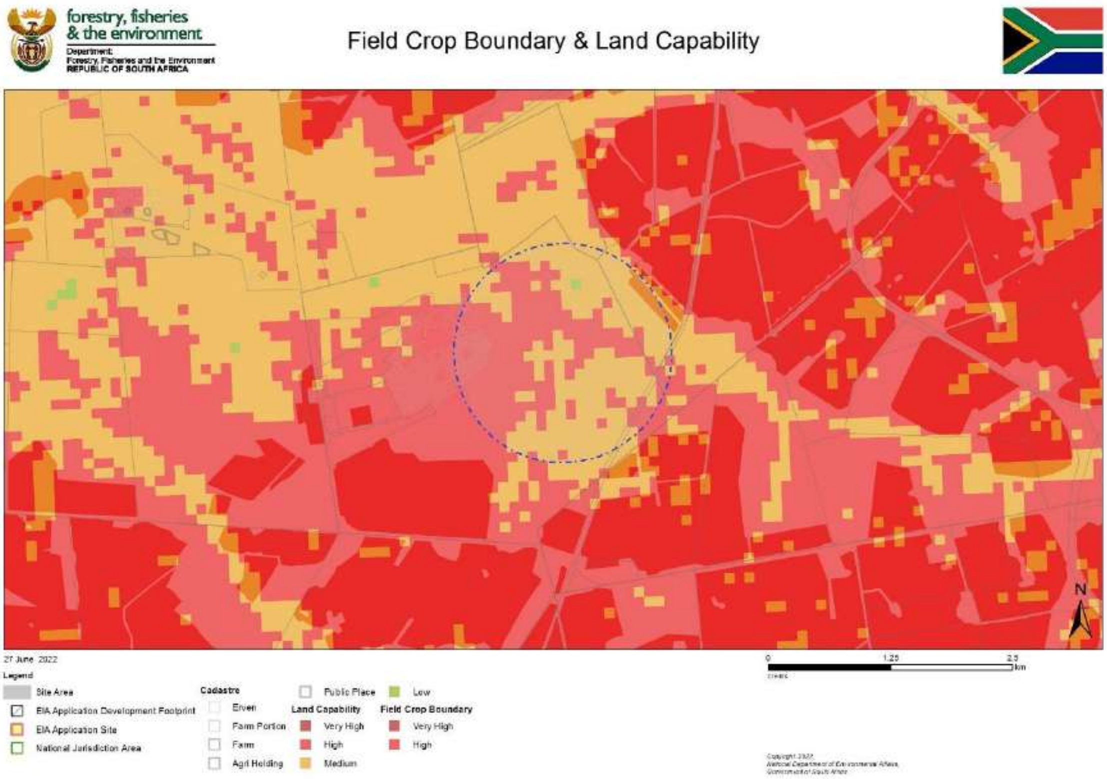
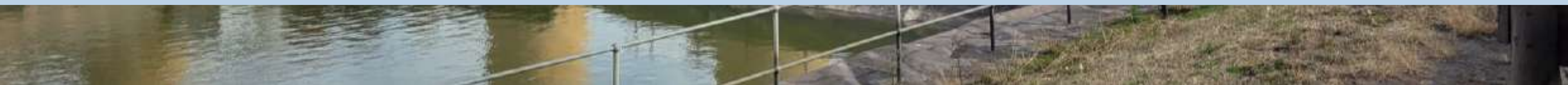


Figure 102: Field crop boundary (DFFE Screening Tool, 2022)

Cultivated land occurs to the immediate east, south-east and south-west of the power station. A cultivated area is also located on the KPS property, which is leased out for farming purposes.

The area is characterised by medium to high land capability (see Figure 102 above). It is noted that certain areas with a high rating have been transformed by the power station's footprint.

CHAPTER 5: POTENTIAL ENVIRONMENTAL & SOCIAL IMPACTS & MITIGATION



5 Potential Environmental & Social Impacts & Mitigation

5.1 Introduction

According to ESS1 (World Bank, 2016), the ESIA needs to consider, in an integrated way, all relevant direct, indirect, and cumulative environmental and social risks and impacts of the project, including those specifically identified in ESSs1–10. The ESIA needs to be undertaken at the scale and level of detail appropriate to the project's potential risks and impacts. In addition, ESS1 also requires that mitigation measures and significant residual negative impacts that cannot be mitigated be identified (World Bank, 2016).

This draft ESIA was undertaken at a scoping level to identify environmental and social impacts for further detailed assessment as part of the ESIA. Preliminary mitigation measures are also provided, which will be updated through the detailed findings of specialist studies and further outcomes of the ESIA.

5.2 Predicting Potential Environmental and Social Impacts

The potential environmental and social risks and impacts associated with the proposed Project were identified during the draft ESIA through an appraisal of the following:

- Legal context;
- International and national case studies;
- Existing infrastructure, structures and areas earmarked for closure at KPS;
- Activities associated with the closure of KPS;
- Waste to be generated during closure;
- Nature and profile of the receiving environment and social environment, including potential sensitive features and receptors;
- Preliminary findings of specialist studies;
- Outcomes from the initial stakeholder engagement; and
- Input received from authorities and the Project Team (including the World Bank and Eskom).

5.3 Mitigation of Impacts

As part of the ESIA, suitable measures will be identified to manage the identified environmental and social impacts according to the following mitigation hierarchy:

1. Initial efforts will strive to avoid the occurrence of the impact;
2. If this is not possible, mitigation will include measures that reduce or minimise the significance of the impact to an acceptable level;
3. Remediation or restoration will take place if measures cannot suitably prevent or reduce the impacts, or to address the residual impacts; and

4. As a last measure, where significant residual impacts remain, compensation or offsets (where technically and financially feasible) will be employed as a form of mitigating the impacts associated with the Project.

An Environmental and Social Management Plan (ESMP) will be developed as part of the ESIA. According to ESS1 (World Bank, 2016), an ESMP is an instrument that details (a) the measures to be taken during the implementation and operation of a project (*in this case closure*) to eliminate or offset adverse environmental and social impacts, or to reduce them to acceptable levels; and (b) the actions needed to implement these measures. The ESMP will include requirements for mitigation, monitoring, capacity development and training, implementation schedule and cost estimates, as well as integration with the Project.

The mitigation measures provided in the draft ESIA Report are by no means exhaustive, as detailed specialist studies and technical investigations (including design measures) still need to be completed to provide a sufficiently comprehensive list of mitigation measures. Nonetheless, the mitigation measures included in this report aim to address some of the salient impacts that may be caused by the Project, albeit on a high level at this stage.

5.4 Environmental and Social Management Objectives of Project

The Environmental and Social Management Objectives for the Project, which define the successful closure of the KPS, are as follows:

- Complying with the legislation governing the Project, including obligations in terms of existing environmental approvals and obtaining the new requisite authorisations and licences;
- Safe closure of all facilities at KPS to prevent any risks in terms of occupational and community health and safety;
- Undertaking closure in accordance with best international practices in terms of environmental, health, and safety requirements, as tailored to the hazards and risks determined for the Project;
- Striving to leave a positive legacy when exploring closure options;
- Mitigating all potential impacts to ensure that no residual impacts remain significant;
- Applying the waste management hierarchy during the closure of the KPS;
- Ensuring that all waste is managed to prevent environmental pollution, in accordance with all legal requirements for the classification, handling, storage, transportation and disposal of waste (as relevant);
- Managing historical contamination at KPS to avoid risks to human health and ecological receptors;
- Rehabilitating the areas where facilities are removed to enable the renewable energy development at KPS;
- Providing sufficient funds for the successful closure and rehabilitation of KPS; and

- Maintaining all records related to closure to demonstrate compliance with mitigation measures.

5.5 Geohydrology

Note that the impacts, mitigation measures and additional investigations linked to the ADF are covered separately in Section 5.10 below.

5.5.1 Impact Description

5.5.1.1 Positive Impacts

There are various pollution sources at KPS that impact on groundwater quality (see Section 4.18 above). The removal and/or containment of pollution sources and remediation of the site will benefit groundwater resources.

5.5.1.2 Negative Impacts

Potential adverse impacts of the Project on groundwater include the following:

- From historical groundwater pollution trends and current studies, it is confirmed that the groundwater at KPS is contamination from the operational activities at the power station. Failure to isolate pollution sources and to remediate contaminated land will result in localised and regional impacts to groundwater that will persist beyond the closure of the power station;
- Possible influence on groundwater flow as a result of trenching and excavations;
- Potential contamination of groundwater through poor closure practices (e.g., improper management of waste, wastewater, and hazardous substances); and
- Polluted groundwater will negatively impact surrounding water users especially domestic and agricultural uses.
- Due to areas of shallow groundwater tables, springs are common. There will be a negative impact on communities that hunt and poach animals in these areas;
- Cumulative impact of groundwater pollution from mining and agricultural activities in the catchment.
- Climate change may impact on the Project through extreme rainfall events, which may pose a risk to closure activities and rehabilitated areas (including the ADF). Rainfall in excess of the designed capacity of the storm water system will result in runoff from the site, which may pollute soil, surface water and groundwater.

5.5.2 Governance

WBG	SA Legislation	Authority	Regulatory Control Mechanisms
• ESS1 • ESS3 • ESS4 • ESS6 • ESS10	• NEMA & EIA Regulations • NWA • NEM:WA	• DFFE • DWS • MTPA	• NWA – ○ Resource Directed Measures (RDM) - objectives for the desired level of protection of the resource – Reserve,

WBG	SA Legislation	Authority	Regulatory Control Mechanisms
• EHS Guidelines			Classification System, Resource Quality Objectives. ○ Source Directed Controls (SDCs) – measures to control water use (including impacts to water resources), e.g., water use authorisation (WUL) and water quality standards. ○ Any conditions related to closure / decommissioning in the existing WUL's for the power station need to be adhered to. ○ Prevention and remedying effects of pollution. ○ Control of emergency incidents. • NEMA – ○ Authorisation of related listed activities in terms of the EIA Regulations that may impact on water resources. ○ Any conditions related to closure / decommissioning in the existing Environmental Authorisations and EMPr's for the power station need to be adhered to. ○ Duty of care and remediation of environmental damage. ○ Control of incidents. • NEM:WA – ○ Licencing of waste management activities that may impact on water resources. ○ Any conditions related to closure / decommissioning in the existing WML's and EMPr's for the power station need to be adhered to. ○ Framework for the Management of Contaminated Land. • NEM:BA – ○ Aquatic CBAs and ESAs.

5.5.3 Mitigation

5.5.3.1 Control Measures

In June 2022, WSP took grab samples from 10 new boreholes located around KPS. Based on a grid and density sampling approach, the high-risk areas have been sampled. Therefore, a site history based (judgemental) sampling approach will be used to confirm if additional sampling points are required. The groundwater data from the WSP 2022 study will confirm the extent of the pollution and, areas with high levels of groundwater contamination will be re-sampled. Also, samples will be taken during the summer season so that seasonal variation in contamination flows can be detected. The study will provide the basis for mitigating the environmental and social risks associated with contaminated groundwater at KPS.

Remediation options to be considered for contaminated groundwater may include:

- In situ biological, physical, and or chemical treatment;
- Ex situ biological, physical, and or chemical treatment (i.e., groundwater extraction and treatment);

- Upgrade existing demineralization plant to treat contaminated groundwater;
- Containment of the flow of groundwater through engineering solutions;
- Natural attenuation; or
- Other treatment processes.

Any waste generated during the decontamination of groundwater will be managed in accordance with a Waste Management Plan that will be developed for the Project (see Section 5.15 below).

The Engineers need to confirm whether buried pipelines and other infrastructure will be removed as part of the decommissioning. If they are to remain in situ, then all risk of pollution needs to be nullified and the pipelines need to be purged, fully covered and be left with no exposed open ends.

Additional mitigation measures to be employed to manage the impacts on groundwater include the following:

- Identify all possible sources of dirty water and implement appropriate collection and containment systems.
- Continue implementing existing water management strategies across the KPS site.
- Ensure that the storage of hazardous substances and waste is in a contained area with impervious surfaces that meets all legal requirements and best practices (including signage, fire protection, spill containment, weatherproofing, ventilation, etc.).
- Provide sufficient and suitable sanitation facilities during closure, which shall conform to all relevant health and safety standards and codes. Consideration should be given to using the existing facilities at KPS if they conform to the legal requirements.
- Divert water from remaining dewatering operations to existing water management system at KPS.
- All unused coal must be removed. Fugitive coal and a contaminated layer of 150mm in-situ soil must be collected across the footprint of the coal stockyard and disposed of.
- Current numerical models show that groundwater pollution plumes can be contained through engineering solutions at the source of the pollution.
- Install scavenger boreholes around sources of continuous pollution. Contaminated water abstracted from scavenger boreholes must be appropriately treated before releasing into the environment.

The ESMP will include mitigation measures for managing impacts to groundwater during decommissioning and post-closure. The ESMP will also include a Remediation Plan (decontamination) and Groundwater Management Plan.

5.5.3.2 Monitoring

A Groundwater Monitoring Protocol will be compiled to address the shutdown and dismantling activities and post-closure requirements. As a minimum all groundwater monitoring boreholes around the sources of groundwater pollution such as the ADF, Coal Stockyard, hazardous waste and substances storage area and the boiler houses must be maintained and sampled in line with existing WUL limits. In addition to chemical data, groundwater levels to determine flow direction and hydraulic gradient must be monitored.

As an absolute minimum the following parameters will be included in the monitoring protocol: arsenic, cadmium, chromium, iron, lead, mercury, nickel, selenium, manganese, and zinc from the ash and coal storage areas; polychlorinated biphenyls, polycyclic aromatic hydrocarbon, BTEX (benzene, toluene, ethyl benzene, xylene), and other petroleum hydrocarbons from oil storage and mechanical and electrical equipment; and copper, iron, nickel, chromium, and zinc from metal cleaning and cooling tower blowdown wastewaters. Any additional parameters will be identified in consultation with DWS.

The Groundwater Monitoring Protocol will be designed to determine the success of containment and/or decontamination mitigation measures.

5.5.4 ESIA Investigations

5.5.4.1 Specialist Studies

A Soil, Surface Water and Groundwater Assessment (refer to ToR in Section 8.5.2.3 below) will be undertaken, and the results will inform the final ESIA Report.

Cumulative impacts due to pollution sources external to KPS that influence the groundwater quality in the catchment such as mining and agricultural activities will be considered in the specialist studies.

The stakeholder engagement process will extend to organisations within the vicinity and catchment of the KPS that have a potential to pollute groundwater.

5.5.4.2 Technical Investigations

A technical investigation of the efficacy of the existing storm water management system at KPS will need to be undertaken to ensure that it will be able to control dirty water during decommissioning and post-closure.

It is proposed to remove the auxiliary water reservoir dam. However, to confirm the removal of the dam, a geohydrological assessment is required to simulate the volume of water that may leach into the auxiliary water reservoir dam and the quality thereof. This study is necessary to determine any potential future impacts.

In terms of Condition 10.4 of WUL 04/B11BCGI/1970. KPS must investigate and design accordingly a water treatment plant to address pollution as a long-term strategy. The ESIA will be informed by this investigation.

Eskom to provide a dam safety report for the decommissioning of dams with a safety risk.

5.5.4.3 Compliance with Existing Environmental Approvals

The IWWMP, RSIP and Closure Plan will be compiled as part of the Project, in accordance with condition 10.3 of KPS' existing WUL (04/B11B/BCGI/1970).

Eskom must engage with DWS to determine the implications of the Project on the existing WUL for the water uses associated with the closure of KPS (Component A) and repurposing project (Component B), as well as to confirm DWS' requirements for decommissioning dams with a safety risk.

5.6 Surface Water

5.6.1 Impact Description

5.6.1.1 Positive Impacts

The Project will have the following positive impacts with regards to surface water:

- The KPS is a ZLED station and there are no direct discharges into watercourses. However, there are non-point or diffusive pollution sources that impact on the water quality and overall aquatic health of the receiving watercourses. The aquatic systems will benefit from the remediation of the site and removal of the pollution sources as part of the Project; and
- With the closure of KPS, the power station's water consumption will be considerably reduced. Water will still be required for the water treatment plant, dust suppression (dust control) and for the operation of the repurposing components (e.g., cleaning of PV panels and domestic use). Condition 5.31 of the WUL (27/2/1/C211/1/1) stipulates that no water may be pumped, stored, diverted or alienated for purposes other than intended in this licence, without written approval by the Minister or his/her delegated nominee. This condition will need to be adhered to in order to provide water for the renewable energy development at KPS.

5.6.1.2 Negative Impacts

None of the facilities to be decommissioned have a physical footprint within watercourses. Hence, the morphology of streams surrounding the KPS, including the Koring Spruit (north of overall site), Komati Spruit (west of the ADF) and Geluk Spruit (east of overall site) will not be directly affected by the Project. It is also not expected that closure activities will take place within the riparian zones of these watercourses. Closure activities may take place in proximity to the buffer zones of the wetlands along the Geluk Spruit and Komati Spruit.

Surface water could be adversely affected by the Project as follows:

- From historical surface water pollution trends and current studies, it is confirmed that the surface water at KPS is contamination from the operational activities at the power station. Failure to isolate pollution sources and to remediate contaminated land will impact surface water that will persist beyond the closure of the power station.

- Reduction in water quality caused by poor closure practices (e.g., improper management of waste, wastewater and hazardous substances).
- Reduction in water quality through sedimentation (e.g., silt from cleared areas transported via runoff and poor storm water management).
- Alteration of drainage at KPS due to the removal of facilities.
- Encroachment of closure activities into buffers of wetlands and damage to wetland vegetation as well as soil and sub-surface flow characteristics.
- Although most watercourses in the vicinity of the KPS are perennial, surface water contamination may affect water users abstracting directly from a watercourse downstream of the power station.
- Communities that use water from surrounding watercourses will be affected by contamination of surface water.
- Potential for cumulative impact on surface water pollution from mining and agricultural activities in the catchment both upstream and downstream of KPS.
- Climate change may impact on the Project through extreme rainfall events, which may pose a risk to closure activities and rehabilitated areas (including the ADF). Rainfall in excess of the designed capacity of the storm water system will result in runoff from the site, which may pollute soil, surface water and groundwater.

Consumptive water uses anticipated during closure and post-closure will include domestic use (labourers), washing and cleaning, irrigation of rehabilitated areas, dust suppression, and continued operation of the water treatment plant.

5.6.2 Governance

Same as for geohydrology (see Section 5.5.2 above).

5.6.3 Mitigation

5.6.3.1 Control Measures

The findings of the Soil, Surface Water and Groundwater Assessment as well as the Aquatic Impact Assessment will provide the basis for mitigating the environmental and social risks to surface water at KPS. This will include identifying and addressing the pollution sources, as well as determining the decontamination requirements.

Mitigation measures to be implemented to manage impacts to surface water resources include the following:

- The existing water management system at KPS will intercept polluted runoff during closure. The system will be maintained and monitored post-closure. The clean and dirty water separation system will remain in tack until all dismantling and decontamination activities are complete.

- Ensure that the storm water system is upgraded to keep dirty and clean water separated for the foreseeable future. Also, the system must accommodate a defined rainfall event, taking into consideration climate change factors.
- Where closure activities take place within the buffer zones of watercourses, the affected areas will need to be suitably rehabilitated to a state that they were before closure or better. No new facilities are to be created within wetlands or riparian zones.
- Ensuring the protection of the natural environment and the safety of personnel on site, as well as the community, by the correct management and handling of hazardous substances and waste. Consideration should be given to using the existing facilities at KPS for the storage of hazardous substances and waste assuming the facility conforms to the legal requirements and best practices (including signage, fire protection, spill containment, weatherproofing, ventilation, etc.).
- Erosion protection measures are to be implemented where there are possibilities of surface water sheet flow causing erosion.
- The camp site shall not be situated within 100 meters or within the 1:100 year flood line of any watercourse.
- All unused coal must be removed. Fugitive coal and a contaminated layer of 150mm in-situ soil must be collected across the footprint of the coal stockyard and disposed of.
- All surface water contained in dams will be allowed to evaporate, the liners and contaminated sediment will be removed and disposed of at a registered site.
- Water consumption at KPS will continue complying with the WUL (27/2/1/C211/1/1) for Section 21(a) water use (i.e., taking water from a water resource). Water conservation measures will be implemented during the decommissioning and post-closure activities at KPS. Ongoing monitoring of water consumption will also need to be undertaken.
- All rehabilitated areas to be profiled to be free draining and to emulate the natural surface topography to avoid ponding and stagnating surface water.
- Any decontaminating facility must be located within a bunded area with an impervious surface.

The ESMP will include mitigation measures for managing impacts to surface water during decommissioning and post-closure. A Surface Water Management Plan as well as a Rehabilitation and Biodiversity Management Plan will also be developed during the ESIA.

5.6.3.2 Monitoring

A Surface Water Quality Monitoring Programme will be compiled. The programme will include a biomonitoring programme and will be informed by the findings of the Soil, Surface Water and Groundwater Assessment, the Aquatic Impact Assessment and WUL and WML requirements. The programme will be implemented during decommissioning and post-closure.

The programme will be amended in response to any observed and/or detected impact on the of the aquatic systems.

Monitoring of water utilisation will be done post-closure.

5.6.4 ESIA Investigations

5.6.4.1 Specialist Studies

A delineation of riparian areas and wetlands, a river health and an aquatic impact assessment will be undertaken (refer to ToR in Section 8.5.2.3 below), and the results will be included in the final ESIA Report.

5.6.4.2 Technical Investigations

The following technical investigations will be required:

- Updating the water balance to inform the requirements for storm water management post-closure;
- Determining the efficacy of the existing storm water management system at KPS to ensure that it will be able to control dirty water during decommissioning and post-closure; and
- Determining the consumptive water requirements post-closure (also linked to renewable energy development).
- It is proposed to remove the auxiliary water reservoir dam. However, to confirm the removal of the dam, a geohydrological assessment is required to simulate the volume of water that may leach into the auxiliary water reservoir dam and the quality thereof. This study is necessary to determine any potential future impacts.

5.6.4.3 Compliance with Existing Environmental Approvals

The IWWMP, RSIP and Closure Plan will be compiled as part of the Project, in accordance with condition 10.3 of KPS' existing WUL (04/B11B/BCGI/1970).

Eskom must engage with DWS to determine the implications of the Project on the existing WUL for the water uses associated with the closure of KPS (Component A) and repurposing project (Component B), as well as to confirm DWS' requirements for decommissioning dams with a safety risk.

5.7 Soil

5.7.1 Impact Description

5.7.1.1 Positive Impacts

There will be a net benefit to the land at KPS from the remediation of the site and removal of existing pollution sources.

5.7.1.2 Negative Impacts

Potential adverse impacts of the Project to soil include the following:

- Existing studies confirm soil contamination in only specific locations at KPS hence, failure to identify and isolate all pollution sources and to remediate contaminated land will result in soil impacts that will persist beyond the closure of the power station;
- There is a likelihood of localised soil erosion during closure as a result of creating open areas from dismantling existing facilities, excessive use of the gravel roads at the ADF, changes to site drainage, earthworks and improper storm water management;
- The use of heavy equipment during closure (e.g., for transportation of large dismantled components) could lead to soil compaction;
- Soil could be contaminated through poor decommissioning practices (e.g., improper management of waste, wastewater and hazardous substances);
- Contaminated soil blown off areas such as the coal stockyard could impact communities and workers in the vicinity of KPS; and
- Climate change may impact on the Project through extreme rainfall events, which may pose a risk to closure activities and rehabilitated areas (including the ADF). Rainfall in excess of the designed capacity of the storm water system will result in runoff from the site, which may pollute soil, surface water and groundwater.

5.7.2 Governance

WBG	SA Legislation	Authority	Regulatory Control Mechanisms
• ESS1 • ESS2 • ESS3 • ESS4 • ESS6 • ESS10 • EHS Guidelines	• NEMA & EIA Regulations • NWA • NEM:WA	• DFFE • DWS	• NEMA – o Authorisation of related listed activities in terms of the EIA Regulations that may impact on land. o Duty of care and remediation of environmental damage. o Control of incidents. • NWA – o Authorisation of water uses that may impact on soil. o Prevention and remedying effects of pollution. o Control of emergency incidents. • NEM:WA – o Licencing of waste management activities that may impact on land. o Framework for the Management of Contaminated Land.

5.7.3 Mitigation

5.7.3.1 Control Measures

KPS will need to adhere to the regulatory requirements under NEM:WA and the Framework for the Management of Contaminated Land. The Framework defines “remediation” as “the management of a contaminated site to prevent, minimise, or mitigate damage to human health or the environment”. Remediation may include both direct physical actions (e.g., removal, destruction, and containment of contaminants) and institutional controls.

Therefore, a Soil Contamination Assessment in line with Part 2 of the 2010 DFFE Framework for the Management of Contaminated Land will be undertaken.

In accordance with Phase 3 under the Framework for the Management of Contaminated Land, a Remediation Plan includes the following:

- Remediation objectives (including numerical soil and groundwater targets where relevant)
- Discussion of the remedial options available, assessment of alternatives including the status quo, identifying the means of risk reduction proposed in each
- Rationale for selection of the recommended remedial option
- Discussion of the remediation required to achieve the remedial objectives
- Risk assessment of proposed remediation activities and mitigatory measures required to minimise environmental hazards and impacts during remediation
- Identification of regulatory requirements such as permits, licences and approvals
- Proposed monitoring and testing to validate the site during, and on completion of the remedial activities
- Contingency plan if remedial strategy fails to reach the remediation objectives.

The Remediation Plan will require approval under Section 20(b) of NEM:WA.

In June 2022, WSP took 25 augur samples from locations around KPS. Based on a grid and density sampling approach, the high-risk areas have been sampled. Therefore, a site history based (judgemental) sampling approach will be used to confirm if additional sampling points are required. Once the WSP Soil Contamination Report is available, areas with high levels of contamination will be re-sampled. Also, samples will be taken during the summer season so that seasonal variation in contamination flows can be detected.

The detailed findings of the Soil Contamination Assessment will provide the basis for mitigating the environmental and social risks associated with contaminated land at KPS. This will include identifying and addressing the pollution sources, as well as determining the decontamination requirements.

Remediation options to be considered for contaminated soil may include:

- Removal and treatment and/or safe disposal of contaminated soil.
- All unused coal must be removed. Fugitive coal and a contaminated layer of 150mm in-situ soil must be collected across the footprint of the coal stockyard and disposed of.
- *In situ* biological, physical, and or chemical treatment.
- *In situ* thermal treatment.
- *Ex situ* biological treatment (e.g., excavation and composting).
- *Ex situ* physical / chemical treatment (e.g., excavation and stabilisation).

- *Ex situ* thermal treatment (e.g., excavation and thermal desorption or incineration).
- Containment (e.g., landfill).
- Other treatment processes.

Any waste generated during the decontamination of soil will be managed in accordance with a Waste Management Plan that will be developed for the Project (see Section 5.15 below).

General mitigation measures to be employed for managing impacts to soil include the following:

- Restrict site clearing activities to areas that are already disturbed at KPS;
- Manage drainage from sites to minimise erosion;
- Reinstate and rehabilitate disturbed areas to prevent future erosion; and
- Rehabilitate eroded areas.

The ESMP will include mitigation measures for managing impacts to soil during decommissioning and post-closure. A Remediation Plan for decontamination and a Rehabilitation Plan to provide measures for re-contouring, reinstating and rehabilitating the site, taking into consideration the intended end-states of the areas to be decommissioned, will be developed during the ESIA.

5.7.3.2 Monitoring

Soil monitoring will continue during decommissioning and post-closure, in compliance with the WUL and WML requirements and the Remediation Plan.

The soil monitoring programme will be refined for decommissioning and post-closure, as necessary, based on the findings and recommendations from the Soil, Surface Water and Groundwater Assessment.

5.7.4 ESIA Investigations

5.7.4.1 Specialist Studies

A Soil, Surface Water and Groundwater Assessment (refer to ToR in Section 8.5.2.3 below) will be undertaken and the results will be included in the ESIA Report. The aforementioned assessment will be aligned to the EHS Guidelines for contaminated land.

5.7.4.2 Technical Investigations

A Geotechnical Assessment will be undertaken to determine geotechnical constraints and to advise on suitable options for decommissioning civil structures (e.g., pollution control dams). The geotechnical report will take soil samples at strategic locations which will also contribute to the overall picture of the extent of soil contamination at KPS.

Eskom undertook a Geotechnical Desktop Study (Leseka, 2022) at KPS as part of the Project's pre-feasibility investigation to inform the feasibility-stage geotechnical investigations. The findings of the pending detailed Geotechnical Study will be included in the ESIA Report.

5.8 Air Quality

5.8.1 Impact Description

5.8.1.1 Positive Impacts

Coal combustion from an operational coal-fired power station emits pollutants such as carbon oxides (CO_x), sulphur oxides (SO_x), NO_x, particulate matter (PM) and heavy metals, which cause significant environmental and health impacts. With the cessation of the operation of KPS, these emissions will come to an end. The areas impacted by emissions from KPS and the sensitive receptors are discussed in Section 4.9.1 above. Fugitive emissions at KPS from coal storage and handling will also cease. The closure of KPS will thus cause positive impacts to air quality in the area. With Eskom planning the decommissioning of 3 power stations in Mpumalanga, there will be a cumulative positive impact of GHG emissions in the province.

5.8.1.2 Negative Impacts

Sources of air quality impacts associated with the closure activities may include:

- Dust from the ADF;
- Dust from bare areas that have been cleared or other exposed areas on the site;
- Dust from the use of dirt roads by vehicles;
- Dust from demolishing infrastructure and structures at KPS (e.g., chimneys, cooling towers and other key buildings), including where blasting is required;
- Dust from ash beneficiation processes;
- Although the asbestos dump site on the ash dam has been covered with 2 layers of ash, if the seal is breached asbestos fibres can become air borne; and
- Emissions from equipment, machinery and vehicles used for decommissioning purposes (including transportation of waste).

The most common pollutant involved in fugitive emissions is dust or PM. Certain fugitive emissions may persist following closure. A primary source of fugitive dust will include the ash dam, use of the dirt roads and during ash beneficiation activities. Fugitive dust will also emanate from areas when the ground cover is inadequate to prevent wind erosion and entrainment.

The area will remain impacted by air pollution from mining activities in the area.

Apart from environmental and social receptors in the Project Area, the efficiency of the solar PV plant will be also reduced if the modules are soiled (covered) by particulates / dust from closure activities and as well as unattended dust sources.

5.8.2 Governance

WBG	SA Legislation	Authority	Regulatory Control Mechanisms
• ESS1 • ESS2 • ESS3 • ESS4 • ESS6 • ESS10 • EHS Guidelines	• NEMA & EIA Regulations • NWA • NEM:WA • NEM:AQA & National Dust Control Regulations • Ambient Air Quality Standards • Municipal by-laws	• DFFE • DWS • NDM	• NEMA – o Authorisation of related listed activities in terms of the EIA Regulations that may impact on air quality. o Duty of care and remediation of environmental damage. o Control of incidents. • NEM:AQA – o An AEL is not required for the Project. Any conditions related to closure / decommissioning in the AEL need to be adhered to. This includes informing the licensing authority (NDM) of the ceasing of the listed activities for which the AEL was issued (i.e., solid fuels combustion, storage and handling of petroleum products and storage and handling of coal). o Air pollution prevention and remediation measures. o Air Quality Management System - Compliance monitoring and reporting. • NEM:WA – o Licencing of waste management activities that may impact on air quality. o Framework for the Management of Contaminated Land. • By-law contravention notice.

5.8.3 Mitigation

5.8.3.1 Control Measures

Measures to be implemented by the Project to control fugitive dust include:

- Fugitive emissions –
  - Identify sources of fugitive emissions during decommissioning phase and post-closure;
  - Provide adequate cover to all bare areas at KPS, such as establishing vegetation with suitable coverage targets; and
  - Implementing dust control methods, such as covers, water suppression, chemical stabilisation, and the reduction of surface wind speed through the use of windbreaks and source enclosures.
  - Blasting of infrastructure for during decommissioning must employ technology options that creates the smallest dust cloud.
  - Dust monitoring will continue for the duration of the shutdown and dismantling process.
- General –
  - Open burning of solid wastes, whether hazardous or general waste, will not be permitted.

- Cover asbestos disposal facility with separate geotextile layer (A4 bidim), apply 2 x 150 mm clay layers, 1,5mm HDPE single extruded geomembrane, 350mm topsoil layer and final vegetation cover.

The ESMP will include mitigation measures for managing impacts to air quality during decommissioning and post-closure. The ESMP will also include an Air Quality Management Plan.

5.8.3.2 Monitoring

General condition 4.1 of the AEL stipulates that Eskom must immediately on cessation or decommissioning of the listed activity inform the licensing authority (NDM) in writing. The listed activities under NEM:AQA that are covered in the AEL include solid fuels combustion, storage and handling of petroleum products and storage and handling of coal. The air quality monitoring programme will need to be updated to only consider the relevant future monitoring points and parameters to be monitored during decommissioning and post-closure. This will include sources of fugitive dust emissions such as the ash dam (depending on decommissioning option selected).

5.8.4 ESIA Investigations

5.8.4.1 Specialist Studies

A Fugitive Emission Assessment to address dust during demolition will be undertaken as part of the ESIA (refer to ToR in Section 8.5.2.3 below). The aforementioned assessment will be aligned to the EHS Guidelines for air emissions and ambient air quality.

5.8.4.2 Technical Investigations

Capping of the ADF is required to assess the impact of dust pollution post-closure.

5.8.4.3 Compliance with Existing Environmental Approvals

KPS to comply with existing AEL, NDM/AEL/MP313/12/12.

KPS to seek approval from the STLM for the demolition of buildings and infrastructure.

KPS to seek approval from the STLM for the use of explosives.

5.9 Climate

5.9.1 Impact Description

5.9.1.1 Positive Impacts

The closure of KPS will cease the emission of greenhouse gases directly associated with coal combustion. In addition, the proposed solar PV and wind energy development that forms part of the repurposing of KPS, which will be enabled by the closure of the power station, will generate energy from renewable resources and mitigate climate change.

5.9.1.2 Negative Impacts

Greenhouse gases may be emitted by the following sources as part of the closure activities:

- Indirect emissions from grid power consumption;
- Mobile combustion emissions from fuel used in vehicles / mobile equipment;
- Use of diesel generators for back-up power production; and
- Emissions associated with transporting materials for offsite reuse, recycling or disposal.

5.9.2 Governance

Same as for air quality (see Section 5.8.2 above).

5.9.3 Mitigation

5.9.3.1 Control Measures

Best practices to mitigate greenhouse gas emissions and reduce the carbon footprint of the Project will be explored during the ESIA and will be incorporated into the ESMP. This will include measures for promoting energy and fuel efficiency (including minimising grid electricity and diesel/petrol fuel consumption), optimising the operation of plant and machinery, rehabilitating the site by planting vegetation (promote carbon dioxide sequestration) and other measures to minimise greenhouse gas emissions.

The Engineers will need to take into account the impact of climate change on the proposed Project. This includes providing engineering designs (e.g., ADF stability, capacity of the storm water management system, etc.) that are cognisant of increased storm events and other factors that may impact on the closure process.

5.9.3.2 Monitoring

Monitoring indicators related to greenhouse gas emissions will be included in the ESMP.

5.9.4 ESIA Investigations

5.9.4.1 Technical Investigations

Investigation into the impacts of climate change on the Project (e.g., design of storm water system, stability of ash dam).

5.10 ADF

5.10.1 Impact Description

Two options are primarily under consideration for the ADF at KPS, both of which will have environmental and social impacts. The first and default option is to keep and rehabilitate the ADF. The second option is to use the ash for beneficiation.

The following impacts needs to be considered for each of these options:

- Keep and rehabilitate the ADF –
  - Offsite water quality impacts associated with seepage from the ash dam post-closure.
  - Ash dam failure can have catastrophic consequences especially on the Gelukplaas 1 community. Technical requirements related to dam safety for the ADF will need to be determined.
  - Dwellings approximately 100m to the south-east of Ash Dam 1, Gelukplaas 1 community may be within a zone of influence of the ash dam, these dwellings may need to be relocated.
  - As part of the repurposing of KPS, the intention is to construct a solar PV area on top of the ADF. This development can only proceed if the ADF is to be rehabilitated and capped and will not be possible under the ash beneficiation option until such time as the ash dam has been removed. Factors to consider in determining the feasibility of the development of the solar PV area on top of the ADF will include the closure status, slope and stability, settlement potential, cap characteristics, vegetative cover, leachate, and storm water management system.
  - Air borne asbestos fibres from the old asbestos disposal facility should the ash layer on the disposal facility fail.
- Ash beneficiation –
  - From Eskom's perspective, KPS is not one of the most favourable stations for ash beneficiation. There is a lower market for ash beneficiation at Komati than at other stations. This is related to the location of KPS as well as the quality (age) of the ash.
  - Should it be determined that a percentage of ash at KPS can be beneficiated, the removal thereof should be carefully guided by the stability assessments undertaken on an annual basis.
  - The section of the ADF containing the asbestos, should not be beneficiated and should be closed as per its approved closure plan.
  - For ash beneficiation, the impact of dust on the soiling of the PV panels, and the related water volumes required to clean these panels, will also need to be considered.

- The layout of the facilities required for ash beneficiation will need to be determined and assessed.
- There are financial, operational, environmental and socio-economic benefits associated with ash beneficiation. The viability of ash beneficiation will need to weigh up the negative and positive impacts.

5.10.2 Governance

Same as for geohydrology, surface water, soil and air quality.

5.10.3 Mitigation

5.10.3.1 Control Measures

Mitigation measures for the ADF will rely on the option to be pursued under the Project. The following is noted in terms of the mitigation of impacts associated with the keeping and rehabilitating the ADF versus ash beneficiation:

- ❑ Keeping and rehabilitating the ADF –
  - In the case of this default option, the ash dam will be shaped and capped and the AWR Dam will be removed. The ash dams must be capped with at least a clay liner which must be designed according to the relevant engineering specifications. It should be noted that a clay liner is likely to still be permeable to a recharge percentage of approximately 8% of annual rainfall. Therefore, management measures will need to be in place for managing the leachate from the ADF post-closure.
  - To address the current contaminant plumes sustainably, allowance has been made for the following (Golder Associates, 2017):
    - Establish a wellfield (15 wells) on the downstream side of the existing ash dam. Affected groundwater would be abstracted from the wellfield and pumped to a dedicated water treatment facility to be established on site. Affected water will be treated to a predetermined water quality to preferably allow for the beneficial reuse of this water.
    - It is assumed that all the affected surface water contained in dams on the site would not be treated but will be allowed to evaporate. As part of the proposed closure the liners and contaminated sediment will be removed and incorporated onto the ash dam (deep buried) prior to rehabilitation, dam walls will be dozed in, shaped and rehabilitated once dry.
  - Options for the asbestos disposal facility include providing a dedicated cover and rehabilitation (as per its approved closure plan) or removal of asbestos waste from this facility for disposal at Holfontein.
  - According Kimopax (Halenyane, 2019), who undertook the most recent geohydrological modelling study for KPS, a clay cover is likely to still be permeable to a recharge percentage of approximately 8% of annual rainfall. Therefore,

additional measures to capture contaminated seepage must be implemented such as capture trenches around the ash dams.

- Ash beneficiation –
  - Controls relating to the handling, storage and transportation of ash will need to be in place to prevent related impacts.
  - The facilities required for ash beneficiation would need to be located in an area that is technically suitable, with minimal impacts to the receiving environment.
  - No ash beneficiation activities can take place within the vicinity of the old asbestos disposal facility on the ash dam.

Regardless of the option selected, general mitigation measures will be required for managing the following aspects associated with the ADF:

- Stability;
- Leachate;
- Dust;
- Vegetation (including coverage on the rehabilitated dams as well as invasive alien plants and noxious weeds); and
- Access control.

Additional options relating to contaminated seepage from the ash dams at KPS include (Halenyane, 2019):

- Cover and capping research studies and design to reduce water reactions which may include investigations into synthetic liners such as geomembranes;
- Biological treatment (stimulation of sulphate reducing bacteria) of contaminated water;
- Passive leachate management and treatment using wetlands; and
- Chemical dosing treatment of contaminated water.

The ESMP will include mitigation measures for managing impacts related to the ADF for decommissioning and post-closure. The ESMP will also include an ADF Rehabilitation Plan, with the necessary technical inputs from the project team.

5.10.3.2 Monitoring

The groundwater, surface water, soil and air quality monitoring programme for decommissioning and post-closure will include the ADF and will be adapted based on the preferred alternative.

If the ash dam is to be kept and rehabilitated, a monitoring programme will need to be implemented to inspect the stability of the facility and its cap. A closure plan will be compiled.

5.10.4 ESIA Investigations

5.10.4.1 Specialist Studies

The options of keeping and rehabilitating the ADF versus ash beneficiation will be assessed to identify the overall preferred and most sustainable option for the Project. Factors to be considered include the site's constraints and opportunities, regulatory drivers, engineering aspects, costs implications, stakeholder input, and environmental considerations. There may also be potential for combining these options, which will include encapsulating the ash and preserving it as a resource for future or progressive use. The selection of the preferred option will need to be undertaken with due consideration of and integration with the proposed renewable energy development.

5.10.4.2 Technical Investigations

Technical investigations to confirm the requirements for the capping of the ash dam, dam safety, storm water management and leachate management.

The Engineering team to assess the feasibility of the 2 treatment options proposed contaminated water and leachate from the ADF post-closure.

5.11 Land Use

5.11.1 Impact Description

The closure end-state for KPS will entail decontamination and dismantlement of certain facilities, with restrictions on future use. According to Golder Associates (2017), all fencing at KPS (including gates) that is not required to support the next land use (i.e., repurposing project under Component B) will be removed and new suitable security fencing will be erected around the facilities that will remain after closure. Apart from the proposed renewable energy development, another possible land use that can be explored in reclaimed areas include agriculture, which is consistent with the dominant land use in the surrounding areas and the historical use of the land on which KPS is located. This will require the removal of contaminated land and ensuring that the water resources that need to supply farming are not polluted by the power station. Eskom would also need to enter into a lease agreement with the party that undertakes the agricultural practice, which is already being done in the area to the south-west of the ADF where the solar PV site is planned. Limited space exists on the KPS land for potential agricultural use, and it may need to be considered as an option in the long-term for the ADF area if ash beneficiation is to be pursued and space will be created. The soil will need to be treated to ensure the viability of agricultural use. Grazing may be more suitable than cultivation in this case.

The ESIA for Component B will determine the impacts associated with renewable energy development, including the impacts on land use. This includes the loss of the cultivated area on the south-western portion of the property. Rehabilitating decommissioned areas for agricultural purposes (if viable) will offset the loss of this cultivated area on the KPS land.

Another end-state that will be considered during the ESIA is returning decommissioned areas outside of the repurposing footprint and ADF to natural areas. This will require remediation if contamination is present or poses a risk, and rehabilitation with indigenous vegetation and management of invasive alien plants. More obvious areas where such an end-state can be aimed for include land near secondary natural grassland and moist grassland, or within buffer zones of wetlands (see Figure 103 below).

Positive impacts are expected to farming activities that occur in the areas surrounding the KPS. Sources of air, water and soil contamination at the power station will be removed and contaminated areas will be remediated.

Mining activities to the north and west will continue, in accordance with the Mining Rights. The risks associated with undermining of the KPS property will need to be managed by the responsible mining companies, in consultation with Eskom.

The Komati Village and other nearby settlements that are inhabited and supported by KPS will be affected by the closure of the power station. Refer to impacts discussed under the socio-economic environment.

During the preliminary stakeholder engagement, an interest was expressed by local community members for the recreational use of Fish Dam that is located north of the new ash dam (see Figure 103 below). According to VPC GmbH (2021), this dam it to be kept for repurposing and it will thus not be available for recreational use.

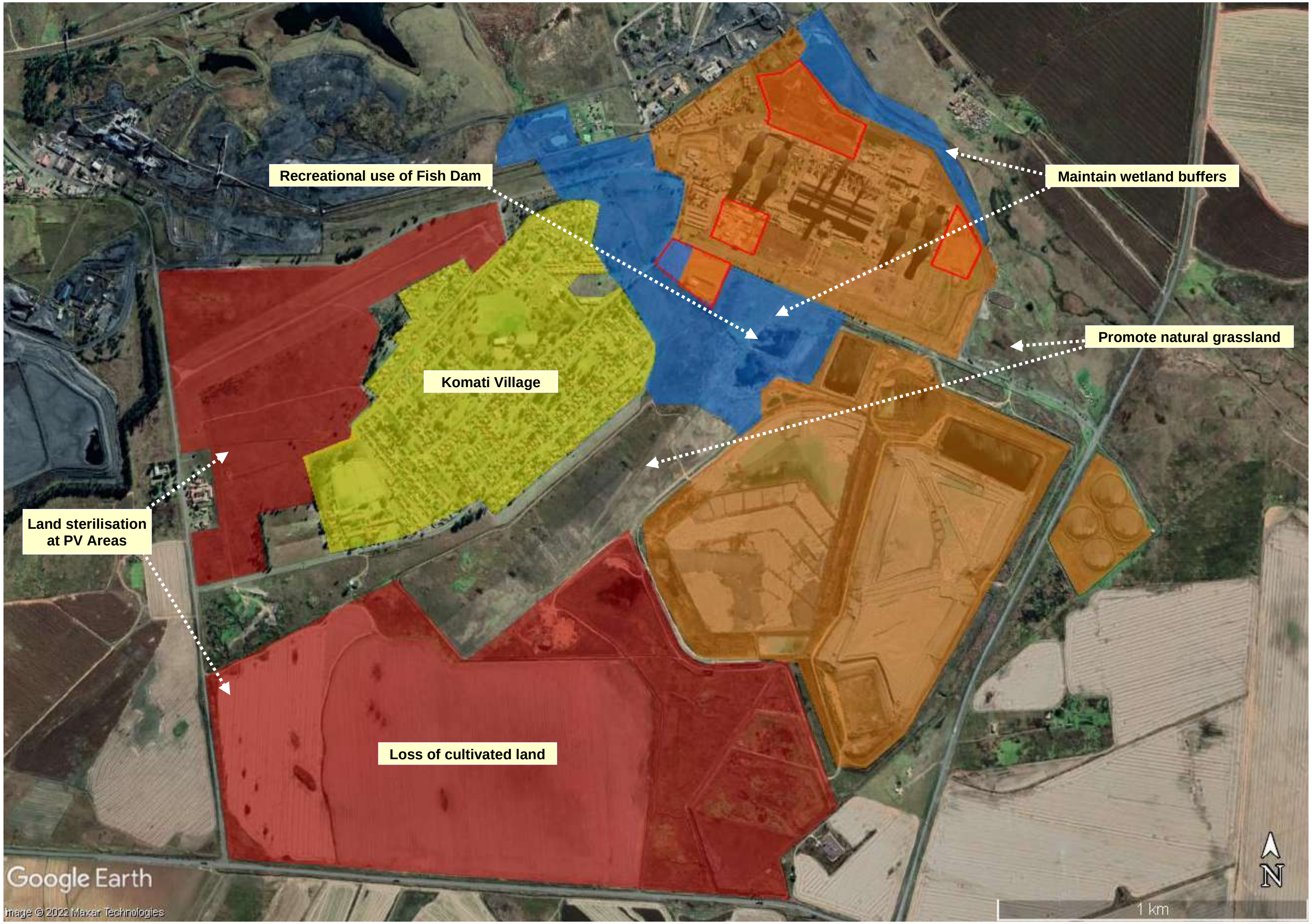


Figure 103: Land use and end-state considerations (Google Earth™)

5.11.2 Governance

Linked to governance of geohydrology, surface water, soil, air quality, visual quality, noise, and socio-economic environment.

5.11.3 Mitigation

5.11.3.1 Control Measures

The closure must ensure that the desired end-state is achieved to enable the repurposing of KPS to take place. This includes removing the infrastructure and structures in the designated footprints of the renewable energy development, and remediating contaminated land, to allow for safe construction and operation of this development. Pollution sources and pathways also need to be controlled to prevent impacts to the surrounding farming practices and settlements.

5.11.3.2 Monitoring

Linked to monitoring requirements for geohydrology, surface water, soil, air quality, noise, and socio-economic environment.

5.11.4 ESIA Investigations

5.11.4.1 Specialist Studies

Due to its cross-cutting nature, the following specialist studies to be conducted during the ESIA will also consider land use:

- Social Impact Assessment;
- Soil, Surface Water and Groundwater Assessment;
- Soil Assessment;
- Aquatic Impact Assessment;
- Visual Impact Assessment;
- Waste Management Assessment;
- Fugitive Emission Assessment; and
- Noise Impact Assessment.

5.12 Terrestrial Ecology

5.12.1 Impact Description

5.12.1.1 Positive Impacts

The closure of the power station and the remediation and rehabilitation of the land will benefit terrestrial ecology. This will be promoted by the removal of pollution sources and decontamination of the site, a reduction in activities and human presence on the site, and the rehabilitation of decommissioned areas with indigenous vegetation. In the case of the last-mentioned, this will depend on the planned end-states (e.g., greenfields) of these areas and future intended use as part of the repurposing.

5.12.1.2 Negative Impacts

Despite the heavily modified nature of the footprint of the power station complex and the ADF, the Project falls within a threatened ecosystem (i.e., Eastern Highveld Grassland). Areas classified as CBA Optimal also occur on the western part of the property, next to the Komati Village, as well as to the north of KPS (linked to Koring Spruit). Other natural areas occur in various parts of the site, including along the Geluk Spruit and Komati Spruit. These factors emphasise the need to ensure that impacts to terrestrial ecology are minimised and that the areas affected by closure activities are adequately rehabilitated.

Potential impacts of the Project to terrestrial ecology include the following:

- Failure to identify and isolate pollution sources and to remediate contaminated land will result in legacy impacts that will persist beyond the closure of the power station, and which will impact negatively on fauna and flora that are reliant on the receiving environment;
- Encroachment of closure activities into natural areas due to poor planning and execution, which may lead to the loss of vegetation and threaten animal life;
- Invasive alien plants and weeds may proliferate in areas cleared during closure and if rehabilitation is not undertaken properly, which may spread to adjoining areas;
- Animals may be killed (road collisions, poaching) or disturbed (noise, light, dust, vibration, etc.);
- Pollution caused by poor closure practices (e.g., improper management of waste, wastewater and hazardous substances) may result in the offsite migration of contaminants, which will harm flora and fauna; and
- Poor waste management practices may result in the occurrence of pest animals.

5.12.2 Governance

WBG	SA Legislation	Authority	Regulatory Control Mechanisms
• ESS1 • ESS3 • ESS6	• NEMA & EIA Regulations • NWA • NEM:WA • NEM:BA	• DFFE • MTPA	• NEMA – o Authorisation of related listed activities in terms of the EIA Regulations that may impact on biodiversity. o Duty of care and remediation of environmental damage. o Control of incidents. • NWA – o Authorisation of water uses that may impact on biodiversity. o Prevention and remedying effects of pollution. o Control of emergency incidents. • NEM:WA – o Licencing of waste management activities that may impact on biodiversity.

	WBG	SA Legislation	Authority	Regulatory Control Mechanisms
				○ Framework for the Management of Contaminated Land. • NEM:BA – ○ Managing invasive and alien species. ○ Protecting threatened ecosystems and species. ○ Rehabilitating areas affected by Project. ○ It is not anticipated that protected fauna and flora species will be affected at KPS, due to the transformed nature of the environment at the facility. It is thus not anticipated that a permit under this Act will be required

5.12.3 Mitigation

5.12.3.1 Control Measures

Mitigation measures to be implemented to manage impacts to terrestrial ecology include the following:

- Avoid disturbing natural areas and damaging indigenous vegetation during closure. Control the movement of all vehicles and plant;
- No activities are to encroach into wetlands (ensure barricading, signage and education programme);
- Ensuring the protection of the natural environment by the correct management and handling of hazardous substances and waste;
- Where decommissioned areas are not to be retained for the repurposing of the site, or do not form part of permanently rehabilitated facilities for the containment of pollution (e.g., capped ash dam), rehabilitation should stive to achieve a greenfields end-state of natural veld (using an indigenous grass mix) that is consistent with the immediate adjacent areas;
- Manage invasive alien plants in decommissioned areas and prevent them from spreading to adjacent areas. Ensure that the control of these plants is undertaken by suitable contractors using appropriate methods such hoeing, hand pulling, digging, mowing or herbicide applications. The use of any pesticides or herbicides shall not have negative impacts on the surrounding environment. The rehabilitation of the KPS site as part of the Project will consider Eskom's Alien Invasive Species Monitoring, Control and Eradication Plan further;
- No wilful harming of any wildlife will be tolerated;
- No site fires will be allowed; and
- Safeguard excavations and inspect daily to check whether animals have become trapped.

Impacts to fauna and flora will also be mitigated through the control measures identified for geohydrology, surface water, soil, air quality and noise.

The ESMP will include mitigation measures for managing impacts to terrestrial ecology during decommissioning and post-closure. A Rehabilitation and Biodiversity Management Plan will also be developed during the ESIA, which will make provision for managing biodiversity, rehabilitation of wetlands and natural areas, and managing invasive alien species.

5.12.3.2 Monitoring

Implement a monitoring programme for invasive alien species and rehabilitation performance at the KPS site during decommissioning and after closure.

5.12.4 ESIA Investigations

5.12.4.1 Specialist Studies

A Terrestrial Ecological Impact Assessment (refer to ToR in Section 8.5.2.3 below) will be undertaken as part of the ESIA.

5.12.4.2 Technical Investigations

The following technical input will be required to inform the rehabilitation of the site:

- ❑ Specifications for desired end-states of areas to be decommissioned;
- ❑ Technical Rehabilitation Plans for relevant power station facilities;
- ❑ Storm water management and site drainage;
- ❑ Re-contouring of the site, where natural areas are to be created; and
- ❑ Findings from the Geotechnical Assessment.

5.13 Visual Quality

5.13.1 Impact Description

5.13.1.1 Positive Impacts

The visual quality of the region is severely influenced by extensive coal mining, power generation and industries. KPS has been in existence since the 1960’s and, due to its age, it can be argued that it forms part of the Project Area’s “sense of place”. The shutdown and dismantling of the power station, particularly the large structural components that are highly visible, will have a positive impact on the overall visual quality of the area. The contribution of the operational activities at the power station towards air quality deterioration, with the associated visual impacts, will also no longer take place.

5.13.1.2 Negative Impacts

Temporary visual impacts will be caused during the closure phase, due to the various activities associated with dismantling facilities. Potential sensitive receptors to visual impacts in the area include residents on the surrounding settlements (particularly Komati Village) and farms, as well as motorists using the R35 and R542. The visual impacts of the ADF will depend on whether the ash dam is to be rehabilitated and capped, or if ash beneficiation is to be pursued. Improper rehabilitation will result in long-term visual impacts.

5.13.2 Governance

Same as for geohydrology, surface water, soil, air quality and terrestrial ecology.

5.13.3 Mitigation

5.13.3.1 Control Measures

Visual impacts will be mitigated through best practices in the ESMP, such as the following:

- Ensure that waste generated during closure is properly managed;
- The laydown area and waste management facilities are to be shielded /screened to minimise visual impacts, where practicable;
- Following closure, the areas disturbed will be suitably rehabilitated. For those areas that are to be returned to a natural state, the surfaces need to be ripped, shaped and vegetated;
- Backfill all excavations through cut to fill and/or from the crushed benign concrete from infrastructure demolition;
- Rehabilitate asphalt and engineered gravel roads that are no longer to be used. The profile must be free draining and should emulate natural surface topography;
- Re-establish natural drainage on the rehabilitated areas, without impacting on the water management system that will remain post-closure;
- Undertake on-going housekeeping during closure to maintain a tidy site; and
- Prior to closure the position and type of lighting will be planned to ensure that unnecessary light pollution will be eliminated. All lighting installed on site must not lead to unacceptable light pollution to the surrounding community and natural environment.

The facilities at KPS to be decommissioned (refer to Table 9 above) will require specific rehabilitation measures, with the requisite technical input.

The ESMP will include mitigation measures for managing visual impacts that may be caused by the Project. A Rehabilitation and Biodiversity Management Plan will also be developed during the ESIA, which will make provision for the rehabilitation of wetlands and natural areas (amongst others).

5.13.3.2 Monitoring

Rehabilitation monitoring will need to be undertaken that will continue after closure for a suitable period of at least 5 years. Monitoring indicators will include the stabilisation of the rehabilitated areas, (including subsidence and erosion), drainage and the establishment of vegetation.

5.13.4 ESIA Investigations

5.13.4.1 Specialist Studies

A Visual Impact Assessment will be undertaken during the ESIA.

The findings of other specialist studies, such as the Aquatic and Terrestrial Ecological Impact Assessments, will inform the Rehabilitation Plan in those instanced where the desired end-state is to create natural areas (i.e., greenfields with unrestricted reuse).

5.14 Noise & Vibration

5.14.1 Impact Description

5.14.1.1 Positive Impacts

With the closure of KPS the various noise sources associated with an operational power station will cease, which is a positive impact associated with the Project.

5.14.1.2 Negative Impacts

During closure activities, noise and vibration will be caused by the following:

- Demolition of infrastructure and structures (e.g., chimneys, cooling towers and other key buildings), including where blasting is required;
- Operation of equipment used to dismantle and rehabilitate facilities;
- Transportation of equipment, materials and people to and from the site;
- Noise created by the labour force used to undertake the decommissioning.

Noise and vibration may disturb surrounding communities and fauna and can also pose occupational risks.

5.14.2 Governance

WBG	SA Legislation	Authority	Regulatory Control Mechanisms
• ESS1 • ESS2 • ESS3 • ESS4 • ESS6 • ESS10 • EHS Guidelines	• NEMA & EIA Regulations • NEM:AQA • Noise Standards • Municipal by-laws	• DFFE • NDM • STLM	• NEMA – ○ Authorisation of related listed activities under the EIA Regulations that may cause noise pollution. ○ Duty of care in terms of noise pollution. • By-law contravention notice.

5.14.3 Mitigation

5.14.3.1 Control Measures

It must be ensured that noise levels of closure activities are within the lawfully acceptable limits as per SANS 10103:2008.

Measures to control noise will include the following:

- Noise control devices will be considered, which may include temporary noise barriers and deflectors for impact activities, and exhaust muffling devices for combustion engines;
- Closure activities shall take place during working hours. Should overtime work be required that will generate noise, consultation with the affected community shall take place;
- Project transportation through community areas such as Komati Village will be avoided.

The ESMP will include mitigation measures for managing noise and vibration impacts.

5.14.3.2 Monitoring

The provisions of SANS 10103:2008 will apply to all areas at the perimeter of the site, within audible distance of residents. Noise shall be monitored at the nearest sensitive receptor and where the noise is generated.

5.14.4 ESIA Investigations

5.14.4.1 Specialist Studies

A Noise Impact Assessment will be undertaken for the Project, which will inform the mitigation measures and monitoring requirements.

5.15 Waste

5.15.1 Impact Description

5.15.1.1 Positive Impacts

A positive impact associated with the closure of KPS is that the plant will no longer generate waste, such as ash.

5.15.1.2 Negative Impacts

Various waste types will be generated during the closure of KPS. The environmental impacts associated with inadequate waste management during the Project include the following:

- Risk to human health (occupational and community health and safety);
- Soil pollution (spillages and leachate);
- Surface and groundwater pollution (spillages and leachate);
- Air pollution (e.g., smoke if set alight and emissions);
- Odours;
- Compromised aesthetics (e.g., poor storage, windblown litter); and
- Vermin.

Poor management of operational waste from end of generation at KPS (up to shutdown and during preparations for closure) may also adversely affect safe decommissioning.

5.15.2 Governance

WBG	SA Legislation	Authority	Regulatory Control Mechanisms
• ESS1 • ESS2 • ESS3 • ESS4 • ESS6 • ESS10 • EHS Guidelines	• NEMA • NEM:WA, including Regulations, Norms and Standards • SANS 10234 • NWA • OHSA and Regulations • Hazardous Substances Act & Regulations • Municipal by-laws • Explosives Act	• DFFE • DWS • DEL • NDM • STLM	• NEMA – o Authorisation of related listed activities under EIA Regulations that may impact on water resources. o Duty of care and remediation of environmental damage. o Control of incidents. • NEM:WA – o Licencing of waste management activities. o Any conditions related to closure / decommissioning and waste management in the existing WML's and EMPr's for the power station need to be adhered to. o Framework for the Management of Contaminated Land. o Registration and management requirements under the Norms and Standards for the Storage of Waste (GN R. 926 of 29 November 2013). o Waste generated during the dismantling of the facilities at KPS will need to be classified in terms of the Waste Classification and Management Regulations and analyzed in terms the National Norms and Standards for the Assessment of Waste for Landfill Disposal (GN R. 635 of 23 August 2013). • NWA – o SDCs – measures to manage impacts from waste to water resources, e.g., water use authorisation (WUL). o Any conditions related to closure / decommissioning in the existing WUL's for the power station need to be adhered to. o Preventing and remedying pollution. o Control of emergency incidents. • OHSA – o Requirements under the Asbestos Abatement Regulations (GN No. R.11196 of 10 November 2020), including identification, risk assessment, duties, management and control (amongst others).

5.15.3 Mitigation

5.15.3.1 Waste Management Strategy

All waste will be managed in accordance with the prevailing legal requirements, which include:

- Adhering to the obligations of existing WML's for the ash disposal facility (12/9/11/L1010/6) and for the decommissioning of the asbestos disposal site (12/9/11/L73467/6);
- Applying for a new WML for the waste management activities triggered by the project (see Section 2.4.5.2 above);
- Complying with the Framework for the Management of Contaminated Land (Part 8 of NEM:WA);
- Complying with the National Norms and Standards for the Storage of Waste (GN R. 926 of 29 November 2013); and
- Waste generated during the dismantling of the facilities at KPS will be classified in terms of the Waste Classification and Management Regulations and analyzed in terms the National Norms and Standards for the Assessment of Waste for Landfill Disposal (GN R. 635 of 23 August 2013).

The waste management strategy will also be aligned to the requirements in ESS3 in terms of pollution prevention, control and management.

The following principles will apply to the Project's waste management strategy:

- The Project will aim to adhere to the waste management hierarchy, which promotes the following order of priority: waste avoidance / reduction, re-use, recycling, recovery and disposal (last option).
- *Duty of Care Principle* – The industry that generates a waste (i.e., Eskom KPS) is responsible for the fate of the generated waste in all circumstances. The generator of the waste is ultimately responsible for ensuring that the waste is handled, stored, transported and disposed of according to the legislation and in an environmentally sound and responsible manner;
- *Polluter Pays Principle* – the person or organisation causing pollution is liable for any costs involved in cleaning-up or rehabilitating its effects. The generator of the waste (i.e., Eskom KPS) is thus liable unless able to prove that the transferal of management of the waste was a responsible action; and
- *Precautionary Principle* – all waste is assumed to be hazardous until proven otherwise.

Eskom's Decommissioning Plan will provide clarity on the sequence of closure activities. This will also guide the overall planning of waste management for the Project.

5.15.3.2 Management of Waste Streams

Table 44 below lists the waste types, sources and management measures related to the Project.

Table 44: Overview of waste types, sources and management measures

<table>
<tr><th colspan="2">Waste Type</th><th>Source</th><th>Management Measures & Options</th></tr>
<tr><td colspan="2">Existing operational waste (various waste types – see Section 4.17.3 above)</td><td>Operational waste from end of generation at KPS (up to shutdown and during preparations for closure).</td><td>Operational wastes will be handled in accordance with existing waste management strategies at KPS and will be processed using the existing waste processing facilities in preparation for reuse, recycling or disposal.</td></tr>
<tr><td rowspan="2">Non-Hazardous / General Waste</td><td>Infrastructure, structures and hard surfaces (including steel, inert waste, decontaminated building rubble and concrete)</td><td>Infrastructure of the main power station including the boiler house, turbine house (waste from remodelling), cooling towers and auxiliary bay. The related infrastructure includes the office buildings, stores, workshops, substations and the security access buildings.</td><td>Facilities to be decommissioning will be taken out of service and isolated, drained and purged or flushed and vented to make them safe.
Steel and concrete structures will be decontaminated before final dismantling of these structures. This includes contaminated veneer at the Coal Stockyard, workshops adjacent to cooling towers, turbine and boiler house (including stacks) (as relevant), Rotek offices and Contractors' yard.
Infrastructure that has no beneficial reuse of options for recycling will be dismantled / demolished.
General demolition waste will be sorted and screened.
Inert and decontaminated waste will be disposed of at a new onsite waste disposal facility at KPS or disposed of at an appropriately licenced waste disposal facility (see Section 5.15.3.3 below).
Decontaminated concrete will be crushed for placement in the onsite cavities created by the demolition of structures. Only the excess concrete not used for this purpose will be deposited in the onsite waste disposal facility.
Where relevant, certain material will be returned to the manufacturers.</td></tr>
<tr><td>Re-usable & recyclable waste</td><td>Various (e.g., transformers, generators, conveyors, etc.).
Domestic waste and other general waste types (including paper / cardboard, plastic, glass, metals, textiles, rubber (e.g., conveyor belts), electrical cables, electronic equipment, scrap wood) from various sources.</td><td>Recycling and reuse of materials is to be maximised to the greatest extent possible.
Suitable recycling options will be identified.
Infrastructure components with potential for salvage or re-use will be dismantled, decontaminated (as necessary), and removed.
The contamination levels of general waste will be confirmed. If suitable, general waste will be separated and recycled.
Waste to be reused or recycled will be stored in a dedicated area, which makes provision for separation of waste types, and which prevents contamination from other waste types and closure activities. Consideration will be given to using existing waste processing facilities at KPS for reuse or recycling, if these facilities satisfy all regulatory requirements.
All recycled waste will be removed by an accredited recycling contractor.</td></tr>
</table>

Waste Type		Source	Management Measures & Options
Hazardous Waste	Hazardous waste from dismantled facilities	Infrastructure and facilities at the main power station and ADF.	• General management requirements for all hazardous waste types to be implemented include: ○ Safety Data Sheets will be required for all hazardous waste streams, as per SANS 10234. ○ Hazardous waste will be segregated from general waste. ○ Hazardous waste will be stored in such a way as to prevent or control accidental releases to air, soil, and water resources. ○ Hazardous waste will be stored in a manner that prevents the commingling or contact between incompatible waste types. ○ Hazardous waste will be stored in closed containers away from direct sunlight, wind and rain. ○ Each container will be labelled to identify its contents. ○ Secondary containment systems (least 110% of the largest storage container / 25% of total storage capacity, whichever is greater) will be in place at the storage facility. ○ Adequate ventilation will be provided where volatile wastes are stored. ○ Relevant signage will be provided at the storage area. ○ All relevant Personnel Protective Equipment (PPE) will be provided to employees handling hazardous waste. ○ Access to the hazardous waste storage area will be strictly controlled. ○ Adequate training will be provided to the employees responsible for handling and managing hazardous waste. ○ The storage area will be monitored frequently for leaks or spills, and for compliance against regulatory requirements. ○ All relevant documentation (e.g., Emergency Response Plan) and records will be maintained. • Identification and removal of lead contamination (e.g., historical use of lead-based paint at KPS) (if applicable). Comply with above requirements. • One of the options under consideration is the disposal of all hazardous waste at Holfontein. According to Enviroserv (Malele pers. comm., 2022), the standard procedure for disposing of hazardous waste at Holfontein includes the following: ○ Samples of the hazardous waste types must be submitted at Enviroserv's SANAS accredited laboratory for analysis and treatment verification. ○ The various waste streams will be classified according to their properties (physical, health and environmental risks) to determine the types of hazardous waste.

Waste Type		Source	Management Measures & Options
			○ The volumes of the hazardous waste types to be taken to Holfontein must be confirmed. ○ Safety Datasheet of all hazardous waste types need to be compiled. • Another option to be explored during the ESIA entails the onsite treatment of hazardous waste to change its physical, chemical, or biological character or composition to neutralise such waste or to render such waste non-hazardous. In this instance, management requirements will need to be implemented in terms of the following: ○ Identifying a suitable location and setting up of a treatment facility. ○ Managing environmental and social risks associated with treatment. ○ Managing pollutants and waste generated during treatment.
	Residual coal	Coal Stockyard, rehabilitated coal dump, and other coal handling areas, silos, bins, conveyors, mills and burners.	• Utilise all possible coal reserves at KPS including stockpile in readiness for cessation of generation. • Residual coal at cessation of generation is to be incorporated into coal stockpile for rehabilitation. • Fugitive coal and a contaminated layer of 150 mm *in situ* soil will be collected across the footprint of the stockpile and disposed of on the existing ash dam (if chosen option for ADF closure) or disposed of offsite (e.g., engage with surrounding mines to arrange for disposal as part of their approved waste management methods). • The old coal dump located on the north-western part of site earmarked for the Solar PV Area B will need to be characterised to determine the pollution risks and waste management requirements for removing the material.
	Contaminated soil	Contaminated areas at KPS (including Coal Stockyard, bulk chemical store, hazardous waste temporary storage, ash dams).	• Contaminated soil will be removed to a predetermined depth from areas identified to be contaminated. • Excavated contaminated soil will be placed into suitable receptacles to prevent pollution and human exposure risks. • The contaminated soil will either be deposited onto the ash dam prior to final rehabilitation (if chosen option for ADF closure) or disposed of offsite at an appropriately licenced facility.
	Liquid waste	• Fluids, lubricating oils and hydrocarbons (transformer oils, lubricating fluids, etc.). • PCBs (oils from capacitors, transformers and other electrical switchgear). • Chemical substances (storage area). • Fuel (storage area and fuel station). • Draining of pipelines and sumps.	• Transformers and other equipment that are potentially polluted will first be checked, analysed and sealed before transportation to the hazardous waste storage area. • Fluids, lubricating oils and hydrocarbons will be recovered from process equipment and tanks. Any hydrocarbons shall be recovered and re-used (if possible). • Empty, drain and clean chemical and fuel storage and distribution systems. Determine suitability to reuse or recycle. If not possible,

Waste Type		Source	Management Measures & Options
			dispose of at Holfontein. Treat as hazardous waste (unless stated otherwise on MSDS) and manage accordingly. • Empty and drain fuel oil storage and distribution systems. • PCBs – ○ All due care will be taken to prevent accidental release of waste PCBs. ○ Decommissioned PCB-contaminated equipment or PCB waste will be transferred to a secure, and appropriately labelled store, and stored in appropriate sealed containers.
	Asbestos	Asbestos disposal facility (on a portion of the upper surface of the existing ash dam) and any remaining asbestos encountered on the KPS site.	• Options for the asbestos disposal facility include providing a dedicated cover and rehabilitation (as per its approved closure plan) or removal of asbestos waste from this facility for disposal at Holfontein. The option will be influenced by the preferred alternative identified for the closure of the ASD (i.e., capping or beneficiation). • Any other asbestos waste encountered on the KPS site will be disposed of at Holfontein. • Asbestos waste will be contained in labelled and sealed containers to prevent exposure from handling, for proper off-site disposal. • All asbestos waste management activities will be performed in accordance with the Asbestos Abatement Regulations (GN No. R.11196 of 10 November 2020). • Registered asbestos contractors will be utilised for the handling and disposal of asbestos waste.
	Unspecified waste (in terms of Schedule 3 of NEM:WA)	Various (e.g., hazardous portion of wastes from electrical and electronic equipment, wastes from discarded gases in pressure containers and discarded chemicals, wastes from discarded batteries, wastes from transport and storage tanks, etc.)	*See management measures and options for above for hazardous waste from dismantled facilities*.

5.15.3.3 Waste Management Facilities

a) Temporary Facilities

The following temporary waste management facilities will be established at the power station complex during the closure phase:

- Concrete crushing facility;
- Decontamination bay;
- Onsite facility to treat contaminated soil (based on volumes and treatment options selected);
- Salvage yard;
- Non-hazardous waste storage area (including facility for recycling waste); and
- Hazardous waste storage area.

All waste management facilities will adhere to the regulatory requirements under the following:

- NEM:WA and the Norms and Standards for the Storage of Waste (GN R. 926 of 29 November 2013); and
- The OHSA and relevant Regulations and Codes of Practice; and
- The Hazardous Substances Act (Act No. 15 of 1973) and the Regulations for Hazardous Chemical Agents (GN No. R.280 of 29 March 2021).

Consideration will be given to using existing facilities at KPS for storing and processing waste if these facilities have sufficient capacity and will satisfy all above regulatory requirements, or if they can be upgraded to be compliant.

Based on the layout of the power station complex (see Figure 6 above), possible existing areas that can be used to create temporary waste management facilities include the following (see Figure 104 below):

- Scrap / waste storage area (to be cleared and rehabilitated after closure activities to allow for BESS Area C to be developed);
- Hazardous substances storage area;
- Contractors' yards; and
- Main stores area.

Following decommissioning, the temporary waste management facilities will be dismantled and removed. The waste generated from the dismantling of these facilities will be reuses, recycled, or disposed of offsite as general or hazardous waste at licenced disposal facilities.

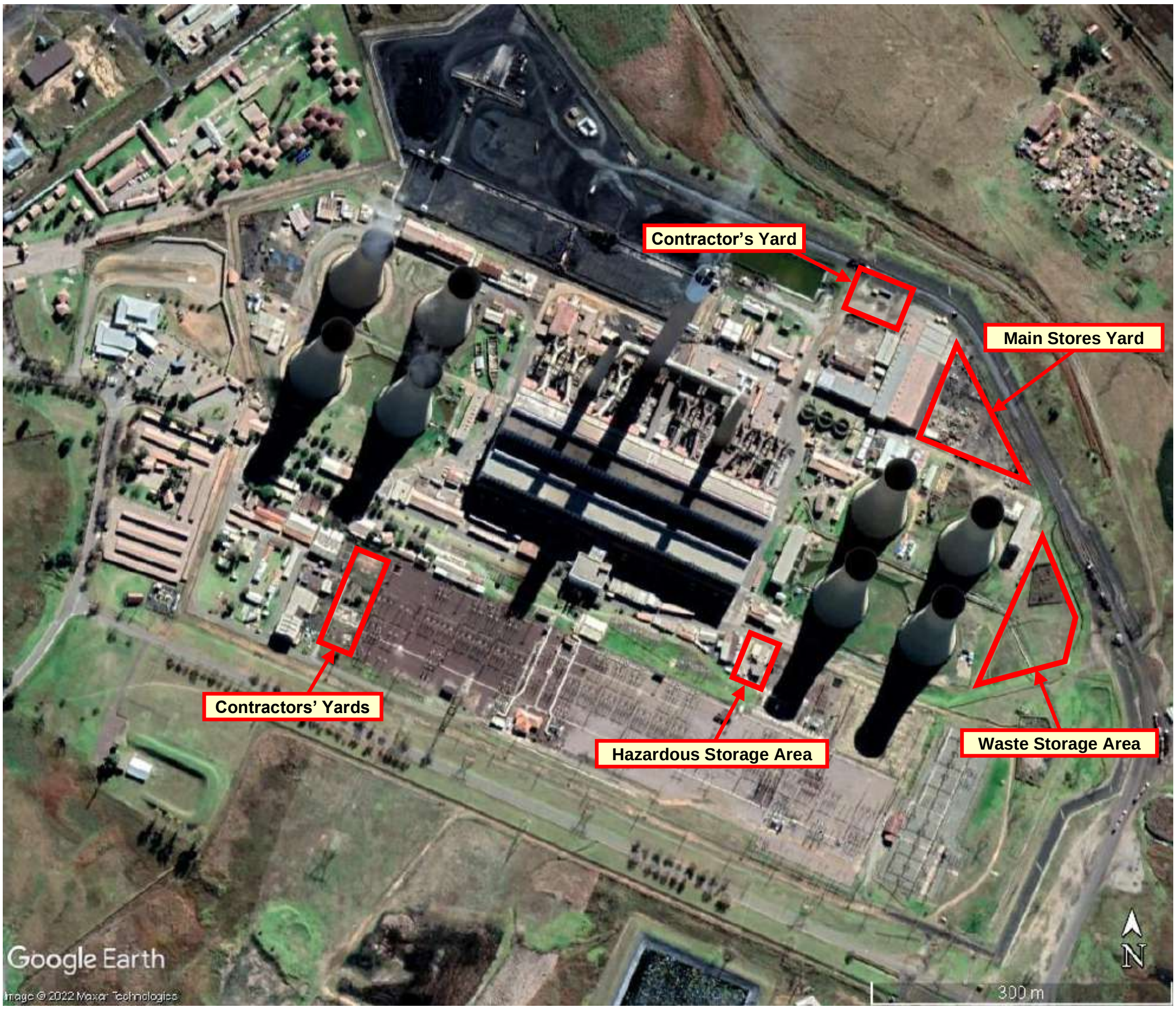


Figure 104: Possible areas to establish temporary waste management facilities during decommissioning (Google Earth™)

b) <u>Permanent Facility</u>

The options of creating a dedicated, permanent onsite waste disposal facility at KPS versus offsite disposal will be assessed as part of the ESIA.

If an onsite waste disposal facility is to be established at KPS, then Eskom will not only need to adhere to all the obligations of a "waste generator", but also those of a "waste manager" in terms of the Waste Classification and Management Regulations and National Norms and Standards for Disposal of Waste to Landfill (GN R. 636 of 23 Aug 2013).

If an onsite waste disposal facility is to be created, then it will need to comply with minimum engineering design requirements. It is assumed that the waste to be produced during closure will be classified as a Type 3 waste in terms of the Waste Classification and Management Regulations. The new onsite waste disposal facility will thus require a bottom barrier/liner for a Class C landfill (see Figure 105 below). The cover will need to comply with the minimum requirements with the inclusion of features to limit infiltration and resultant ponding on the bottom liner. Once all the demolition waste has been disposed of, the onsite waste disposal facility will be covered and rehabilitated.

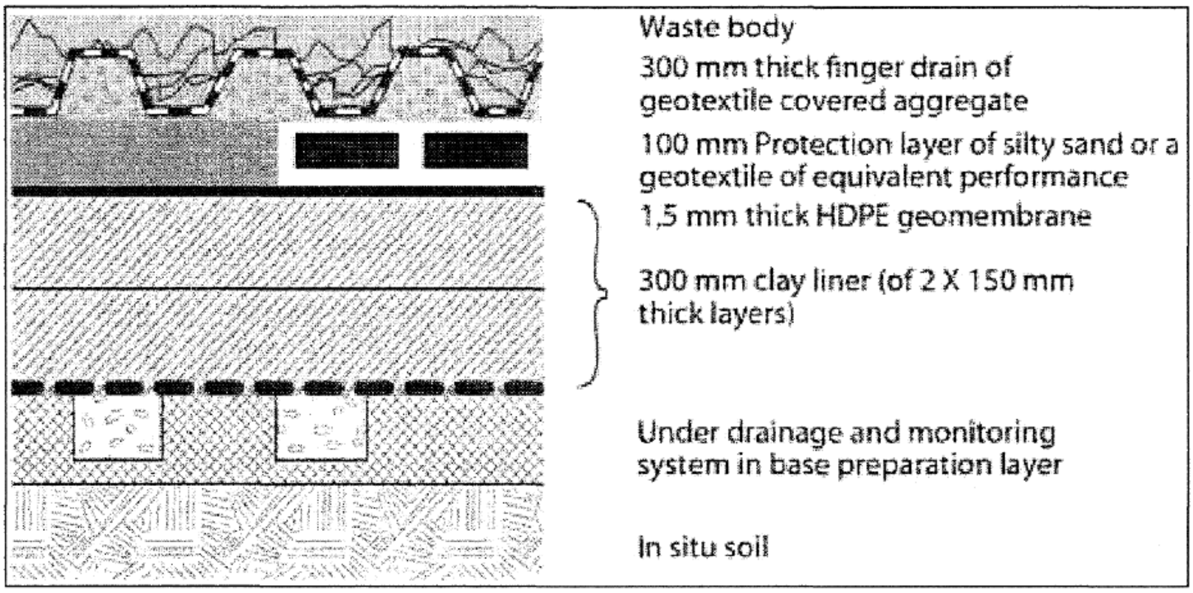


Figure 105: Class C Landfill containment barrier design (GN R. 636 of 23 Aug 2013)

From an appraisal of the KPS site, taking into consideration the footprint of the proposed renewable energy development, infrastructure that is to remain (e.g., water treatment plant) and containment barrier requirements, it is noted that limited space is available at the power station complex to accommodate a permanent waste disposal facility. If an area is to be cleared at the complex to create space for this facility, then logistical problems with the interim storage of waste until the waste disposal facility has been created need to be overcome. An option to be explored is for the permanent waste disposal facility to be created at the new ash dam. If ash beneficiation is identified as a preferred option, then it can be considered in the northern part of the ash dam to maximise the distance to the proposed PV site to the south-west of the ADF, taking into the consideration the soiling of the PV panels from dust and the prevailing wind directions (see Section 4.2 above). A permanent waste disposal facility can then be considered in the southern part of the ash dam. Another option is to create a permanent waste disposal facility within the AWR dam, if technically and environmentally viable.

The permanent waste disposal facility will be rehabilitated post-closure, which will include ensuring structural stability and providing suitable cover. The cover will include applying composite fertilizer and topsoil, providing compacted clay type soil, laying a geotextile and establishing vegetation.

5.15.3.4 Decontamination for Waste Management

Decontamination will be informed by the waste characterisation and balanced against safety, cost and the potential environmental impact. Decontamination of waste, where deemed viable, will adhere to the following control measures:

- A risk assessment will be undertaken in advance to determine potential causes and sources of environmental pollution resulting from the decontamination activity;
- Decontamination will only be carried out by experienced practitioners;
- Decontamination will be carried out in a suitably bunded area where there are no drains or floor valves leading to open areas;
- Appropriate spill control measures will be in place prior to decontamination; and
- All hazardous wastes associated with the decontamination process including washing solvent, contaminated clothing and used spill absorbent material, will be disposed at a hazardous waste disposal site (Holfontein).

5.15.3.5 Waste Transportation

Suitable control measures will be implemented to prevent or minimise spills, releases, and exposures to employees and the public during the on- and off-site transportation of waste during closure.

All waste containers to be transported, whether on- or offsite, will be secured and labelled with the contents and associated hazards. The containers will also be properly loaded onto the transport vehicles and be accompanied by a waste manifest that describes the load and its associated hazards.

5.15.3.6 Document Control

Accurate and up to date records will be kept of the management of the waste to be generated during closure. These records will reflect the following:

- The classification of the wastes;
- The quantity of each waste type generated;
- Detailed manifest of each waste that has either been reused, recycled, recovered, treated or disposed of; and
- Details or parties responsible for waste management.

5.15.3.7 Monitoring

The purpose of monitoring will be to verify that any waste types generated during closure are appropriately managed.

Monitoring will include the following:

- Inspecting the waste management activities (including handling, decontamination, storage, transportation and disposal);

- Inspecting the waste management facilities for compliance with control measures and checking for visible evidence of spillages or pollution; and
- Checking records related to waste management activities;

The Waste Management Plan that will be compiled as part of the ESIA will include a detailed monitoring plan.

5.15.4 ESIA Investigations

5.15.4.1 Specialist Studies

A Waste Management Assessment (refer to ToR in Section 8.5.2.3 below) will be undertaken and the findings will be included in the ESIA Report.

The feasibility of disposing large volumes of hazardous waste at Holfontein will be investigated. This will be compared with treating hazardous waste onsite for disposal at a general waste disposal site.

The options of creating a dedicated, permanent onsite waste disposal facility at KPS versus offsite disposal will be assessed as part of the ESIA. This investigation will include a cost-benefit analysis.

5.15.4.2 Technical Investigations

Detailed containment barrier requirements (including design reports and drawings, service life considerations, total solute seepage, etc.) will be required if a permanent onsite waste disposal facility is to be created as part of the Project.

5.16 Transportation

5.16.1 Impact Description

5.16.1.1 Positive Impacts

The surrounding round network will no longer be used by trucks hauling coal to KPS. In addition, the renewable energy facility will not have as many employees as the power station during its operational phase, and the roads will not carry as many commuters to KPS. The Project will thus ultimately result in a positive impact to the road infrastructure and traffic loads during peak time.

5.16.1.2 Negative Impacts

During the closure phase, a large number of trucks will utilise the road network to transport waste and workers. This may pose potential traffic and road safety risks to workers, the surrounding communities and road users.

The landing strip and helipad on the north-western part of the site will be decommissioned to make way for the solar PV plant. Based on feedback from Eskom, the landing strip is no longer operational as the area is undermined. It could not be ascertained whether the helipad is still used, such as for emergencies. If neither of these facilities are in use, then no impact is anticipated by the Project.

5.16.2 Governance

WBG	SA Legislation	Authority	Regulatory Control Mechanisms
• ESS1 • ESS2 • ESS3 • ESS4 • ESS10 • GPN • EHS Guidelines	• Mpumalanga Roads Act, 2008 • OHSA and Regulations • Municipal by-laws	• SANRAL • PWRT* • NDM • STLM	• Licences. • Managing transportation of dangerous goods. • Abnormal load permits. • Fines for violations. • Standards for traffic signs. • By-law contravention notice.

** PWRT - Mpumalanga Department of Public Works, Roads and Transport*

5.16.3 Mitigation

5.16.3.1 Control Measures

Mitigation measures, including appropriate safety measures, will be implemented to avoid traffic-related incidents and accidents.

Sections of the roads leading to KPS are in a poor state and will need to be repaired to allow safe usage during closure as well as for the overall repurposing project (Component B). It is understood that Eskom maintains the access roads leading to KPS and will need to continue doing so after closure for the renewable energy development. The roads will also need to be able to handle abnormal loads that may be transporting large dismantled components from the power station during closure. Eskom will need to comply with the requirements of the Mpumalanga Department of Public Works, Roads and Transport, as the custodian of the provincial roads, as well as the South African National Roads Agency Limited (SANRAL)

Traffic management measures will be implemented during the closure phase for the movement of vehicles and plant at KPS and surrounds, as well as offsite transportation. These measures will be included in the Traffic Management Plan, which will form part of the ESMP.

Control measures related to traffic safety of workers and the public include the following:

- ❑ Determine and document the conditions of roads to be affected by the Project. Undertake selective upgrade of the relevant access roads to ensure that they are capable of accommodating the type of vehicles and/or mechanical plant to be used for closure;
- ❑ Implement traffic safety measures (e.g., enforcement of speed limits, traffic warning signs, flagmen);
- ❑ All drivers / operators are to be in possession of the appropriate licences, based on the vehicles or plant to be driven / operated;

- All vehicles are to be maintained regularly and manufacturer approved parts are to be used;
- Ensure proper transportation of hazardous materials and waste in accordance with national laws and good international industry practices such as the ADR Best Practices for transportation of dangerous goods by road; and
- Project transportation through community areas such as Komati Village must be avoided.

5.16.3.2 Monitoring

Monitoring for traffic impacts will include the following:

- Baseline traffic monitoring (part of technical investigations) to confirm the traffic status quo on the road links that are to be affected (including along the R35);
- Monitoring during closure to check traffic volumes, track abnormal loads, and check compliance against traffic management measures (e.g., adherence to time restrictions, access restrictions, speed limits, signage, etc.);
- Monitoring of dangerous locations (e.g., truck crossings);
- Monitoring of incidents and accidents; and
- Overloading management through auditing of bulk material delivery slips to ensure high-level adherence to current legislation.

5.16.4 ESIA Investigations

5.16.4.1 Specialist Studies

Although a dedicated traffic impact study is not planned, a Traffic Management Plan will be compiled for the Project.

5.16.4.2 Technical Investigations

The following technical input will be required for the Project:

- Traffic Impact and Management Plan based on predicted traffic volumes during closure;
- Identification of the need for abnormal loads during closure; and
- Confirmation of the suitability of the road network leading to KPS to accommodate decommissioning plant and vehicles.

5.17 Socio-Economic & Social Aspects

5.17.1 Impact Description

5.17.1.1 Socio-Economic Impacts

The key findings from the Socio-Economic Impact Study that was undertaken for the shutdown of KPS (Urban-Econ Development Economists, 2020) follow.

a) **Potential Economic Losses**

Figure 106 below summarises the economic impact of the KPS shutdown on the PSA, provincial and national economies. It reflects the total impact on these economies considering both the direct effects and multiplier effects that ensue as a result of the reduction in production and household consumption.

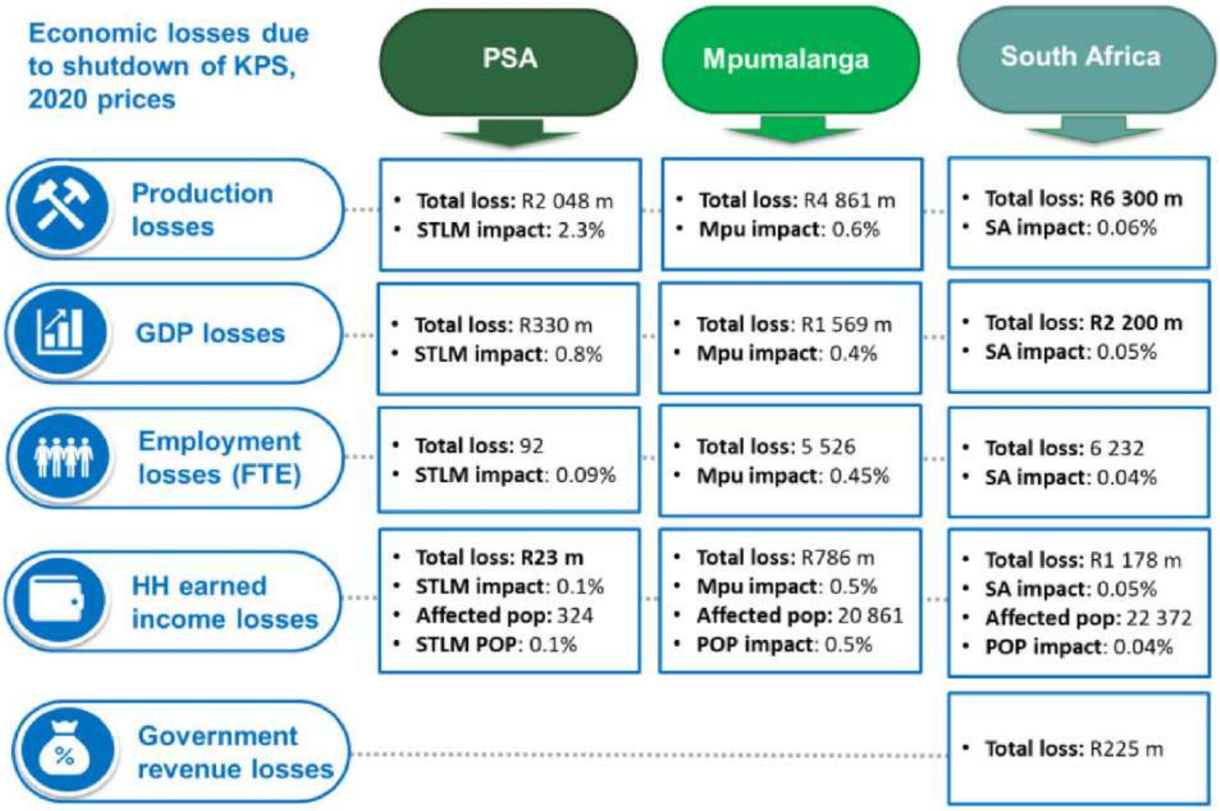


Figure 106: Summary of economic losses due to KPS shutdown, 2020 prices (Urban-Econ Development Economists, 2020)

At the national level, the shutdown of KPs will lead to the loss of R6 300 million of business sales, which translates into R2 200 million of Gross Domestic Product (GDP) or 0.05% of the country's GDP in 2020. The reduction in the production in the economy will lead to the loss of 6 232 full-time equivalent (FTE) jobs, which will reduce the size of the employed population in the country, relative to the 2020 figure, by 0.04%. The reduction in employment will be translated into the loss of household income, which in the case of KPA will equate to R1 178 million in 2020 prices or R15 755 per month per household, impacting just under 22 400 people throughout the country.

The effects on the provincial economy will be more noticeable, leading to a 0.4% decline of the provincial economy and a loss of 5 526 FTE jobs throughout Mpumalanga. The reduction in employment will lead to a decline in household income of R786 million, which will affect 20 861 people, given an average household size of 3.8 and assuming that one lost FTE job will affect one household.

Within the PSA, which comprises settlements such as Komati Village, Blinkpan, Banks and Goedehoop, the economic losses will be particularly noticeable as the power station has been among the primary contributors to the local area's economies alongside the mining and agricultural sectors. A total of R330 million of value-added will be lost in the PSA, which will reduce the STLM by 0.8% and lead to the loss of 92 FTE jobs. Households residing in the PSA will lose R23 million in earned income, which will affect at least 324 people.

b) <u>Summary of Potential Socio-Economic Impacts</u>

Given the current situation described in the baseline, the shutdown of the power station will lead to numerous negative socio-economic impacts that would threaten the stability of the local area and require the introduction of targeted mitigation measures (refer to Figure 107 below). It is worth noting, however, that KPS has been mothballed in the past, which created a precedent, and as of 2020 already shut down most of its units; however, the closure of Koornfontein Mine and other activities in the area in the past decade has significantly eroded the social fabric of the PSA, making it particularly sensitive to any future negative shocks.

The root cause of most of the negative socio-economic impacts is the expected slowdown of the development in the PSA accompanied by the reduced employment and loss of household income.

These medium-significance impacts are expected to create a varied range of risks in the communities which will lead to the medium-ranked deterioration of the communities' health and the exodus of skills from the area, as well as noticeable declines in property values and social cohesion.

Coupled with the possible deterioration of the built environment, which is expected to also be noticeable, some of the above impacts will lead to a reduction in the standard of living in the PSA to an extent that will require mitigation to avoid its further deterioration.

Overall, as illustrated in Figure 107 above, the quality of life in the PSA due to the closure of KPS is expected to drop significantly, considerably exacerbating the already poor levels of quality of life. However, the shutdown will also be accompanied by several positive effects which would create opportunities for the development of the local economy and could contribute to a reduction in climate-change impacts associated with coal-fired power stations.

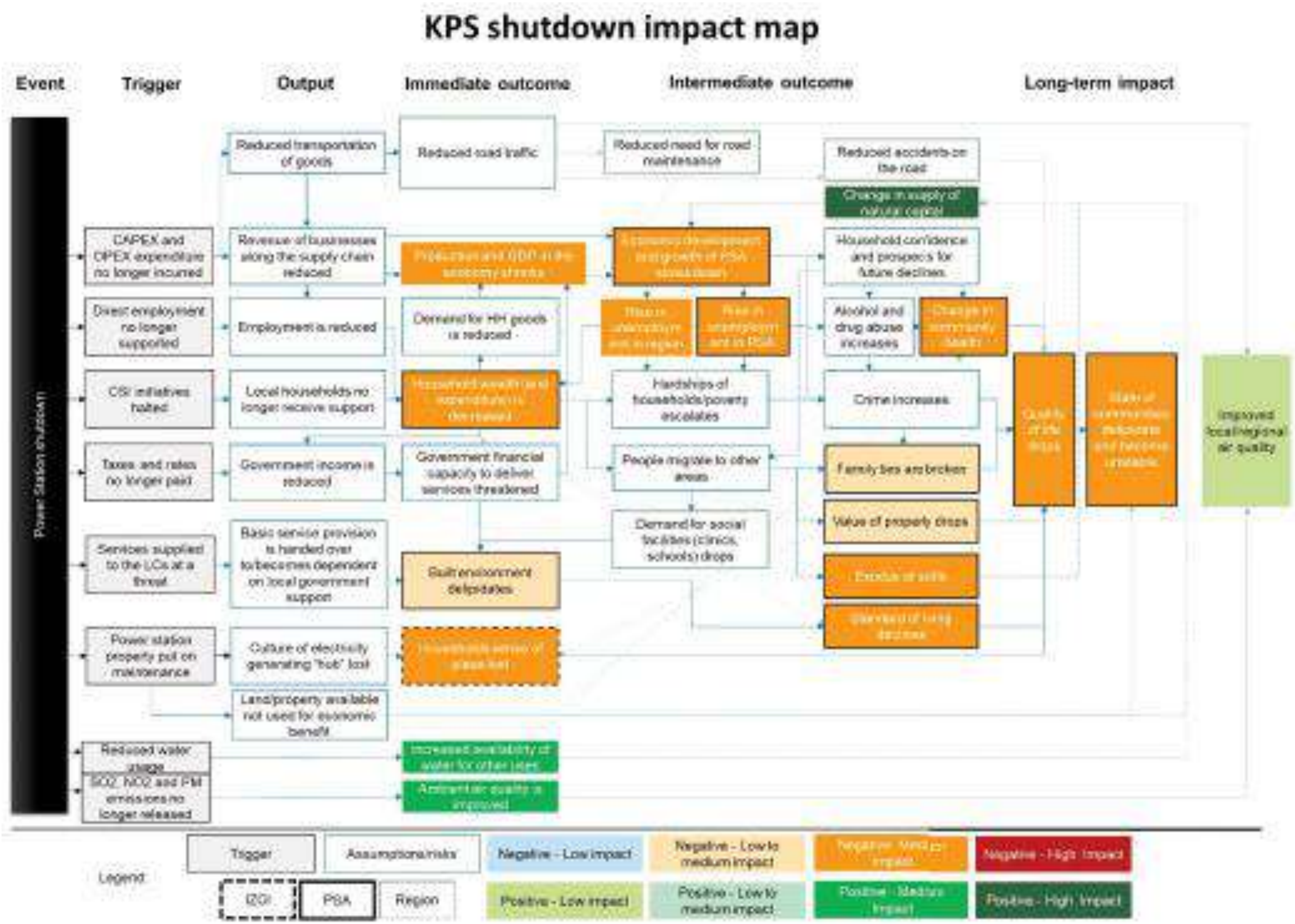


Figure 107: Populated impact map for KPS shutdown (Urban-Econ Development Economists, 2020)

5.17.1.2 Social Impacts during Closure

Insufficient or inadequate stakeholder engagement will be detrimental to the successful planning, management and execution of the Project and may result in opposition from stakeholders. Preliminary stakeholder engagement was undertaken to gain an upfront understanding of the concerns of stakeholders related to the Project and the findings are presented in Section 4.15.2.2 above. A Stakeholder Engagement Plan (SEP) was developed for the ESIA and is contained in Section 7 below.

Following the preliminary assessment of the KPS site and engagement with the Eskom staff at the power station, there are no settlements or dwellings located on the property that will need to be relocated. However, there is a small settlement housing two family units that is situated approximately 100m to the south-east of Ash Dam 1, which is known as Gelukplaas 1. Depending on the required buffer zone around the ash dam (e.g., for fugitive emissions, safety in case of dam failure, etc.), these dwellings may need to be relocated. The need for relocation will be informed by the risks identified as part of the technical studies for the Project.

Below is an overview of some of the potential social impacts at a localised level:

- The health and social well-being impacts related to the Project include the following –
  - Annoyance, dust and noise;
  - Increase in crime;
  - Increased risk of HIV and AIDS;
  - Increased social tensions, conflict or serious divisions within the community;
  - Impacts caused by the presence of construction workers; and
  - Reduced actual personal safety, increased hazard exposure.
- The following quality of the living environment impacts are related to the Project –
  - Disruption of daily living;
  - Increased population density and crowding;
  - Disruptions to social and community infrastructure;
  - Reduced adequacy of physical infrastructure;
  - Reduced quality of housing; and
  - Reduction in perceived quality of life.
- The negative economic and material well-being impacts associated with the Project include the following –
  - 661 workers (236 permanent Eskom workers, 292 contract workers and 133 employed with ERI) will be directly affected by the closure of KPS;
  - Tension over the work opportunities;
  - Deteriorating economic situation; and
  - Decreased autonomy, independence, security of livelihoods.

- The positive economic and material well-being impacts associated with the Project include the following –
  - Increase in employment opportunities during closure; and
  - Increased opportunities for SMMEs during closure.
- Apart from this, and on a social basis, the following processes also need to be considered –
  - Diminished cultural integrity;
  - Loss of rights over and access to natural resources; and
  - Changes in movement patterns.
- Given the stable and close-knit nature of the surrounding communities, both the displacement of people as well as the influx of construction workers will have an impact on families and the sense of community within the vicinity of the Project. These impacts are likely to include the following –
  - Disruption to family structures and social networks; and
  - Changed attitudes towards local communities and the level of satisfaction with the neighbourhood.
- The institutional, legal political and equity impacts associated with the Project include the following –
  - Increased demand on existing infrastructure facilities and social services, should there be an influx of people;
  - Attitude formation towards project;
  - Decreased level of community participation in decision making, loss of empowerment; and
  - Disaster management.
- Gender related impacts include the following –
  - The study area is typical of a rural patriarchal society with women having less access to productive services and opportunities, such as land, livestock, financial services, education and job opportunities than those available to men. This was confirmed during the social survey that was undertaken. Some of impacts could include cultural resistance towards women and division of labour.

5.17.2 Governance

WBG	SA Legislation	Authority	Regulatory Control Mechanisms
• ESS1 • ESS2 • ESS3 • ESS4 • ESS5 • ESS8 • ESS10 • EHS Guidelines • GPN	• NEMA & EIA Regulations • OHSA and Regulations • Municipal by-laws	• DFFE • DEL • NDM • STLM	• NEMA – o Authorisation of related listed activities in terms of the EIA Regulations that may impact on the social environment. o Duty of care and remediation of environmental damage. o Control of incidents. • Prohibition notice, contravention notice or direction notice. • Prosecution.

WBG	SA Legislation	Authority	Regulatory Control Mechanisms
			• By-law contravention notice.

5.17.3 Mitigation

5.17.3.1 Control Measures for Socio-Economic Impacts

The following mitigation measures were identified as part of the Socio-Economic Impact Study that was undertaken for the shutdown of KPS (Urban-Econ Development Economists, 2020):

Formulation of the mitigation strategy was guided by four principles and approaches, namely:

- Alignment with Just Energy Transition (JET) vision and principles for SA;
- Integration of JET strategy of Eskom;
- Consideration of lessons learned from case study analysis of coal-fired power stations' repurposing in other countries;
- Alignment with government priorities and strategic objectives; and
- Partnership and collaborative approach.

Following the above principles, the devised mitigation framework encompassed interventions that aim to mitigate impacts on both regional and local levels. At the regional level, as reflected in the impact assessment map (see Figure 107 above), impacts are concentrated within the financial and economic capital and are, thus, mitigated through the interventions focusing on the development of that capital. At the PSA level, the potential socio-economic impacts are expected to negatively affect not only the financial and economic capital, but also human resource, built, and social capital. At the same time, natural capital was identified to offer opportunities to exploit various interventions and was therefore considered when devising the interventions under other capitals.

At the core of the mitigation strategy lie the interventions that focus on building and strengthening the financial and economic capital, both at the regional and at the PSA level. This is premised on the fact that the root causes of most of the socio-economic impacts lie in the economic shock triggered by the shutdown of the power station. The framework, though, is also designed to include interventions that target social and human resource capitals, as well as built and political capitals to facilitate a holistic approach to development. These interventions, though, as PSA-based and aim to address the PSA-related impacts, only. Lastly, partnerships and collaborations are recognised to be integral to achieving the optimal benefits from interventions and form a critical component of the mitigation strategy.

Following a rigorous screening approach, various interventions were identified, both at the regional and the PSA levels. At the regional level, given the focus on financial and economic capital interventions, 15 projects were identified that are planned to be implemented in the NDM, thus, serving as potential mitigation measures against the regional indirectly and induced effects that could ensue from the KPS shutdown. Although accurate data regarding these interventions' job creation and operating expenses is not available, it is estimated that they will have the potential to create between 4 680 and 8 120 direct, indirect and induced employment opportunities in the region and the rest of SA. These interventions at the regional level are envisaged to strengthen the regional economy and improve its resilience against any potential economic shocks.

In addition to the above interventions on the regional level, another 12 economic projects were identified to be suitable for roll out in the PSA of KPS. These projects will have the potential to create between 810 and 1 620 direct employment opportunities and an additional 5 140 to 8 560 FTE person-years in the rest of the region and SA.

Given the potential losses associated with the shutdown of KPS, which suggested a total loss of 6 232 FTE jobs in the country and 92 direct jobs in the PSA, the implementation of the projects recommended for the PSA has the potential to create significant positive net benefits for the local economy and considerably diversify the local economic base. In short, were all the proposed projects implemented in the PSA, the area is expected to be better off than in 2020. It is worth noting though that the actual benefits from these interventions can only be accurately estimated once the projects are confirmed and have gone through the feasibility studies.

The interventions need to also consider other capitals to ensure holistic development of the affected communities. Therefore, in addition to the financial and economic interventions, various other projects and initiatives are proposed to be implemented to strengthen and develop the PSA's human capital, social capital, built capital, and political capital.

Further details of the proposed interventions will be provided in the ESIA Report.

5.17.3.2 Control Measures for Social Impacts

As with the potential social impacts, the control measures are linked to various other themes in this chapter. In this regard, refer to the control measures provided for OHS (see Section 5.19.3.1 below) and community health and safety (see Section 5.20.3.1 below).

Examples of preliminary control measures for the Project to manage potential social impacts, which supplement mitigation measures included in other sections of this chapter, include:

- Identify measures to provide special assistance to vulnerable groups;
- Establish lines of communications with community members (e.g., Councillors, community leaders and traditional leaders). Existing communication channels shall be duly respected and adhered to when engaging with communities;
- Establish a KPS Shutdown and Dismantling Communication Forum. The forum must be tasked with sharing and disseminating information about the project in an accessible and transparent manner;
- Develop a Grievance Redress Mechanism (GRM) for the Project. Establish processes to effectively verify and address complaints and claims received;

- Complaints or liaison with community members with regard to environmental and social aspects shall be recorded and reported to the correct person and a record of the response shall be entered in the complaints register;
- Provide the relevant contact details to community members for queries / raising of issues or complaints;
- Provide all information, especially technical findings, in a language that is understandable to the general public;
- Promptly deal with any raised expectations amongst communities regarding perceived benefits associated with the Project, through a process of communication and consultation; and
- Where necessary always provide prompt and clear feedback to communities.

Gelukplaas 1 is a small settlement located to the south of the power station, immediately south-east of the ash dams. According to the cadastral boundaries, this area does not form part of KPS. Regardless, there may be a need for relocating these people (e.g., to provide a suitable buffer from the ADF). If so, then the Project will need to adhere to ESS5, and a RAP will need to be developed for the Project. The RAP will include measures to provide special assistance to vulnerable groups. The need for relocation will be informed by the risks identified as part of the technical investigations for the Project.

Additional control measures for social impacts will be identified during the ESIA, including from inputs received from stakeholders during engagements.

The ESMP will include mitigation measures for managing social impacts that may be caused by the Project.

The following management plans will be developed, which will accompany the ESMP:

- RAP;
- SEP, including a GRM;
- Labour Management Procedure; and
- Sexual Exploitation and Abuse and Sexual Harassment (SEA/SH) Prevention and Response Plan.

5.17.3.3 Monitoring

The ESMP and individual management plans will provide monitoring requirements, including indicators.

5.17.4 ESIA Investigations

5.17.4.1 Specialist Studies

The findings and recommendations from the Socio-Economic Impact Study that was undertaken for the shutdown of KPS (Urban-Econ Development Economists, 2020) will be incorporated into the ESIA Report. A Social Impact Assessment will also be undertaken during the ESIA.

5.18 Heritage

5.18.1 Impact Description

In terms of the NHRA, no person may alter or demolish any structure or part of a structure which is older than 60 years without a permit issued by the relevant provincial heritage resources authority (i.e., MPHRA). Due to the age of the KPS, structures older than 60 years will need to be decommissioned and an application will need to be submitted to the MPHRA.

5.18.2 Governance

WBG	SA Legislation	Authority	Regulatory Control Mechanisms
• ESS1 • ESS6 • ESS8 • ESS10	• NHRA & Regulations	• SAHRA • MPHRA	• Issuing of permits. • Implementation of SAHRIS.

5.18.3 Mitigation

5.18.3.1 Control Measures

Due to the age of the KPS, structures older than 60 years on the site will need to be decommissioned and an application will need to be submitted to the MPHRA. Individual permit applications will need to be submitted for each protected building proposed for demolition. The affected structures must be recorded in detail prior to their alteration or destruction. This will include photographs and measured drawings (amongst others).

Any cultural heritage identified during stakeholder engagement (e.g., grave sites) will be confirmed and recorded, and suitable measures will be implemented to safeguard these features if there is a risk of damage or disturbance during closure.

The heritage authorities, which include SAHRA (national) and MPHRA (provincial), will be engaged with during the course of the ESIA.

The ESMP will include a chance find procedure should unknown cultural heritage be encountered during closure.

5.18.3.2 Monitoring

Any monitoring requirements identified by the heritage authorities will be included in the ESMP.

General compliance monitoring against the ESMP will include the implementation of the chance finds protocol, if applicable.

5.18.4 ESIA Investigations

5.18.4.1 Specialist Studies

A Heritage Impact Assessment will be undertaken for the Project (refer to ToR in Section 8.5.2.3 below).

5.18.4.2 Technical Investigations

Input will be sourced from Eskom on the historical background to the structures and confirmation of age.

5.19 Occupational Health and Safety

5.19.1 Impact Description

Potential OHS hazards to project workers during closure are associated with the following:

- Working near water such as pollution control dams, reservoirs, and watercourses;
- Working at heights during the dismantling of large structures;
- Working with heavy machinery;
- Working in confined spaces;
- Working underground (e.g., decommissioning of pipelines);
- Working with hazardous substances and dangerous goods (e.g., fuels, cement, and fly ash);
- Working with contaminated material and hazardous waste (e.g., PCBs, asbestos, residual coal);
- Working with vessels under pressure;
- Working on slopes and unstable ground (e.g., at ash dam);
- Risk of fires;
- Undertaking demolition work (including blasting);
- Working with electrical and mechanical equipment;
- Using vehicles on public and project roads;
- Extended or elevated exposure to dust, noise, the sun, heat and wet weather;
- Working at night / shift work / fatigue / heat stress;
- Exposure to illnesses, communicable diseases, COVID-19 and others;
- Exposure to mental or physical harassment, SEA/SH, and injury from interpersonal conflicts; and
- Exposure to floods and other natural disasters.

5.19.2 Governance

	WBG	International Commitments	SA Legislation	Authority	Regulatory Control Mechanisms
	• ESS1 • ESS2 • ESS3	• International Labour Organisation	• OHSA & Regulations • Explosives Act	• DEL	• Prohibition notice, contravention notice or direction notice.

	WBG	International Commitments	SA Legislation	Authority	Regulatory Control Mechanisms
	• ESS4 • ESS6 • ESS8 • ESS10 • EHS Guidelines • GPN	(ILO) Conventions			• Prosecution.

5.19.3 Mitigation

5.19.3.1 Control Measures

The Project's management objectives for OHS include the following:

- Provide and maintain a healthy and safe work environment for closure;
- Protect the health and safety of project workers during closure;
- Prevent the use of all forms of forced labour and child labour;
- Effectively manage grievances from project workers related to OHS; and
- Comply with local legal and other requirements.

An OHS Management Plan will be compiled as part of the ESIA, which will accompany the ESMP. This plan will address the following:

1. Identification of potential hazards to project workers;
2. Preventive and protective measures;
3. Training of project workers and maintenance of training records;
4. Documentation and reporting of OHS accidents, diseases and incidents; and
5. Prevention, preparedness and response arrangements to emergency situations, which will be captured in an Emergency Response Plan (ERP).

The OHS Management Plan will further provide guidance for site-specific practices and procedures which the Contactor will develop and implement, such as Standard Operating Procedures (SOPs), Management and Control Measures and/or Method Statements (where necessary). These practices and procedures will be based on the actions listed in Table 45 below (preliminary list).

Table 45: Preliminary OHS control measures

No.	Themes	Control Measures	Indicators
1.	**OHS Management System**	• The Contractor shall develop and implement an Occupational Health and Safety System.	• OHS management system in place
2.	**Environmental, Social and Health Policy**	• The Contractor's Environmental, Social and Health Policy shall be made available.	• OHS Policy available at workplace
3.	**Legal Review**	• The Contractor shall carry out a detailed legal review of OHS requirements relating to labour practice for the Project.	• Documented OHS Legal Review
4.	**Hazard Identification and Risk Assessment**	• Undertake a hazard identification and risk assessment.	• Documented assessment and safe work procedures

No.	Themes	Control Measures	Indicators
		• Identify preventive and protective measures based on the following hierarchy: o Eliminating the hazard. o Controlling the hazard at its source through use of engineering controls. o Minimising the hazard through design of safe work systems and administrative or institutional control measures. o Providing appropriate PPE in conjunction with training, use, and maintenance of the PPE. • Review the risk assessment from time to time, as necessary.	• Records of review
5.	**OHS Competence, Training and Awareness**	• Conduct OHS orientation training to all new employees. • Provide visitor orientation. • Conduct basic safety awareness training with all employees. • Provide basic occupational training program and specialty courses should, as needed, to ensure that workers are oriented to the specific hazards of individual work assignments. • Maintain OHS bulletin boards. • Provide suitable signage. • Distribute OHS related communication.	• OHS training modules • Completed Attendance Registers • Visible signage • Proof of OHS communication
6.	**Personal Protective Equipment (PPE)**	• Provide all workers with the necessary PPE. • PPE shall be of certified quality. • PPE shall be kept in good working condition. • Provide training on the use of PPE.	• PPE Register • Visible PPE signage • Training materials and attendance registers
7.	**Emergency Preparedness and Response**	• Prepare a project-specific ERP which includes at least the following: o Identified potential emergency incidents. o Emergency Response Team (structure and responsibilities). o List of emergency contact details. o Emergency equipment and facilities. o Procedures to notify/report an emergency. o Emergency evacuation and response process for specific emergencies such as fire, structure collapse, etc. o Emergency communication flow. o Control of visitors. o Emergency termination and restore normality. o Testing whether the ERP is effective. o Training and awareness creation.	• Documented Emergency Response Plan • List of emergency contact details • Training materials and attendance registers
8.	**Incidents**	• Develop SOP for investigating and reporting on incidents and near misses. This will include the process for investigation and corrective action to ensure prevention and continuous improvement.	• Documented SOP • Records of investigations and corrective actions
9.	**Health Facilities & Resources**	• Provide first aid kits. • Carry out monthly inspections of first aid kits • One vehicle shall be available at all times to drive wounded workers to the nearest clinic or hospital (e.g., Middelburg).	• Inspection Register • First Aid Kit Contents • List of minimum emergency equipment
10.	**Fire and Explosions**	• Develop SOP for managing flammables storage areas. • Flammables shall be stored away from ignition sources and oxidizing materials. • Provide manual firefighting equipment that is easily accessible and simple to use. • Ensure proper ventilation for flammables storage area.	• Documented SOP • Inspection Register • Visible signage • Training materials and attendance registers

No.	Themes	Control Measures	Indicators
		• Use spark-proof fixtures. • Provide suitable signage. • Provide specific worker training in handling of flammable materials, and in fire prevention or suppression. • Maintain good housekeeping at site. • Implement no smoking policy.	
11.	**Chemical Hazards**	• Develop SOP for the classification and labelling of hazardous substances and dangerous goods to ensure their safe use, storage, transportation and disposal. • Develop a documented list of hazardous materials stored, handled or used. • Develop and implement management system for chemical safety data sheets. • Storage requirements for chemicals to adhere to requirements stipulated in the Material Safety Data Sheets (MSDSs). • Provide suitable PPE. • Provide related training.	• Documented SOP • Inspection Register • List of hazardous materials • Labelling system in place • Chemical safety data sheets • Training materials and attendance registers
12.	**Mechanical and Electrical Equipment**	• Develop SOP to prevent hazards associated with electrical and mechanical equipment. • Undertake inspection of mechanical and electrical equipment. • Provide related training. • Conduct detailed identification and marking of all buried electrical wiring prior to any excavation work.	• Documented SOP • Inspection Register • Records of competency of responsible persons • Training materials and attendance registers • Records of existing electrical infrastructure and services
13.	**Traffic, Road Safety and Vehicles / Equipment**	• Develop a SOP describing basic requirements for vehicle accident prevention to include the broader risks of community and site transportation safety. • Equipment is serviced regularly and maintained. • Training and licensing for industrial vehicle operators. • Conduct medical surveillance of operators. • Moving equipment to be provided with audible back-up alarms. • Establish rights-of-way, site speed limits, vehicle inspection requirements, operating rules and procedures. • Manage the circulation of delivery and private vehicles. • Proper traffic management with traffic signage, barricade and warning lights. • Traffic controller provided with whistle, high visibility vest and flags and stationed at high risk areas. • Vehicles shall not be overloaded and all loose materials shall be securely tied down before being transported. • Provide appropriate pedestrian control. • Ensure adequate security system implemented to minimise vandalism and public is restricted to enter the site. • Make use of designated access roads.	• Documented SOP • Records of operators' competency • Inspection Register • Training materials and attendance registers
14.	**Stacking and Storage**	• Develop SOP for stacking and storage • Provide adequate stacking and storage areas, which need to be demarcated. • Keep stacking and storage neat and under control.	• Documented SOP • Inspection Register • Training materials and attendance registers

No.	Themes	Control Measures	Indicators
15.	**Working in Confined Spaces**	• Develop SOP that ensures the safety of all workers when working in confined spaces • Provide related training.	• Documented SOP • Records of competency of responsible persons • Training materials and attendance registers
16.	**Working at Heights**	• Develop SOP for fall prevention and protection measures. • Provide fall prevention devices and suitable PPE. • Undertake inspection of ladders, scaffolds, harnesses, safety belts and lanyards, etc. • Provide related training.	• Documented SOP • Inspection Register • Records of competency of responsible persons • Training materials and attendance registers
17.	**Hot Work**	• Develop a SOP that defines procedures for conducting hot work that may involve open flames, sparks or potential ignition sources. • Provide suitable PPE (e.g., face shield, leather gloves, safety boots, etc.). • Provide related training.	• Documented SOP • Records of competency of responsible persons • Training materials and attendance registers
18.	**Heat Exposure**	• Monitor weather forecasts for outdoor work to provide advance warning of extreme weather and scheduling work accordingly. • Provide temporary shelters to protect against the elements during working activities or for use as rest areas. • Use of protective clothing. • Provide easy access to adequate hydration such as drinking water. • Provide related training.	• Training materials and attendance registers
19.	**Noise, Vibration and Dust**	• Comply with relevant noise, vibration and dust limits. • Provide suitable PPE, including hearing protection to staff working close to high noise machinery and dust masks to those working in dusty conditions. • Ensure routine servicing of equipment to limit noise and emissions. • Apply suitable dust suppression measures. • The equipment to be used will be properly maintained with the objective of increasing its performance and longevity, reducing levels of noise and air pollution, and minimising failure that may cause incidents. • Provide related training.	• Inspection Register • Training materials and attendance registers
20.	**Trenches and Excavations**	• Develop a SOP for excavations and trenches. • Ensure the stability and safety of excavations and prevent collapse or subsidence from occurring. Provide adequate supports and braces for all excavations. • Provide warning signs for excavations • All excavation shall be adequately lit at .night complete with hazard warning lights to pedestrians and traffic. • Erect and maintain adequate safety measures around all trenches and other open excavations. • Excavations shall be kept free from water. • Heavy equipment will be kept away from trench edges. • Excavated soil (spoils) and other materials will be kept away from trench edges. • Underground utilities will be located and safeguarded before digging. • Trenches will be inspected:	• Documented SOP • Visible signage • Records of competency of responsible persons • Inspection Register • Training materials and attendance registers

No.	Themes	Control Measures	Indicators
		○ At the start of each shift. ○ Following a rainstorm or other water intrusion. ○ After any occurrence that could have changed conditions in the trench. • Provide suitable PPE. • Provide related training.	
21.	**Demolition**	• Develop a SOP for the safe demolition of structures. • Locate all existing services that may be affected by demolition work and safeguard these services. • Use safety measures to prevent any deform subsidence, collapse, or damage to nearby facilities. • Manage noise and dust that may be caused by the demolishment. • Provide suitable PPE. • Provide related training.	• Documented SOP • Training materials and attendance registers
22.	**Crane, Lifting and Rigging**	• Develop a SOP for lifting and rigging. • Lifting and rigging shall only be performed by competent persons. • Transportation of people in handling / lifting equipment is strictly prohibited. • The equipment and its lifting accessories will be suitable for the weight, size and characteristics of the material to be lifted. • Ensure that the area of influence of lifting equipment is clear of personnel, structures and equipment. • Prevent damage to overhead powerlines at KPS. • All load paths will be clear of people and equipment or any other obstacles. • Mobile equipment shall be equipped with sound and / or light-signalling devices to warn of imminent movement. • Regularly inspect lifting equipment. • Provide signallers to direct the crane operator, as necessary. • All cranes and other lifting devices will be stabilised prior to lifting. • Loads will be kept suspended only for as long as is strictly necessary. • During breaks or after work, all the equipment will be put in safe mode, and loads will not be left suspended. • Provide suitable PPE. • Provide related training.	• Documented SOP • Inspection Register • Records of competency of responsible persons • Training materials and attendance registers
23.	**Blasting**	• The Contractor shall comply with SA's regulations concerning blasting. • Develop a SOP for blasting. • Explosives shall be used only with the written permission of the Engineer. • The Contractor will assess risks to infrastructures by doing a ground-truthing survey of wells, houses, churches, buildings, before conducting blasting. • Rock blasting shall only take place on times as agreed with the Engineer, and with at least 48 hours advance notice to the Engineer, who in turn will immediately inform stakeholders.	• Documented SOP • Training materials and attendance registers

No.	Themes	Control Measures	Indicators
		• Portable noise-absorbing walls shall enclose all sites of blasting. • Local communities shall be warned of any blasting through radios, churches, and local authorities, etc. • Provide adequate warning prior to blasting events. A safety patrol with an alarm shall be used to ensure that all individuals are evacuated in advance from quarries or other blasting sites. • Provide related training.	
24.	**Surface Mining**	• Develop a SOP to safeguard workers against risks associated with surface activities of mining (e.g., borrow pit). • Regularly inspect slopes and other aspects of mined areas. • Provide related training.	• Documented SOP • Inspection Register • Training materials and attendance registers
25.	**Working near Water**	• Develop a SOP to safeguard workers when working close to water. • Provide life jackets, if working near water. • Provide related training.	• Documented SOP • Visible signage Training materials and attendance registers
26.	**Existing Infrastructure and Structures**	• Develop a SOP to safeguard existing infrastructure and structures at KPS. • Inspect existing infrastructure and structures at suitable intervals to check for possible damage.	• Documented SOP • Inspection Register • Training materials and attendance registers
27.	**Welfare and Facilities**	• Provide an adequate supply of potable drinking water at convenient accessible points. • Provide shelter to workers. • Provide workers with washrooms. • Provide workers with ablution facilities at convenient accessible points. Ensure adequate number of toilets, based on the number of workers and gender. Toilets are to be maintained. • Provide hand washing facilities. • All necessary measures will be taken to contain the spread of COVID-19 and to safeguard workers from this virus. • Provide clean eating areas. • Implement an HIV/AIDS program, which is sensitive to cultural perceptions. Provide male and female condoms at toilets. • Toilets and eating areas will be kept clean at all times. • Prevent all unhealthy and unhygienic conditions. • Provide related training.	• Inspection records • Visible signage • Training materials and attendance registers
28.	**Environmental Hazards**	• Preventative measures will be implemented to protect workers from environmental hazards, including venomous, dangerous or harmful fauna (e.g., insects, snakes) and flora (e.g., poisonous plants). • Provision will be made in the ERP for incidents related to environmental hazards. • Provide suitable PPE. • Provide related training.	• Documented ERP • List of emergency contact details • Training materials and attendance registers

5.19.3.2 Monitoring

Monitoring will be undertaken to verify the effectiveness of OHS control measures and to check the implementation of the Project's OHS system. Preliminary OHS indicators are also provided in Table 45 above.

The OHS Management Plan will make provision for monitoring requirements, which will also be aligned with the Construction Regulations (GN No. R. 84 of 7 February 2014).

5.19.4 ESIA Investigations

5.19.4.1 Specialist Studies

A Health and Safety Assessment (refer to ToR in Section 8.5.2.3 below) will be undertaken as part of the ESIA for the Project, based on the OHSA and relevant Regulations.

5.19.4.2 Technical Investigations

The necessary input will be required from Eskom and the designer, in accordance with their respective duties stipulated in the Construction Regulations (GN No. R. 84 of 7 February 2014) in terms of the potential hazards and technical mitigation measures (amongst others) related to project workers.

5.20 Community Health and Safety

5.20.1 Impact Description

5.20.1.1 Positive Impacts

There are various pollution sources at KPS that impact on surface and groundwater quality, which also place the surrounding communities at risk. The remediation of the site and removal of the pollution sources as part of the Project will benefit water resources.

With the closure of KPS, the emissions associated with coal combustion will come to an end. Fugitive emissions at KPS from coal storage and handling will also cease. The closure of KPS will thus cause positive impacts to air quality, which will benefit the community.

5.20.1.2 Negative Impacts

The potential risks and adverse impacts of the Project to the health and safety of the affected communities during decommissioning and post-closure include the following:

- Impacts caused by poor planning and communication with the affected communities in the Project Area;
- Failure to identify and isolate pollution sources and to remediate contaminated land, with resultant legacy impacts to local communities that will persist beyond the closure of the power station;
- Contamination of air (e.g., fugitive emissions), soil and water (surface and groundwater) (e.g., spillages) from closure activities or facilities, with resultant impacts to local communities;
- Accidents (e.g., traffic incidents) occurring during closure that involve communities and their animals and livestock;
- Impacts of Project’s security on local communities;

- Spread of communicable diseases by workers to the local communities;
- Transfer of Sexually Transmitted Infections (STIs) from in-migrants and workforce to community;
- Potential exposure to vector-related diseases;
- Increased competition for the direct and indirect economic opportunities created by the Project (labour Influx);
- Gender-Based Violence (GBV) and SEA/SH regarding community members;
- Forced labour and child labour;
- Risks to vulnerable and marginalised groups (including informal settlements surrounding KPS);
- Risk of dam failure (ADF) to the community;
- Drowning risks related to water bodies (including pollution control dams and reservoirs) at KPS; and
- Breakdown in worker–community relationship.

During preliminary stakeholder engagement, members of the community emphasised the health impacts associated with the dust from the ash dam. Ultimately, both closure options for the ADF will result in the improvement of fugitive dust emissions from this facility, with the implementation of the necessary mitigation measures (including adequate rehabilitation, dust management, etc.).

5.20.2 Governance

Same as for OHS (see Section 5.19.2 above).

5.20.3 Mitigation

5.20.3.1 Control Measures

The Project's management objectives for community health and safety include the following:

- Respect cultural diversity and the livelihoods of local communities;
- Protect the health and safety of local communities;
- Effectively manage grievances raised by local communities;
- Prevent the spreading of communicable diseases and STIs from project workers; and
- Comply with local legislation and other requirements.

The Project's ESMP will be aligned to the relevant Good Practice Notes (GPN) of the World Bank, including:

- Addressing GBV/SEA/SH in Investment Project Financing involving major civil works;
- Road safety;
- Assessing and managing the risks and impacts of the use of security personnel; and
- Managing the risks of adverse impacts on communities from temporary project induced labour influx.

A Community Health and Safety Plan, as well as an ERP, will be compiled as part of the ESIA, which will accompany the ESMP.

A preliminary list of control measures for community health and safety for the Project is provided in Table 46 below.

Table 46: Preliminary control measures for community health and safety

No.	Themes	Control Measures	Indicators
1.	**Environmental, Social and Health Policy**	• The Contractor's Environmental, Social and Health Policy is to make adequate provision for community health, safety and security. • The Contractor's Environmental, Social and Health Policy shall be made available.	• Documented Policy
2.	**Risk Assessment**	• Undertake a risk assessment of the Project's community health, safety and security risks and impacts. • Identify preventive and protective measures. • Review the risk assessment from time to time, as necessary.	• Documented risk assessment • Records of review
3.	**Communication & Induction**	• Induction training will be mandatory for all project workers and shall include a cultural induction, delivered with the help of Traditional Authority / community leaders. • The Contractor and project workers will abide by the Code of Conduct, which will form part of the induction training. • The Contractor will provide a mailbox at the camp site to collect grievances and will set in place a feedback mechanism. • The Contractor will control direct communication of unauthorised project workers with third parties. • The Contactor will develop and implement a formal grievance redress mechanism to record, investigate and resolve any complaints from communities.	• Records of communication • Induction records • Documented grievance redress mechanism for communities • Numbers of grievances • Training materials and attendance registers
4.	**Vector-related Diseases**	• Undertake a risk assessment for vector-related diseases. • Develop and implement a vector surveillance and control program. • Ensure effective management of suspected and confirmed cases. • Maintain good housekeeping and waste management on the Project site to prevent the creation of potential vector breeding areas. • Provide training and awareness campaigns on vector-related diseases.	• Documented risk assessment • Documented program • Inspection records • Monitoring records • Training materials and attendance registers
5.	**Soil, Water and Waste-related Diseases & Contamination**	• Manage decommissioning waste and wastewater in accordance with the ESMP. • Prepare a project-specific ERP. Assess how local community protection is incorporated into emergency response. • Implement the measures contained in the OHS Management Plan related to welfare and facilities. • Provide workers with ablution facilities at convenient accessible points. Ensure adequate number of toilets, based on the number of workers and gender. Toilets are to be maintained.	• Documented ERP • Inspection records • Monitoring records • Visible signage • Training materials and attendance registers

No.	Themes	Control Measures	Indicators
		• Provide hand washing facilities. • Toilets and eating areas will be kept clean at all times. • Prevent all unhealthy and unhygienic conditions. • Avoid spills affecting communities. • Provide related training.	

6.	**Accidents, Injuries & Harm**	• Traffic –
		  ○ Implement the measures contained in the OHS Management Plan related to traffic management.
		  ○ Develop a SOP describing basic requirements for vehicle accident prevention to include the broader risks of community and site transportation safety.
		  ○ Develop and implement a community traffic safety awareness program.
		  ○ Establish rights-of-way, site speed limits, vehicle inspection requirements, operating rules and procedures.
		  ○ Proper traffic management with traffic signage, barricade and warning lights.
		  ○ Traffic controller provided with whistle, high visibility vest and flags and stationed at high risk areas.
		  ○ Ensure adequate security system implemented to minimise vandalism and public is restricted to enter the site.
		  ○ Make use of designated access roads.
		  ○ Decommissioning vehicles or trucks shall not be permitted to pick up anyone who is not an employee of the Project, except in case of an emergency.
		  ○ Heavy machinery shall only be operated by those who have the license and proven skills to use those types of machines (refer to OHS Management Plan).
		  ○ Drivers and passengers shall watch out for wild or domestic animals or people crossing the access road. In case of collision with any domestic animal, full compensation shall be paid.
		  ○ The movement and transportation of materials and waste to and from the site shall be done in a manner that generates minimum air quality impacts, flying objects risks and safety to road users, learners and general public.
		• Excavations –
		  ○ Implement the measures contained in the OHS Management Plan related to excavations and trenches.
		• Noise, Vibration and Dust –
		  ○ Implement the measures contained in the OHS Management Plan related to noise, vibration and dust.
		  ○ Comply with relevant noise, vibration and dust limits.
		  ○ Workers shall be strictly prohibited from playing outdoor music or radios, or otherwise making any unnecessary loud sounds.
			• Documented SOP
			• Documented community traffic safety awareness program
			• Monitoring records
			• Inspection Register
			• Training materials and attendance registers

No.	Themes	Control Measures	Indicators
		○ Implement environmental monitoring program for noise, vibration and dust, in accordance with the ESMP. ○ Apply dust suppression by water spraying in areas being impacted by dust. ○ Limit works to daytime to mitigate impact of noise for surrounding communities during the night. ○ Limit noise by generators. ○ The Contractor will ensure routine servicing of vehicles to limit noise and emissions. • Storage of Materials and Equipment – ○ Prevent access by the public or unauthorised persons, to materials and equipment storage areas. • Solid Waste Management – ○ Adhere to the requirements of the Waste Management Plan for the Project. ○ Burning of any waste is forbidden. ○ Supply waste bins throughout the site at locations where project workers are working. The bins shall be provided with lids and an external closing mechanism to prevent their contents blowing out and shall be scavenger-proof to keep out other animals that may be attracted to the waste. ○ The bins shall not be used for any purposes other than waste collection. ○ Prevent emissions of noxious or offensive substances into the air, land and water and make every effort to render any such emissions (if unavoidable) inoffensive and harmless to people and the environment. • Drowning – ○ Maintain access control to areas where pollution control dams and reservoirs are located. ○ Minimise drowning risks to community members. • Provide related training and awareness creation.	
7.	**Community Security**	• Assess the risks posed by the Contractor's security arrangements to those within and outside the Project site, guided by the principles of proportionality and good international practice in relation to hiring, rules of conduct, training, equipping, and monitoring of such workers, and by applicable law. • Undertake a due diligence on the security services provider. • Define and implement pre-employment requirements for candidates for security positions, which includes screening of candidates for previous offences. • Training of security team with respect to the appropriate use of force (and where applicable, firearms), appropriate conduct toward workers and affected communities. • Audit the performance of security providers. • Record and track any security incidents due to the use of inappropriate, disproportionate or unlawful use of force. • Initiate and maintain effective community engagement on security arrangements.	• Documented assessment • Monitoring records • Training materials and attendance registers

No.	Themes	Control Measures	Indicators
		• Provision will be made in the grievance redress mechanism for affected communities to express concerns about the security arrangements and acts of security personnel. • Train security personnel.	
8.	**Community Livestock**	• Prevent livestock from entering the site.	• Monitoring records
9.	**Worker – Community Relationship**	• Respect cultural diversity and the livelihoods of local communities. • Respect the sites of worship, religious symbols, cemeteries, and other social emblems. • Respect the hours of silence and access restrictions, according to the traditions of local communities and engage community when diverting from the norm. • No encouragement of any kind of child labour and avoid the purchase of products sold by children and teenagers of less than the minimum age. • No negotiation directly with the communities and compensating for damage caused to economic assets without prior knowledge of local authorities.	• Monitoring records • Training materials and attendance registers
10.	**Communicable Diseases**	• Undertake a risk assessment for communicable diseases. • Define and implement pre-employment medical requirements for all workers. • Implement a vaccination program for all workers, as necessary. • Provide adequate hygiene and sanitation facilities to workers. • Implement all necessary measures to contain the spread of COVID-19 and to safeguard workers and the local communities from this virus. • Provide adequate accommodation for workers to prevent overcrowding. • Ensure effective management of suspected and confirmed cases. • Provide training and awareness campaigns on how these diseases spread and on their prevention. • Notify relevant authorities of confirmed cases of communicable diseases, as required.	• Documented risk assessment • Documented medical requirements • Vaccination records • Documented program • Inspection records • Training materials and attendance registers
11.	**STIs**	• Undertake a risk assessment for STIs. • Develop a clear HIV/AIDS policy and program, which needs to be functional prior to closure. • The HIV/AIDS program will be sensitive to cultural perceptions. • Maintain voluntary counselling, testing, and referral testing for HIV consistent with SA laws. • Provision of Appropriate IEC materials on site. • Both male and female condoms shall be distributed to workers on the site. • Employment of workers shall not discriminate HIV and AIDS affected persons. • Develop an effective interface with community / Traditional Authorities and local authorities for reporting any increase in high-risk sexual behaviour from elements of the workforce and development of commercial sex work in communities especially linked the Project workforce.	• Documented risk assessment • Documented program • Inspection records • Training materials and attendance registers

No.	Themes	Control Measures	Indicators
		• Evaluate opportunities to develop a Community STI Control Program as an extension of the Project program. Align with current programs undertaken in Project Area. • Evaluate supporting the local health authorities with STIs. • Provide training and awareness campaigns.	
12.	**Health Services Infrastructure & Systems Issues**	• Assess status and capacity of local community health services in relation to the Project. • Consider assisting with the improvement of local healthcare infrastructure.	• Documented assessment • Monitoring records
13.	**Conflict**	• Institute policies restricting worker contact with local communities. • Establish system to monitor violence at the community level, linked to closure activities. • Provide related training and awareness creation.	• Documented policy • Training materials and attendance registers
14.	**Population Influx**	• Develop and implement a policy for hiring of local labour and support to local sub-contractors. • Disseminate clear employment and contracting requirements to the local communities. • Collaborate with local authorities and comply with local systems for recruitment of local labour and contracting. • Provide training to local community members to help them meet basic hiring requirements. • Establish exclusion zone around the worker camp and Project site to manage illicit activities. • Consider including local law enforcement staff in the Project Area. Provide training to these staff on how to deal with all risks (e.g., prostitution) from the presence of labour influx. • Prevent the development of illegal settlements caused as a result of the Project. Collaborate with STLM on a regular basis to rapidly take action. • Mobilise and reinforce the presence of the local law enforcement in the Project Area. • Implement community awareness campaigns to build awareness about public health impacts from labour influx.	• Documented policy • Proof of community consultation and awareness creation
15.	**Illicit Behaviour & Crime**	• All workers shall be prohibited from: ○ Hunting ○ Fishing ○ Capturing wildlife ○ Purchasing Bush-meat ○ Purchasing any mineral (gold, stones, etc.) ○ Plant collection ○ Unauthorised vegetation burning ○ Over-speeding ○ Weapons possession (except by security personnel) ○ Working without PPE ○ Inappropriate interactions with local communities ○ Making disrespectful gestures or using any swearing words to anyone either in the community, or along the access road ○ Disrespecting local customs and traditions ○ Littering of the site and disposing trash in unauthorised places, ○ Use of alcohol by workers during working hours ○ Use of drugs by workers	• Enforcement of Code of Conduct • Crime levels • Training materials and attendance registers

No.	Themes	Control Measures	Indicators
		◦ Sexual harassment ◦ Engaging in prostitution ◦ Building unauthorised fires outside camp areas • Institute disciplinary measures for contraventions. • Provide training and awareness campaigns. • Monitoring of crime levels.	
16.	**GBV & SEA/SH**	• Health Services: ◦ Assess the capacity and the availability of quality, safe and ethical services for survivors of SEA/SH for the Project. • Consultation & Communication: ◦ Inform local communities of SEA/SH risks related to the Project. Implement a SEA/SH and Violence Against Children (VAC) awareness campaign with the affected communities. ◦ Obtain feedback from relevant local stakeholders (political, cultural or religious leaders, health teams, local councils, social workers, women's organisations and groups working with children) on SEA/SH safeguards. • Induction, Training & Awareness Creation: ◦ Induction training about GBV and VAC will be mandatory for all construction workers. ◦ Provision will be made for the local law enforcement to be present during induction to explain the national laws that make SEA/SH and VAC punishable offences. ◦ Provide ongoing SEA/SH and VAC training to workers. • Grievance Redress Mechanism (GRM): ◦ Develop and implement a formal GRM to record, investigate and resolve any incidents of GBV/SEA/SH related to the Contractor's workers. ◦ Multiple complaint channels will be provided as part of the GRM, included submission in person, by phone, text message, mail or e-mail. ◦ Survivor information will be kept confidential and anonymous. ◦ Raise awareness of the GRM with the local communities and stakeholders. ◦ Monitor the effectiveness of the GRM. • Facilities: ◦ Provide separate, safe and easily accessible facilities for women and men working on the construction site. ◦ Locker rooms and/or latrines will be located in separate areas, well-lit and include the ability to be locked from the inside. ◦ Display signage indicating the Contractor's zero tolerance to SEA/SH. ◦ Public spaces around the construction site will be well-lit ◦ Inspect facilities • Local Law Enforcement: ◦ Mobilise and reinforce the presence of the local law enforcement in the Project Area.	• Documented assessment • Identified SEA/SH Services Provider(s) • Proof of communication • Induction records • Training materials and attendance registers • Documented GRM • Monitoring records • Proof of awareness creation • Visible signage • Inspection records • Proof of local law enforcement involvement • Documented program • Documented sanctions • Enforcement of Code of Conduct

No.	Themes	Control Measures	Indicators
		○ Involve local law enforcement in induction training to discuss SEA/SH offences. • Child Labour: ○ Develop program to ensure that children and minors are not employed directly or indirectly by the Contractor of sub-contractors. ○ Any person under the age of 18 shall not be employed in the project sites. • Sanctions: ○ Sanctions will be applied if a construction worker is confirmed as a SEA/SH perpetrator. • Sanctions will be explained to all workers.	

5.20.3.2 Monitoring

Monitoring will be undertaken to verify the effectiveness of the control measures for community health and safety. The Community Health and Safety Plan will make provision for monitoring requirements. Preliminary indicators are also provided in Table 46 above.

5.20.3.3 Technical Investigations

The following technical input will be required for the Project in terms of community health and safety:

- The necessary input will be required from Eskom and the designer, in accordance with their respective duties stipulated in the Construction Regulations (GN No. R. 84 of 7 February 2014) in terms of the potential hazards and technical mitigation measures (amongst others) related to the public; and
- Technical investigations will need to be undertaken to inform the requirements for the capping of the ash dam, dam safety and leachate management, in order to safeguard the community.

5.21 Cumulative Impacts

5.21.1 Introduction

A cumulative impact, in relation to an activity, means the past, current and reasonably foreseeable future impact of an activity, considered together with the impact of activities associated with that activity, that in itself may not be significant, but may become significant when added to the existing and reasonably foreseeable impacts eventuating from similar or diverse activities.

Cumulative impacts can be identified by combining the potential environmental implications of the Project with the impacts of projects and activities that have occurred in the past, are currently occurring, or are proposed in the future within the Project Area or region. It is noted that the accurate characterisation of the future state of the Project Area is inherently speculative to an extent, due to the dynamic nature of future decisions related to land use (e.g., surrounding mines), water use (consumptive, waste-related and encroachments), protection of terrestrial and aquatic biological resources, etc.

The following is noted in terms of sources of potential cumulative impacts:

- Current and reasonably defined/foreseeable third-party projects – At this stage, no other third-party projects have been identified in the Project Area; and
- Developments or activities induced by the Project – These include Component B (repurposing project) and Component C (transition support for Komati permanent workers, suppliers and contract workers, community development and economic diversification and stakeholder engagement).

According to the IFC Good Practice Handbook (Cardinale & Greig, 2013), cumulative impacts are contextual and encompass a broad spectrum of impacts at different spatial and temporal scales. The spatial area of influence (AOI) encompasses the geographical area impacted by the Project. The timescale over which the Project is likely to cause impacts include the decommissioning phase as well as post-closure.

The potential negative and positive cumulative impacts are listed in the sub-sections to follow, based on the current understanding of the Project and the receiving environment. The final ESIA Report will contain a detailed assessment of cumulative impacts, which will incorporate the findings of the specialist studies and technical investigations.

5.21.2 Cumulative Impacts between Components A & B

It is anticipated that there will be an overlap between the programmes for the execution of the closure (Component A) and repurposing (Component B) projects, which could lead to cumulative impacts (such as noise, dust, social disturbances, OHS risks, traffic, etc.). However, the closure activities will first need to be sufficiently completed in certain areas before the construction of the renewable energy components can commence (e.g., rehabilitation of the ADF to allow for the construction of a solar PV area on top of it). These cumulative impacts will be assessed during the ESIA by considering the Decommissioning Plan (including execution plan) for Component A and detailed scope of Component B, as well as the outcomes of the respective specialist studies and technical investigations for both these projects.

5.21.3 Negative Cumulative Impacts

The potential negative cumulative impacts associated with the Project are captured in Table 47 below.

Table 47: Potential negative cumulative impacts associated with the Project

Theme	Potential Negative Cumulative Impacts	Additional Investigations	Mitigation
Geohydrology	• Cumulative impacts associated with the failure to isolate pollution sources and to remediate	• Soil, Surface Water and Groundwater Assessment.	• Remediation Plan.

Theme	Potential Negative Cumulative Impacts	Additional Investigations	Mitigation
	contaminated land will result in localised and regional impacts to groundwater that will persist beyond the closure of the power station.	• Technical investigations related to water management (see Section 8.5.3 below).	
	• Contribution of poor decommissioning practices to ground water pollution that is also being caused by other land uses (e.g., mining).	Technical investigations related to water management (see Section 8.5.3 below).	• Groundwater Management Plan. • IWWMP. • Closure Plan. • ESMP.
Surface Water	• Cumulative impacts associated with the failure to isolate pollution sources and to remediate contaminated land will impact surface water that will persist beyond the closure of the power station.	• Soil, Surface Water and Groundwater Assessment. • Technical investigations related to water management (see Section 8.5.3 below).	• Remediation Plan.
	• Contribution of poor decommissioning practices to reduction in water resource quality (water quality, aquatic biota, flow and habitat) that is also being caused by other land uses (e.g., mining and agriculture) in the catchment.	Aquatic Impact Assessment	• Surface Water Management Plan. • IWWMP. • Closure Plan. • ESMP.
Soil	• Cumulative impacts associated with the failure to isolate pollution sources and to remediate contaminated land will result in localised and regional impacts to soil that will persist beyond the closure of the power station.	• Soil, Surface Water and Groundwater Assessment. • Technical investigations related to water management (see Section 8.5.3 below).	• Remediation Plan.
	• Soil erosion may be exacerbated during closure and post-closure, which is already encountered in the greater area as a result of other land use disturbances.	• Geotechnical Assessment. • Technical investigations related to rehabilitation and site drainage (see Section 8.5.3 below).	• Rehabilitation & Biodiversity Management Plan. • RSIP. • ESMP.
Air Quality	• Contribution of closure activities to fugitive emissions (particularly PM) in the area. • Certain fugitive emissions may persist following closure (including unrehabilitated ash dam and cleared areas). • The area will remain impacted by air pollution from mining activities in the area.	• Fugitive Emission Assessment. • Technical investigations related to rehabilitation (see Section 8.5.3 below).	• Air Quality Management Plan. • ESMP.
Terrestrial Ecology	• Potential additive effects of the closure activities to fauna include disturbances (e.g., noise, light, dust, vibration), disruption of wildlife corridors or habitat, contamination (surface water, groundwater and soil), transportation (road collisions) and poaching. • Contribution of closure activities to cumulative loss of indigenous vegetation. • Proliferation of invasive alien plants and weeds due to clearing of areas during closure and inadequate rehabilitation.	Terrestrial Ecological Impact Assessment	• Rehabilitation & Biodiversity Management Plan. • RSIP. • ESMP.

Theme	Potential Negative Cumulative Impacts	Additional Investigations	Mitigation
Waste	• Cumulative increase in waste generated by the closure activities and other projects in the region, with associated use of landfill space in STLM (non-hazardous waste) and Holfontein (hazardous waste).	Waste Management Assessment.	• Waste Management Plan. • ESMP.
Traffic	• The Project will cause additional traffic in the area on the local and regional roads. This may compound traffic impacts if other large-scale projects are planned during the same period, or existing traffic caused by mines in the region .	Technical investigations related to traffic (see Section 8.5.3 below).	• Traffic Management Plan. • ESMP.
Socio-Economic & Social Aspects	Cumulative impacts identified in the Socio-Economic Impact Study for the shutdown of Komati, Hendrina and Grootvlei (Urban-Econ Development Economists, 2020): • Cumulative reduction in national, provincial and municipal economies and GDP; • Cumulative employment losses and reduction in employment opportunities, with a resultant loss of sustainable income; • Loss of government revenue (loss of rates and taxes); and • Dilapidation of communities.	*As per the Socio-Economic Impact Study.*	
	• Cumulative risks to community health and safety due to closure activities.	• Social Impact Assessment.	• RAP. • SEP & GRM. • Labour Management Procedure. • SEA/SH Prevention and Response Plan.

5.21.4 Positive Cumulative Impacts

The potential positive cumulative impacts associated with the Project are captured in Table 48 below.

Certain of these positive impacts relate to incremental benefits associated with the shutdown of KPS together with the potential closure of mines in the area at some point in the future (to be confirmed and reliant on the end of life of these mining operations).

Table 48: Potential positive cumulative impacts associated with the Project

Theme	Potential Positive Cumulative Impacts
Geohydrology	• Contribution of closure activities, which are linked to the removal and/or containment of pollution sources and remediation of KPS site, to positive cumulative impacts to groundwater.
Surface Water	• Contribution of closure activities, which are linked to the removal and/or containment of pollution sources and remediation of KPS site, to positive cumulative impacts to surface water.
Soil	• Contribution of closure activities, which are linked to the removal and/or containment of pollution sources and remediation of KPS site, to positive cumulative impacts to soil.

Theme	Potential Positive Cumulative Impacts
Air Quality	• Contribution of closure activities, which are linked to the cessation of emissions related to coal combustion at KPS, to positive cumulative impacts to air quality. • With Eskom planning the decommissioning of 3 power stations in Mpumalanga, there will be a cumulative positive impact of GHG emissions in the province.
Terrestrial Ecology	• Contribution of closure activities, which are linked to the remediation and rehabilitation of the land and removal of pollution sources, to positive cumulative impacts to terrestrial ecology.
Visual	• Contribution of closure activities, which are linked to the dismantling of structures at KPS, to positive cumulative impacts to the visual quality of the area.
Traffic	• The Project will ultimately result in a positive impact to the road infrastructure and traffic loads during peak time.
Socio-Economic & Social Aspects	• Positive cumulative economic effects from Component A and Component B in terms of the temporary increase in job opportunities and economic input into local businesses during construction, as well as from Component C in terms of support to workers and communities.

5.22 Summary

Table 49 below provides a summary of the potential environmental and social impacts associated with the Project and indicates the anticipated application of the mitigation hierarchy for these impacts.

Note that this list is only regarded as preliminary and needs to be elaborated on following the receipt of technical information for the Project and once the findings of the specialist studies are available. Inputs received during detailed stakeholder engagement will also assist with developing a more comprehensive list of impacts, for which appropriate mitigation measures will be identified during the ESIA.

Table 49: Preliminary summary of potential environmental & social impacts and application of mitigation hierarchy
(A = avoid, R = reduce, M = mitigate, C = compensate)

Themes	Potential Environmental & Social Impacts	Mitigation Hierarchy A	R	M*	C
Geohydrology	• Negative impacts -				
	○ Failure to identify and isolate pollution sources and to remediate contaminated land will result in legacy impacts to groundwater that will persist beyond the closure of the power station.		✓		
	○ Possible influence on groundwater flow as a result of trenching and excavations.	✓			
	○ Potential contamination of groundwater through poor decommissioning.	✓			
	○ An indirect impact of groundwater pollution is the negative effects to surrounding landowners that utilise the groundwater for agricultural purposes.	✓			
	• Positive impacts –				
	○ The remediation of the site and removal of the pollution sources as part of the Project will benefit groundwater resources				
Surface Water	• Negative impacts -				
	○ Failure to identify and isolate pollution sources and to remediate contaminated land will result in legacy impacts to surface water that will persist beyond the closure of the power station.		✓		
	○ Reduction in water quality caused by poor decommissioning practices.	✓			
	○ Reduction in water quality through sedimentation.	✓			
	○ Alteration of drainage at KPS due to the removal of facilities.	✓			
	○ Encroachment of decommissioning activities into buffers of wetlands and damage to wetland vegetation as well as soil and sub-surface flow characteristics.		✓		
	• Positive impacts –				
	○ The aquatic systems will benefit from the remediation of the site and removal of the pollution sources as part of the Project.				
	○ With the closure of KPS, the power station's water consumption will be considerably reduced.				
Soil	• Negative impacts -				
	○ Failure to identify and isolate pollution sources and to remediate contaminated land will result in legacy impacts to soil that will persist beyond the closure of the power station.		✓		
	○ There is a likelihood of localised soil erosion during decommissioning as a result of creating open areas from dismantling existing facilities, excessive use of the gravel roads at the ADF, changes to site drainage, earthworks and improper storm water management.		✓		
	○ The use of heavy equipment during the decommissioning could lead to soil compaction.		✓		
	○ Soil could be contaminated through poor decommissioning practices.	✓			
	• Positive impacts –				
	○ There will be a net benefit to the land at KPS from the remediation of the site and removal of the pollution sources as part of the Project.				

Themes	Potential Environmental & Social Impacts	Mitigation Hierarchy			
		A	R	M*	C
Air Quality	• Negative impacts -				
	○ Dust from bare areas that have been cleared or other exposed areas on the site.		✓		
	○ Dust from the use of dirt roads by vehicles.		✓		
	○ Emissions from equipment, machinery and vehicles used for decommissioning purposes.		✓		
	• Positive impacts –				
	○ With the cessation of the operation of KPS, emissions from coal combustion will come to an end.				
	○ Fugitive emissions at KPS from coal storage and handling will cease.				
Climate	• Negative impacts -				
	○ Indirect emissions of GHG from grid power consumption.		✓		
	○ Mobile combustion emissions from fuel used in vehicles / mobile equipment.		✓		
	○ Emissions of GHG from use of diesel generators for back-up power production		✓		
	○ Emissions associated with transporting materials for offsite reuse, recycling or disposal.		✓		
	○ Rainfall in excess of the designed capacity of the storm water system will result in runoff from the site, which may pollute soil, surface water and groundwater.	✓			
	• Positive impacts –				
	○ The closure of KPS will cease the emission of greenhouse gases directly associated with coal combustion.				
	○ The proposed solar PV and wind energy development that forms part of the repurposing of KPS, which will be enabled by the decommissioning of the power station, will generate energy from renewable resources and mitigate climate change.				
ADF	*See comparison of options in Section 6.2.1*				
Land Use	*See comparison of options in Section 6.2.3*				
Terrestrial Ecology	• Negative impacts -				
	○ Failure to identify and isolate pollution sources and to remediate contaminated land will result in legacy impacts that will persist beyond the closure of the power station, and which will impact negatively on fauna and flora that are reliant on the receiving environment.		✓		
	○ Encroachment of decommissioning activities into natural areas due to poor planning and execution, which may lead to the loss of vegetation and threaten animal life.	✓			
	○ Invasive alien plants and weeds may proliferate in areas cleared during decommissioning and if rehabilitation is not undertaken properly, which may spread to adjoining areas.		✓		
	○ Animals may be killed (road collisions, poaching) or disturbed (noise, light, dust, vibration, etc.).		✓		
	○ Pollution caused by poor decommissioning practices may result in the offsite migration of contaminants, which will harm flora and fauna.	✓			
	○ Poor waste management practices may result in the occurrence of pest animals.	✓			
	• Positive impacts –				
	○ The closure of the power station and the remediation and rehabilitation of the land will benefit terrestrial ecology.				
Visual Quality	• Negative impacts -		✓		

Themes	Potential Environmental & Social Impacts	Mitigation Hierarchy			
		A	R	M*	C
	○ Temporary visual impacts will be caused during the decommissioning phase, due to the various activities associated with dismantling facilities • Positive impacts – ○ The shutdown and dismantling of the power station, particularly the large structural components that are highly visible, will have a positive impact on the overall visual quality of the area.				
Noise & Vibration	• Negative impacts - ○ Noise and vibration will be caused by the operation of equipment used to dismantle and rehabilitate facilities, and by the transportation of equipment, materials and people to and from the site. ○ Noise can be created by the labour force used to undertake the decommissioning. ○ Noise and vibration may disturb surrounding communities and animal life and can also pose occupational risks. • Positive impacts – ○ Cessation of operations at coal-fired power station.		✓ ✓ ✓		
Waste	*See comparison of options for managing non-hazardous waste in Section 6.2.2.1 and hazardous waste in Section 6.2.2.2*				
Transportation	• Negative impacts - ○ During the decommissioning phase, a large number of trucks will utilise the road network to transport waste and workers. This may pose potential traffic and road safety risks to workers, the surrounding communities and road users. • Positive impacts – ○ The surrounding round network will no longer be used by trucks hauling coal to KPS. ○ The renewable energy facility will not have as many employees as the power station during its operational phase, and the roads will not carry as many commuters to KPS.		✓		
Socio-Economic Aspects	• Negative impacts - ○ Potential economic losses and reduced employment and loss of household income, due to closure of KPS and impacts on those dependent on the coal value chain. ○ Threats to the stability of the local area. ○ Deterioration of the communities' health. ○ Exodus of skills from the area. ○ Decline in property values and social cohesion. ○ Possible deterioration of the built environment. ○ Reduction in the standard of living. • Positive impacts – ○ Create opportunities for the development of the local economy. ○ Create green jobs. ○ Reduction in coal dependency. ○ *Cross-cutting mitigation measures under other themes, especially related to Component C in terms of support to workers and communities*.			✓	

Themes	Potential Environmental & Social Impacts	Mitigation Hierarchy			
		A	R	M*	C
Social Aspects	• Negative impacts -				
	○ Insufficient or inadequate stakeholder engagement.	✓			
	○ Dwellings of community members situated approximately 100m to the south-east of Ash Dam 1. Depending on the required buffer zone around the ash dam, these dwellings may need to be relocated for their own safety.			✓	
	○ Health and social well-being impacts.				
	○ Quality of the living environment impacts.				
	○ Economic and material well-being impacts.				
	○ Displacement of people and influx of construction workers.				
	○ Institutional, legal political and equity impacts.				
	○ Gender related impacts.				
	○ *Cross-cutting adverse impacts under other themes*.				
	• Positive impacts –				
	○ Economic and material well-being impacts.				
	○ *Cross-cutting mitigation measures under other themes, especially related to Component C in terms of support to workers and communities.*				
Heritage	• Negative impacts -				
	○ Dismantling of structures older than 60 years.			✓	
	• Positive impacts –				
	○ Opportunity for conserving structures older than 60 years.				
OHS	• Negative impacts -				
	○ Occupational injuries and diseases.	✓			
Community Health and Safety	• Negative impacts -				
	○ Impacts caused by poor planning and communication with the affected communities in the Project Area.	✓			
	○ Failure to identify and isolate pollution sources and to remediate contaminated land, with resultant legacy impacts to local communities that will persist beyond the closure of the power station.		✓		
	○ Contamination of air, soil and water from decommissioning activities or facilities, with resultant impacts to local communities.	✓			
	○ Accidents occurring during decommissioning that involve communities and their animals and livestock.	✓			
	○ Impacts of Project's security on local communities.	✓			
	○ Spread of communicable diseases by workers to the local communities.	✓			
	○ Transfer of disease from in-migrants and workforce to community.	✓			
	○ Potential exposure to vector-related diseases.	✓			
	○ Increased competition for the direct and indirect economic opportunities created by the Project (labour Influx).	✓			
	○ SEA/SH regarding community members.	✓			
	○ Forced labour and child labour.	✓			
	○ Risks to vulnerable and marginalised groups (including informal settlements surrounding KPS).	✓			
	○ Drowning risks related to water bodies at KPS.	✓			
	○ Risk of dam failure (ADF) to the community.	✓			

Themes	Potential Environmental & Social Impacts	Mitigation Hierarchy			
		A	R	M*	C
	○ Breakdown in worker–community relationship. • Positive impacts – ○ Benefits associated with removal of pollution sources and remediation of contamination.	✓			

* *According to the World Bank ESF, the requirement to mitigate impacts may include measures to assist affected parties to improve or at least restore their livelihoods as relevant in a particular project setting*

CHAPTER 6: ANALYSIS OF ALTERNATIVES

6 ANALYSIS OF ALTERNATIVES

6.1 Introduction

Alternatives are the different ways in which the Project can be executed to ultimately achieve its objectives. Examples could include carrying out a different type of action, choosing an alternative location or adopting a different technology or design for the Project. According to ESS1 (World Bank, 2016), the ESIA needs to systematically compare the Project's feasible alternatives in terms of their potential environmental and social impacts.

This chapter discusses the Project's feasible alternatives considered during the compilation of the draft ESIA Report. The description of Project alternatives will be elaborated on once Eskom's detailed Decommissioning Plan has been reviewed. At this stage, the environmental and social impacts associated with the alternatives were only compared on a qualitative level (where sufficient information was available) and will only be quantified in the final ESIA Report. Economic values of the alternatives will also only be available following further investigations that will form part of the ESIA and will be presented in the final ESIA Report.

The final ESIA Report will include a detailed comparative analysis of the Project's feasible alternatives, taking into consideration the environmental, social, technical, and economic factors. This will ultimately result in the selection of the best practicable environmental option (BPEO). Münster (2005) defines the BPEO as the alternative that "*provides the most benefit or causes the least damage to the environment as a whole, at a cost acceptable to society, in the long term as well as in the short term*". The justification of the BPEO will aim to demonstrate that the outcomes of this preferred alternative will be able to satisfy the objectives of the ESSs and the applicable EHS Guidelines and is unlikely to result in any significant environmental or social harm.

6.2 Project Alternatives

6.2.1 ADF Options

The options under consideration for the closure of the ADF, as discussed in Section 3.4.4 and Section 5.10 above, include the following:

- Default Option: Keep ADF;
- Ash beneficiation; and
- Treatment.

There may also be potential for combining these options, such as encapsulating the ash dam and preserving it as a resource for future or progressive use.

A preliminary list of advantages and disadvantages related to the above alternatives is provided in Table 50 below.

Table 50: Preliminary comparison of ADF closure options

Project Alternatives	Advantages	Disadvantages
Default Option: Keep ADF	• Allows for solar PV development on top of the ash dam, if deemed viable. • Allows for disposal of inert waste and coal residue at ash dam during closure. • Conventional approach to decommissioning ash dams. • This option does not preclude future beneficiation, if a market is established.	• WML required. • Long-term management and monitoring obligations (air quality, water resources, soil, stability, visual). • Liabilities related to legacy impacts. • Risks of structural failure.
Ash Beneficiation	• Productive use of ash as a resource for multiple applications. • Preference in terms of the waste management hierarchy, as opposed to disposal. • Potential uptake by surrounding mines for mine Backfilling and treatment of mine drainage. • Job creation, small business development and opportunities for community-based projects. • Existing railway network supports transportation of product. • Commercial benefits from selling ash. • Eskom was granted approval under the Waste Exclusion Regulations (GN No. 715 of 18 July 2018) for ash to be excluded from the definition of waste in terms of NEM:WA for various beneficial uses. • Creating vacant space at ADF footprint to allow for other land use (e.g., agriculture, renewable energy).	• Market constraints include the location of KPS as well as the quality (age) of the ash. • Requires a market that will consume high volumes of ash. • Risks to stability of ash dams during beneficiation. • Environmental and social risks related to handling, storage, transportation and processing of ash (e.g., spillages during loading and unloading and during transportation). • Removal of section of the ADF containing the asbestos to allow for beneficiation. Risks associated with handling and transportation of asbestos. Capacity constraints at Holfontein (or another hazardous waste disposal site) to receive large volume of asbestos. • Delay with creating open space following beneficiation of ADF to allow for future renewable energy development. • Fugitive dust - inadequate management of dust during ash beneficiation activities and health risks to community and renewable energy development (including soiling of PV panels). • The layout of the facilities required for ash beneficiation will need to be determined and assessed, including constraints posed by land space, water management system, presence of wetlands and secondary natural grasslands, and proposed footprint of new solar PV plant (amongst others). There may also be a requirement to seek environmental approvals for ash beneficiation facilities. • Cradle-to-grave requirements - compliance of ash users with legal requirements and best practices.
Treatment	• Preference in terms of the waste management hierarchy, as opposed to disposal. • Commercial benefits from selling decontaminated material.	• Managing pollution and waste from treatment of ash. • Capacity constraints at Holfontein (or another hazardous waste disposal site) to receive large volume of concentrated waste material.

6.2.2 Waste Management Options

6.2.2.1 Non-Hazardous Waste

Options for disposal of non-hazardous waste, if deemed unsuitable for reuse or recycling, include creating a permanent onsite waste disposal facility at KPS that will be rehabilitated after closure or disposal at a licenced waste disposal facility.

A preliminary list of advantages and disadvantages related to the options for the disposal of non-hazardous waste is provided in Table 51 below.

Table 51: Preliminary comparison of waste management options – non-hazardous waste

Project Alternatives	Advantages	Disadvantages
Permanent onsite waste disposal facility	• Avoid long hauling distances and associated risks and costs linked to offsite disposal.	• WML required. • Long-term management and monitoring obligations (air quality, water resources, soil, stability, visual). • Eskom becomes custodian of permanent facility and needs to adhere to obligations of a "waste manager" in terms of the Waste Classification and Management Regulations and National Norms and Standards for Disposal of Waste to Landfill (GN R. 636 of 23 Aug 2013). • Liabilities related to legacy impacts of permanent facility. • Sterilisation of land within footprint of permanent waste disposal facility. • Adherence to minimum engineering design requirements for containment barrier. • Constrains associated with limited space at the power station complex to accommodate a permanent waste disposal facility.
Offsite Disposal	• Eskom remains "waste generator", with no long-term obligations following disposal at licenced waste disposal facility. • Existing waste management system at KPS includes offsite disposal of non-hazardous waste.	• Environmental and social risks associated with transportation of waste to offsite waste disposal facility. • Potential high costs of offsite disposal. • Capacity constraints at existing waste disposal facilities in region. • Cradle-to-grave requirements - compliance of existing waste disposal facilities in region to licence conditions.

6.2.2.2 Hazardous Waste

Various hazardous waste types will be generated during closure (see Section 5.15.3.2 above). Options for dealing with hazardous waste include the following:

- ❑ Offsite disposal at Holfontein (or another hazardous waste disposal site); or

- ❑ Onsite treatment to change the physical, chemical, or biological character or composition of hazardous waste to neutralise such waste or to render such waste non-hazardous.

A preliminary list of advantages and disadvantages related to dealing with hazardous waste is provided in Table 52 below.

Table 52: Preliminary comparison of waste management options – hazardous waste

Project Alternatives	Advantages	Disadvantages
Treat and manage as non-hazardous waste	• Reduction in volume of hazardous waste to be disposed of offsite. • Allows for treated waste to be handled and disposed of as non-hazardous waste. Provides disposal options (see Section 6.2.2.1 above). • Allows for beneficial use of treated waste (e.g., use as fill material).	• Treatment costs. • Risk of unsuccessful treatment. • Identification of treatment facility. • Environmental and social risks associated with treatment. • Management obligations and liabilities associated with treatment of hazardous waste. • Managing pollutants and waste generated during treatment.
Offsite Disposal	• Conventional approach to disposing of hazardous waste. Existing waste management system at KPS includes disposal of hazardous waste at Holfontein.	• Environmental and social risks associated with transportation of hazardous waste. • Capacity constraints at Holfontein (or another hazardous waste disposal site) to receive large volume of hazardous waste. • High costs associated with offsite disposal of hazardous waste. • Cradle-to-grave requirements.

6.2.3 Land Use & End-State Options

The future use of the land that is reclaimed by the dismantling and decommissioning of the facilities at KPS will determine the desired end-state of the affected areas. Apart from the proposed renewable energy development that forms part of the repurposing of the power station, other areas will also become available for consideration of other land uses and end-states (see Section 5.11 above). A preliminary comparison of future land use and end-state options is provided in Table 53 below.

Table 53: Preliminary comparison of future land use and end-state options

Project Alternatives	Advantages	Disadvantages
Remain vacant	• Create natural areas that link to surrounding ecological systems (e.g., wetlands and grassland). • Restoration of ecosystem goods and services. • Remove facilities and elements of KPS that currently encroach into wetland buffers (e.g., haul road along the north-eastern boundary of the power station).	• Constraints to rehabilitation for natural areas (e.g., significantly altered soil structure and drainage). • Constraints posed by contamination of surrounding land uses (historical and future). • Control of invasive alien species. • Risk of overgrazing once rehabilitated, in absence of access control.
Agriculture	• Restoration of productive use of land.	• Limited space. • Constraints to rehabilitation for agricultural purposes (e.g.,

Project Alternatives	Advantages	Disadvantages
	• Offset for loss of cultivated area south-west of ADF earmarked for solar PV plant. • Community benefits.	significantly altered soil structure and drainage). • Long-term option at ADF only if ash beneficiation is to proceed and land will become available to accommodate agriculture. • Historical impacts on land capability to prevent viable agriculture. • Legal requirements (e.g., lease agreement).

6.2.4 Repurposing Options

Consideration will need to be given to repurposing options (other than renewable energy) that will benefit the surrounding communities, including the nearby Komati Village, that will be impacted by the closure of the KPS. Although there will be temporary benefits during closure and the subsequent construction phase for repurposing (e.g., accommodation, use of services, purchasing of goods at local stores, job opportunities, etc.), mitigation options for long-term impacts to communities that are reliant on the power station will need to be explored.

The advantages associated with repurposing for community benefits will need to be weighed against possible disadvantages, such as high remodelling costs, management burden, exposure to occupational and community health and safety risks, etc.

6.2.5 Remediation Options

Contaminated soil and groundwater will need to be remediated to prevent, minimise, or mitigate harm to human health or the environment. Remediation techniques are categorised as follows:

- ❑ Ex situ remediation, which involves excavating contaminated soil from its original location and subsequent treatment onsite or offsite, as well as extracting contaminated groundwater and further treatment at the surface; or
- ❑ In situ remediation, which involves treating the contamination in its original place, without removing the soils or groundwater from their original location.

The detailed findings of the Soil, Surface Water and Groundwater Assessment will provide the basis for mitigating the environmental and social risks associated with contaminated groundwater at KPS. This will include identifying and addressing the pollution sources, as well as determining the remediation requirements.

6.2.6 No-Go / Without Project Option

The “no go” or “without project” option needs to be considered in light of the need and desirability of the Project. Some key considerations in this regard include:

- ❑ From a national strategic perspective, the Project supports SA’s commitment to just energy transition. In addition, SA has identified the need to supply a diversified power generation that includes renewable energy technologies, such as proposed by the repurposing project that will be enabled by the shutdown and dismantling of KPS. This is in light of the country's endeavour and commitment to reduce the carbon footprint created by the current heavy reliance on coal to produce electricity.

- KPS' units are small and have a higher operating and maintenance cost per MW generated compared to modern newer stations. The power station will reach its end-of-life expectancy in September 2022 when Unit 9, which is the last unit still in operation, will reach its DSD. This necessitated the shutdown and closure of the power station.
- The Project holds various environmental and social benefits associated with the cessation of operation of a coal combustion power station, as well as the associated removal of pollution sources and the remediation of contamination, including improvements in air quality, surface and groundwater quality, and soil conditions.

CHAPTER 7: STAKEHOLDER ENGAGEMENT

7 STAKEHOLDER ENGAGEMENT

7.1 Introduction

The Stakeholder Engagement Plan (SEP) outlines the stakeholder engagement process that will be undertaken throughout the ESIA with stakeholders who are either interest in the Project or who will be or are likely to be affected by the proposed closure of KPS.

The SEP will be updated and refined throughout the Project, as and when required. Nemai Consulting will inform the relevant parties if any significant changes are made to the SEP and disclose the updated version.

7.2 Purpose of the Stakeholder Engagement Plan

Overall, the purpose of the SEP is to ensure that the approach to stakeholder engagement and project disclosure is as transparent, consistent, comprehensive and coordinated as possible. The SEP aims to make sure the stakeholder engagement process is conducted in a timely, relevant and accessible way, allowing for all stakeholders to voice their opinions and concerns in a way that suits them best. It is intended to illustrate Eskom's commitment to approaching engagement through an international best practice approach and fully complying with all relevant SA legislation and regulations, as well as the standards set out by the World Bank with regards to stakeholder engagement.

The SEP does not just outline the approach to stakeholder engagement and how it will be integrated into the overall ESIA process and throughout the Project, but also identifies and describes the different categories of stakeholders, how they are going to be included in the ESIA process and the specific way they should be engaged with. Lastly, the SEP describes how engagement will be documented throughout the Project and it includes a GRM.

7.3 Objectives of Stakeholder Engagement

Effective and inclusive stakeholder engagement allows for all stakeholders to express their views throughout a project life cycle. It fosters a reliable, responsive, and constructive relationship between project management and stakeholders which often proves to be a crucial factor in the successful assessment and management of environmental and social risks associated with a project.

The objectives of engagement with stakeholders during the ESIA process and throughout the Project include:

- Building Relationships: Designing a systematic approach to engagement that supports open dialogue between Eskom and stakeholders will allow productive relationships between them to be built and maintained. Good relationships will make the ESIA process more effective and streamlined.

- Ensuring Understanding: The stakeholder engagement process will increase mutual understanding between Eskom and the stakeholders. This will allow stakeholders to be well informed about the Project and the associated environmental and social impacts and risks, and for Eskom to understand the concerns as well as the level of support stakeholders have with regards to the Project. This way Eskom can take into consideration the stakeholders' views when designing the Project.
- Foster Effective Communication: Effective stakeholder engagement will foster effective communication between the different parties involved. Information regarding the Project and its environmental and social risks and impacts should be disclosed to stakeholders in a timely and understandable manner. This means information will be disclosed in an accessible place and in a form and language that is appropriate and understandable to project-affected parties and other interested parties. It should be easy for stakeholders to communicate issues and grievances and for Eskom to respond to concerns being raised.
- Involving Stakeholders in the Assessment: Stakeholders can inform the ESIA by providing important information and local knowledge relevant to the Social Impact Assessment, such as the social baseline, scoping of issues as well as assessment of impacts and mitigation measures.

7.4 Key Standards and Legislation Guiding Stakeholder Engagement

This SEP was developed to comply with all relevant SA legal requirements as well as the World Bank's Environmental and Social Standards (ESS) 10: *Stakeholder Engagement and Information Disclosure* and the World Bank Technical Note: *Public Consultations and Stakeholder Engagement in WB-supported operations when there are constraints on conducting public meetings*, published by the World Bank on March 20, 2020.

7.4.1 SA Legislative Requirements

Chapter 6 of the EIA Regulations prescribes the requirements for public participation for the S&EIR process (refer to Section 8.7 below).

7.4.2 World Bank Environmental and Social Standards

7.4.2.1 ESS 10: Stakeholder Engagement and Information Disclosure

The World Bank requires the Borrower to provide Stakeholders with sufficient information about potential risks and impacts that the project might have on them, in a way that is timely, understandable, and accessible. The Bank recognised the importance of meaningful and continuous engagement with stakeholders through consultation, information disclosure and informed participation (ESF, 2017).

ESS 10 states that the Borrower should communicate with stakeholders throughout the project life cycle and that this communication should start as soon as possible. In order to have meaningful consultation with the stakeholders on the design of the project, it is important that the Borrower engages with the stakeholder in a timely manner.

It is important that the stakeholder can understand and access the relevant information. The information that is provided by the Borrower must be tailored to the cultural context and language of the stakeholder. It is forbidden to use manipulation, coercion, discrimination, intimidation, or interference throughout the stakeholder engagement process.

7.4.2.2 The World Bank Covid-19 Protocol

This SEP and the engagement activities and public consultations it describes are subject to the Technical Note: *Public Consultations and Stakeholder Engagement in WB-supported operations when there are constraints on conducting public meetings*, published by the World Bank on March 20, 2020. This document provides technical guidance to World Bank-supported operations when dealing with Covid-19 related issues, especially within the stakeholder engagement process.

It is understood that currently, the Covid-19 situation is relatively stable and that as of June 22, 2022, all national Covid-19 restrictions have been lifted. Therefore, there are no restrictions placed on public gatherings that would impede the stakeholder engagement process. However, the team will make provisions to protect stakeholders through encouraging voluntary mask wearing, enabling social distancing and meeting in well-ventilated spaces. This SEP will be adapted accordingly, should the Covid-19 situation worsen. The team will use the World Bank Technical Note for guidance when re-designing the engagement process, as necessary.

7.5 Stakeholder Identification and Analysis

7.5.1 Stakeholder Identification

When trying to identify the stakeholders and their needs, the team looked at specific sectors and areas that might be affected or influenced by the closure of KPS, either in a negative or positive way. Within these categories, we looked for relevant communities, governmental agencies and institutions, NGOs and civil society groups, special interest groups and research organisations. The team came up with the following set of spheres of impact:

- Environment;
- Business;
- Agriculture;
- Tourism;
- Labour; and
- Science and Innovation.

7.5.2 Stakeholder Categorisation

The identified stakeholders were categorised into interested or project-affected parties:

Interested Parties	Interested parties are stakeholders that have an interest in the Project but are not affected by the Project in a significant way.
Project-Affected Parties	Project-affected parties are stakeholders that are directly/indirectly affected by the Project or likely to be affected by the Project. **Directly affected** parties are stakeholders whose environment, health or livelihood is directly affected (either positive or negative) by the shutdown of Komati Power Plant**. Indirectly affected** parties are stakeholders who are involved with or responsible for directly affected parties.

7.5.3 Stakeholder Prioritisation

After identifying and categorising the relevant stakeholders, the stakeholders were analysed to determine the level of influence a stakeholder has on the Project and level of impact the Project might have on the stakeholder. This stakeholder prioritisation process will help inform the mode and frequency of engagement with every individual stakeholder and help determine which stakeholders are more vulnerable to being left out of the engagement process all together.

	Level of Influence/Interest
High	The stakeholder or stakeholder group has a high level of potential influence over the success and reputation of the Project. They may be able to halt or delay the Project significantly or significantly influence the reputation of the Project, both nationally and internationally.
Medium	The stakeholder or stakeholder group has some a moderate amount of potential influence over the Project. They are moderately able to influence the site's operations and/or reputation.
Low	The stakeholder or stakeholder group is isolated and does not have a lot of influence over the Project. They are not able to meaningfully influence the site's operations or influence the Project's reputation.

	Level of Impact
High	The stakeholder or stakeholder group is going to be highly affected by the Project, either in a negative or positive way, and is highly sensitive to certain impacts.
Medium	The stakeholder or stakeholder group will be moderate affected by the Project and is moderately sensitive to certain impacts.
Low	The stakeholder or stakeholder group is minimally affected by the Project and is not sensitive to certain impacts.

Table 54 below summarises the stakeholders according to the following categories:

- Interested parties are highlighted in green and project-affected parties are highlighted in yellow;
- National, Provincial, District and Local level; and
- High, medium or low level of Influence and/or Interest and high, medium, or low level of Impact.

The preliminary database of stakeholders is contained in Appendix C.

Table 54: Stakeholder Identification and Prioritisation

Organisation	High interest/influence	Medium interest/influence	Low interest/influence	High impact	Medium impact	Low impact
NATIONAL LEVEL						
National Treasury			X			X
Mining and Environmental Justice community Network of South Africa (MEJCON-SA)	X				X	
Centre for Environmental Rights (CER)	X				X	
The National Union of Mineworkers (NUM)	X				X	
The National Union of Metalworkers of South Africa (NUMSA)	X				X	
The South African Transport and Allied Workers Union (SATAWU)	X				X	
DFFE	X					X
Department of Employment and Labour (DEL)	X					X
DARDLEA		X				X
Department of Public Enterprise (DPE)	X				X	
Department of Trade, Industry and Competition (DTIC)		X				X
DMRE		X				X
Department of Science and Innovation (DSI)		X				X
Mineral Council South Africa		X				X
National Energy Regulator of South Africa (NERSA)		X				X
PROVINCIAL LEVEL						
Mpumalanga Environmental Youth Network	X				X	
Mpumalanga Green Cluster Agency	X				X	
Vukani Environmental Justice Movement in Action	X				X	
Mpumalanga Green Economy Cluster	X				X	
groundWork	X				X	
Mpumalanga Department of Economic Development and Tourism		X				X
Mpumalanga Economic Growth Agency		X				X
Mpumalanga Tourism and Parks Agency		X				X

Organisation	High interest/influence	Medium interest/influence	Low interest/influence	High impact	Medium impact	Low impact
Mpumalanga Heritage Resource Authority		X				X
Mpumalanga Department of Community Safety, Security and Liaison		X				X
Mpumalanga Department of Health		X				X
Mpumalanga Department of Social Development		X				X
Mpumalanga Department of Human Settlements	X				X	
Mpumalanga Department of Cooperative Governance and Traditional Affairs	X				X	
Office of the Premier		X				X
DISTRICT LEVEL						
Nkangala District Municipality	X					X
LOCAL LEVEL						
Steve Tshwete Local Municipality	X				X	
Middleburg Environmental Justice Network	X				X	
Greater Middelburg Residents Association	X				X	
Greater Middelburg Housing Association	X				X	
Middelburg Collective Unemployment Forum	X				X	
Middelburg Chamber of Commerce and Industry		X				X
Goedehoop / Hope		X		X		
Banks Collieries		X		X		
Sizanane		X		X		
PRIMARY STUDY AREA						
Komati Town / Koornfontein Village		X		X		
Blinkpan		X		X		
Broodsnyersplaas		X		X		
Gelukplaas		X		X		
Middelkraal		X		X		
'Big House'			X	X		
Schoeman Farm			X	X		
Snybroerplaas / Vlakplaas			X	X		
Farm Belt		X		X		
Ward 4		X		X		

Organisation	High interest/influence	Medium interest/influence	Low interest/influence	High impact	Medium impact	Low impact
Ward 6		X		X		
OTHER						
Mintek			X			X
University of Cape Town (UCT)			X			X
The Impact Catalyst			X			X

7.5.3.1 Stakeholder Matrix

Below are five matrixes (Figure 108 to Figure 112) that visualise the influence/interest – impact analysis that was conducted. The results have been organised according to National, Provincial, District and Local Level, as well as Other.

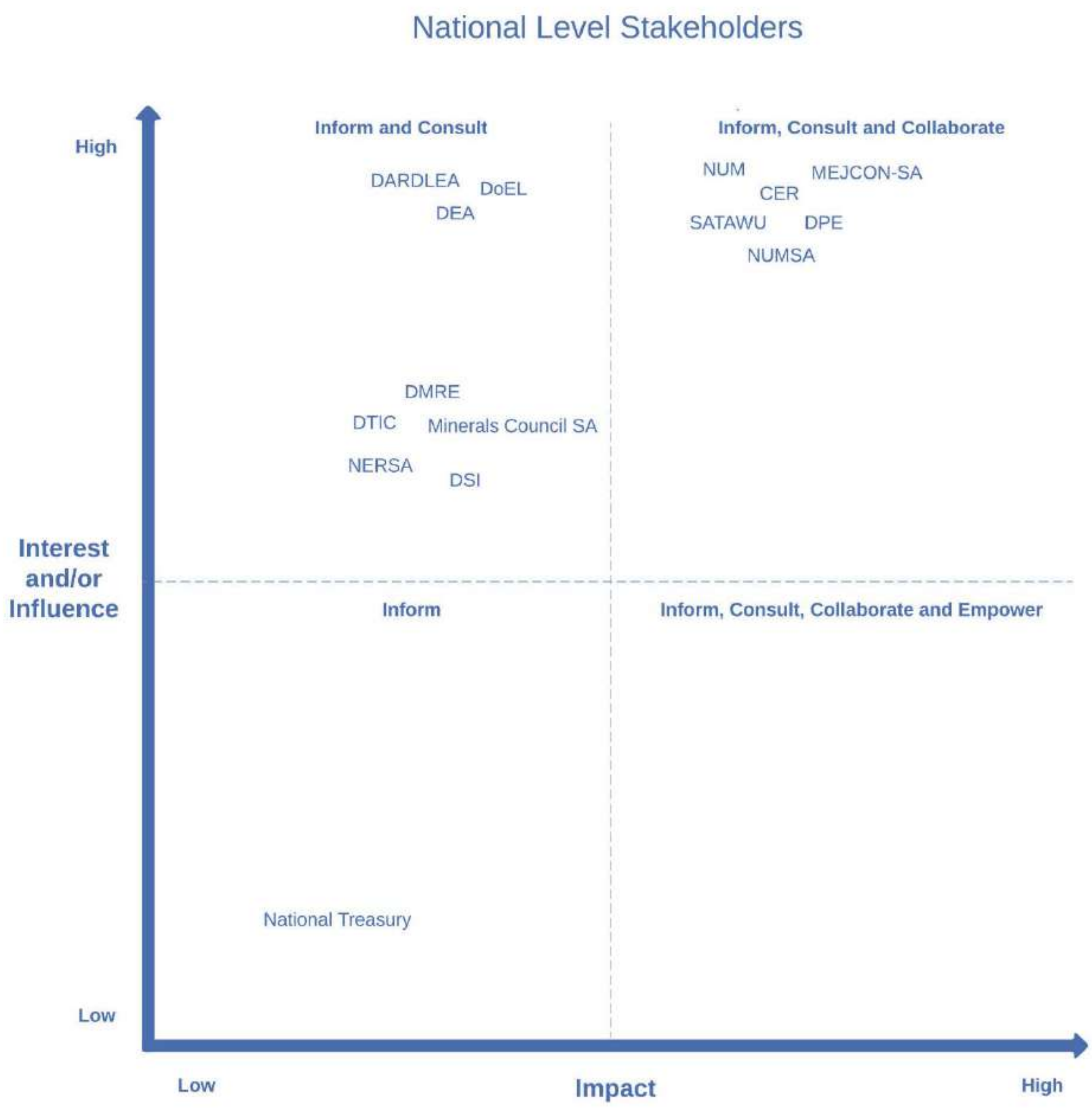


Figure 108. National Level Stakeholder Matrix

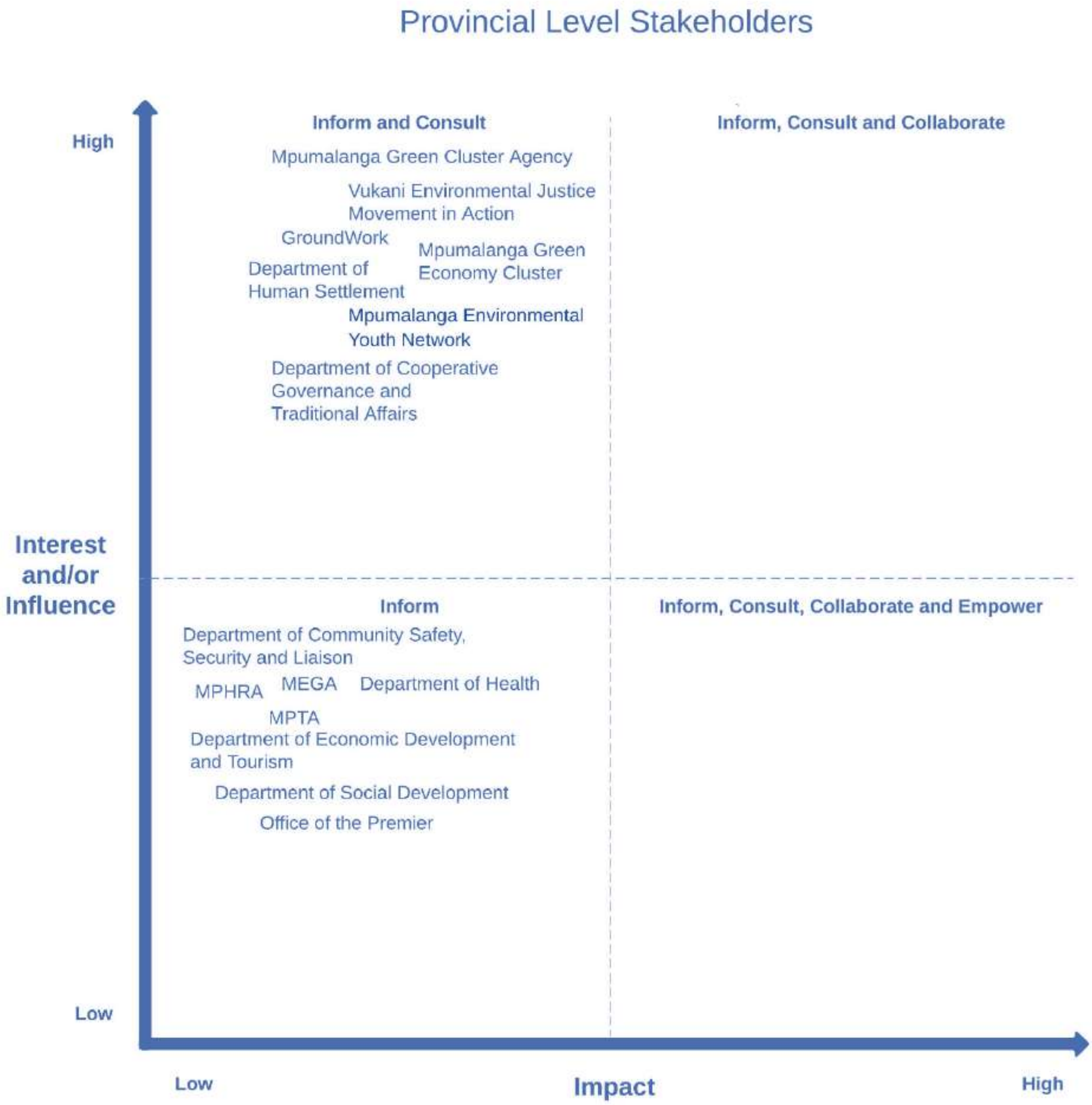


Figure 109. Provincial Level Stakeholder Matrix

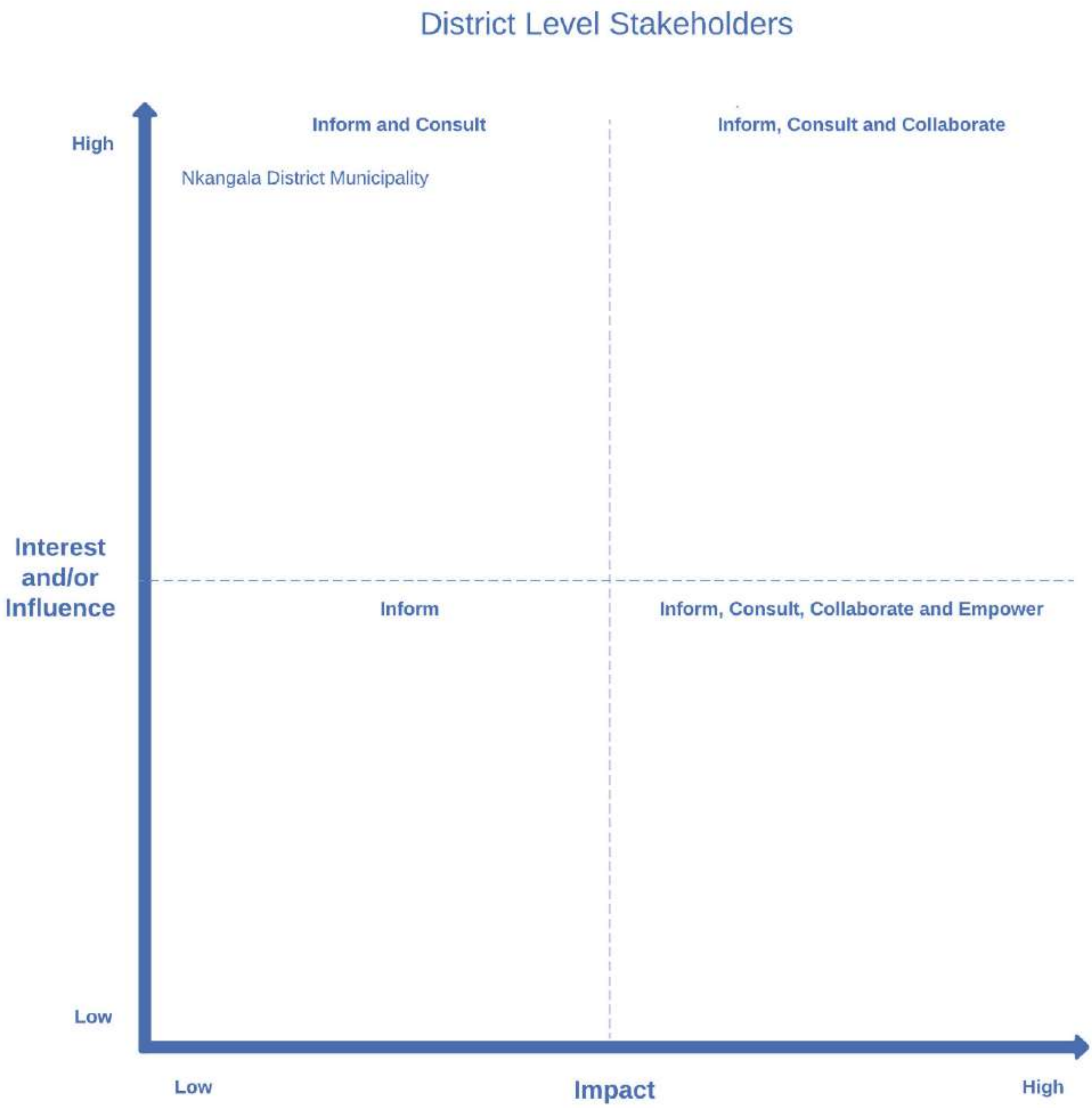


Figure 110. District Level Stakeholder Matrix

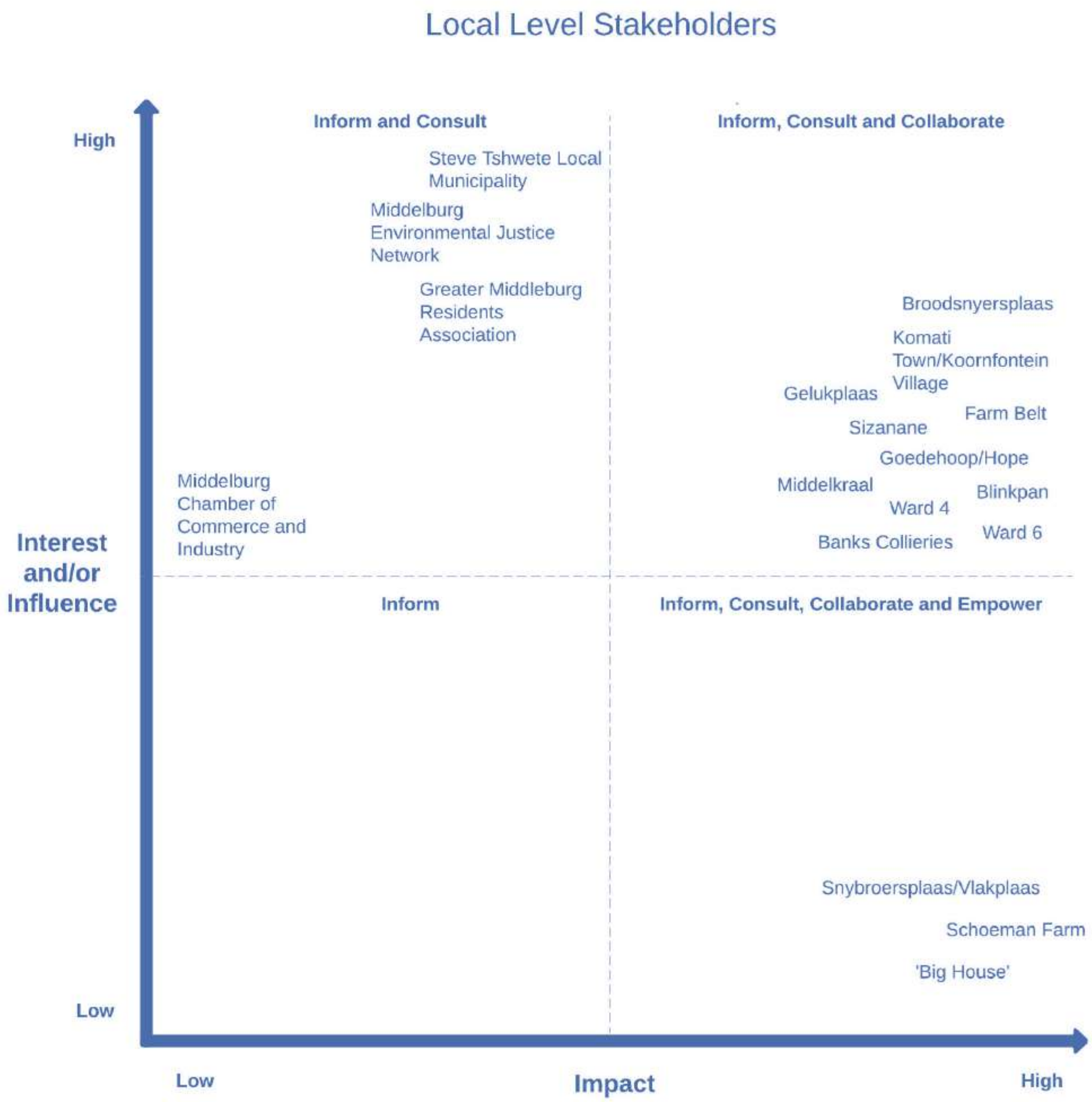


Figure 111. Local Level Stakeholder Matrix

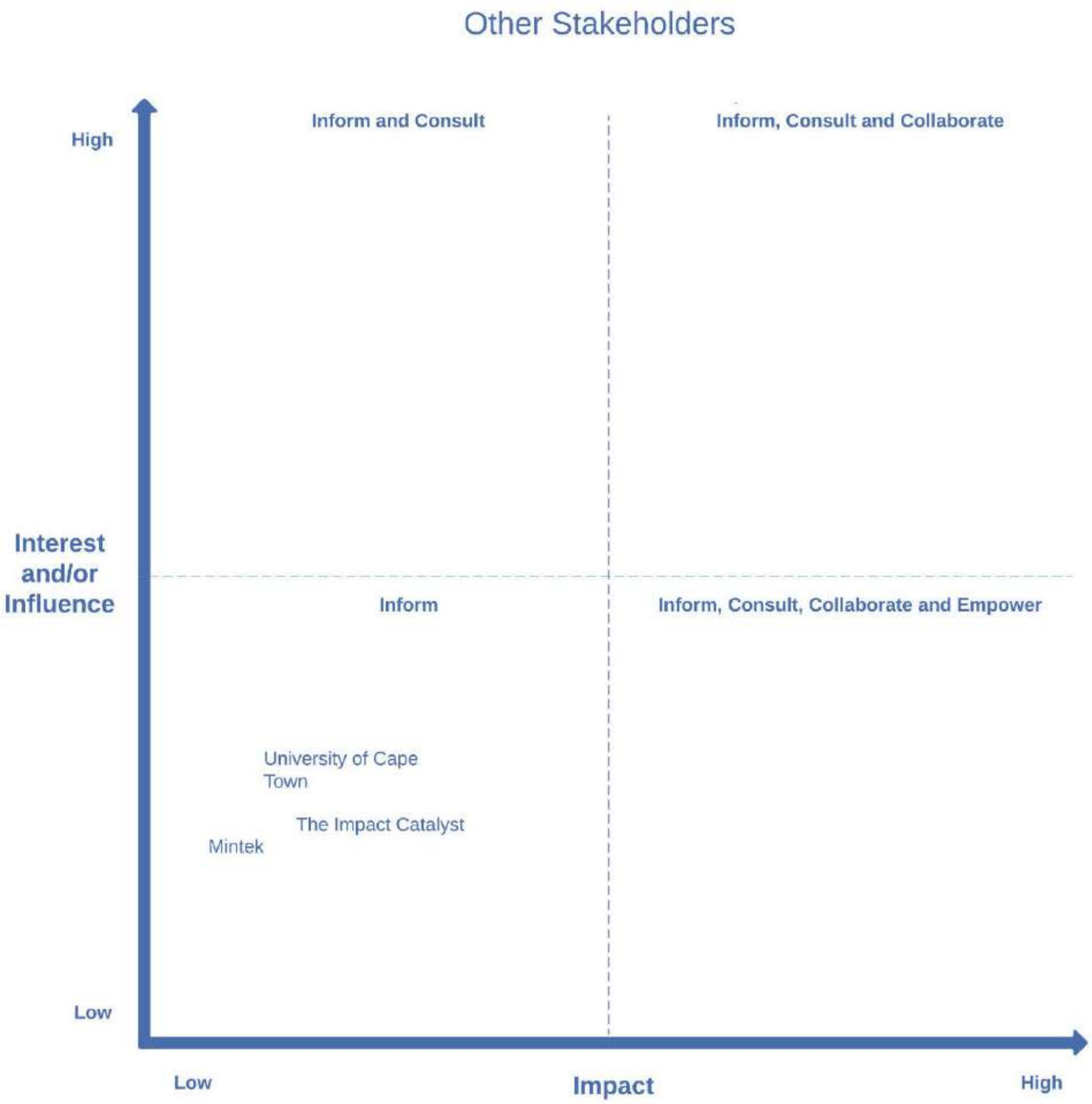


Figure 112. Other Stakeholder Matrix

7.5.3.2 Identification of Vulnerable Groups in Relation to Engagement

Vulnerable individuals, communities or groups within the project-affected parties that might be excluded or prohibited from meaningful participation will be identified and consultation will be done in a way that encourages the group to be part of the process. The factors listed in Table 55 will be considered to ensure that no group or individual is left out of the engagement process.

Table 55: Factor to be considered in ensuring all stakeholders are identified and consulted

The stakeholder is part of a marginalised group within society and is normally excluded from public participation (such as ethnic monitories, migrants etc.);
Culturally determined power dynamics prevent the stakeholder from attending or actively participating in public gatherings and vocalising their opinions (such as women, children etc.);
The stakeholder has a language barrier;
The stakeholder has a precarious livelihood (due to undocumented status or informal living arrangements);
The stakeholder faces barriers to accessing and understanding information (due to literacy levels, isolation, lack of access to internet, no mobile phones); and/or
The stakeholder faces barriers to attending meetings (due to lack of financial resources, mobility issues, old age, illness etc.).

7.6 Approach to Stakeholder Engagement

This chapter will describe the way the team will approach stakeholder engagement. The approach will be adapted according to stakeholder prioritisation and categorisation. It is understood that for engagement to be effective and meaningful, the team will have to adopt different engagement strategies for different stakeholder groups, as well as make provisions for groups that are vulnerable to exclusion.

7.6.1 Timing and Approach of Engagement

Based on the level of influence and/or interest the stakeholder has on the Project and the level of impact the Project has on them, the team will adopt a specific approach to engagement that is best suited to the stakeholder group. The tables describe the four engagement approaches that will be employed by the team, as well the stakeholders involved within each approach.

7.6.1.1 High Influence/Interest – Low Impact

Table 56 below describes the engagement approach for stakeholders that either have a high level of interest in the Project, a high level of influence over the Project or both. However, they are not significantly affected by the Project.

This group of stakeholders will be thoroughly informed and consulted to make sure they can voice their concerns and continuously advocate for the people, groups and sectors they are responsible for.

Table 56: High Influence/Low Impact Stakeholders

Core Approach	*Inform and Consult*
Priority	To properly inform on the Project and consult the stakeholder through a continuous dialogue. The team will investigate their concerns and issues and invite them to give feedback on the Project.
Ways of Engagement	Project website, Background Information Document (BID), e-mail correspondence, face-to-face meetings, phone interviews, newsletter.
Frequency of Engagement	Regular
Language of Engagement	English
Potential Pitfalls	Stakeholders are potentially influential to the Project success and reputation. It is important to continually inform and consult these stakeholders to ensure a good relationship and Project success.
Stakeholders Involved	Mpumalanga Green Cluster Agency, Vukani Environmental Justice Movement in Action, GroundWork, Department of Human Settlement, Mpumalanga Green Economy Cluster, Mpumalanga Environmental Youth Network, Department of Cooperative Governance and Traditional Affairs, DARDLEA, DoEL, DEA, DMRE, DTIC, NERSA, DSI, Minerals Council South Africa, STLM, NDM, Middelburg Environmental Justice Network, Greater Middelburg Residents Association, Middelburg Chamber of Commerce and Industry

7.6.1.2 High Influence/Interest – High Impact

Table 57 below describes the engagement approach for stakeholders that either have a high level of interest in the Project, a high level of influence over the Project or both. Moreover, they are significantly impacted by the Project or they are directly involved or responsible for stakeholders that are significantly impacted by the Project.

It is important that the team understands how these stakeholders are affected and how these impacts can be mitigated. The team will continuously inform and consult this group, as well as invite them to give feedback on the Project. This will ensure a collaborative and meaningful engagement process.

Table 57: High Influence / High Impact Stakeholders

Core Approach	*Inform, Consult and Collaborate*
Priority	Identification of impact and mitigation measures
Ways of Engagement	Site notices, communication committee, working group, feedback box, Project website, public meetings, focus groups
Frequency of Engagement	Continuous
Language of Engagement	English, Afrikaans, Zulu and Sotho
Potential Pitfalls	The team must make sure this group is well informed and consulted since they could have a relatively high amount of influence over the Project. We must also be mindful of the relationship between the different stakeholders, especially between the farmers, formal and informal communities around KPS.
Stakeholders Involved	Broodsnyersplaas, Komati Town/Koornfontein Village, Gelukplaas, Farm Belt, Sizanane, Goedehoop/Hope, Middelkraal, Ward 4, Ward 6, Blinkpan, Banks Collieries, NUM, MEJCON-SA, CER, SATAWU, DPE, NUMSA

7.6.1.3 Low Interest/Influence – Low Impact

Table 58 table below describes the engagement approach for stakeholders that do not have a high level of interest in the Project, a high level of influence over the Project or both. Nor are they significantly affected by the Project.

These stakeholders will be informed about the Project and the progress that is being made.

Table 58: Low Influence / Low Impact Stakeholders

Core Approach	***Inform***
Priority	Informing the group or individuals regarding the Project.
Ways of Engagement	Media statement, project website, newsletter, BIDs
Frequency of Engagement	Occasional
Language of Engagement	English
Potential Pitfalls	It is important to make sure the relationship between Eskom and stakeholders is safeguarded and will be good in the future.
Stakeholders Involved	National Treasury, University of Cape Town, The Impact Catalyst, Mintek, Department of Community Liaison, MEGA, MPHRA, MPTA, Department of Health, Department of Economic Development and Tourism, Department of Social Development, Office of the Premier

7.6.1.4 Low Interest/Influence – High Impact

Table 59 below describes the engagement approach for stakeholders that either have a low level of interest in the Project, a low level of influence over the Project or both. Yet, they are significantly impacted by the Project, or they are directly involved or responsible for stakeholders that are significantly impacted by the Project.

This group is likely to be isolated from the Project and has a harder time voicing their opinions and concerns. They are more likely to be excluded from the engagement process. This is why the team will empower this group of stakeholders to make sure they are meaningfully engaged with.

Table 59: Low Interest / High Impact Stakeholders

Core Approach	***Inform, Consult and Empower***
Priority	Identification of impact and mitigation measures
Ways of Engagement	One-on-one meetings, small group meetings, settlement visits
Frequency of Engagement	Continuous
Language of Engagement	English, Afrikaans, Zulu and Sotho
Potential Pitfalls	This group is more likely to be neglected due to low influence. This group is likely to include vulnerable people such as migrants, undocumented individuals, less mobile people, illiterate people etc. The team runs a higher risk of having less meaningful engagement with this specific group.
Stakeholders Involved	Snybroersplaas/Vlakplaas, Schoeman Farm, 'Big House'

7.6.2 Mitigation Measures for Obstacles to Participation

The team is aware of the risk that stakeholders may be prohibited from the engagement process. The team is dedicated to removing obstacles to participation as best we can. Some of the mitigation measures for specific obstacles to participation are listed in Table 60 below:

Table 60: Obstacles to participation and proposed mitigation measures

Obstacle	Mitigation Measure
Low literacy level	Through the data collection process, the team will gain a better understanding of the literacy levels and provisions will be made to ensure that everyone is accommodated. Public meetings and focus groups will create the opportunity for everyone to get information and express their views. It is suggested that a communication forum is established that will reach out to communities to share information and to get their views on an ongoing basis.
Low access to information and engagement (no phone or access to internet)	The team will reach out to community members who cannot readily access information through community representatives and leaders. Invitations to public meeting, open days and focus groups will be communicated at the community level.
Low access to information and engagement (disability, old age, illness)	Public meetings and focus groups will be organised in spaces that are accessible for less mobile people. Stakeholders that are completely immobile will be informed and engaged with through a family member or friend who is willing. Alternatively, the social team will visit all immobile people to undertake the survey, however, information will be communicated telephonically.
Precarious livelihood (informal, undocumented)	Everyone will be encouraged to be part of the process irrespective of their documented status. Communities will be informed that they can engage with us on an individual basis or in a group.
Language barrier	Make provisions for English, Afrikaans, Zulu and Sotho within all written communications and public meetings organised within the Primary Study Area
Gender-based power dynamics	Provide stakeholders with ample opportunity to engage on a one-on-one basis, either through written or verbal communication. The feedback box, phone/written communication and one-on-one meetings (in especially vulnerable areas) will help mitigate this.

7.6.3 Schedule of Engagement

The schedule for stakeholder engagement is presented in Table 61 below.

Table 61: Stakeholder engagement schedule

Stakeholders	Method of Engagement	Topics of engagement	Frequency	Language	Start date / Completion date	Location
All I&APs	Project Website The website will contain information about the Project, a feedback form, a way to register for the newsletter and other means of communication. Media Statement & E-mail Newsletter This will inform anyone who is affected by or interested in the Project and provide information on how to voice concerns/provide feedback.	• ESIA • ESMP • GRM	3	English, Afrikaans, Zulu	End of August	Public meetings
All local and project-affected stakeholders (includes *inter alia* STLM, Ward 4, Ward 6, Goedehoop/Hope, Banks Colllieries, Sizanane, Farm Belt, Komati Town/ Koornfontein Village, Blinkpan, Broodsnyersplaas, Gelukplaas, Middelkraal, 'Big House', Schoeman Farm, Snybroerplaas/Vlakplaas)	Site Notices These notices will contain information about the Project, explaining the feedback procedure, dates for public meetings and contact details of Nemai Consulting and Eskom Communication Committee.	ESIA	6	English, Afrikaans, Zulu	End of August	Public and highly visible spaces within Komati Town/Koornfontein Village, Blinkpan, Banks, Sizanane, Goede Hoop, 'Big House' and other informal settlements. Could be churches, schools, clinics, Community Centres, entrance to KPS, etc.
All National, Provincial, District and Local Level Government Departments, NGOs, Special Interest Groups and Associations that are interested in the Project and/or indirectly affected (includes *inter alia* National Treasury, University of Cape Town, The Impact Catalyst, Mintek, Department of Community Liasison, MEGA, MPHRA, MPTA, Department of	Circulate BIDs These documents will contain a high level of (technical) information and background information regarding the Project.	ESIA	3	English	End of August	n/a

Stakeholders	Method of Engagement	Topics of engagement	Frequency	Language	Start date / Completion date	Location
Health, Department of Economic Development and Tourism, Department of Social Development, Office of the Premier, Mpumalanga Green Cluster Agency, Vukani Environmental Justice Movement in Action, GroundWork, Department of Human Settlement, Mpumalanga Green Economy Cluster, Mpumalanga Environmental Youth Network, Department of Cooperative Governance and Traditional Affairs, DARDLEA, DoEL, DEA, DMRE, DTIC, NERSA, DSI, Minerals Council South Africa, STLM, NDM, Middelburg Environmental Justice Network, Greater Middelburg Residents Association, Middelburg Chamber of Commerce and Industry)						
All local stakeholders that are highly influential and highly impacted. (Broodsnyersplaas, Komati Town/Koornfontein Village, Gelukplaas, Farm Belt, Sizanane, Goedehoop/Hope, Middelkraal, Ward 4, Ward 6, Blinkpan, Banks Collieries)	Focus Group Meetings & Public Meeting Interviews - The team will conduct in depth interviews with affected parties who need to be consulted. These interviews will be conducted over the phone and will have a semi-structured nature.	• ESIA & ESMP • RAP • GRM	6	English, Zulu	11/07/2022 – End of August Mid-September	TBD
All local stakeholders that have a high or low level of influence and highly impacted. (Broodsnyersplaas, Komati Town/Koornfontein Village, Gelukplaas, Farm Belt, Sizanane, Goedehoop/Hope, Middelkraal, Ward 4, Ward 6, Blinkpan, Banks Collieries, Snybroersplaas/Vlakplaas, Schoeman Farm, 'Big House')	Feedback Box This will be a way for locals to provide feedback anonymously. The response protocol is described below in chapter 4.3 Feedback Response Protocol.	• ESIA & ESMP • RAP • GRM	6	English, Afrikaans, Zulu	Half September	Public and highly visible spaces within Komati Town/Koornfontein Village, Blinkpan, Banks, Sizanane, Goede Hoop, 'Big House' and other informal settlements. Could be churches, schools, clinics, Community Centres, entrance to KPS etc.

Stakeholders	Method of Engagement	Topics of engagement	Frequency	Language	Start date / Completion date	Location
All local stakeholders that do not have a high level of influence on the project but are highly impacted. (Snybroersplaas/Vlakplaas, Schoeman Farm, 'Big House', any group or individual that has been identified as vulnerable within the engagement process)	One-on-One Meetings & Small Group Meetings	• ESIA & ESMP • RAP • GRM	3	English, Zulu, Sotho	Start half September	TBD

7.6.4 *Use of Community Representatives*

The team will make use of representatives from the different communities and settlements within the Project Area. The community representatives will act as gatekeepers to their communities and allow the team to better identify different stakeholders within the community and whether they have any special needs or vulnerabilities. Communicating and organising will also be improved using community representatives. Public meetings and settlement visits will be organised together with the community representative.

7.7 Stakeholder Communication Protocol

Meaningful consultation is possible when stakeholders are offered a transparent, timely and understandable way to communicate. The team will make sure that the procedure for feedback and grievances will be publicly advertised in an understandable and transparent way. Stakeholders will be informed of the procedure for submitting grievances, comments and questions, the timeframe of acknowledgement of receipt, the response time, timeframe of resolution and will be transparent about the governing structures and decision-makers.

7.7.1 *Grievance / Feedback Mechanism*

A GRM will be developed, which will provide stakeholder with a tool to address issues as they arise in a non-confrontational manner. The GRM will be communicated and explained to project affected parties early on in the project lifecycle, to allow for landowners and other parties, such as members of the adjoining communities, to come forward without resorting to confrontation.

The GRM will be objective and will allow project-affected parties with a set process for raising, discussing, and resolving concerns relating to the Project. The procedure results in fair and lasting outcomes that builds trust between KPS and project-affected peoples. The GRM will ensure that concerns are raised and addressed in a timely manner, that the raising and resolution of grievances will ensure that the project does not impact negatively on economically displaced communities and result in community vulnerabilities being addressed (IFC, 2009).

The GRM will be developed in terms of the IFC Performance Standards (IFC, 2012) with guidance from the Good Practice Note: Addressing Grievances from Project-Affected Communities (IFC, 2009).

The objective of the GRM is to ensure that KPS is aware and responds to stakeholder concerns. The mechanism will be designed to empower all employees, stakeholders and contractors to successfully and effectively manage project-related grievances and complaints.

Refer to the requirements of the GRM listed in Table 46 above, regarding community health and safety.

7.7.2 Response Protocol

The team will adhere to the following response protocol, which will be continually communicated to all stakeholders throughout the process:

- For all digital communication, the team will acknowledge receipt within 72 hours. Depending on the question, the team will provide answer or proposed resolution within five working days; and
- For written comments, questions and grievances, the team will acknowledge receipt within two working days and provide an answer or proposed resolution within ten working days.

7.7.3 Documentation Protocol

The team will systematically and adequately document all stakeholder engagement. This information will be safely stored, and the team will apply the appropriate guidelines for data protection in the design and operation of the documentation system.

- The team will continuously update and maintain the stakeholders' database, including stakeholder names and contact information;
- A Consultation Log will be kept to –
  - Register all incidences of contact made with stakeholders or stakeholder groups, including the method of contact, time and location (if applicable) of contact, the nature of the contact (grievance, question or concern) and the response or resolution outcome;
  - Record all material exchanged with stakeholders and at what date and location; and
  - This information will be saved in a spreadsheet which will be appropriately and safely stored, and access will be granted only to the relevant parties. Emails will be stored in .msg formats.
- All meetings will be recorded, but only if approval was granted by attendees. The minutes of the meeting will transcribed and stored verbatim. Questions and comments raised during the meeting and responses provided will be tabulated and attached to the minutes. Recordings of meetings will be saved on a USB.
- Attendance of meetings will be recorded. Attendance records will include name and surname, living area, designation, mobile number, and email address.

CHAPTER 8: PLAN OF STUDY FOR THE FULL ESIA

8 PLAN OF STUDY FOR THE FULL ESIA

8.1 Introduction

This Plan of Study explains the approach to be adopted to conduct the ESIA for the proposed Project. To ensure alignment with SA's regulatory framework, it also conforms to the content requirements stipulated in Appendix 2 of the EIA Regulations.

8.2 Adherence of Process to Governance Framework

The ESIA will be undertaken in accordance with the following:

- World Bank's ESS1: Assessment and Management of Environmental and Social Risks and Impacts; and
- The EIA Regulations promulgated under NEMA. At this stage, it is understood that a full S&EIR process will be undertaken (as outlined in Figure 113 below), which will be confirmed based on the legal triggers for the Project (see Section 2.4.5 above).

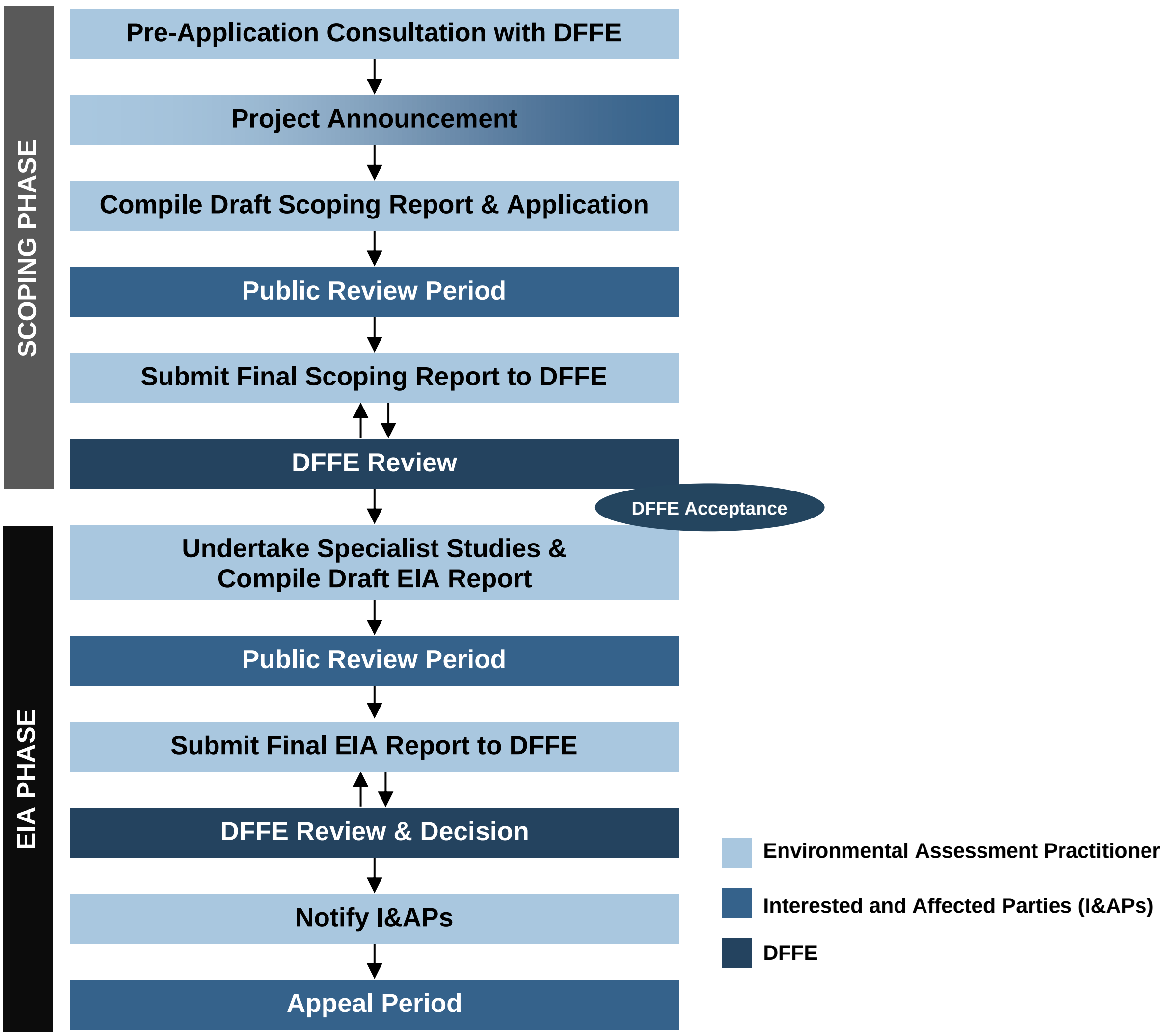


Figure 113: Outline of S&EIR process

The ESIA Report will be compiled in accordance with the indicative outline provided in the World Bank's ESS1 (see Table 1 above). The Scoping Report and EIA Report will contain the content prescribed in Appendix 2 and Appendix 3 of the EIA Regulations, respectively.

The following critical components of the EIA Report are highlighted:

- A description of the policy and legislative context;
- A detailed description of the proposed development (full scope of activities);
- A detailed description of the proposed development site, which will include a plan that locates the proposed activities applied for as well as the associated structures and infrastructure;
- A description of the interactions between Component A and Component B, as well as other potential/additional land use(s);
- A description of the environment that may be affected by the activity and the manner in which physical, biological, social, economic and cultural aspects of the environment may be affected by the proposed development;
- The methodology of the stakeholder engagement process;
- The Comments and Responses Report and I&APs Database will be appended to the EIA Report;
- A description of the need and desirability of the proposed development and the identified potential alternatives to the proposed activity;
- A summary of the methodology used in determining the significance of potential impacts;
- A description and comparative assessment of the project alternatives;
- A summary of the findings of the specialist studies;
- A detailed assessment of all identified potential impacts;
- A list of the assumptions, uncertainties and gaps in knowledge;
- An Environmental Impact Statement;
- Any aspects which were conditional to the findings of the assessment either by the EAP or specialists which are to be included as conditions of authorisation;
- 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;
- Copies of all specialist reports will be appended to the EIA Report; and
- Any further information that will assist DFFE during decision making.

The IWWMP, RSIP and Closure Plan will also be compiled as part of the Project, in accordance with condition 10.3 of KPS' existing WUL (04/B11B/BCGI/1970).

8.3 Assessment & Mitigation of Environmental & Social Impacts during ESIA

The draft ESIA Report identified potentially significant environmental and social risks for further assessment as part of the ESIA. The final ESIA Report will include a detailed qualitative and quantitative assessment of direct, indirect and cumulative impacts associated with the Project. The assessment will incorporate the findings of the specialist studies and technical investigations.

The following criteria will be used to determine the significance of the Project's environmental and social impacts:

Nature (/Status)
The project could have a positive, negative or neutral impact on the environment.

Extent
- Local - extend to the site and its immediate surroundings.
- Regional - impact on the region but within the province.
- National - impact on an interprovincial scale.
- International - impact outside of SA.

Magnitude
Degree to which impact may cause irreplaceable loss of resources.
- Low - natural and social functions and processes are not affected or minimally affected.
- Medium - affected environment is notably altered; natural and social functions and processes continue albeit in a modified way.
- High - natural or social functions or processes could be substantially affected or altered to the extent that they could temporarily or permanently cease.

Duration
- Short term - 0-5 years.
- Medium term - 5-11 years.
- Long term - impact ceases after the operational life cycle of the activity either because of natural processes or by human intervention.
- Permanent - mitigation either by natural process or by human intervention will not occur in such a way or in such a time span that the impact can be considered transient.

Probability
- Almost certain - the event is expected to occur in most circumstances.
- Likely - the event will probably occur in most circumstances.
- Moderate - the event should occur at some time.
- Unlikely - the event could occur at some time.
- Rare/Remote - the event may occur only in exceptional circumstances.

Significance
Provides an overall impression of an impact's importance, and the degree to which it can be mitigated. The range for significance ratings is as follows-
0 – Impact will not affect the environment. No mitigation necessary.
1 – No impact after mitigation.
2 – Residual impact after mitigation.
3 – Impact cannot be mitigated.

Suitable mitigation measures will be identified and applied according to the mitigation hierarchy (see Section 5.3 above) to manage the environmental and social impacts. In the case where significant residual negative impacts are identified that cannot be mitigated, the acceptability of those residual impacts will be evaluated. In addition, the feasibility of mitigating the environmental and social impacts, as well as the capital and recurrent costs, will be assessed. The institutional, training, and monitoring requirements for the proposed mitigation measures will also be determined. The consolidated list of mitigation measures will be incorporated into the ESMP.

8.4 Feasible Alternatives to be Assessed during ESIA

The alternative identified in the draft ESIA Report include the following:

- ADF management options;
- Waste management options;
- Land use and end-state options;
- Repurposing options;
- Remediation options; and
- No-go / without project option.

The ESIA Report will include a detailed comparative analysis of the Project's feasible alternatives. The analysis will consider the following:

- Potential environmental and social impacts associated with the alternatives, which will be quantified to the extent possible, and the feasibility of mitigation measures;
- Capital and recurrent costs of alternative mitigation measures;
- Suitability of mitigation measure under local conditions; and
- Institutional, training, and monitoring requirements for the alternative mitigation measures.

The comparative analysis of alternatives will incorporate the findings of the specialist studies and technical investigations.

Detailed justification for the BPEO will be provided in the ESIA Report, based on the outcomes of the comparative analysis.

8.5 Specialist Studies

8.5.1 Introduction

According to Münster (2005), a "trigger" for a specialist study is "*a particular characteristic of either the receiving environment or the proposed project which indicates that there is likely to be an issue and/or potentially significant impact associated with that proposed development that may require specialist input*". According to the World Bank's ESS1, it is also appropriate to engage independent specialists to undertake the parts of an assessment that address specific risks and impacts of concern.

8.5.2 Specialist Studies as part of ESIA's Scope of Work

8.5.2.1 List of Studies

The specialist studies that were identified to be required for the ESIA, due to the nature of the proposed Project and its receiving environment, include the following:

1 Soil, Surface Water and Groundwater Assessment;
2 Aquatic Impact Assessment and Delineation;
3 Terrestrial Ecological Impact Assessment;
4 Social Impact Assessment (followed by a RAP, if required);
5 Visual Impact Assessment;
6 Waste Management Assessment;
7 Holfontein Feasibility Study;
8 Fugitive Emission Assessment;
9 Noise Impact Assessment;
10 Heritage Impact Assessment; and
11 Health and Safety Assessment.

8.5.2.2 General ToR for all Specialist Studies

The following general terms of reference (ToR) apply to all the specialist studies to be undertaken as part of the ESIA for the proposed Project:

1. Address all triggers for the specialist studies, based on the findings of the draft ESIA;
2. Consider the findings of other specialist studies undertaken in the Project Area, as relevant;
3. Review baseline information for KPS;
4. Address issues raised by stakeholders;
5. Ensure that the requirements of the environmental authorities that have specific jurisdiction over the various disciplines and environmental features are satisfied;
6. Approach to include desktop study and site visits, as deemed necessary, to understand the affected environment and to adequately investigate and evaluate salient issues. Indigenous knowledge (i.e., targeted consultation) should also be regarded as a potential information resource;
7. Assess the impacts (direct, indirect and cumulative) in terms of their significance (using suitable evaluation criteria) and suggest suitable mitigation measures in accordance with the mitigation hierarchy. A risk-averse and cautious approach should be adopted under conditions of uncertainty;
8. Consider time boundaries, including short to long-term implications of impacts for closure;
9. Consider spatial boundaries, including:
   a. Broad context of the proposed Project (i.e., beyond the boundaries of KPS);
   b. Off-site impacts; and
   c. Local, regional, national or global context.

10. The provision of a statement of impact significance for each issue, which specifies whether or not a pre-determined threshold of significance (i.e., changes in effects to the environment which would change a significance rating) has been exceeded, and whether or not the impact presents a potential fatal flaw or not. This statement of significance should be provided for anticipated impacts both before and after application of impact management actions, including residual impacts;
11. Recommend a monitoring programme to implement mitigation measures and measure performance. List indicators to be used during monitoring;
12. Appraisal of alternatives (including the no-go option) by identifying the BPEO with suitable justification;
13. Engage with other specialists whose studies may have bearing on your specific investigation (including studies under the repurposing project);
14. Present findings and participate at stakeholder meetings, as necessary;
15. Sign a declaration stating independence;
16. The appointed specialists must take into account the policy framework and legislation relevant to their particular studies; and
17. All specialist reports must adhere to Appendix 6 of the EIA Regulations or to the Procedures for the Assessment and Minimum Criteria for Reporting on Identified Environmental Themes (GN No. 1150 in Government Gazette No. 43855 of 30 October 2020), as relevant.

8.5.2.3 Specific ToR

Specific ToR for the ESIA's respective specialist studies are provided in Table 62 below.

Table 62: Specific ToR for ESIA's specialist studies

Specialist Study	Approach
Soil, Surface Water and Groundwater Assessment	• Align study with the following: ○ ESS2: Labor and Working Conditions; ○ ESS3: Resource Efficiency and Pollution Prevention and Management; ○ ESS4: Community Health and Safety; and ○ EHS Guidelines, Section 1.8 – Contaminated Land. • A benchmarking of screening values will be undertaken to ensure GIIPs are considered. • After reviewing all existing information including the analysis of the 25 soil samples and 10 additional boreholes taken as part of the Component B study, 20 additional soils samples and 3 additional boreholes will be installed. The additional soil samples will be taken in the vicinity around the coal stockyard, the turbine house, the generators, hazardous store, the fuel and oil storage areas and the ADF. The 3 additional boreholes are located at the hazardous substances storage area, bulk fuel storage area and fuel station (refer to Figure 114 below). • The same sampling protocol used by the Component B team will be used. Refer to Annexure D for the sampling protocol. • <u>Soil investigation</u>: ○ Undertake a Phase 2 site assessment in accordance with the Framework for the Management of Contaminated Land (Part 8 of NEM:WA). ○ Undertake soil vapour survey through the advancement of up to 20 shallow hand augured soil bores including the collection of 20 representative soil samples at selected locations for chemical analysis.

Specialist Study	Approach
	○ Shallow auger holes, maximum depth of 3.0 mbgl or refusal whichever is encountered first, are to be drilled utilising a hand auger in areas clear of buried utilities. ○ The auger holes are to be profiled, and olfactory evidence of contamination recorded, where present. ○ Soil vapour readings are to be recorded during the augering process. ○ Soil vapour logs are to be taken at 0.5m screened intervals up to depth of refusal. ○ Sub-surface samples are to be collected for laboratory analysis. Sample location and the depth are to be based on PID readings for organics, visual or olfactory signs of impact or shallower depths for potential metal impacts. ○ A detailed soil profile is to be determined. ○ During sampling any olfactory or visual signs of contamination need to be noted. ○ The following analysis will be conducted on the 20 soil samples – ▪ pH. ▪ Metal analysis (arsenic, cadmium, copper, chromium (III), copper, iron, manganese, nickel, lead, selenium, zinc, and mercury). ▪ TPH C8 – C40. ▪ Gasoline Range Organics (GRO) - BTEXN - fully speciated including o- and m,p-Xylenes with sum of Xylenes), MTBE, TAME, Trimethylbenzene (fully speciated 1,2,4 and 1,3,5-trimethylbenzenes). ▪ SVOCs – PAHs and PCBs. • Groundwater Investigation: ○ Three (3) monitoring boreholes need to be advanced to a maximum of 10m bgl. ○ During the site assessment the following information on the groundwater monitoring system needs to be collected – ▪ The presence, location and condition of monitoring boreholes (new and existing). ▪ The depth of the groundwater monitoring wells and depth to static water level. ▪ In-field physicochemical measurements. ○ Low-Flow Groundwater Sample Collection (<6.0 m bgl Static Water Level) - ▪ Field parameters will be measured during sampling using a HANNA probe (with HI7698194-1- 2-3 probes). Groundwater samples will be collected once the measured field parameters have stabilized according to the low-flow sampling guidelines of the USEPA Region I. ○ Purge Groundwater Sample Collection (>6.0 m bgl Static Water Level) - ▪ Where water is too deep (>6.0m bgl) to collect groundwater samples via low-flow pump, three times the borehole water volume will be purged from each borehole with the use of dedicated bailers before collecting groundwater samples for laboratory analysis and in-field physicochemical measurements. ○ Groundwater samples are to be collected from the 3 newly installed locations for the following analyses: ▪ Arsenic, cadmium, copper, chromium (III), copper, iron, manganese, nickel, lead, selenium, zinc, and mercury. ▪ pH, sulphate, ammoniacal nitrogen, total alkalinity, chloride, cyanide, fluoride, nitrate, nitrite and orthophosphate. ▪ TPH C6-C10, C10-C28, and C28-C40. ▪ GRO - BTEXN - fully speciated including o- and m,p-Xylenes with sum of Xylenes), MTBE, TAME, Trimethylbenzene (fully speciated 1,2,4 and 1,3,5-trimethylbenzenes). ▪ SVOCs – PAHs and PCBs. • Collate the gathered information in terms of a preliminary site conceptual model indicating any contamination sources, the related pathways and the potential receptors. The results of the investigation need to be interpreted, and all results compared with the applicable local and international screening values. • Prepare a remedial options appraisal as well as remedial action plan. This will include civil engineering, biological, chemical and physical measures. The

Specialist Study	Approach
	assessment must take into consideration the type and contaminant mass, practicality, effectiveness, durability and sustainability (including health and safety considerations) of mitigation measures. • Recommend a soil, surface and groundwater monitoring programme for decommissioning and post-closure.
Aquatic Impact Assessment and Delineation	• Align study with ESS6. Biodiversity Conservation and Sustainable Management of Living Natural Resources. • Undertake aquatic survey and describe affected aquatic environments / watercourses within the Project Area, including the Koring Spruit and its tributaries (Komati Spruit and Geluk Spruit) and wetland systems. • Determine ecological status of the receiving aquatic environment through appropriate techniques (including biomonitoring). • Identify aquatic CBAs and ESAs in Project Area and risks posed by the Project. • Delineate riparian habitats and all wetlands in accordance with the guideline: A practical field procedure for identification and delineation of wetlands and riparian areas (DWAF, 2005) (or any prevailing guidelines prescribed by DWS). This includes assessing terrain, soil form, soil wetness and vegetation unit indicators to delineate permanent, seasonal and temporary zones of the wetlands. Allocate buffers from the outer edge of the temporary zones of the wetlands. • Prepare an aquatic ecological sensitivity map with the use of GIS, based on the findings of the study. • Describe the importance of the affected aquatic environments/watercourses in terms of pattern and process, as well as ecosystem goods and services. • Assess impacts of proposed Project to aquatic environments/watercourses (including biota, habitat, water quality and flow). Consider cause-effect-impact pathways. • Provide suitable mitigation measures to protect the aquatic ecosystems during the Project. • Recommend rehabilitation measures and desired end-states for watercourses affected by the Project. • Recommend monitoring programme and indicators for aquatic environments, where findings from the survey would serve as baseline data. • Comply with specific requirements and guidelines of DFFE, DWS and MTPA. • Make recommendations on preferred options from an aquatic ecological perspective.
Terrestrial Ecological Impact Assessment	• Align study with ESS6. Biodiversity Conservation and Sustainable Management of Living Natural Resources. • Undertake baseline survey and describe affected terrestrial ecology in Project Area. • Take into consideration the provincial conservation goals and targets (including the MBSP). • Assess the current ecological status and the conservation priority of the Project Area. • Identify terrestrial CBAs and ESAs in Project Area and risks posed by the Project. • Describe the importance of the affected area to biodiversity in terms of pattern and process, as well as ecosystem goods and services. • Identify protected and conservation-worthy species. • Prepare a terrestrial ecological sensitivity map with the use of GIS, based on the findings of the study. • Assess impacts to terrestrial ecology (including fauna, flora and systems). Consider cause-effect-impact pathways. • Recommend rehabilitation measures and desired end-states for natural areas to be created by the Project. • Recommend control measures for invasive alien species. • Recommend monitoring programme and indicators for terrestrial ecology and rehabilitation. • Comply with specific requirements and guidelines of DFFE and MTPA. • Make recommendations on preferred options from a terrestrial ecological perspective.
Social Impact Assessment	• Align study with the following: o ESS2: Labor and Working Conditions;

Specialist Study	Approach
	○ ESS3: Resource Efficiency and Pollution Prevention and Management; ○ ESS4: Community Health and Safety; ○ ESS5: Land Acquisition, Restrictions on Land Use and Involuntary Resettlement; ○ ESS8: Cultural Heritage; ○ ESS10: Stakeholder Engagement and Information Disclosure; ○ GPN – ▪ Addressing SEA/SH in investment projects financing involving in major civil works; ▪ Addressing Gender based violence in Investment Project Financing involving major civil works; ▪ Gender; ▪ Road safety; ▪ Assessing and managing the risks and impacts of the use of security personnel; and ▪ Managing the risks of adverse impacts on communities from temporary project induced labour influx. • Determine social baseline for the Project Area and region. • Assess social impacts (positive and negative) associated with the Project. • Undertake a thorough review of the records of stakeholder engagements. • Suggest suitable mitigation measures to address the identified social impacts. • Recommend monitoring programme and indicators for social aspects. • Make recommendations on preferred options from a social perspective.
Visual Impact Assessment	• Align study with ESS3: Resource Efficiency and Pollution Prevention and Management. • Determine the visibility of the proposed Project's components. • Consider the existing visual characteristics of KPS in relation to the surrounding areas. • Determine the specific aesthetic implications of the Project. • Suggest suitable mitigation measures to address the identified visual impacts.
Waste Management Assessment	• Align study with the following: ○ ESS2: Labor and Working Conditions; ○ ESS3: Resource Efficiency and Pollution Prevention and Management; ○ ESS4: Community Health and Safety; and ○ EHS Guidelines, Section 1.6 – Waste Management. • Quantify waste volumes and identify waste streams for the Project. • Classify waste in terms of the Waste Classification and Management Regulations (GN R. 634 of 23 August 2013) (except if it is listed in Annexure 1 of these Norms and Standards) and SANS 10234, which is based on the Global Harmonised System. • Analyse waste in terms the National Norms and Standards for the Assessment of Waste for Landfill Disposal (GN R. 635 of 23 August 2013). To assess waste for the purpose of disposal to landfill, the following will be undertaken - ○ Identify chemical substances present in the waste; ○ Take representative samples of waste types and analyse in terms of the following: ▪ Determine the Total Concentrations (TC) (mg/kg) of the elements and chemical substances that have been identified in the waste and compare to the Total Concentration Threshold (TCT) limits specified in these Norms and Standards; and ▪ Determine the Leachable Concentrations (LC) (mg/l) of the elements and chemical substances that have been identified in the waste and compare to the Leachable Concentration Threshold (LCT) limits specified in these Norms and Standards. • Assess environmental and social risks and impacts related to waste. • Identify management measures for handling, storage, transportation and disposal of waste. • Identify options for reuse and recycling. • Identify waste management facilities required at KPS during closure. • Assess options of creating an onsite waste disposal facility at KPS versus offsite disposal (including environmental aspects, environmental

Specialist Study	Approach
	considerations, cost-benefit analysis, waste haulage requirements, landfill requirements, etc.). • Assess options for managing the Project's hazardous waste. • Assess ADF closure options from a waste management perspective. • Assess the risks associated with the transportation of hazardous waste. • Compile a Waste Management Plan for decommissioning • Identify legal requirements for waste management (including WML).
Holfontein Feasibility Study	• Undertake a due diligence of Holfontein or similar hazardous waste disposal facilities to determine adequacy and capacity for disposal of the Project's hazardous waste.

Fugitive Emission Assessment	• Align study with the following:
	  o ESS2: Labor and Working Conditions;
	  o ESS3: Resource Efficiency and Pollution Prevention and Management;
	  o ESS4: Community Health and Safety;
	  o EHS Guidelines, Section 1.1 – Air Emissions and Ambient Air Quality;
	  o NEM:AQA & National Dust Control Regulations; and
	  o Ambient Air Quality Standards.
	• Assess sources and impacts of fugitive dust associated with decommissioning and post-closure.
	• Provide suitable mitigation measures to manage fugitive dust.
	• Recommend fugitive dust monitoring programme for decommissioning and post-closure.

Noise Impact Assessment	• Align study with the following:
	  o ESS2: Labor and Working Conditions;
	  o ESS3: Resource Efficiency and Pollution Prevention and Management;
	  o ESS4: Community Health and Safety;
	  o EHS Guidelines, Section 1.7 – Noise; and
	  o SANS 10103:2008.
	• Assess sources and impacts of noise during decommissioning.
	• Provide suitable mitigation measures to manage noise.
	• Recommend noise monitoring programme for decommissioning.

Heritage Impact Assessment	• Align study with the following:
	  o ESS8: Cultural Heritage; and
	  o NHRA and Regulations.
	• Undertake a Level 1 Heritage Impact Assessment in accordance with the NHRA.
	• Identify and map all heritage resources in the Project Area.
	• Identify structures older than 60 years and determine status.
	• Assess impacts to heritage resources and identify mitigation measures.
	• Determine requirements of SAHRA (national) and MPHRA (provincial).
	• Prepare a heritage sensitivity map (GIS-based), based on the findings of the study.
	• Prepare a chance find procedure.
	• Identify heritage resources to be monitored, as relevant.

Health and Safety Assessment	• Align study with the following:
	  o ESS2: Labor and Working Conditions;
	  o ESS3: Resource Efficiency and Pollution Prevention and Management;
	  o ESS4: Community Health and Safety;
	  o EHS Guidelines, Section 2 – Occupational Health and Safety; and
	  o OHSA and Construction Regulations (GN No. R. 84 of 7 February 2014).
	• Assess OHS hazards and risks associated with the Project for project workers and the community. Identify suitable control measures.
	• Compile OHS Management Plan.
	• Recommend OHS monitoring programme for decommissioning.

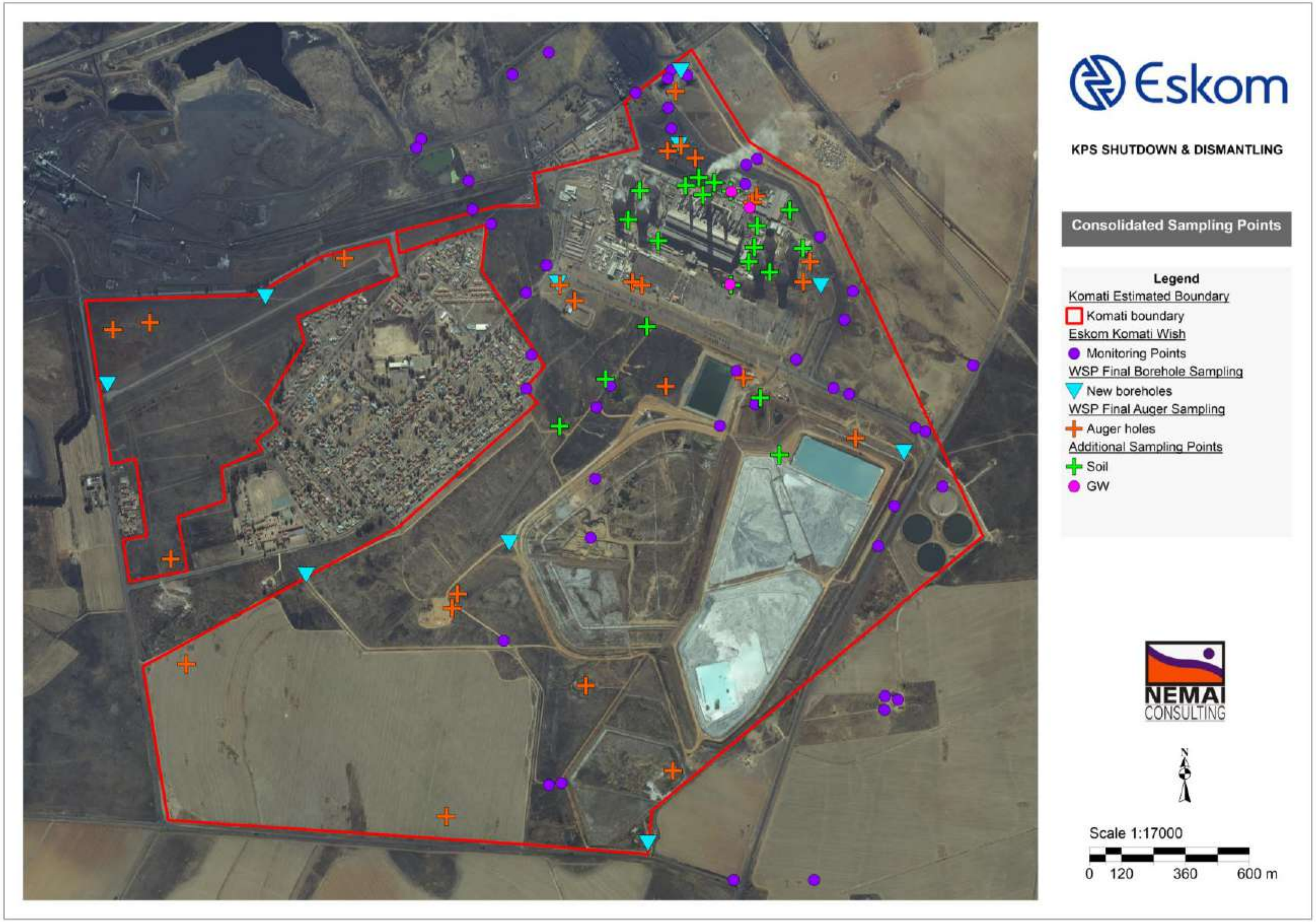


Figure 114: Consolidated groundwater and soil sampling points (Eskom, WSP and additional points)

8.5.3 Technical Investigations

This section refers to engineering assessments and technical studies that need to be completed to inform the ESIA, including investigations to be undertaken by Eskom or by specialists directly appointed by Eskom.

Technical investigations for the Project, which will be incorporated into the ESIA Report, include the following:

- Water management –
  - Efficacy of the existing storm water management system at KPS to ensure that it will be able to control dirty water during decommissioning and post-closure;
  - Interception of contaminated groundwater plume with well fields and treatment;
  - Undertake a geohydrological assessment to simulate how much water will continue to leach into the AWR after closure, and the quality thereof, to inform the decision to remove the AWR;
  - Inform the requirements for storm water management post-closure;
  - Consumptive water requirements post-closure (also linked to renewable energy development); and
  - Although it is not deemed necessary for a water balance to be developed for the closure of KPS, the water uses will be identified and quantified.
- ADF –
  - Requirements for the capping of the ash dam, dam safety and leachate management.
- Geotechnical conditions –
  - Geotechnical Assessment to determine geotechnical constraints and to advise on suitable options for decommissioning civil structures (e.g., pollution control dams).
- Climate change –
  - Impacts of climate change on the Project (e.g., design of storm water system, stability of ash dam).
- Waste management –
  - Detailed containment barrier requirements (including design reports and drawings, service life considerations, total solute seepage, etc.) associated with the option of creating a permanent onsite waste disposal facility at KPS; and
  - Assessment of quantities of materials to be dismantled and demolished.
- Temporary facilities –
  - Existing facilities at the power station complex that can possibly be used as temporary facilities for decommissioning (e.g., site offices, laydown area(s), waste management facilities, medical facilities).
- Technical input to inform the rehabilitation of the site –
  - Specifications for desired end-states of areas to be decommissioned;

- Technical Rehabilitation Plans for remodelling or dismantling power station facilities;
- Storm water management and site drainage; and
- Re-contouring of the site, where natural areas are to be created.

❑ Traffic –
- Predictions of traffic volumes during decommissioning;
- Identification of the need for abnormal loads during decommissioning; and
- Confirmation of the suitability of the road network leading to KPS to accommodate decommissioning plant and vehicles.

❑ OHS –
- Technical input from Eskom and the designer, in accordance with their respective duties stipulated in the Construction Regulations (GN No. R. 84 of 7 February 2014), in terms of the potential hazards and technical mitigation measures (amongst others) related to project workers and the community.

8.6 ESMP & Associated Management Plans

The ESMP will be compiled in accordance with the indicative outline provided in the World Bank's ESS1. To ensure alignment with SA's regulatory framework, it will also conform to the content requirements stipulated in Appendix 4 of the EIA Regulations

The following Management Plans will be contained in the ESMP:

❑ Generic Management Plan, which will contain mitigation measures to address general aspects and impacts associated with the Project;

❑ Monitoring Plan, which will contain the following –
- Details of monitoring to be undertaken during decommissioning and post-closure, including parameters to be measured, methods to be used, sampling locations, frequency of measurements, detection limits (where appropriate), and definition of thresholds that will signal the need for corrective actions; and
- Monitoring and reporting procedures.

❑ Thematic Management Plans, which will include discipline-specific mitigation and monitoring measures covering the following topics that related to potential sources of environmental and social impacts –
- Remediation Plan (decontamination);
- Groundwater Management Plan;
- Surface Water Management Plan;
- Air Quality Management Plan;
- Rehabilitation and Biodiversity Management Plan, which will make provision for:
  - Managing biodiversity;
  - Rehabilitation of wetlands and natural areas; and

  - Managing invasive alien species.
- Traffic Management Plan;
- ADF Rehabilitation Plan;
- Waste Management Plan
- RAP;
- SEP, including a GRM;
- Labour Management Procedure;
- SEA/SH Prevention and Response Plan;
- OHS Management Plan;
- Community Health and Safety Plan; and
- ERP.

8.6.1.1 Monitoring

Monitoring is required to ensure that the receiving environment is suitably safeguarded against the identified potential impacts, and to ensure that the environmental and social management requirements are adequately implemented and adhered to during the Project.

Monitoring frequency will be sufficient to provide representative data for the parameters being monitored. Monitoring will be conducted by trained individuals following monitoring and record-keeping procedures and using properly calibrated and maintained equipment. Monitoring data will be analysed and reviewed at regular intervals and compared with the operating standards, so that any necessary corrective actions can be taken.

The ESMP will include a Monitoring Plan. The following types of monitoring will be catered for.

a) <u>Baseline Monitoring</u>

Baseline monitoring aims to determine the pre-construction state of the receiving environment and serves as a reference to measure the residual impacts of the Project by evaluating the deviation from the baseline conditions and the associated significance of the adverse effects.

Baseline monitoring forms part of the monitoring regime currently implemented by Eskom at KPS, as well as the findings of the specialist studies undertaken for the respective closure and repurposing ESIA's.

b) <u>Environmental & Social Monitoring Programmes</u>

Environmental monitoring entails checking at pre-determined frequencies whether thresholds and baseline values for certain environmental parameters are being exceeded. The parameters and sampling localities used during the baseline monitoring, including further recommendations from authorities and specialists, will form the basis of the environmental monitoring program.

The monitoring programs, which are to be undertaken during decommissioning and post-closure, are listed in Table 63 below.

Table 63: Environmental and Social Monitoring Programmes

<table>
<tr><th>Environmental Monitoring Programme</th><th>Requirements</th><th>Environmental Parameter</th><th>Monitoring Locations</th><th>Frequency</th></tr>
<tr><td>Groundwater Quality</td><td>• Conditions of existing and new environmental approvals (including WUL and WML).
• EHS Guidelines.
• IWWMP.
• Periodic monitoring of groundwater quality (during decommissioning and post-closure).</td><td colspan="3" rowspan="3">To be confirmed as part of the Soil, Surface Water and Groundwater Assessment.</td></tr>
<tr><td>Surface Water Quality</td><td>• Conditions of existing and new environmental approvals (including WUL and WML).
• EHS Guidelines.
• IWWMP.
• Periodic monitoring of surface water quality (during decommissioning and post-closure).</td></tr>
<tr><td>Soil Quality</td><td>• Conditions of existing and new environmental approvals (including WML).
• EHS Guidelines.
• IWWMP.
• Periodic monitoring of soil quality (during decommissioning and post-closure).</td></tr>
<tr><td>Air Quality</td><td>• South African Ambient Air Quality Standards.
• EHS Guidelines, Section 1.1 - Air Emissions and Ambient Air Quality.
• World Health Organization (WHO) Air Quality Guidelines Global Update, 2005.
• Periodic monitoring of air quality (during decommissioning and post-closure).</td><td colspan="3">To be confirmed as part of Fugitive Emission Assessment.</td></tr>
<tr><td>Social Aspects</td><td>• EHS Guidelines, Section 3 – Community Health and Safety.
• See preliminary indicators in Table 46 above.</td><td colspan="3">To be confirmed as part of the Social Impact Assessment and Health and Safety Assessment.</td></tr>
<tr><td>OHS</td><td>• EHS Guidelines, Section 2 – Occupational Health and Safety.
• See preliminary indicators in Table 45 above.</td><td colspan="3">To be confirmed as part of the Health and Safety Assessment.</td></tr>
<tr><td>Noise & Vibration</td><td>• SANS 10103:2008.
• EHS Guidelines, Section 1.7 – Noise.
• WHO Guidelines for Community Noise, 1999.</td><td colspan="3">To be confirmed as part of Noise Impact Assessment.</td></tr>
</table>

Environmental Monitoring Programme	Requirements	Environmental Parameter	Monitoring Locations	Frequency
	• Periodic monitoring of noise and vibration (during decommissioning).			
Rehabilitation	• Periodic monitoring during decommissioning and post-closure of: o Dam safety. o Stability. o Erosion. o Rehabilitation progress and success.	*To be confirmed as part of technical investigations and specialist studies.*		
Water Consumption	• WUL. • EHS Guidelines, Section 1.4 - Water Conservation. • Periodic monitoring of water consumption during decommissioning and post-closure.	*To be confirmed as part of technical investigations.*		
Waste	• New WML. • EHS Guidelines, Section 1.6 - Waste Management. • Periodic monitoring during decommissioning of: o Waste inventory; o Reuse; o Recycling rates; o Waste storage practices and facilities; o Waste contractors; o Wase records; o Disposal sites.	*To be confirmed as part of technical investigations and Waste Management Assessment.*		
Undermining	*The status of undermining on the overall KPS property could not be confirmed during the compilation of the draft ESIA Report and is to be determined in consultation with the mine in question. Long-term monitoring of undermining risks may be required, depending on the extent to which KPS is affected by underground mining.*			

8.7 Stakeholder Engagement

Stakeholder engagement as part of the ESIA will be aligned with the requirements in World Bank's ESS10. The Stakeholder Engagement Plan is contained in Section 7 above.

In addition, as part of stakeholder engagement it will also be ensured that the tasks required in Chapter 6 of the EIA Regulations are undertaken, which include the following:

- Compiling a register of I&APs.
- Providing written notices to I&APs by –
  - Fixing notice boards at places conspicuous to and accessible by the public within the Project Area.
  - Giving written notice to:
    - The occupiers of the sites where the activity is to be undertaken, as relevant;

- Owners, persons in control of, and occupiers of land adjacent to the site where the activity is or is to be undertaken, as relevant;
- The Municipal Councillor of the affected municipal Ward;
- Formal organisations or groups in the area;
- The STLM and NDM, which have jurisdiction in the area;
- Any organ of state having jurisdiction in respect of any aspect of the activity (e.g., DWS, NDM, DMRE, DARDLEA, MTPA, MPHRA, PWRT, DEL); and
- Any other party as required by DFFE.

- Place adverts in local and regional newspapers.
- Using reasonable alternative methods, as agreed to by DFFE, in those instances where a person is desirous of but unable to participate in the process. Notifications will be translated into the preferred local languages and meetings with stakeholder groups will also be held in their languages of choice.
- A Comments and Response Report (CRR) will be compiled and updated throughout the process.

- Allowing I&APs to review and provide comments on the Scoping and EIA Reports.

9 REFERENCES

Cardinale, P. & Greig, L., 2013. Cumulative Impact Assessment and Management : Guidance for the Private Sector in Emerging Markets. International Finance Corporation (IFC), Washington, DC, USA.

Cilliers, B.D., 2021. Report on Cone Penetration Testing (CPTu) at Komati Power Station Ash Dam, Komati, Mpumalanga. Geobella (Pty) Ltd, Pretoria, South Africa.

DEA, 2010. Framework for the Management of Contaminated Land. Department of Environmental Affairs (DEA, Pretoria, South Africa.

DEAT, 2004. Cumulative Effects Assessment, Integrated Environmental Management, Information Series 7, Department of Environmental Affairs and Tourism (DEAT), Pretoria, South Africa.

Durgapersad, K., 2021. Preliminary Komati Biomonitoring – July 2021. Eskom Research, Testing & Development (RT&D), Johannesburg, South Africa.

DWS, 2019. A Desktop Assessment of the Present Ecological State, Ecological Importance and Ecological Sensitivity per Sub Quaternary Reaches for Secondary Catchments in South Africa. Department of Water and Sanitation (DWS), Pretoria, South Africa.

Enslin-Liebenberg, H. & Mudeme, L., 2008. Air Quality Impact Assessment for the Proposed Komati Power Station Ash Dam Extension, Mpumalanga. Airshed Planning Professionals (Pty) Ltd, Midrand, South Africa.

Eskom, 2021. Komati Power Station. Emergency Response Procedure. Eskom Holdings SOC Ltd, Johannesburg, South Africa.

Ferrar, A.A. & Lötter, M.C., 2007. Mpumalanga Biodiversity Conservation Plan Handbook. Mpumalanga Tourism & Parks Agency, Nelspruit, South Africa.

Golder Associates, 2017. Review and Update of the Decommissioning and Closure Costs for Komati Power Station, as at May 2017. Golder Associates, Midrand, South Africa.

Halenyane, K., 2019. Numerical Modelling and Geochemistry Assessment of Eskom Komati Power Station. Kimopax (Pty) Ltd, Johannesburg, South Africa.

Hemming, M., 2013. Operation of Ash Dam Extension 3 at the at Komati Power Station, Mpumalanga. Environmental Impact Assessment Report. Synergistics Environmental Services (Pty) Ltd, Johannesburg, South Africa.

Holl, T., 2022. Personal communication. Eskom Holdings SOC Ltd, Johannesburg, South Africa.

ILISO Consulting, 2012. Construction and Operation of Infrastructure and Facilities for the Return to Service of Komati Power Station, Mpumalanga Province. Draft Environmental Impact Report. ILISO Consulting (Pty) Ltd, Pretoria, South Africa.

Jeffrey, L., 2021. Independent Competent Person's Report on Goedehoop Colliery. SRK Consulting (South Africa) (Pty) Ltd, Johannesburg, South Africa.

Leseka, N., 2022. Geotechnical Desktop Study Report for Komati Power Station. Eskom, Johannesburg, South Africa.

Lourens, M., 2022. Eskom Komati Power Station – Groundwater Laboratory Results Review. RSK GCS Environment (PTY) Ltd, Johannesburg, South Africa.

Malele, L., 2022. Personal communication. Enviroserv Waste Management (Pty) Ltd, Germiston, South Africa.

Maliba, B., 2016. Routine Biomonitoring Network for Eskom: 2015/16. Eskom Research, Testing & Development (RT&D), Johannesburg, South Africa.

Mathetsa, S. & Swartz, N. 2019. Komati Hydrocensus Report. Eskom Research, Testing & Development (RT&D), Johannesburg, South Africa.

Mathoho, G., Khuzwayo L., & Samuels V. 2017. Komati Surface and Groundwater Monitoring Report, Phase 3. Eskom Research, Testing & Development (RT&D), Johannesburg, South Africa.

Matimolane, M., 2021. Air Quality Offsets Implementation Plan for Nkangala District Municipality: Hendrina, Arnot, Komati, Kriel, Matla, Kendal and Duvha Power Stations. Eskom Holdings SOC Ltd, Johannesburg, South Africa.

Moatshe, A., 2022. Komati Air Quality Report - May 2022. Eskom Research, Testing & Development (RT&D), Johannesburg, South Africa.

Mphohle, T., 2013. An Environmental Noise Survey at Eskom Komati Power Station. Ergosaf Environmental and Occupational Health Services, Johannesburg, South Africa.

MTPA, 2014. Mpumalanga Biodiversity Sector Plan Handbook. Compiled by Lötter M.C., Cadman, M.J. and Lechmere-Oertel R.G. Mpumalanga Tourism & Parks Agency (MTPA), Mbombela, South Africa.

Mucina, L. & Rutherford, M.C., 2006. The vegetation of South Africa, Lesotho and Swaziland, in Strelitzia 19. South African National Biodiversity Institute, Pretoria, South Africa.

Münster, F., 2005. Guideline for determining the scope of specialist involvement in EIA processes: Edition 1. CSIR Report No ENV-S-C 2005 053 A. Republic of South Africa, Provincial Government of the Western Cape, Department of Environmental Affairs & Development Planning, Cape Town, South Africa.

Muswubi, T.R., 2018. Komati Power Station Alien Invasive Species Monitoring, Control and Eradication Plan. Eskom Holdings SOC Ltd, Johannesburg, South Africa.

Muswubi, T.R., 2022. Personal communication. Eskom Holdings SOC Ltd, Johannesburg, South Africa.

Pocock, G. & Joubert, H., 2021. NATSURV 16 - Water and Wastewater Management in the Power Generating Industry (Edition 2). WRC Report No. TT 853/21. Water Research Commission (WRC), Pretoria, South Africa.

Raimondo, D., von Staden, L., Foden, W., Victor, J.E., Helme, N.A., Turner, R.C., Kamundi, D.A. & Manyama, P.A., 2009. Red List of South African Plants. Strelitzia 25. South African National Biodiversity Institute, Pretoria, South Africa.

Rutherford, M.C. & Westfall, H., 1994. Biomes of Southern Africa: An objective categorization. 2nd ed. Memoirs of the Botanical Survey of South Africa, 63: 1-94.

SANBI, 2018. The Vegetation Map of South Africa, Lesotho and Swaziland. Mucina, L., Rutherford, M.C. and Powrie, L.W. (Editors), Online, http://bgis.sanbi.org/SpatialDataset/Detail/18, Version 2018. South African National Biodiversity Institute (SANBI), Pretoria, South Africa.

Shakwane, O.T., 2015. Environmental Impact Report and Environmental Management Programme: Goedehoop Colliery, Hope No. 4 Seam Project. Geovicon Environmental, Middelburg, South Africa.

Sinthumule, M., 2022. Komati Power Station Surface and Groundwater Monitoring – Quarter 3. Eskom Research, Testing & Development (RT&D), Johannesburg, South Africa.

Skinner, S., 2022. Eskom Komati Power Station ESIA and WULA: Preliminary Contaminated Land Study. WSP, Johannesburg, South Africa.

STLM, 2022. 2022/23 Integrated Development Plan. Steve Tshwete Local Municipality (STLM), Middelburg, South Africa.

Strydom, H.A. & King, N.D., 2009. Environmental Management in South Africa. Second Edition. Cape Town: Jutta.

The Biodiversity Company, 2022. Biodiversity Screening Report for the Komati Power Station. The Biodiversity Company, Johannesburg, South Africa.

uMoya-NILU, 2014. Atmospheric Impact Report in support of Eskom's application for postponement of the Minimum Emission Standards compliance timeframes for the Komati Power Station. uMoya-NILU, Durban, South Africa.

Urban-Econ Development Economists, 2020. Socio-Economic Impact Study for the Shutdown and Repurposing of Komati Power Station to Create a Basis for Sustainable Livelihood. Draft Integrated Report. Urban-Econ Development Economists, Pretoria, South Africa.

van Deventer, H., Smith-Adao, L., Mbona, N., Petersen, C., Skowno, A., Collins, N.B., Grenfell, M., Job, N., Lötter, M., Ollis, D., Scherman, P., Sieben, E. & Snaddon, K., 2018. South African National Biodiversity Assessment 2018: Technical Report. Volume 2a: South African Inventory of Inland Aquatic Ecosystems (SAIIAE). Version 3, final released on 3 October 2019. Council for Scientific and Industrial Research (CSIR) and South African National Biodiversity Institute (SANBI), Pretoria, South Africa.

van Niekerk, L.J. & Staats, S., 2008. Komati Power Station Hydrological & Geohydrological Baseline Study. Geo-Hydro Technologies (Pty) Ltd, Bloemfontein, South Africa.

van Schalkwyk, J., 2007. Heritage Survey Report for the Komati Power Station Ash Dam Extension.

VPC GmbH, 2021. Draft Report for Komati Thermal Power Plant. Technical Analysis on retiring and repurposing four coal plants, South Africa. VPC GmbH, Germany.

World Bank, 2016. World Bank Environmental and Social Framework. World Bank, Washington, DC, USA.

World Bank, 2020. Technical Note: Public Consultations and Stakeholder Engagement in WB-supported operations when there are constraints on conducting public meetings. World Bank, Washington, DC, USA.

World Bank, 2018. ESS10: Stakeholder Engagement and Information Disclosure. World Bank, Washington, DC, USA.

WBG, 2022. Komati Thermal Power Plant Decommissioning and Repurposing: Project Scoping Report. Pretoria, South Africa.

Websites

https://socialway.angloamerican.com/en/toolkit/engagement-and-analysis/stakeholder-engagement/guidance/plan/task-3-map-stakeholders

https://conceptboard.com/blog/stakeholder-analysis-mendelow-matrix/

https://jpt.spe.org/stakeholder-engagement-in-the-decommissioning-process

https://www.lucidchart.com/blog/how-to-do-a-stakeholder-analysis

https://ctb.ku.edu/en/table-of-contents/participation/encouraging-involvement/identify-stakeholders/main

https://screening.environment.gov.za/screeningtool/#/pages/welcome

https://www.saps.gov.za/services/crimestats.php