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DRAFT ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT

Proposed Stormwater Drainage and Associated Infrastructure at the Kusile Power Station, near Delmas, Mpumalanga

Report No : 22018-04-Rep-001-Kusile Stormwater DEMPr-Rev0

Submitted to:

Department of Forestry, Fisheries and the Environment
Environment House,
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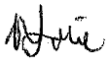
Prepared	Senior EAP	Ms. Natasha Lalie	30 October 2022	
Reviewed/ Approved	Project Manager	Dr. Mathys Vosloo	04 November 2022	

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LIST OF ACROYNYMS

Acronym	Description
ADDD	Ash Dump Dirty Dam
AIP	Alien Invasive Plants
APHP	Accredited Professional Heritage Practitioner
ASAPA	Association of Southern African Professional Archaeologists
BA	Basic Assessment
BAR	Basic Assessment Report
BBB-EE	Broad Based Black Economic Empowerment
CA	Competent Authority
CARA	Conservation of Agricultural Resources Act, 1983 (Act No. 43 of 1983)
CBA	Critical Biodiversity Area
DFFE	Department of Forestry, Fisheries and the Environment
DM	District Municipality
EA	Environmental Authorisation
EAP	Environmental Assessment Practitioner
EAPASA	Environmental Assessment Practitioners Association of South Africa
ECO	Environmental Control Officer
EIA	Environmental Impact Assessment
EM	Environmental Manager
EMPr	Environmental Management Programme
EN	Endangered
EO	Environmental Officer
ESA	Ecological Support Area
ESO	Environmental Site Officer
EST	East Settling Tank
GA	General Authorisation
GNR	Government Notice Regulation
HGM	Hydrogeomorphic Unit
I&APs	Interested and Affected Parties
IWULA	Integrated Water Use License Application
IS	Importance and Sensitivity Assessment
MBSP	Mpumalanga Biodiversity Sector Plan
MS	Method Statement
MSDS	Material Safety Data Sheet
NEMA: EIA	Environmental Impact Assessment Regulations of 2014 (as amended)
NEMA	National Environmental Management Act 107 of 1998 (as amended)
NEMBA	National Environmental Management: Biodiversity Act, 2004

Acronym	Description
ADDD	Ash Dump Dirty Dam
AIP	Alien Invasive Plants
APHP	Accredited Professional Heritage Practitioner
ASAPA	Association of Southern African Professional Archaeologists
NEMWA	National Environmental Management Waste Management Act 59 of 2008
NBA	National Biodiversity Assessment
NHRA	National Heritage Resources Act 25 of 1999
NPAES	National Protected Areas Expansion Strategy
NWA	National Water Act 36 of 1998
OEM	Original Equipment Manufacturers
OHS	Occupational Health and Safety Act 85 of 1993
OLC	Overland Conveyor
PM	Project Manager
PPE	Personal Protection Equipment
PPP	Public Participation Process
SACNASP	South African Council of Natural and Scientific Professions
SANRAL	Spatial Planning & Land Use Management
SAHRA	South African Heritage Resources Agency
SCC	Species of Conservation Concern
RAM	Risk Assessment Matrix
SCC	Species of Conservation Concern
SEI	Site Ecological Importance
TBC	The Biodiversity Company
VU	Vulnerable
WST	West Settling Tank
WUL	Water Use License
WULA	Water Use License Application

GLOSSARY OF TERMS

Term	Description
Alien species	A species that is not indigenous to the area or out of its natural distribution range.
Alternatives	Alternatives are different means of meeting the general purpose and need of a proposed activity. Alternatives may include location or site alternatives, activity alternatives, process or technology alternatives, temporal alternatives or the 'do nothing' alternative.
Alternatives	Alternatives are different means of meeting the general purpose and need of a proposed activity. Alternatives may include location or site alternatives, activity alternatives, process or technology alternatives, temporal alternatives or the 'do nothing' alternative.
Ambient sound level	Background noise level already present in the environment (in the absence of noise generated by any other proposed development).
Assessment	The process or collecting, organising, analysing, interpreting and communicating information which is relevant.
Commencement	The start of any physical activity, including site preparation and any other activity on site resulting in the furtherance of a listed activity or specified activity, but does not include any activity required for the purposes of an investigation or feasibility study as long as such investigation or feasibility study does not constitute a listed activity or specified activity.
Commissioning	Commissioning commences once construction is completed. Commissioning covers all activities including testing after all components of the power station are installed.
Construction	Construction means the building, erection or establishment of a facility, structure or infrastructure that is necessary for the undertaking of a listed or specified activity. Construction begins with any activity which requires Environmental Authorisation.
Construction Activity	A Construction activity is any action taken by the Contractor, his subcontractors, suppliers or personnel during the Construction process.
Contractor	Any legal entity or consortium contracted to undertake the activity associated with the proposed project.
Decommissioning	Means to take out the active service permanently or dismantle partly or wholly, or closure of a facility to the extent that it cannot be readily re-commissioned.
Development	Means the building, erection, construction or establishment of a facility, structure or infrastructure, including associated earthwork or borrow pits, that is necessary or for the undertaking of a listed or specified activity but excludes any modification, alteration or expansion of such a facility, structure or infrastructure, including associated earthworks or borrow pits, and excluding the redevelopment of the same facility in the same location, with the same capacity and footprint.
Development footprint	Means any evidence of physical alteration as a result of the undertaking of any activity.
Environment	Environment means the surroundings within which humans exist and that are made up of – (i) the land, water and atmosphere of the earth; (ii) micro-organisms, plant and animal life; (iii) any part or combination of (i) and (ii) and the interrelationships among and between them; and (iv) the physical, chemical, aesthetic and cultural properties and conditions of the foregoing that influence human health and well-being.
Environmental Aspect	Element of an organization's activities or products or services that can interact with the environment.
Environmental Control Officer (ECO)	The person to be appointed by the Contractor, with the approval of the Engineer, to oversee the construction activities and to ensure that all environmental specifications and EMPr obligations are met during these

Term	Description
	phases. The ECO will be responsible for the monitoring, reviewing and verifying of compliance with the EMPr by the Contractor.
Environmental Assessment Practitioner	Individual responsible for the planning, management, coordination or review of Environmental Impact Assessments, Strategic Environmental Assessments, Environmental Management Programmes or any other appropriate environmental instruments introduced through regulations.
Environmental Impact	Any change to the environment, whether adverse or beneficial, wholly or partially resulting from an organization's environmental aspects.
Habitat	The place in which a species or ecological community occurs naturally.
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 (Van der Linde and Feris, 2010; pg 185).
Heritage	That which is inherited and forms part of the National Estate (Historical places, objects, fossils as defined by the National Heritage Resources Act of 2000
Indigenous	All biological organisms that occurred naturally within the study area prior to 1800
Interested and Affected Party	Interested and Affected Party for the purposes of Chapter 5 of the NEMA and in relation to the assessment of the environmental impact of a listed activity or related activity, means an interested and affected party contemplated in Section 24(4)(a)(v) of the NEMA and which includes - a) Any person, group of persons or organisation interested in or affected by such operation or activity; and b) Any organ of stale that may have jurisdiction over any aspect of the operation or activity.
Maintenance	Means actions performed to keep a structure or system functioning or in service on the same location, capacity and footprint.
Pollution	Pollution means any change in the environment caused by - (i) substances; (ii) radioactive or other waves; or (iii) 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.
Pre-construction	The period prior to the commencement of construction, which may include activities (e.g. geotechnical surveys) which do not require Environmental Authorisation.
Significant impact	An impact that by its magnitude, duration, intensity or probability of occurrence may have a notable effect on one or more aspects of the environment.
Waste	Any substance, whether or not that substance can be reduced re-used, recycled and recovered; that is surplus, unwanted, rejected, discarded, abandoned or disposed of which the generator has no further use for the purposes of production. Any product which must be treated and disposed of, that is identified as waste by the minister of Environmental affairs (by notice in the Gazette) and includes waste generated by the mining, medical or other sectors, but: A by-product is not considered waste, and portion of waste, once re-used, recycled and recovered, ceases to be waste.

1 INTRODUCTION AND BACKGROUND

Zitholele Consulting (Pty) Ltd (ZC) has been appointed by Eskom Holdings SOC Ltd (Eskom), to undertake the Basic Assessment process for the proposed construction of stormwater drainage and associated infrastructure at the Kusile Power Station, underneath the existing Overland Conveyor and near the existing radial stacker.

The proposed stormwater drainage and associated infrastructure will be located at the Kusile Power Station complex within the Victor Khanye Local Municipality, near Delmas, Mpumalanga. The Power Station is located along Lone Rock Road (R686). The proposed infrastructure will be located underneath the existing overland conveyor system that conveys mixed coarse ash and gypsum from the power station to the radial stacker (refer to the Locality Map in Figure 1-1).

The existing overland conveyor system is operating without stormwater infrastructure, and this has resulted in ash-laden stormwater runoff entering into the nearby wetlands, thereby contaminating the water resources. The proposed stormwater drainage and associated infrastructure is aimed at improving the environmental performance of the power station by eliminating the pollution of the watercourses.

The proposed activities entails the construction of the following infrastructure, viz, stormwater collection channels, Overland Conveyor (OLC) 1&2 collection sump with a working capacity of 125m^3 , the East Settling Tanks (EST) comprising of two compartments and a pump sump with a total storage capacity of 5394.3 m^3, two 250NB interconnecting pipelines (Length = 45m each) from the OLC 1&2 sump to the EST, a 300mm diameter above ground steel pipeline to transfer clarified water from the east settling tank pump sump to the ash dump dirty water drain (Total Length - 688m), the West Settling Tanks (WST) comprising of two compartments and a pump sump with a total storage capacity of 1270.2m^3, a 200mm diameter overland steel pipeline to transfer clarified water from the west settling tank pump sump to the ash dump dirty water drain (Total Length - 178m) and groundwater interception drains will also be installed underneath east and west settling tank foundations with groundwater drains draining to the environment. A gravel access road (169m) will be constructed from the sump the EST.

This Environmental Management Program (EMPr) details the specifications and requirements identified for the proposed development.

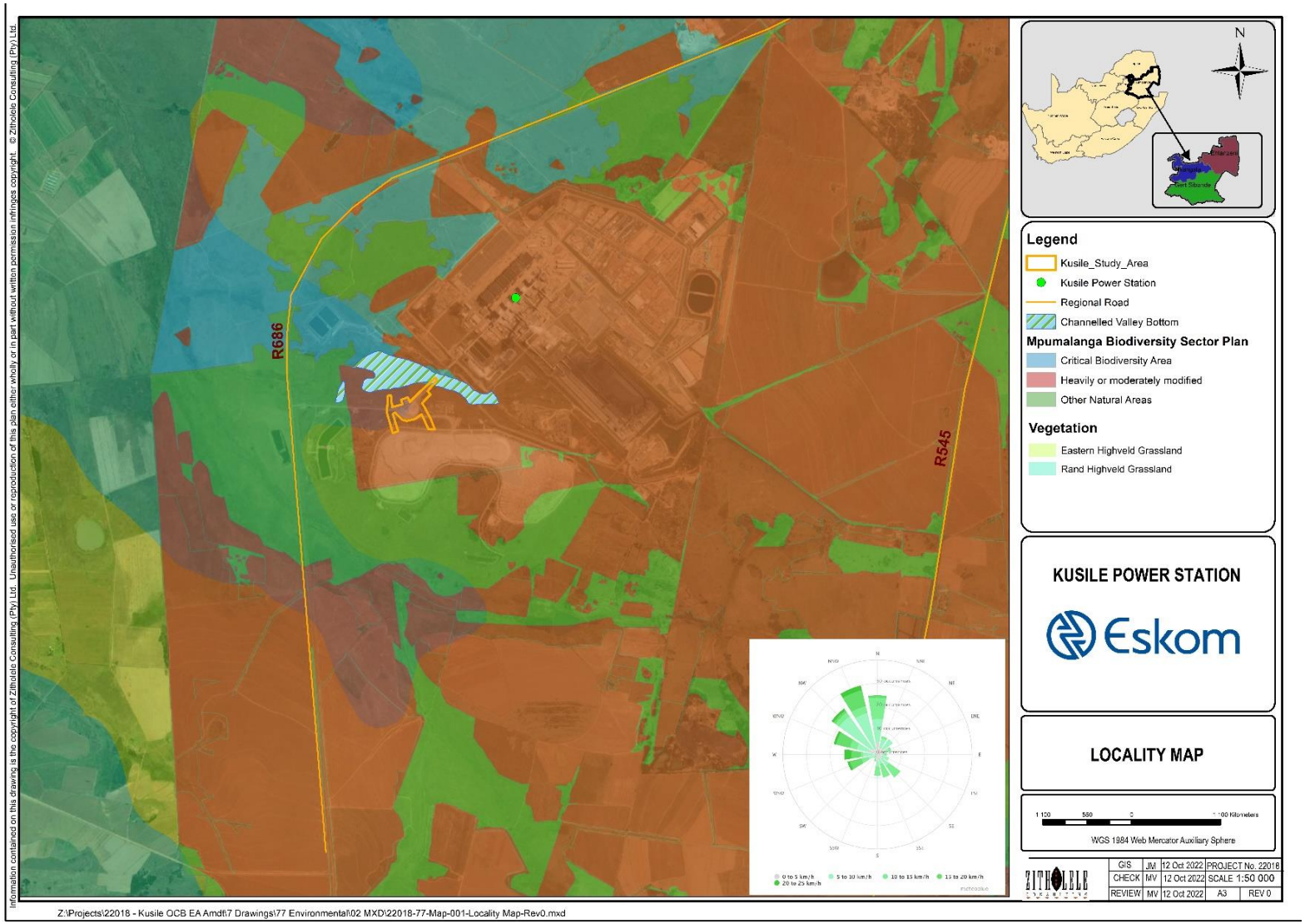

Figure 1-1: Locality Map

1.1 Need and desirability

As explained earlier, contaminated ash-laden stormwater run-off is entering into the nearby watercourses and the surrounding environment, as a result of the lack of a proper stormwater drainage infrastructure being in place at OLC1 and 2 and the radial stacker. Environmental non-conformances have been issued by the Department of Forestry, Fisheries and the Environment (DFFE) to the Power Station for the operations around the radial stacker and the OLC 1 and 2 system. Therefore, a need exists at the site in particular, i.e. at the radial stacker and the OLC 1 and 2 systems for stormwater drainage to prevent further contamination of the watercourse.

2 GENERAL OBJECTIVES AND PURPOSE OF EMPr

Eskom (Applicant) together with the Contractors appointed to undertake the development and installation activities will be required to do the following:

- Manage and operate their activities with due care and diligence;
- Avoid and/or limit any adverse impacts they may have on the environment by the proper design and construction of the proposed development;
- Control predicted impacts that may occur, so as to meet acceptable standards, both as a legal and a moral responsibility to the environment within which they operate; and
- Ensure transparency in their operation and environmental management of the site.

This Draft Environmental Management Programme (EMPr) serves as a stand-alone document to be issued to and used by Eskom (Applicant), the Contractor/s, sub-consultants and Project Managers (PMs) / Supervisors during the construction and operational phases of the project. By its very nature, the EMPr is a dynamic document and updating may be required over the life of the development.

3 DOCUMENT ROADMAP

The Draft EMPr document has been structured and collated to conform to Section 19(4) read with Appendix 4 of the National Environmental Management Act 107 of 1998 (NEMA) (as amended) Environmental Impact Assessment (EIA) Regulations of 2014. The relevant document parts which addresses each of the aspects provided in Appendix 4 of the NEMA EIA Regulation 2014 is provided in Table 3-1. This has been done to ensure that the Competent Authority (CA) (i.e. DFFE) is provided with a comprehensive document that can be translated into a working / dynamic document during the Construction and Operational Phases of the proposed project.

Table 3-1: Document Roadmap

Relevant regulation, stipulation or condition		Relevant Document Part
Appendix 4		
1. An EMPr must comply with section 24N of the Act and include-		
(a)	details of -	

Relevant regulation, stipulation or condition			Relevant Document Part
	(i)	the EAP who prepared the EMPr; and	Section 5
	(ii)	the expertise of that Environmental Assessment Practitioner (EAP) to prepare an EMPr, including curriculum vitae;	Section 5 and Appendix A
(b)	a detailed description of the aspects of the activity that are covered by the EMPr as identified by the project description;		Section 4
(c)	prepared map at an appropriate scale which superimpose the proposed activity, its associated structures, and infrastructure on the environmental sensitivities of the preferred site, indicating any areas that should be avoided, including buffers;		Section 4, Figure 4-1
(d)	assessment description of the impact management outcomes, including management statements, identifying the impacts and risks that need to be avoided, managed and mitigated as identified through the environmental impact assessment process for all phases of the development including-		
	(i)	Planning and design;	Section 10
	(ii)	Pre-construction activities;	Section 10
	(iii)	Construction activities	Section 10
	(iv)	Rehabilitation of the environment after construction and where applicable post closure; and	Section 17
	(v)	Where relevant, operational activities	Section 10
(e)	a description and identification of impact management outcomes required for the aspects contemplated in paragraph (d);		Section 10
(f)	a description of the proposed impact management actions, identifying the manner in which the impact management outcomes and outcomes contemplated in paragraphs (d) will be achieved, and must, where applicable, include actions to-		
	(i)	Avoid, modify, remedy, control or stop any action, activity or process which causes pollution or environmental degradation;	Section 10 & 15
	(ii)	Comply with any prescribed environmental management standards or practices;	Section 7 & 15
	(iii)	Comply with any applicable provisions of the Act regarding closure, where applicable; and	Not applicable
	(iv)	Comply with any provisions of the Act regarding financial provisions for rehabilitation, where applicable;	Not applicable
(g)	the method of monitoring the implantation of the impact management actions contemplated in paragraph (f);		Section 10, 14, 15 & 16
(h)	the frequency of monitoring the implementation of the impact management actions contemplated in paragraph (f);		Section 15
(i)	an indication of the persons who will be responsible for the implementation of the impact management actions;		Section 8, 9 & 15
(j)	the time periods within which the impact management actions contemplated in paragraph (f) must be implemented;		Section 15
(k)	the mechanism for monitoring compliance with the impact management actions contemplated in paragraph (f);		Section 11 & 15 & 16
(l)	a program for reporting on compliance, taking into account the requirements as prescribed by the Regulations;		Section 16
(m)	an environmental awareness plan prescribing the manner in which-		
	(i)	The applicant intends to inform his or her employees of any environmental risk which may result from their work; and	Section 13
	(ii)	Risks must be dealt with in order to avoid pollution or the degradation of the environment; and	Section 15

Relevant regulation, stipulation or condition		Relevant Document Part
(n)	any specific information that may be required by the competent authority	Not Applicable
(2)	Where a government notice gazetted by the Minister provides for a generic EMPr, such generic EMPr as indicated in such notice will apply.	n/a

4 PROJECT DESCRIPTION

4.1 Study Area

4.1.1 Description of the Study Area

The Kusile Power Station is located approximately 9km south-west of the Balmoral town in the Mpumalanga Province. Access to the site is gained from the R686 Provincial Roads. The study area is located at the Kusile Power Station, within the coarse ash OLC where the transport of ash and gypsum from the power station to the radial stacker occurs (Table 4-1).

Table 4-1: Details relating to project location

Local Municipality	Victor Khanye Local Municipality
District Municipality	Nkangala District Municipality
Ward Number	Ward 9
Access to the site	Access to the site is gained from the R686 Provincial Roads.
Nearest Towns	Balmoral ~9km from the site Botleng ~26km from the site Witbank ~30km from the site Ogies ~ 20km from the site Kendal ~16km from the site Kwa-Guqa ~19km from the site Delmas ~30km from the site Phola ~15km from the site

The proposed development (*part of the stormwater v-drain*) will be located on Portion 1 of the Farm Hartebeesfontein 537 JR and the remainder of the proposed stormwater v-drain and associated infrastructure will be located on the Remainder of the Farm Klipfontein 566JR, approximately 32km north-east of Delmas. Details relating to the above properties and the ownership thereof, is provided in Table 4-2 and Table 4-3.

The site for the proposed development occurs within Ward 9 of the Victor Khanye Local Municipality within the Nkangala District Municipality in the Mpumalanga Province.

Table 4-2: Development property details of Portion 1 of the Farm Hartebeesfontein 537 JR

Property No.	537
Portion of Property	1
Property Type	Farm
Holding Area	Portion 1 of the Farm Hartebeesfontein 537 JR
Registration Division	JR
Surveyor-General Cadastral Code	T0JR00000000053700001
Property Area Size (ha)	475ha

Development Area Size (ha), of the linear infrastructure	~242m^2
Property Owner	Eskom Holdings SOC Limited
Title Deed Number	T106356/2007
Registration Date	2007/08/07

Table 4-3: Development property details of Remainder of the Farm Klipfontein 566JR

Property No.	566
Portion of Property	0
Property Type	Farm
Holding Area	Remainder of the Farm Klipfontein 566JR
Registration Division	JR
Surveyor-General Cadastral Code	T0JR00000000056600000
Property Area Size (ha)	32.5482
Development Area Size (ha), excl. linear infrastructure.	~16,800m^2
Property Owner	Eskom
Title Deed Number	T34481/1947
Registration Date	1947

Table Refer to Table 4-4 for a description of the land uses surrounding the site earmarked for the proposed stormwater and associated infrastructure.

Table 4-4: Surrounding land uses

Direction	Land Use and Distance
North	Kusile Power Station Complex (adjacent) Lone Rock Road (R686) (~2km)
North-east	Open veld consisting of degraded vegetation (adjacent) Power Station Complex (adjacent) Channelled valley bottom wetland (adjacent)
East	Open veld consisting of degraded vegetation (adjacent) Power station internal road (adjacent)
South-east	Power station internal road (~200m)
South	Power station internal road (~160m) Ash dump (~350m)
South-west	Radial stacker (adjacent)
West	Open veld consisting of degraded vegetation (adjacent) Lone Rock Road (R686) (~1km)
North-west	Channelled valley bottom wetland (adjacent) Ash Dump Dirty Dam (ADDD) (~500m)

The Kusile Power Station is accessed from the R686 Provincial Roads (Lone Rock Road). The site for the proposed stormwater drainage and associated infrastructure is accessed from the main internal roads through the power station. The proposed stormwater infrastructure will be located south-west of the existing Kusile Power Station, underneath the existing OLC and near the existing radial stacker.

4.2 Environmental Site Sensitivity

The site for the proposed development, occurs within a 'vulnerable' ecosystem (Ecosystem Threat Status (NBA, 2018) and according to the Mpumalanga Biodiversity Sector Plan (MBSP), 2014, the project area overlaps with portions of heavily modified area, with a portion falling within a Critical Biodiversity Area (CBA) Optimal area (Figure 4-1). The project area does overlap with priority focus areas for expansion according to the 2016 NPAES dataset (Figure 4-1).

The project area was found in a heavily modified condition, mainly attributed to the Power station and its impacts associated, resulting in the area being largely unnatural or disturbed in some way. Dust from the road, as well as ash from Power station has degraded the veld severely. The area has been disconnected and fragmented from any natural areas. These aspects further limit the functional capacity of the project area. The majority of the development footprint is located within or along roads or transformed areas and their associated servitudes, which are considered with very low sensitivity.

The only area of indigenous vegetation stands included grassland which was found in wetland areas. The CBA identified by the Conservation Plan that overlaps with the medium sensitivity area (drainage/wetland) may be considered viable, albeit disturbed. No protected trees or Species of Conservation Concern (SCC) flora species were observed.

Mammal activity was observed within the water resource areas (wetlands), and species like Water Mongoose (*Atilax paludinosus*) tracks were observed. The species present are most likely not resident due to the modified state of the area, however using the drainage/wetland areas for forage or a migration corridor.

The channelled valley bottom wetland area has medium ecological sensitivity with the remaining portion of the site having low ecological sensitivity (refer to Figure 4-1).

No adverse impact on heritage and fossil heritage resources are expected by the project and it is recommended that the project can commence on the condition that the recommendations (Section 15) are implemented as part of the EMPr.

Refer to the composite sensitivity map in Figure 4-1.

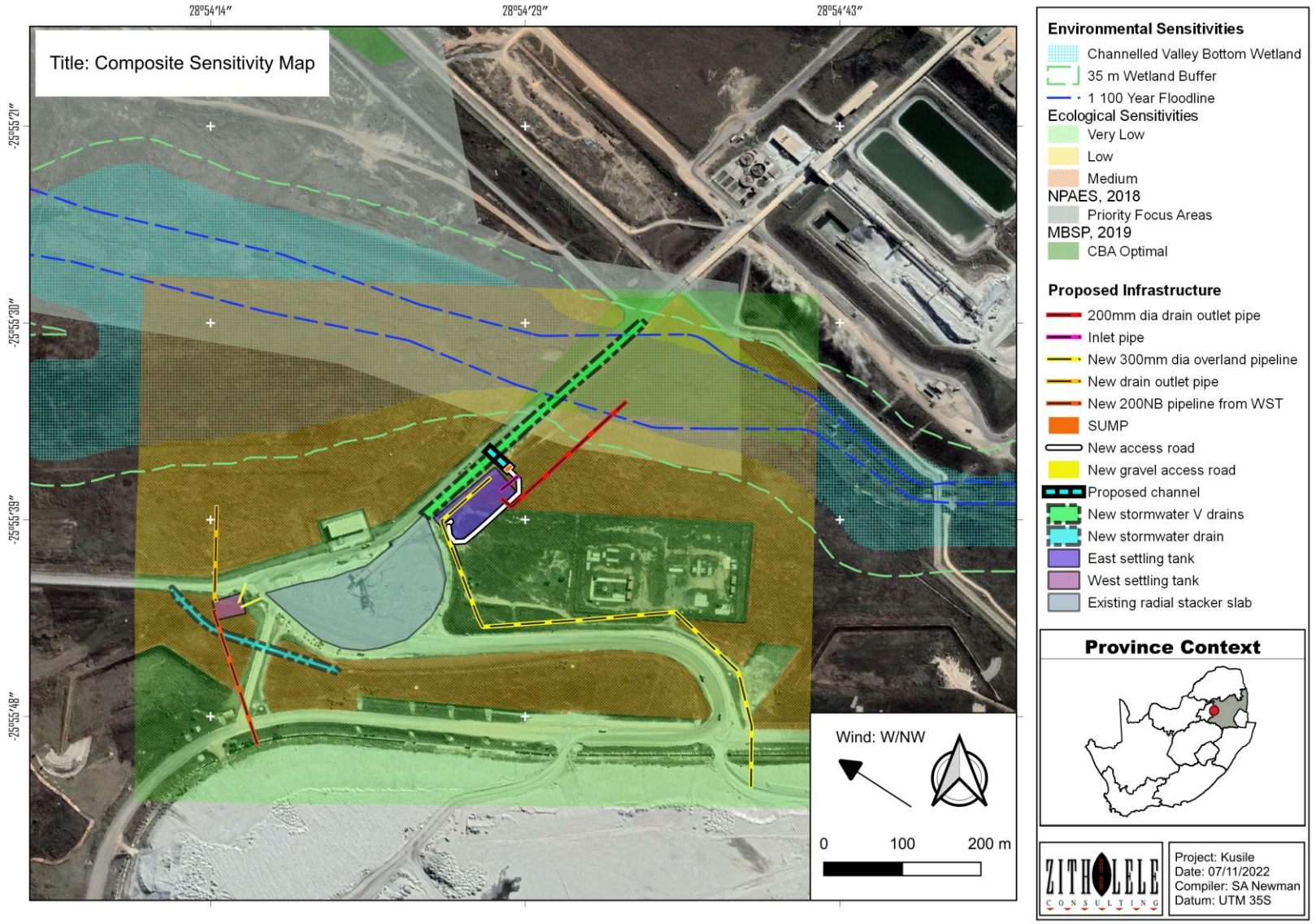

Figure 4-1: Composite sensitivity map

4.3 Project Activities

Eskom Holdings SOC Ltd proposes the construction of stormwater drainage underneath the existing Overland Conveyor Belt and associated infrastructure near the power station internal road and the existing radial stacker at the Kusile Power Station in Mpumalanga.

The Overland Link Conveyor 1 & 2 (OLC 1 & 2) system transmits mixed coarse ash and gypsum from the power station to the radial stacker. The system is currently operating without storm water drainage infrastructure to contain ash contaminated water along the conveyor servitudes, and this resulted in ponding and discharge of the wastewater into the watercourse, thereby contaminating the environment. The ash contaminated water has also resulted in environmental non-conformances being issued by the Department of Forestry, Fisheries and the Environment (DFFE) to the Kusile Power Station for its operations around the radial stacker and the OLC.

Therefore, the purpose of project, is to prevent environmental pollution, major impacts on surrounding wetlands, and spillage of ash laden stormwater into the nearby streams. This proposed solution entails stormwater channels to contain and divert contaminated water to the proposed collection sumps for storage. Thereafter, the collection sumps will be emptied by means of pumping, through overland pipelines, to the Radial Stack's collection sump. A new overland pipeline will be constructed from the East Settling Tank to the existing Ash Dump Dirty Water channel for final disposal to the existing Ash Dump Dirty Dam (ADDD). A new gravel road will be constructed from the sump to the EST, for operation and maintenance of the sumps and the tank.

4.3.1 System summary description

The detailed design for the OLC 1&2 Drainage system includes stormwater channels, a collection sump, and pipelines. The collection sump is situated on the south side of the OLC 1&2 system at the lowest point to ensure gravity flow within the channels to the sump. The collection sump acts as a drainage basin to temporarily store water from the identified dirty catchment area of the OLC 1&2 system. Subsequently, the water is pumped through a pipeline to the Radial Stack dirty water collection sump. The design includes stormwater channels to drain water from the identified dirty catchment area of the OLC 1&2 system to the collection sump. The design also includes earthworks (slope shaping, i.e. backfill and/or cut) to ensure runoff to the stormwater channels.

Refer to Drawing No. K30300098/06-571 (East Settling Tank) for the proposed infrastructure in Appendix A.

4.3.2 Upgrade of the radial stacker

The radial stacker ash storage slab currently has no facilities to prevent ash being washed off the slab and into the perimeter drains during storm events, nor to settle the ash for

recovery to the slab or to pass clarified water free of ash to the Ash Dump Dirty Drain (ADDD).

There are no facilities to settle the ash before washing off the radial stacker slab to the East canal or the buried pipeline inlet sumps. These two existing facilities, including the inlet sumps along the length of the buried pipeline and the pipeline itself, have become totally blocked with ash. Because the ash has pozzolanic properties, it has hardened and is difficult to remove. The result of the blockages is that ash and dirty stormwater are being spilled to the surrounding environment.

The aim is to retain as much ash from the storm run-off as possible on the stacker slab, and then to settle and clarify the remaining stormwater discharge from the slab in new East and West Settling tanks, before transferring clarified water to the Ash Dump Dirty Dam (ADDD) complex via the existing ash dump perimeter dirty drain.

This will be achieved firstly by constructing an up-stand wall 700 mm high and 430m in total length, around most of the perimeter of the slab as shown in concept design Figure 4-2. Decant outlet chambers positioned at intervals at low spots will transfer clarified water off the slab into the perimeter channels.

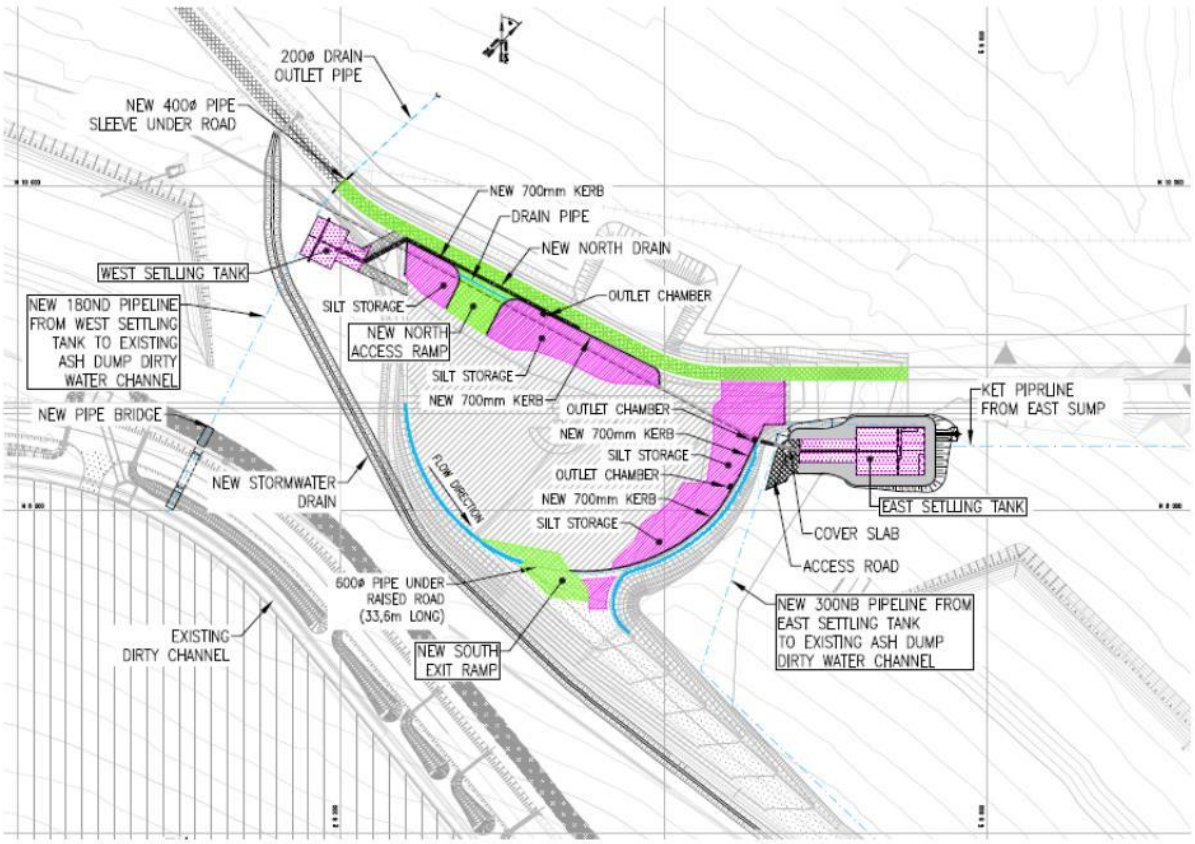

Figure 4-2: Conceptual Design Plan

The stacker slab is divided into two zones as shown in Figure 4-2:

- A large zone draining South-Eastwards towards the East trapezoidal perimeter drain
- A smaller zone draining North-Westwards towards the Northern perimeter of the slab, where a new rectangular perimeter drain will be necessary.

Clarified water from minor storm events on the Eastern part of the slab catchment will be decanted through outlet chambers, after settling out of the ash, to the existing trapezoidal perimeter drain on the East perimeter and hence to a new East Settling Tank.

Similarly, the Northern slab zone will discharge clarified water from minor storms via a new North perimeter drain to a new West Settling Tank.

Slab overflow with suspended ash solids that cannot be contained on the slab in a large storm, and all other ash-laden stormwater discharge will then be passed to the new East and West settling / detention tanks for settling out of suspended ash and transfer of clarified water to the settling tank pump sump.

After decanting clarified water from the East and West settling tanks into the tank collection/pump sumps, the clarified water will be pumped to the ADDD in two new above ground steel pipelines, via the existing ash dump dirty water channel.

Both pumping options will use standard submersible pumps serviced by slewing, pillar jib cranes, similar to those used in the Fly Ash/Unit 1/EAD de-gritting sump.

Proposed infrastructure for the radial stacker are illustrated on Drawing No. K30300098-06591_Radial Stacker Upgrade in Appendix A. The following infrastructure is proposed:

- 500mm high wall
- 600mm dia pipe under raised road
- 775mm high wall
- Covered trenches x 2
- Extent of flooded area
- New gate 2 and 3
- New 775mm kerb wall
- New 775mm kerb
- New 900mm wide access walkway to Gate G1
- New 900mm wide access walkway to Gate G2

- New 900mm wide access walkway
- New north drain
- New silt storage areas x 3

4.3.3 West Settling Tank

The new west settling tank is shown on Drawing No. K30300098-06-566 (West Settling Tank) in Appendix A.

Three pipe bridges will be constructed to carry a 200mm dia pipeline over the stormwater channels. Please also refer to Drawing No: K30300098/06-565 in Appendix A.

Two pipe culverts for the 200-diameter pipe are required under the access roads. Pre-cast "ROCLA" units, comprising a base slab and a culvert unit, are to be used here. Refer to Drawing No. 30300098/06-583 for detail design and Drawing No. K30300098/06-566 for the location of the culverts on the Drawing in Appendix A.

A new stormwater drain is proposed from the radial stacker to the existing road. Refer to Drawing No. K30300098/06-566 in Appendix A for the location of the new stormwater drain.

Two new gravel access roads will connect to the existing radial stacker from the West Settling Tanks.

The proposed stormwater drainage and associated infrastructure refers to the following:

- Construction of stormwater collection channels (V-drain) underneath the existing OLC
- OLC 1&2 collection sump with a working capacity of 125m^3
- East Settling Tanks (EST) comprising of two compartments and a pump sump with a total storage capacity of 5394.3m^3
- Two 250NB interconnecting pipelines (Length = 45m each) from the OLC 1&2 sump to the EST
- A 300mm diameter above ground steel pipeline to transfer clarified water from the east settling tank pump sump to the ash dump dirty water drain (Total Length - 688m)
- West Settling Tanks (WST) comprising of two compartments and a pump sump with a total storage capacity of 1270.2 m^3
- A 200mm diameter overland steel pipeline to transfer clarified water from the west settling tank pump sump to the ash dump dirty water drain (Total Length - 178m)
- Groundwater interception drains will also be installed underneath the east and west settling tank foundations with a groundwater outlet drain draining into the channelled valley bottom wetland
- A gravel access road (169m) will be constructed from the sump the EST

4.4 Description of Project Component

4.4.1 Pre-Construction and Construction process for the proposed development

The pre-construction and construction of the proposed development will be undertaken in the following steps:

- Undertaking and completion of proposed development concept;
- Obtain the relevant permits and siting approval (Undertake the Basic Assessment (BA) and Integrated Water Use License Application (IWULA) Processes);
- Pre-Construction site work, such as Geotechnical Investigations;
- Undertaking of, and compliance with pre-construction activities and conditions in terms of the Environmental Authorisation and Water Use License (WUL);
- Demarcation of the no-go areas and the construction footprint areas;
- Site preparation (vegetation clearance) and excavations for the above proposed infrastructure;
- Foundations for the construction of the EST and WST;
- Installation of the concrete v-drains, interconnecting pipelines and the overland pipelines;
- Construction and/or installation of water supply and storm water management infrastructure; and
- Testing and commissioning.

The construction phase for the proposed project will take approximately 2 years.

4.4.2 Rehabilitation activities

Once all the construction activities are completed, the site will be rehabilitated where possible and practical. All temporal structures and facilities will be removed from site and the area will be rehabilitated in accordance with the Wetland Rehabilitation Plan (Appendix B).

4.4.3 Operational activities

After the installation and commissioning, the responsibility for safe operation and asset management will be transferred to the Eskom operation team. It should be noted that in some cases the manufacturer of certain components remains responsible for maintenance of specific components as part of a service agreement. A plan for systematic maintenance and function testing should be kept on location, showing in detail how components and systems should be tested and what should be observed during testing. Visual periodical and mandatory services should be kept in place. Maintenance may be performed manually or automated. In case of manual maintenance, a higher level of safety precautions needs to be undertaken.

4.4.4 Decommissioning activities

The proposed stormwater infrastructure will be in operation at the Kusile Power Station for the lifespan of the power station. In the event that the Kusile Power Station will be decommissioned in the future, the installed infrastructure would require de-installation.

The infrastructure will be disassembled, removed from the site, transported, re-used/recycled. Before the transportation of the components of the stormwater infrastructure, it should be made sure that the infrastructure and its components are safe to transport.

The decommissioning of the stormwater infrastructure will have similar activities to those that are performed during construction. The decommissioning activities anticipated once the facility reached its end of life are the following:

- Disassembling of the components of the stormwater and associated infrastructure and appropriate disposal to landfill.
- Site preparation, removal of all equipment for disposal and re-use.
- Site Rehabilitation to acceptable level as per Environmental Management Programme (EMPr) guidelines.

5 DETAILS AND EXPERTISE OF ENVIRONMENTAL ASSESSMENT PRACTITIONER

In terms of the National Environmental Management Act, (Act 107 of 1998) as amended (NEMA) and EIA Regulations (2014), the proponent/developer must appoint an Environmental Assessment Practitioner (EAP) to undertake a BA and/or Public Participation Process (PPP) for listed activities regulated in terms of the aforementioned act. In this regard, Eskom has appointed Zitholele Consulting (Pty) Ltd as the EAP on this project to undertake the BA process for the proposed project, in accordance with the aforementioned regulations.

Zitholele is an empowerment company formed to provide specialist consulting services primarily to the public sector in the fields of Water Engineering, Integrated Water Resource Management, Environmental and Waste Services, Communication (public participation and awareness creation) and Livelihoods and Economic Development.

Zitholele Consulting has no vested interest in the proposed project and hereby declares its independence as required by the EIA Regulations (2014, as amended).

This EMPr report has been compiled by the following persons who have the relevant expertise and experience in environmental management (see attached CV in **Appendix C**):

Table 5-1: Details of EAP on this project

Name and Surname	**Ms. Natasha Lalie (EAP and Technical Reviewer)**
Highest Qualification	MSc (Environment and Society)
Professional Registration	Environmental Assessment Practitioners Association of South Africa (EAPASA) - Registration No: 2021/3611
Company Represented	Zitholele Consulting (Pty) Ltd
Physical Address	Building 1, Maxwell Office Park, Magwa Crescent West, Waterfall City, Midrand
Postal Address	P O Box 6002, Halfway House, 1685
Contact Number	011 207 2060
Facsimile	086 674 6121
E-mail	natashal@zitholele.co.za
Name and Surname	**Dr. Mathys Vosloo (Project Associate, Project Consultant)**
Highest Qualification	PhD Zoology
Professional Registration	Pr.Sci.Nat. (400136/12)
Company Represented	Zitholele Consulting (Pty) Ltd
Physical Address	Building 1, Maxwell Office Park, Magwa Crescent West, Waterfall City, Midrand
Postal Address	P O Box 6002, Halfway House, 1685
Contact Number	011 207 2079
Facsimile	086 674 6121
E-mail	mathysv@zitholele.co.za

5.1 Specialist Teams

Various Specialists were appointed by Zitholele to undertake the relevant assessments to identify and assess impacts, and propose appropriate mitigation and management measures for the identified impacts. The following specialists were commissioned:

- Terrestrial Biodiversity Compliance Statement – Mr. Martinus Erasmus (Cand Sci Nat) of The Biodiversity Company
- Exemption Letter for a Heritage Impact Assessment – Mr. Wouter Fourie (Accredited Professional Archaeologist (ASAPA), Accredited Professional Heritage Practitioner (APHP) of PGS Heritage
- Palaeontological Impact Assessment – Ms. Elize Butler of Banzai Environmental
- Wetland and Aquatic Baseline and Impact Assessment – Mr. Rian Pienaar (Cand Sci Nat) of The Biodiversity Company
- Hydrological and Floodline Assessment – Mr. Deon van der Merwe (Pr Eng - ECSA 960070) of Hydrological Environmental Engineering
- Geohydrological Impact Assessment – Mr. Albert Kruger (Pr Sci Nat) of Milnex Management Services (Pty) Ltd

6 DETAILS OF PROJECT PROPONENT

The details of the project proponent/Developer are provided in Table 6-1.

Table 6-1: Proponent's details

Applicant name:	Eskom Holdings SOC Ltd
Company Registration number:	2002/015527/06
Contact person:	Ms. Zandi Shange
Responsible position:	General Manager
Physical address:	R545 Kendal/Balmoral, Haartbeesfontein Farm
Telephone:	(014) 762 6405
Cell:	082 924 4523
Fax:	n/a
E-mail:	ShangeZG@eskom.co.za

7 LEGISLATIVE FRAMEWORK

7.1 Legislative Requirements for the EMPr

In terms of Section 19(4) read with Appendix 4 of the Environmental Impact Assessment Regulations, 2014 as amended (EIA Regulations); the EMPr must comply with Section 24N of the National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA) as amended and include.

The implementation of the EMPr for the proposed activity is a requirement by the NEMA EIA Regulations (2014) and is likely to similarly be a condition in the Environmental Authorisation (assuming such), issued by the DFFE. As such, failure to comply with this EMPr will constitute an offence and the client and their Contractor may be liable to penalties and/or legal action. Therefore, it is important for all the responsible parties to understand their duties and undertake them with duty and care.

7.2 Other Applicable Legislation

The Applicant is responsible for compliance with the provisions for duty of care and remediation of damage in accordance with Section 28 of NEMA and its obligations regarding the control of emergency incidents in terms of Section 30 of NEMA. Accordingly, the DFFE must immediately be notified of an incident as defined in subsection 30(1) (a) of NEMA.

Environmental legislation in South Africa was promulgated with the aim of, at the very least, minimising and, at the most, preventing environmental degradation. The Acts and Regulations applicable to the proposed stormwater drainage and associated infrastructure, are summarised in Table 7-1.

The list below was compiled to ensure that the Applicant is aware of their legal responsibilities and liabilities during the construction and operation of the proposed stormwater drainage and associated infrastructure.

Eskom, and any agents or Contractor's acting on its behalf, should note that obligations imposed by the EMPr are legally binding in terms of environmental statutory legislation, and in terms of the additional conditions to the general conditions of contract that pertain to this project. Non-compliance to the National Water Act, 1998 (Act No. 36 of 1998) and applicable environmental laws are a criminal offence and if prosecuted, Eskom will be liable for any environmental damage incurred.

Various environmental legislation and policies relate to the proposed activities, including the following listed in Table 7-1.

Table 7-1: List of Applicable Legislation

Name of Act	Act No. and Year	Notes/remarks
The Constitution of the Republic of South Africa	108 of 1996	Includes the Bill of Rights, Environmental rights, Rights to property, administrative justice and Access to information, *inter alia*.
National Environmental Management Act	107 of 1998	List of activities and competent authorities identified in terms of Sections 24 and 24D. NEMA Environmental Impact Assessment (EIA) Regulations 2014 (GN R.982), as amended in April 2017 (published in Government Notice No. R.326).
National Environmental Management: Protected Areas Act	57 of 2003	Provide for the protection and conservation of ecologically viable areas representative of South Africa's biological diversity, natural landscapes and

Name of Act	Act No. and Year	Notes/remarks
		seascapes.
National Environmental Management: Biodiversity Act	10 of 2004	Strategy for achieving the objectives of the United Nation's Convention on Biological Diversity, to which South Africa is a signatory.
National Heritage Resources Act (NHRA)	25 of 1999	The NHRA serves to introduce an integrated and interactive system for the identification, assessment and management of the heritage resources of South Africa. The NHRA promotes good governance and the empowerment of civil society to preserve their heritage for future generations and states the principles of heritage resource management while making provision for legislation protecting national heritage.
National Environmental Management: Air Quality Act	39 of 2004	Control of dust, noise and offensive odours.
Hazard Substances Act, and Regulations	15 of 1973 of	Provides for the definition, classification, use, operation, modification, disposal or dumping of hazardous substances.
Conservation of Agricultural Resources Act (CARA)	43 of 1983	To provide for control over the utilisation of the natural agricultural resources of the Republic in order to promote the conservation of the soil, the water sources and the vegetation and the combating of weeds and invader plants; and for matters connected therewith.
The Promotion of Administrative Justice Act	3 of 2000	• Definitions (Section 1); • Procedural Fairness (Section 3, 4 and 6); • Right to Reasons for Decisions (Section 5); and • Judicial Review (Section 6 and 8).
Occupational Health and Safety Act	85 of 1993	Prescribes health and safety measures necessary to adhere to for all construction workers
Promotion of Access to Information Act	2 of 2000	Right of access to any information held by the State or by another person and that is required for the exercise or protection of any rights
National Water Act, and regulations	36 of 1998	Prevention of effects of pollution, control of emergency incidents, and water use and licensing.
National Veld and Forest Fire Act	101 of 1998	While no permitting or licensing requirements arise from this legislation, this act will find application during the operational phase of the project. Due to the fire prone nature of the area, it must be ensured that the developer proactively manage risks associated with veld fires and provide cooperation to the local Fire Protection Agency.
National Building Regulations and Building Standards	103 of 1997	To promote the promotion of uniformity in the law relating to the erection of buildings in the areas of jurisdiction of local authorities for the prescribing of building standards and for matters connected therewith.
National Road Traffic Act (NRTA)	93 of 1996	To provide for road traffic matters which shall apply uniformly throughout the Republic and for matters connected therewith.
All other National and Provincial Legislation and any relevant Ordinance, Regulation, By-laws and relevant National Standards and Norms.		
All relevant Provincial and Municipal bylaws. The Victor Khanye Local Municipality may have certain requirements in terms of bylaws and trade permits, and a few of these may be applicable to this project: Water and Sanitation Bylaw Waste Management Bylaw Municipal Health Bylaw		
National Noise Control Regulations as outlined in the Environmental Conservation Act, 1989 (Act No.		

Name of Act	Act No. and Year	Notes/remarks
73 of 1989).		
Construction Regulations of 2003, which applies to any persons involved in construction work and are therefore applicable to the construction phase. The regulations provide guidelines for safe operation during construction.		
Hazardous Chemical Substance Regulations of 1995, which stipulates the requirements for storage and handling of hazardous chemical substances and provide guidelines for the training of staff.		

7.3 List of activities associated with the project

The activities that are associated with the proposed project trigger activities listed in Government Notice No. R.983 (2014) as amended. As set out in Regulations 19 of the National Environmental Management Act (NEMA) Environmental Impact Assessment Regulations, 2014, the proposed project is subjected to a BA Process (Government Notice No. R.982). Zitholele Consulting (Pty) Ltd has therefore been appointed as the independent EAP to undertake the BA Process for the proposed Project.

The BAR will be submitted to the DFFE for licensing of the listed activity triggered as indicated in Table 7-2 below:

Table 7-2: Detailed description of the listed activity associated with the project

Activity No(s):	Basic Assessment Activity(ies) as set out in Listing Notice 1 of the EIA Regulations, 2014 as amended	Applicability of listed activities to the proposed development
12 of GNR No. 983	The development of— (ii) infrastructure or structures with a physical footprint of 100 square metres or more, where such development occurs— (a) within a watercourse; (b)in front of a development setback; or (c) if no development setback exists, within 32 metres of a watercourse, measured from the edge of a watercourse.	The proposed stormwater drainage (v-drain) will occur 32m of the channelled valley bottom wetland. The drainage outlet pipe will occur within the channelled valley bottom wetland.
19 of GNR No. 983	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.	The drainage outlet pipe will occur within the channelled valley bottom wetland. The construction of the stormwater drainage infrastructure (V-drain) will not directly impact on the wetland as the v-drain will be constructed within the internal access road at the Kusile Power Station.
Activity No(s):	**Basic Assessment Activity(ies) as set out in Listing Notice 3 of the EIA Regulations, 2014 as amended**	**Applicability of listed activities to the proposed development**
14 of GNR No. 985	xii) The development of infrastructure or structures with a physical footprint of 10 square metres or more. Where such development occurs – (a) within a watercourse. (c) if no development setback has been adopted, within 32 metres of a watercourse, measured from the edge of a watercourse.	The proposed stormwater drainage and associated infrastructure will be more than 10m^2 in extent. The study area occurs in Mpumalanga. A portion of the site occurs within a CBA (*Systematic Biodiversity Plan was adopted by the Mpumalanga Department of Agriculture, Rural Development, Land and Environmental Affairs*). A portion of the

	(a) In Mpumalanga: (ii) Outside urban areas, in: (bb) National Protected Area Expansion Strategy Focus Areas (NPAES). (ff) Critical biodiversity areas (CBA) or ecosystems service areas as identified in systematic biodiversity plans adopted by the competent authority or in bioregional plans.	site falls within the priority focus areas for expansion according to the 2016 NPAES dataset. The proposed stormwater drainage (v-drain) will occur 32m of the channelled valley bottom wetland. The drainage outlet pipe will occur within the channelled valley bottom wetland.

8 ORGANISATION STRUCTURE

The organisational structure identifies and defines the responsibilities and authority of the various role-players (individuals and organisations) involved in the project. All instructions and official communications regarding environmental matters shall follow the organisational structure shown in **Figure 8-1** below.

The organisational structure reflected in **Figure 8-1** has been developed to ensure that:

- There are clear channels of communication;
- There is an explicit organisational hierarchy for the integration project; and
- Potential conflicting or contradictory instructions are avoided.

In terms of the defined organisational structure reflected in **Figure 8-1** below, all instructions that relate to environmental matters will be communicated to the Contractor via the Environmental Officer (EO). The only exception to this rule would be in an emergency situation. An emergency is defined as a situation requiring immediate action and where failure to intervene timeously would, in the reasonable opinion of the Environmental Control Officer (ECO), result in unacceptable environmental degradation. In emergency situations instructions may be given directly to the Contractor. The detailed roles and responsibilities of the various role-players identified in the organisational structure are outlined in **Section 9**.

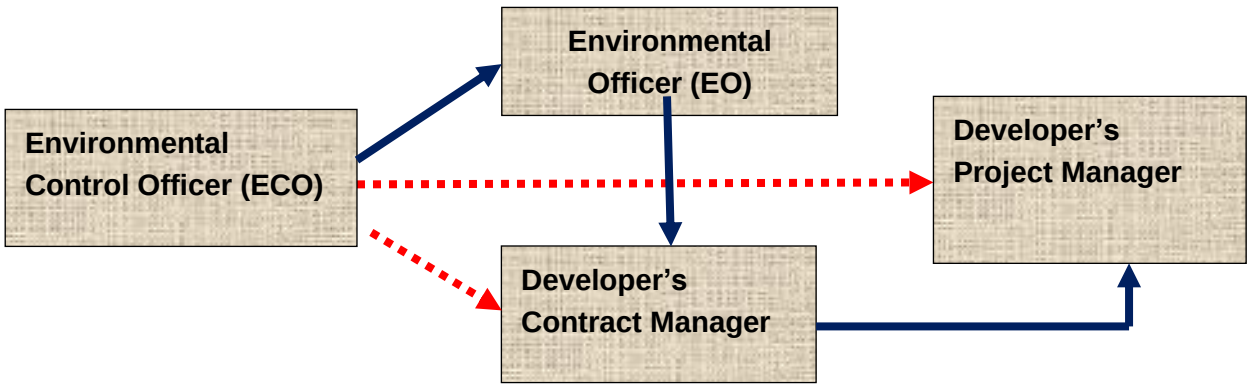

Figure 8-1: Organisation Structure for Environmental Reporting

9 ENVIRONMENTAL ROLES AND RESPONSIBILITIES

The Contractor, for the proposed development and installation, shall be responsible for ensuring compliance with the provisions contained in the EMPr, and shall be held accountable in terms of the EMPr. The detailed roles and responsibilities of each of these organisations are outlined below.

9.1 Department of Forestry, Fisheries and the Environment

As the Competent Authority (CA), the DFFE has the responsibility to ensure that the developer complies with the conditions of the EA for this proposed project (once received) as well as the requirements of the broader environmental legislation, specifically the NEMA. Compliance would be confirmed via the following mechanisms:

- Receipt and review of the environmental reporting required in terms of the EA; and
- *Ad hoc* and planned site inspection by the DFFE Compliance and Enforcement.

The successful implementation of this EMPr requires cooperation between the Developer (Eskom Holdings SOC Ltd.), project manager, the appointed contractors and the appointed ECO.

9.2 General roles and responsibilities

General roles and responsibilities have been outlined below and the project team is required to comply with the conditions defined herein.

Table 9-1: Roles and Responsibilities

Responsible Agent	Role/Responsibility
Monitoring Authority DFFE	The National Department of Forestry, Fisheries and the Environment (DFFE) is the designated authority responsible for authorising this EMPr. DFFE has overall responsibility for ensuring that the Applicant complies with the conditions of Environmental Authorisation and the EMPr. DFFE shall also be responsible for approving any amendments to the EMPr (if required). DFFE may also perform random site inspections to check compliance with the EMPr.
Developer	The Developer has overall responsibility for ensuring that its operations are undertaken in an environmentally sound and responsible manner, and in particular, reflects the requirements and specifications of the EMPr and recommendations from the relevant authorities. The responsibilities of the Project Developer will be to: • appoint or designate a suitably qualified Project Manager (PM) to manage the implementation of the proposed development; • Establish and maintain regular and proactive communications with the designated/ appointed PM, Contractor(s) and ECO; and • Ensure that the EMPr is reviewed and updated as necessary. <u>Reporting Structure:</u> The Developer will liaise with and/or take instruction from the following: • Authorities; • ECO; and • General Public.
ECO	ECO should be a suitably qualified person and should: • Ensure that contractors receive copies of the EMPr, Environmental Authorisation and all agreed Method Statements; • Provide on-site guidance, surveillance and reporting commensurate with the project phase/progress; • Undertake frequent site visits and record key findings. This includes photographic monitoring of the construction site and an evaluation of the implementation, effectiveness and level of compliance of on-site construction activities with the EMPr and associated plans and procedures; • Attend monthly project meetings; • Instruct EO or Contract Manager or Eskom's appointed PM on actions or issues impacting on the environment and provide appropriate site instructions to address and rectify these matters;

Responsible Agent	Role/Responsibility
	• Record and provide written documentation of non-conformances with the EMPr and require Eskom to undertake mitigation measures to avoid or minimise any adverse impacts on the environment or report required changes to the EMPr; • Review corrective and preventative actions to ensure implementation of recommendations made from audits and site inspections; • Order the Contractor to suspend part or all of the works if the Contractor and/or any sub-contractors, suppliers, etc. fail to comply with any aspect of either the EMPr or Environmental Authorisation (EA); • Identify possible areas of improvement; • Ongoing assessment of the suitability or effectiveness of the EMPr and make concomitant recommendations; • Submit monthly environmental audit reports to DFFE (or as per conditions of EA) during the construction phase; • Monitor and record the processing of public complaints and their resolution relating to the construction activities; and • Ensure that updates to the EMPr (as necessary) are implemented.
Construction Contractor (CC) / Appointed EO	The Construction Contractor must: • Appoint a EO to interpret the EA and EMPr on behalf of the Construction Contractor *inter alia* to ensure appropriate environmental awareness and training to achieve conditions of the EA and EMPr; • Ensure that all construction staff, sub-contractors, suppliers, etc. are familiar with, understand and adhere to the EMPr, EA and all agreed Method Statements (Environmental Awareness Plan) per their job function; • Ensure that all facets of the work undertaken are properly and competently directed, guided and executed during construction according to the EMPr; • Ensure construction of the facility to contractual environmental specifications; and • Adherence to laws and standards relevant to the construction of the facility.
PM	The primary role of the PM will to ensure that the Contractor and Developer comply with the environmental specifications in the EMPr. The PM shall further: • Oversee the general compliance of the Contractor with the EMPr and other pertinent site specifications; and • Liaise between and with the Contractor (including EO) and ECO on environmental matters, as well as any pertinent engineering matters where these may have environmental consequences. In addition, the PM shall: • Designate or appoint a suitably qualified Environmental Manager (EM) that will manage all environmental aspects on

Responsible Agent	Role/Responsibility
	behalf of the PM and the Developer; • Assume overall responsibility for the effective implementation and administration of the EMPr; • Be familiar with the contents of the EMPr, and his role and responsibilities as defined herein; • Ensure that the EMPr is included in the Contractor's contract; • Communicate to the Contractor, verbally and in writing, the advice of the ECO and the contents of the ECO reports; • In conjunction with the EO; undertake regular inspections of the Contractor's site as well as the installation works in order to check for compliance with the EMPr in terms of the specifications outlined therein. Inspections shall take place at least once a week during construction and copies of the weekly monitoring checklist will be contained in the file; • Issue site instructions giving effect to the ECO requirements where necessary; • Keep a register of all complaints and incidents (spills, injuries, complaints, legal transgressions, etc.) and other documentation related to the EMPr; • Report to the ECO any problems (or complaints) which cannot first be resolved in co-operation with the Contractor(s); • Implement recommendations of possible audits; • Implement Temporary Work Stoppages as advised by the ECO, where serious environmental infringements and non-compliances have occurred; • Facilitate proactive communication between all role-players in the interests of effective environmental management; and • Ensure that construction staff is trained in accordance with requirements of the EMPr. <u>Reporting Structure:</u> The PM will report to the Developer, as and when required.

10 ENVIRONMENTAL ISSUES IDENTIFIED

A number of Specialist Studies were undertaken, and the summary of the key findings are included in the paragraphs below:

10.1 Terrestrial Biodiversity Compliance Statement

a) Flora and vegetation

The project area was found in a heavily modified condition, mainly attributed to the Power station and its impacts associated, resulting in the area being largely unnatural or disturbed in some way. Dust from the road, as well as ash from Power station has degraded the veld severely. The area has been disconnected and fragmented from any natural areas. These aspects further limit the functional capacity of the project area. The majority of the development footprint is located within or along roads or transformed areas and their associated servitudes, which are considered with very low sensitivity.

The only area of indigenous vegetation stands included grassland which was found in wetland areas. The CBA identified by the Conservation Plan that overlaps with the medium sensitivity area (drainage/wetland) may be considered viable, albeit disturbed. No protected trees or SCC flora species were observed.

Refer to the images below for photographs showing the habitats and the overall state of the project area.

The POSA database, along with the iNaturalist list of species for the area (research grade identifications) and the Mucina and Rutherford (2006) diagnostic species indicate that 295 species of indigenous plants are expected to occur within the development area and surrounding landscape. The POSA database and the screening tool indicates that 3 threatened species are expected to occur within the assessment area.

b) Faunal features

Largely based on the South African Bird Atlas Project Version 2 (SABAP2, 2017), IUCN Digital Distribution Maps (IUCN, 2016), and the Animal Demography Unit (ADU, 2020) databases, Table 10-1 summarises the total number of animal species that have the potential to occur in or around the project area, and the corresponding number of SCC.

Table 10-1: Total number of potential fauna species present, and corresponding SCC

Fauna Type		Total Potential No.	Total SCC
Avifauna		235	9
Mammals		87	16
Herpetofauna	Amphibians	26	1
	Reptiles	73	3

These numbers exclude any animals that only occur within nature reserves and private reserves. Of the 9 avifaunal SCC, none are likely to be found resident in the project area due

to a lack of suitable habitat and the associated modified nature of the project area and surrounds.

Of the 20 total mammal SCC listed, none of the mammal SCC are likely to be found resident within the project area.

None of the herpetofauna SCC are likely to be found within the project area.

The general modified state of the area coupled with the with high levels of sensory disturbance associated with Kusile, results in a high level of persecution and unsuitable environmental conditions.

During the site visit, mammal activity was low, due to the extent of disturbance in general, as well as the poor habitat condition. Mammal activity was observed within the water resource areas (wetlands), species like Water Mongoose (*Atilax paludinosus*) tracks were observed. The species present are most likely not resident due to the modified state of the area, however using the drainage/wetland areas for forage or a migration corridor. No SCC were observed during the field survey. The wetland area has medium ecological importance.

c) Habitat Survey and Site Ecological Importance (SEI)

The water resource (wetland) systems are areas that are saturated with water for most periods throughout the year, and in this case act as a migration corridor and area used for foraging. This habitat occurs in a disturbed state due to the surrounding land uses. This habitat was identified by the respective Wetland and Aquatic Baseline and Impact Assessment by The Biodiversity Company (TBC, 2022).

The disturbed habitat has been modified from its natural state, and it represents habitat that has been historically impacted, and has subsequently recovered to some degree. This habitat is largely limited to areas that have been impacted through edge effects from the Power Station and associated impacts, roads, and land use, as well as mismanagement and inadequate rehabilitation procedures. These habitats are not entirely transformed, but exist in a constant disturbed state, as they cannot recover to a more natural state, due to the ongoing disturbances and impacts received.

Transformed habitat was present in the form of the existing road, existing infrastructure or any other areas devoid of vegetation, artificially. Due to the transformed nature of this habitat, it is regarded as having a very low sensitivity.

The delineated habitat types have each been allocated a sensitivity category, or SEI, and this breakdown is presented in Table 10-2 below. To identify and spatially present sensitive features in terms of the relevant specialist discipline, the sensitivities of each of the habitat types delineated within the project area are mapped in Figure 10-1.

It is important to note that this map does not replace any local, provincial, or national government legislation relating to these areas or the land use capabilities or sensitivities of these environments.

Table 10-2: Site Ecological Importance assessment summary of the habitat types delineated within the project area

Habitat (Area)	Conservation Importance	Functional Integrity	Biodiversity Importance	Receptor Resilience	Site Ecological Importance
Water Resources (Disturbed)	Medium	Low	Low	Low	Medium
Disturbed Grassland	Low	Low	Low	Medium	Low
Transformed	Low	Low	Very Low	Medium	Very Low

The project area is largely modified, and as such, is assigned a sensitivity rating of 'Low' to 'Medium', and the CBA status is considered to be more representative of Ecological Support Area (ESA), due to the poor habitat condition (refer to Figure 10-1). Due to the largely transformed/disturbed state of the area, only a small, degraded portion represents a viable 'Vulnerable' VU ecosystem, represented by the water resource habitat.

Figure 10-1: Biodiversity SEI delineation relevant to the project area

The following impacts that have been identified during the pre-construction phase, are moderate without mitigation:

- Disturbance to faunal migration corridors Displacement of faunal community due to habitat loss, direct mortalities and disturbance (noise, dust and vibration).

With the implementation of mitigation measures, the impacts will be low.

The following impacts that have been identified during the construction phase, are moderate without mitigation:

- Loss and fragmentation of vegetation communities within the CBA
- Fragmentation effects that hinder the safe movement of faunal species

With the implementation of mitigation measures, the impacts will be low.

The following impacts that have been identified during the operational phase, are moderate without mitigation:

- Fragmentation of migration corridor for faunal species
- Loss and disturbance of floral and faunal species and communities. Loss and fragmentation of vegetation communities within the CBA

With the implementation of mitigation measures, the impacts will be low.

The following impacts have been identified during the decommissioning phase, are moderate without mitigation:

- Loss and fragmentation of vegetation communities within the CBA
- Fragmentation effects that hinder the safe movement of faunal species

With the implementation of mitigation measures, the impacts will be low.

A summary of the anticipated environmental impacts associated with each of the project lifecycle phases of the proposed project that were identified during the BA Process is presented in Section 10.

10.2 Wetland Assessment

The Channelled Valley Bottom Wetland (HGM 1) occurring in the north-eastern portion of the site scored “moderately high’ for ecosystem services. This wetland unit (is known for their

ability to attenuate floods, streamflow regulation and erosion control during wet seasons. HGM 1 scored a high ecosystem services score for the assimilation of both carbon, phosphates and toxicants due to its location downslope of the power station. The HGM unit has high volumes of hydrophyte vegetation that plays an important role in the above-mentioned ecosystem services and help the HGM unit to score 'high' scores.

The HGM unit scored between 'intermediate' and 'moderately high' scores for the direct benefits such as provisioning of water, food and resources for human use. This is due to the fact that wetlands are located inside the power stations fence where there is little to no people to use the wetlands. The hydrophyte vegetation present within the wetlands consist mostly of sedges, grasses with some reeds which is not regularly used by humans as resources. There is little to no cultivation taking place within the wetlands to provide food.

HGM 1 is rated as having an overall PES class of Class D (Largely modified) which indicated a large degree of modification. The main modification to the wetland is to the hydrology and vegetation cover of the wetlands due to the modification in the wetlands catchment as well as some modifications inside the wetlands themselves. Modifications to the catchment of the HGM unit consists of power station activities as well as agricultural fields to the west of the wetland.

The wetlands is also subject to roads and conveyor crossing through the wetland altering waterflow in the wetland. The modification to the wetland's catchment causes an increase in waterflow during the rainy season which leads to a modification in the wetland function. The increase in subwater flows, due to the modification to the wetland catchments has formed some channels within the HGM unit that may lead to erosion and the loss of sediment within the wetland.

The wetland has undergone modification to their vegetation cover due to the construction of the road and the conveyor within the wetland as well as the flow of ash laden stormwater run-off from the conveyor into the wetland. The ash makes it undesirable for hydrophyte vegetation to grow. The ash also makes the soil ore suitable for alien invasive plant species to take over and out compete the hydrophyte vegetation. Thus, there are multiple alien invasive plant species present within the wetland which will outcompete the natural hydrophytes if left unattended. Alien invasive plant species take up a lot of space as well as large volumes of water making the habitat less suitable for hydrophytes that plays an importance role in wetlands function. Hydrophytes are important to help prevent erosion and sedimentation and help in providing clean water for the downstream users.

The Importance and Sensitivity Assessment (IS) for the HGM units has been calculated to be 'moderate', which combines the relatively high protection status of the wet veg type and the low protection status of the wetland itself.

The 'Preliminary guideline for determination of buffer zones for rivers, wetlands and estuaries' (Macfarlane et al, 2014) was used to determine the appropriate buffer zone for the proposed

activities. After taking into consideration the different activities, the post-mitigation buffer size for the delineated wetlands were scientifically calculated as 35m (see Figure 10-2).

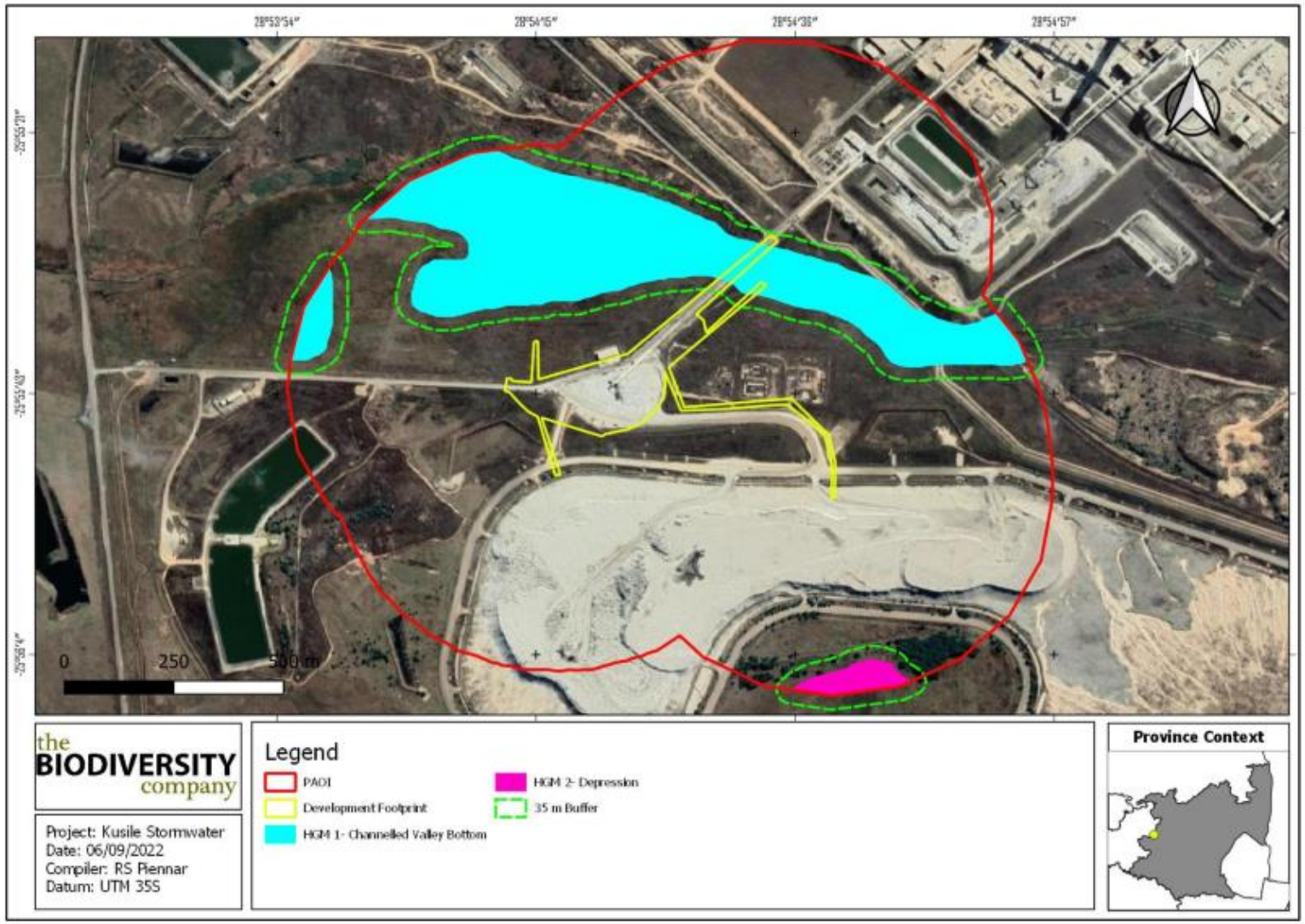

Figure 10-2: Extent of recommended buffer zones from the delineated wetlands

During construction, the operation of heavy machinery and equipment in close proximity to the watercourse and excavations may result in the following potential impacts, which will have a moderate significance without mitigation:

- Erosion of the wetland
- Deposition of dust
- Compaction of soil
- Altering hydromorphic soils

During construction, ablution facilities, domestic and industrial waste, storage of chemicals, mixes and fuel may result in water quality impairment, which will have a moderate significance without mitigation:

During construction, the stripping and stockpiling of topsoil may result in the following potential impacts, which will have a moderate significance without mitigation:

- Drainage patterns change
- Altering overland flow

During construction, the removal/clearing of vegetation to facilitate the installation of the proposed infrastructure may lead to the indirect loss of wetlands and a decrease in the functionality of the wetlands, which will have a moderate significance without mitigation.

With the implementation of mitigation measures for the impacts mentioned herein during the construction phase, the significance will be low.

During the operational phase, should there be a lack of maintenance of the stormwater infrastructure, contaminated stormwater may enter into the wetland and watercourses, thereby leading to pollution of the water resources/water quality impairment. The significance ratings of the impacts on the wetlands before mitigation is rated as ‘moderate’. However, with the implementation of mitigation and management measures as proposed by the wetland specialist, the impact significance will be reduced to ‘low’.

During the decommissioning phase, the impacts as per the construction phase may occur. Without mitigation, the impacts will have a moderate significance rating and with mitigation, the impact will have a low significance rating.

As per the Risk Assessment Matrix (RAM) undertaken for the 500m regulatory area, the post-mitigation risks are low, and a General Authorisation (GA) has been recommended by

the South African Council for Natural and Scientific Professions (SACNASP) registered wetland ecologist for the proposed development.

10.3 Heritage Assessment

No heritage resources or sensitive heritage areas were identified within the study area. However, potential exists for heritage resources to be uncovered during excavations. The impact on heritage resources is rated as 'low' prior to the mitigation and is 'low' post-mitigation. In the unlikely event of unmarked human burials, burial pits, potsherds or stone tools being uncovered during earthworks for the proposed development, these must be reported immediately to the South African Heritage Resources Agency (SAHRA) (Ms. Nokukhanya Khumalo (021 362 2535).

10.4 Paleontological Assessment

No fossil heritage resources were identified within the study area. However, potential exists for fossil heritage resources to be uncovered during excavations. The impact on heritage resources is rated as 'low' prior to the mitigation and is 'low' post-mitigation.

10.5 Aesthetic Environment

The proposed development will occur within the confines of the existing power station, near the existing overland conveyor link and the radial stacker. There are no visual receptors (*adjacent landowners*) who will have sight of the proposed construction activities.

The Eskom employees may have direct views of the construction activities and equipment on site, that will be a short duration, and within an area that is currently disturbed due to the ash conveyance activities that are currently taking place on site.

The significance ratings of the visual impacts on the employees at Eskom, before mitigation is rated as Low. With the implementation of mitigation and management measures, the impact significance will be low.

10.6 Geohydrological Impact Assessment

Based on the groundwater monitoring data (MWEM, 2022), groundwater within the study area is impacted based on the exceedance of Mg, pH, EC, Ca, SO_4, F and NO_3 to the prescribed limits within the water use licences. Several sources of contamination are present on site, of which the coal and ash storage area are within vicinity of the study area. Current activities on site and its result of contamination is therefore evident.

During the operational phase, should be lack of maintenance of the installed stormwater infrastructure, there would be increased contamination of the surface and groundwater resources through seepage from spilled mixed coarse ash and gypsum.

The significance ratings of the impacts on groundwater resources before mitigation is rated as ‘moderate’. However, with the implementation of mitigation and management measures as proposed by the Geohydrologist, the impact significance will be reduced to ‘low’.

10.7 Socio-economic environment

Construction activities will be a short duration temporary employment opportunity will be created, via construction related activities such as clearance of vegetation, manual labour for excavations and the installation of the proposed stormwater drainage and associated infrastructure.

Due to the high percentage of unemployment in the area, sufficient unskilled labour is available for the project and the community in which the labour resides in close proximity to the development site. The project must be used from the start to train people and transfer skills as far as possible. The tender specifications for any construction work on the project must include a compulsory utilisation of a certain percentage of local labour and the compulsory training of local labour.

In light of the above, the project will positively impact on the surrounding community and local economy due to possible skills development and income generation. This impact is predicted to have a low positive significance.

Table 10-3: Summary of Pre-Construction, Construction and Operation Phase Impacts

Potential impacts:	Significance rating of impacts (positive or negative):	Proposed mitigation:	Significance rating of impacts after mitigation:	Risk of the impact and mitigation not being implemented
PRE-CONSTRUCTION				
Disturbance to faunal migration corridors	**5 – Moderate (-)**	• All personnel are to undergo Environmental Awareness Training. A signed register of attendance must be kept for proof. Discussions are required on all sensitive environmental receptors within the project area to inform contractors and site staff of the presence of sensitive habitat features, such as the channelled valley bottom wetland, and management requirements in line with the Environmental Authorisation and within the EMPr. • Contractors and employees must all undergo a strict environmental induction and be made aware of the sensitive habitats within and nearby to the project area. • Activities should as far as possibly take place within the 'low' sensitivity areas. Any activities that must take place within the 'medium' sensitivity areas must take special precautions against disturbing fauna species, as well as the habitat. • Areas to be developed/disturbed must be specifically demarcated so that during the construction/activity phase, only the demarcated areas	**1 – Low (-)**	• If the construction footprint is not clearly demarcated, construction activities may cause disturbance to faunal migration corridors i.e. the channelled valley bottom wetland which is a foraging area for faunal species.

		be impacted upon. • Once the development layout has been confirmed, the open areas must be fenced off appropriately pre-construction in order to allow animals to move or be moved into these areas before breaking ground activities occur. Construction activities must take place systemically. • A qualified environmental control officer must be on site when construction begins. A site walk through is recommended by a suitably qualified ecologist prior to any construction activities, preferably during the wet season and any additional SCC should be noted. Should animals not move out of the area on their own, relevant specialists must be contacted to advise on how the species can be relocated.		
CONSTRUCTION PHASE				
Destruction of heritage resources	**0 - Low (-)**	In the unlikely event of unmarked human burials, burial pits, potsherds or stone tools being uncovered during earthworks for the proposed development, construction activities must cease and these must be reported immediately to the South African Heritage Resources Agency (SAHRA) (Ms. Nokukhanya Khumalo (021 362 2535).	**0 - Low (-)**	Potential exists for heritage resources to be uncovered during excavations. If construction activities damage heritage resources, the Contractor may be contravening the National Heritage Resources Act, 1999 (Act No. 25 of 1999).

Destruction of fossil heritage / palaeontological resources	**0 - Low (-)**	• If a chance find is made the person responsible for the find must immediately stop working and all work that could impact that finding must cease in the immediate vicinity of the find. • The person who made the find must immediately report the find to his/her direct supervisor which in turn must report the find to his/her manager and the ESO or site manager. The ESO or site manager must report the find to the relevant Heritage Agency (South African Heritage Research Agency, SAHRA). (Contact details: SAHRA, 111 Harrington Street, Cape Town. PO Box 4637, Cape Town 8000, South Africa. Tel: 021 462 4502. Fax: +27 (0)21 462 4509. Web: www.sahra.org.za). The information to the Heritage Agency must include photographs of the find, from various angles, as well as the GPS co-ordinates. • A preliminary report must be submitted to the Heritage Agency within 24 hours of the find and must include the following: 1) date of the find; 2) a description of the discovery and a 3) description of the fossil and its context (depth and position of the fossil), GPS co-ordinates. • Photographs (the more the better) of the discovery must be of high	**0 - Low (-)**	Potential exists for heritage resources to be uncovered during excavations. If construction activities damage heritage resources, the Contractor may be contravening the National Heritage Resources Act, 1999 (Act No. 25 of 1999).

		quality, in focus, accompanied by a scale. It is also important to have photographs of the vertical section (side) where the fossil was found. • Upon receipt of the preliminary report, the Heritage Agency will inform the ESO (or site manager) whether a rescue excavation or rescue collection by a palaeontologist is necessary. • The site must be secured to protect it from any further damage. No attempt should be made to remove material from their environment. The exposed finds must be stabilized and covered by a plastic sheet or sand bags. The Heritage agency will also be able to advise on the most suitable method of protection of the find. • If the fossil cannot be stabilized the fossil may be collected with extreme care by the ESO. Fossils finds must be stored in tissue paper and in an appropriate box while due care must be taken to remove all fossil material from the rescue site. • Once the Heritage Agency has issued the written authorization, the developer may continue with the development on the affected area.		
Loss of wetlands and	**6 - Moderate**	• All excavations within the wetland's	**2 - Low**	• During construction, the operation of heavy

a decrease in the functionality of the wetlands		35m buffer zone must be carried out by means of manual labour, instead of heavy vehicles. • The contractors used for the construction should have spill kits available prior to construction to ensure that any fuel, oil or hazardous substance spills are cleaned-up and discarded correctly; • All construction activities must be restricted to the development footprint area. This includes laydown and storage areas, ablutions, offices etc.; • During construction activities, all rubble generated must be removed from the site; • Construction vehicles and machinery must make use of existing access routes; • All chemicals and toxicants to be used for the construction must be stored in a bunded area; • All machinery and equipment should be inspected regularly for faults and possible leaks, these should be serviced off-site; • All contractors and employees should undergo induction which is to include a component of environmental awareness. The induction is to include aspects such as the need to avoid littering, the reporting and cleaning of spills and leaks and general good "housekeeping"; • Adequate sanitary facilities and ablutions on the servitude must be		machinery and equipment in close proximity to the watercourse and excavations may result in the erosion of the wetland and altering of hydromorphic soils. • During construction, ablution facilities, domestic and industrial waste, storage of chemicals, mixes and fuel may result in water quality impairment. • The stripping and stockpiling of topsoil may result in change of drainage patterns and altering of overland flow. • The removal/clearing of vegetation to facilitate the installation of the proposed infrastructure may lead to the indirect loss of wetlands and a decrease in the functionality of the wetlands.

		provided for all personnel throughout the project area. Use of these facilities must be enforced (these facilities must be kept clean so that they are a desired alternative to the surrounding vegetation); • All removed soil and material stockpiles must be protected from erosion, stored on flat areas where run-off will be minimised, and be surrounded by bunds; • Any exposed earth should be rehabilitated promptly by planting suitable vegetation (vigorous indigenous grasses) to protect the exposed soil; • No dumping of construction material on site may take place; • All waste generated on site during construction must be adequately managed; • Separation and recycling of different waste materials should be supported; • The first 300 mm of soil must be stockpiled separate from the soil excavated deeper than 300 mm; • No heavy machinery must be allowed within the delineated wetland. All excavations must be carried out via manual labour, instead of heavy machinery/vehicles; • Lighter vehicles (small trucks and other vehicles) required for the proposed activities should only be allowed to use existing roads (including dirt roads); • All excavations within the wetland's		

		35m buffer zone must be carried out by means of manual labour, instead of heavy vehicles.		
Loss of wetlands and a decrease in the functionality of the wetlands	**6 - Moderate**	Post-construction, the Wetland Rehabilitation Plan (Appendix B) must be implemented to prescribe measures to prevent further deterioration / loss of ecological integrity and functioning of the system. The following rehabilitation measures must be implemented: • The contaminated silt/material that settled into the artificial drainage line and the channelled valley bottom wetland on site must be removed. • The areas excavated for the construction activities must be backfilled with topsoil to ensure successful rehabilitation. • The surface of this topsoil area outside of the delineated wetland must be slightly compacted to compensate for subsidence of this material. • Vegetation cover must be restored to decrease flow velocities, assimilate contaminants, increase biodiversity and minimise erosion. • It is recommended that all invasive species located within wetland, as well as the rehabilitation focus area affected by the proposed activities be controlled / removed. This is to improve the conditions of the wetland as well as to, most importantly, decrease competition between the re-vegetated *Cyperus*	**2 - Low**	• There is evidence of contamination of the wetland (pre-construction) due to the ash laden stormwater entering into the wetland. If the removal of the ash from the wetland and rehabilitation of the wetland does not occur, there would be further loss of wetland functionality, even though proper stormwater drainage and associated infrastructure is in place.

		spp./ *Imperata cylindrica* and alien invasive species. In terms of monitoring of the rehabilitation activities, the following must be undertaken: • Regular monitoring and maintenance (such as removing Alien Invasive Plants (AIP) /weeds and encroachment) must be undertaken for successful revegetation/rehabilitation. • Monitoring must consist of photo points and documentation of observations. It is recommended seasonally for the first two years of establishment and at least annually thereafter. • General maintenance must involve AIP and weed control as well as thinning of encroachment. Continues weed control is critical to the success of revegetation and should be a high priority. Weeding around plants is necessary to avoid competition and stress. This must be carried out as required. • There must be AIP and weed control during the first two years after rehabilitation and the undesired species must be controlled from spreading. As with site preparation, removal of weed can be accomplished by mechanical means. Care must be taken not to damage the emerging plants or the soil layer.		

		Stringent weed management may eventually increase the area's resistance to further weed invasion by favouring the growth and establishment from the seedbank; • If possible, the rehabilitated areas must be irrigated at regular intervals, taking care not to cause erosion or damage the soil surface by using an excessive force of water; and • The rehabilitated area must be left undisturbed, and all access prohibited, except when maintenance is being undertaken. The Monitoring Plan (Table 3-1) of the Wetland Rehabilitation Plan (Appendix B) must be implemented to evaluate the success of the rehabilitation efforts in terms of vegetation cover, erosion, sedimentation, invasive plant species and solid waste management.		
Loss and fragmentation of vegetation communities within the CBA	**3 – Moderate (-)**	• Areas of indigenous vegetation, even secondary communities outside of the direct project footprint, should under no circumstances be fragmented or disturbed further. Clearing of vegetation should be minimized and avoided where possible, especially in medium sensitivity areas. • All vehicles and personnel must make use of the existing roads and walking paths, especially construction vehicles. • No plant species whether indigenous or exotic should be brought into/taken from the project area, to	**2 – Low (-)**	Construction activities may cause a further loss and fragmentation of vegetation communities within the CBA (medium ecological sensitive area) in the vicinity of the project area.

		prevent the spread of exotic or invasive species or the illegal collection of plants. • Leaking equipment and vehicles must be repaired immediately or be removed from project area to facilitate repair. • A hydrocarbon spill management plan must be put in place to ensure that should there be any chemical spill out or over that it does not run into the surrounding areas. The Contractor must ensure the following: • The Contractor shall be in possession of an emergency spill kit that must always be complete and available on site. • Drip trays or any form of oil absorbent material must be placed underneath vehicles/machinery and equipment when not in use. • No servicing of equipment is to take place on site unless necessary. • All contaminated soil / yard stone shall be treated in situ or removed and be placed in containers. • It is important to appropriately contain any diesel storage tanks and/or machinery spills (e.g., accidental spills of hydrocarbons, oils, diesel etc.) in such a way as to prevent them leaking and entering the environment. • Natural areas remaining adjacent to the development footprint must be left to naturally regenerate. Ensure that fire and cutting control methods		

		are not to be used to clear areas containing natural indigenous vegetation. • The implementation of an Alien Invasive Plant Management Plan is very important, due to the presence of invasive plants on site. If left unchecked, will continue to grow and spread prolifically, leading to further and more significant deterioration to the health of the natural environment, within and nearby the project area. The Plan must especially pertain to any recently cleared and changed areas. • The footprint area of the construction area should be kept to a minimum. The footprint area must be clearly demarcated to avoid unnecessary disturbances to adjacent areas. Road footprints must be kept to prescribed widths.		
Fragmentation effects that hinder the safe movement of faunal species within the wetland area	**3 – Moderate (-)**	• No trapping, killing, or poisoning of any wildlife is to be allowed. Signs must be put up to enforce this. These actions are illegal in terms of provincial environmental legislation. • The areas to be developed (or activity areas) must be specifically demarcated to prevent the movement of staff or equipment/vehicles into the surrounding environments. Signs must be put up to enforce this. • Outside lighting should be designed and limited to minimize impacts on fauna. Fluorescent and mercury	**0– Low (-)**	Construction activities in the CBA / channelled valley bottom wetland area may lead to fragmentation effects that may hinder the safe movement of faunal species.

		vapor lighting should be avoided, and sodium vapor (yellow) lights should be used wherever possible. • All construction and maintenance motor vehicle operators must undergo an environmental induction that includes instruction on the need to comply with speed limits, to respect all forms of wildlife. Speed limits must be enforced to ensure that road killings and erosion is limited. Speed bumps must be built to force slow speeds. • Noise must be kept to a minimum during the evenings/ at night to minimize all possible disturbances to amphibian species and nocturnal mammals. • Activities must be scheduled during the least sensitive periods, to avoid migration, nesting, and breeding seasons as far as possible. • Signs must be put up in order to show the importance and sensitivity of surrounding areas and their functions. This especially pertains to the channelled valley bottom wetland area. • Environmentally friendly dust suppressant products must be used. • Any holes/deep excavations must be dug and planted in a progressive manner and should not be left open overnight. Should the holes be left overnight, they must be covered temporarily to ensure no small fauna species fall in and must be subsequently inspected prior to		

		backfilling. • It is recommended that all waste be removed from site on a weekly basis to prevent rodents and pests from entering the site and proliferating. • A pest control plan must be put in place and implemented; it is imperative that poisons not be used.		
Alteration of visual character of the site	**2 – Low (-)**	• The construction area must at all times be neat and tidy. • All litter must be collected and removed (daily) and disposed of appropriately. • Equipment and construction vehicles must be stored or parked in designated areas. • The construction camp must be screened with shade cloth. • If construction is necessary during night-time, light sources should be directed inwards and downwards to prevent obtrusive lighting and light pollution. • Dust suppression techniques should be implemented especially on windy days. Exposed soil stockpiles shall be covered, kept damp or protected using organic binding agents or alternative techniques that are not water intensive.	**0 – Low (-)**	The Eskom employees may have direct views of the construction activities and equipment on site, that will be a short duration, and within an area that is currently disturbed due to the ash conveyance activities that are currently taking place on site.
Temporary job creation	**0 – Low (+)**	• As far as possible, employ local residents during construction, where applicable. This will ensure a reduced dependency on temporary employment in addition to enhancing	**2 – Low (+)**	• Construction activities will be a short duration temporary employment opportunity will be created, via construction related activities such as clearance of vegetation, manual labour for excavations and the installation of the proposed stormwater drainage and associated

		the living standards of local people. • Use manual labour where possible and practical. • Ensure recruitment measures are aimed particularly at construction workers classified as designated employees in terms of the Employment Equity Act (black people, as defined in the Act, women, and disabled people). A local employment procedure and recruitment process should be developed in consultation with local authorities and representatives. Eskom should ensure that a transparent process of employment is followed to limit opportunities for conflict situations. • Ensure that the Labour Relations Amendment Act, 2002 (Act No. 12 of 2002) as well as the necessary policies and procedures are taken into consideration to ensure the correct procurement procedures.		infrastructure. • Due to the high percentage of unemployment in the area, sufficient unskilled labour is available for the project and the community in which the labour resides in close proximity to the development site. The project must be used from the start to train people and transfer skills as far as possible. The tender specifications for any construction work on the project must include a compulsory utilisation of a certain percentage of local labour and the compulsory training of local labour.
OPERATION PHASE				
Surface water quality impairment	**3 – Moderate (-)**	Stormwater infrastructure must be monitored for malfunction and leakages to ensure that spillage of contaminated stormwater is prevented from entering into the wetland and watercourses.	**2 - Low (-)**	Should there be a lack of maintenance of the stormwater infrastructure, contaminated stormwater may enter into the wetland and watercourses, thereby leading to pollution of the water resources.

Groundwater contamination	**3 – Moderate (-)**	The proposed implementation of stormwater drainage infrastructure to contain ash contaminated stormwater water runoff along the conveyor servitudes will improve the current scenario. All areas that contain spilled ash must be cleaned up, post-construction. Stormwater infrastructure must be maintained as follows: • Avoid overflow of sumps • Undertake routine area inspections for spillages • Undertake regular clean up and maintenance • An Emergency Response Plan must be in place in the event of the occurrence of spillages	**2 - Low (-)**	Should be lack of maintenance of the installed stormwater infrastructure, there would be increased contamination of the surface and groundwater resources through seepage from spilled mixed coarse ash and gypsum.
Loss and disturbance of floral and faunal species and communities within the CBA	**3 – Moderate (-)**	• Areas of indigenous vegetation, even secondary communities outside of the direct project footprint, should under no circumstances be fragmented or disturbed further. Clearing of vegetation should be minimized and avoided where possible, especially in medium sensitivity areas. • All vehicles and personnel must	**2 - Low (-)**	• Majority of the site for the proposed development occurs in low ecological sensitivity areas that is transformed and invaded by alien plant species. A portion of the proposed stormwater infrastructure will occur within the medium ecological sensitive area i.e. the CBA within the channelled valley bottom wetland. This area is a foraging and migration corridor for faunal species. If alien invasive plant species continue to proliferate in this area, fragmentation of vegetation communities will occur within the CBA. This will impact on the loss and disturbance of floral and

		make use of the existing roads and walking paths, especially construction/operational vehicles. • No plant species whether indigenous or exotic should be brought into/taken from the project area, to prevent the spread of exotic or invasive species or the illegal collection of plants. • Leaking equipment and vehicles must be repaired immediately or be removed from project area to facilitate repair. • All footprints to be rehabilitated progressively and landscaped after construction is complete. Rehabilitation of the disturbed areas existing in the project area must be made a priority. Topsoil must also be utilised, and any disturbed area must be re-vegetated with plant and grass species which are endemic to this vegetation type. • Areas that are denuded during construction need to be re-vegetated with indigenous vegetation to prevent erosion during flood events. This will also reduce the likelihood of encroachment by alien invasive plant species. • Outside lighting should be designed and limited to minimize impacts on		faunal species and communities.

		fauna. Fluorescent and mercury vapor lighting should be avoided, and sodium vapor (yellow) lights should be used wherever possible. • The implementation of an Alien Invasive Plant management plan is very important, especially because of the invasive species identified on site which, if left unchecked, will continue to grow and spread prolifically leading to further and more significant deterioration to the health of the natural environment within and nearby to the project area. The plan must especially pertain to any recently cleared and changed areas. • It is recommended that all waste be removed from site on a weekly basis to prevent rodents and pests from entering the site and proliferating. • A pest control plan must be put in place and implemented, and it is imperative that poisons not be used. • A dust monitoring programme must be developed and implemented for the area.		

Table 10-4: Summary of Decommissioning Phase Impacts

NB: The impacts below have been determined for the decommissioning of the proposed construction site. All activities relating to the future decommissioning of the proposed development and the associated infrastructure does not form part of this application and as such would be subject to a separate Environmental Authorisation Process.

Id.	Impact	Description	Nature of Impact (Negative / Positive)	Management Objective / Principle	Level of Mitigation
Decommissioning Phase					
Equipment associated with the proposed Project would only be decommissioned once it has reached the end of its life i.e end of the life of the Kusile Power Station. o Site Preparation Site preparation activities will include confirming the integrity of the access to the site to accommodate required equipment, preparation of the site (e.g. lay down areas, construction platform) and the mobilisation of construction equipment. o Disassemble and Remove Infrastructure Disassembled components will be reused, recycled, or disposed of in accordance with regulatory requirements or any other requirements deemed applicable by the Original Equipment Manufacturer. As with construction activities, reversing of site vehicles should be kept to a minimum to minimise the use of reverse warning sounds and wherever possible vehicles should be turned around without using reverse gear. The extent of land cleared of vegetation at any one time should be kept to a minimum. A dust suppression plan should be implemented during the decommissioning phase on all bare areas. Transportation of any abnormal loads away form site and high volumes of heavy trucks should be scheduled for low traffic times on the national roads to limit the impact of this on people travelling on the roads. The site should be re-vegetated with appropriate locally indigenous vegetation as soon as possible. o Creation of local employment associated with decommissioning activities. o Prioritise employment of local people from the Victor Khanye Local Municipality, particularly for semi and unskilled job categories as far as possible. o Ensure recruitment measures are aimed particularly at construction workers classified as designated employees in terms of the Employment Equity Act (black people, as defined in the Act, women, and disabled people). A local employment procedure and recruitment process should be developed in consultation with local authorities and representatives. Eskom should ensure that a transparent process of employment is followed to limit opportunities for conflict situations. o Ensure that the Labour Relations Amendment Act, 2002 (Act No. 12 of 2002) as well as the necessary policies and procedures are taken into consideration to ensure the correct procurement procedures. o Engage with Victor Khanye Local Municipality to enquire about any district or local skills databases.				

Id.	Impact	Description	Nature of Impact (Negative / Positive)	Management Objective / Principle	Level of Mitigation
○ Implement training and on-the-job skills development programmes for temporary employees where feasible. ○ Employ local contactors that are compliant with Broad Based Black Economic Empowerment (BBB-EE) criteria to the extent possible. ○ Vacancies should be advertised in the local media when they become available. ○ Loss of employment ○ Prior to a scheduled closure, engage with all relevant stakeholders such as the Victor Khanye Local Municipality and Labour Unions regarding the proposed closure and decommissioning timeframes and possible socio-economic interventions to ameliorate the impact on individuals and the broader community. ○ Provide counselling and guidance to employees who will need to be retrenched. ○ Provide assistance with claiming UIF and other state assistance if required. ○ Assistance with registering as a jobseeker (with the relevant local and district municipalities and employment agencies).					

11 APPROACH TO CORRECTIVE ACTION

11.1 Implementation of Corrective Action

Checking and corrective action forms part of the environmental management function and is aimed at ensuring that the necessary environmental management activities are being implemented and that the desired outcomes are achieved. When non-conformities do occur that have a negative impact on the environment, these should be rectified by the implementation of corrective actions issued by the ECO and PM within a reasonable or agreed period of time. All corrective actions need to be documented and the outcome photographed and included in the next report. Broadly, the mechanisms for addressing non-compliance that are provided for in the environmental specifications and associated contract documentation can be divided into the following categories:

- Controlling performance via the certification of payments;
- Requiring the Contractor to “make good”, at their own cost, any unjustifiable environmental degradation;
- Implementing a system of penalties to dissuade environmentally risky behaviours;
- Removing environmentally non-compliant staff/ plant from site, or suspending part or all of the activities on site;
- To confirm, upon receipt of the Tender, that the Contractor has made sufficient allowance in his Tender Price for meeting the various environmental requirements; and
- During the tender adjudication process for each Contract, each Contractor should be scored in terms of the aforementioned considerations and allocated an environmental competency score. This score should form a key consideration in the final decision-making regarding the award of the various contracts.

12 METHOD STATEMENTS

Unless indicated otherwise by the Engineer, the Contractor shall provide the following Method Statements no less than 14 days prior to the programmed Commencement Date of the subject Works or activity:

i) Logistics for the Environmental Awareness Training course/s, including the date, time and location of the course/s, the course content and provision for refresher courses;

ii) Location and layout of the construction camp in the form of a plan showing the location of key infrastructure and services, including but not limited to offices, overnight vehicle parking areas, stores, the workshop, stockpile and laydown areas, hazardous storage areas (including fuels), the batching plant/s, designated access routes, equipment cleaning areas and the placement of any staff accommodation, cooking and ablution facilities. This Method Statement shall include the Materials Safety Data Sheets (MSDS’s) for all fuels, lubricants, paints, solvents and other chemicals to be used or stored on site

iii) Location and structure of the fuel storage area, including the type and volume of storage container and the design and capacity of the bund, and procedures for the filling and dispensing of fuel both at the fuel storage area and on Site;

iv) Location, layout and preparation of concrete batching facilities including the methods employed for the mixing of concrete and the management of runoff water from such areas. An indication shall be given of how concrete spoil will be minimised and cleared;

v) Solid waste (refuse) control and removal of waste from the Site, including the number, type and location of rubbish bins, the manner and frequency with which the waste will be removed from site and a description of the identified disposal site;

vi) Contaminated water management system, including an indication of the source and volume of contaminated water and how this would be disposed of;

vii) Method for dealing with runoff, including a stormwater management plan, mechanisms for the control of erosion and sedimentation, location and layout of settlement ponds (including the treatment of sludge), approach to the treatment and control of all contaminated return water to watercourses and approach to water quality monitoring;

viii) Drainage and stormwater planning showing procedures for the control of erosion due to stormwater on Site;

ix) Details of water abstraction, including the site of abstraction, the envisaged volume of water to be pumped and what methods would be implemented to prevent spillage/ pollution during the refuelling and operation of the abstraction pumps. The Contractor shall be responsible for obtaining the requisite permissions/ authorisations to enable abstraction and copies of these permissions/ authorisations shall be attached to the Method Statement;

x) Extent of areas to be cleared within the Working Area (including the construction camps, batching plants, access roads etc.), the method of clearing and the preparation for this clearing so as to ensure minimisation of exposed areas;

xi) Method of undertaking earthworks, including topsoil handling and erosion, dust and noise controls;

xii) Use of herbicides, pesticides and other poisonous substances, including means of storage;

xiii) Dust control, including methods to prevent dust generation and method to reduce dust where its generation is unavoidable;

xiv) Emergency procedures for spillages of hazardous substances, fire and serious accidents;

xv) Motivation and method for undertaking any construction related activities within a “no-go” area, including requisite emergency procedures.

Unless a clearly motivated and proposed methodology exhibiting an obvious focus on environmentally sensitive construction practice is provided, no activity will be permitted within the defined “no-go” areas.

The Contractor shall not commence the activity until the Method Statement has been approved and, except in the case of emergency activities, shall allow a period of two weeks for approval of the Method Statement by the Engineer. Such approval shall not unreasonably be delayed or withheld.

The Engineer may require changes to a Method Statement if the proposal does not comply with this Specification or if, in the reasonable opinion of the Engineer, the proposal may result in, or carries a greater than reasonable risk of, damage to the environment in excess of that permitted by this Specification.

Approved Method Statements shall be readily available on the site and shall be communicated to all relevant personnel. Where necessary the requisite training shall be give to the personnel to facilitate compliance with the approved Method Statement. The Contractor shall carry out the Works strictly in accordance with the approved Method Statement. Approval of the Method Statement shall not absolve the Contractor from any of his obligations or responsibilities in terms of the Contract.

A Method Statement (MS) must be compiled for every activity undertaken by the Contractor which poses a risk to the environment (natural, biophysical and social), and includes the following:

- A MS describes the scope of the intended work in a step by step description to ensure that the ECO / EO understand the Contractors intentions. This will enable them to assist in devising any mitigation measures which would minimise environmental impact during these tasks;
- The Engineer may require changes to a MS if it does not comply with the specification or if, in the reasonable opinion of the Engineer, the proposal may result in, or carries a greater than reasonable risk of damage to the environment in excess of that permitted by the EMPr or any legislation;
- The Contractor shall carry out the activities in accordance with the approved MS;
- Approved MS shall be readily available on the site and shall be communicated to all relevant personnel;
- Approval of the MS shall not absolve the Contractor from any of his obligations or responsibilities in terms of the contract;
- No claim for delay or additional cost incurred by the Contractor shall be entertained due to inadequacy of a MS;

- For each instance where it is requested that the Contractor submit a MS to the satisfaction of the Engineer, the format should clearly indicate as a minimum the following:
    - Responsible person (Name and Identity Number) and an alternative (Name and Identity Number);
    - The applicable requirements provided in all legislation and policies which have a bearing on the proposed activities (refer toTable 7-1);
    - Training Requirements;
    - Timing of activities as per the Project / Construction Schedule;
    - Materials, plant and equipment to be used;
    - Proposed construction procedure, including the order in which the activities making up the procedure will be carried out, designed to implement the relevant environmental specifications;
    - The system to be implemented to ensure compliance with the above;
    - Person Protection Equipment (PPE) required;
    - A detailed description of the process of work, methods and materials;
    - Emergency Procedures;
    - Response in the case of a non-compliance; and
    - Other information deemed necessary by the Engineer.
- All MS must be signed by the Engineer; and
- Work may not commence until the MS has been approved by the Engineer. All MS will form part of the EMPr documentation and are subject to all terms and conditions contained within the EMPr main document.

The following MS shall be prepared by the Contractor for approval:

- **Site Layout**: The graphical representation with detailed notes of the location, layout and method of establishment of the construction camp must be provided and must include the following:
    - All Contractor's buildings, and/or offices;
    - Lay down areas;
    - Vehicle and plant storage areas, including wash areas;
    - Workshops, if required and approved by Engineer;
    - Fuel storage and dispensing areas, if required and approved by Engineer;
    - Cement/concrete batching areas, if required and approved by Engineer (including the methods employed for the mixing of concrete and particularly the containment of runoff water from such areas and the method of transportation of concrete);
    - Other infrastructure required for the running of the project.
- **Access Routes**: Details, including a drawing, showing where and how the access points and routes will be located and managed must be provided in a MS. Details of fences and gates affected or used during the construction activities, including a drawing showing the location of fences and access gates must be provided.
- **Pollution control**: Expected solid waste types, quantities, methods and frequency of collection and disposal as well as location of disposal sites must be identified and stated in a MS. The MS shall further include methods of minimising, controlling, collecting and disposing of contaminated water, and details of any hazardous substances/materials to be used, together with the transport, storage, handling and disposal procedures for the substances.
- **Safety considerations**: The Contractor shall provide details identifying what safety precautions will be implemented to ensure the safety of all staff, and the general public at large, on site during the life of the project. This will include protective clothing

requirements for all types of construction activities on site, including protection against dust, noise, falling objects, and work associated with electricity and working at heights.

- **Emergency procedures**: The Contractor shall provide details regarding all relevant emergency procedures that will be implemented for fire control and accidental leaks and spillages of hazardous substances (including fuel and oil). The Contractor shall further include details of risk reduction measures to be implemented including firefighting equipment, fire prevention procedures and spill kits.
- **Waste management control**: The Contractor shall provide details regarding how solid and liquid waste generated on the construction site and site camp will be collected, stored, transported and disposed of. Details of any service provider(s) appointed to manage this task must also be provided.
- **Storm water and erosion control**: The Contractor shall provide details of how storm water emanating within or adjacent to the construction site may impact on construction activities. Details on how the Contractor will deal with storm water runoff and potential erosion within the construction footprint and servitude must be provided. Details of any service provider(s) appointed to manage this task must also be provided.

13 ENVIRONMENTAL AWARENESS PLAN

Environmental awareness training is required for all personnel involved in the proposed project. This includes all employees working on the site including temporary labourers, contractors and subcontractors. The Environmental Awareness Plan is intended to describe the method that will be adopted by the proponent to inform any person acting on their behalf, including an agent, sub-contractor, employee or any person rendering a service, of any environmental risk which may result from the implementation of the project activities and the manner in which risks must be managed in order to avoid adverse environmental consequences.

Environmental awareness training should cover:

- The importance of the EMPr;
- Specific details of the EMPr;
- Employees role in compliance with the EMPr;
- Environmental effects associated with the activities;
- Training targeted at specific personnel, e.g. example operators of heavy machinery;
- The environmental impacts, actual or potential, of their work activities;
- The environmental benefits of improved personal performance;
- Their roles and responsibilities in achieving conformance with the environmental policy and procedures;
- Emergency preparedness and response requirements;
- The potential consequences of departure from specified operating procedures;
- The mitigation measures required to be implemented when carrying out their work activities;
- Environmental legal requirements and obligations;
- The importance of not littering;

- The importance of using supplied toilet facilities;
- The need to use water and electricity sparingly; and
- Details of and encouragement to minimise the production of waste and re-use, recover and recycle waste where possible.

Training should be conducted by a suitably qualified person and if necessary, in more than one language to ensure it is understood by all workers. Copies of the environmental training must be available on site in languages appropriate to the work force. Records of the training sessions including attendance registers, nature of training and date of training should be kept to ensure all parties have received the necessary training and for auditing purposes.

In addition to training, general environmental awareness must be fostered among the project's workforce to encourage the implementation of environmentally sound practices throughout its duration. Environmental awareness and training is an important aspect of the implementation of the EMPr. Once the awareness plan and training material are available, the entire workforce and project management team should undergo an environmental awareness training course. Environmental awareness training is critical for the workforce to understand how they can play a role in achieving the objectives specified in the EMPr. All visitors to the site (including project team members which are not based onsite), must undergo Environmental Induction before being permitted to the construction and associated area. The Environmental Induction should be structured so as to provide a condensed version of the comprehensive Environmental Awareness Training that will be provided to the workforce / onsite staff.

Environmental awareness could be fostered in the following manner:

- Induction for all workers on site, before commencing work;
- Refresher courses as and when required;
- Daily toolbox talks at the start of each day with all workers coming on site, where workers might be alerted to particular environmental concerns associated with their tasks for that day or the area/habitat in which they are working; and
- Courses must be given by suitably qualified personnel and in a language and medium understood by workers/employees.

The Environmental Awareness Plan should be drawn up by the PM, in consultation with the ECO and EO and should be kept for implementation and audit purposes. The Environmental Awareness Plan should be a dynamic document (or set of documents) which should be updated as changes to the project, environment, staff and *etc.* occur.

14 TRAINING

The applicable training will be as follows:

- The EO shall be appropriately trained in environmental management and shall possess the skills necessary to impart environmental management skills to all personnel involved in the construction of the proposed mixed business and residential development;
- The PM and EO shall ensure, on behalf of the Developer, that the employees (including construction workers, engineers, and long-term employees) are adequately trained and understand the management measures provided in the EMPr; and

- All employees shall have an induction presentation on environmental awareness. The cost, venue and logistics shall be for Eskom's account.

Where possible, training must be conducted in the predominant mother language spoken by the employees. The induction and training shall, as a minimum, include the following:

- The importance of conformance with all the specifications of the EMPr and other environmental policies and procedures;
- The significant environmental impacts, actual or potential, of their work activities;
- The environmental benefits of improved personal performance;
- Their roles and responsibilities in achieving conformance with the EMPr and other environmental policies and procedures;
- The potential consequences of departure from specified operating procedures; and
- The mitigation measures required to be implemented when carrying out their work activities.

14.1 Environmental Authorisation

The ECO shall convey the contents of this EMPr and the conditions of the EA and discuss the contents in detail with the Developer's PM and Contractors. This formal induction training shall be done with all main and sub-contractors. Record of the training dates, people who attended and discussion points shall be kept by the ECO.

15 ENVIRONMENTAL MANAGEMENT MEASURES

The management measures documented in each of the sub-sections below have been compiled using the following information:

- Impact Assessment and mitigation measures documented in the BAR for the proposed establishment of a mixed business and residential development and its operations; and
- Mitigation and management recommendations provided by the specialist studies and EAP.

The mitigation and management measures relating to each anticipated impact are described in Table 10.1 to 10-4.

In addition to the above-mentioned information sources, the EMPr should be updated to include the conditions documented in the EA to be received upon approval of the BAR. The Developer should appoint an EAP to amend the EMPr should amendments be required by DFFE.

15.1.1 Pre-Construction and Construction Phase

Pre-construction -Planning and Design Phase

Overall Goal: undertake the pre-construction (planning and design) phase in a way that:

- Ensures that the design of the Project responds to the identified environmental constraints and opportunities.
- Ensures that pre-construction activities are undertaken in accordance with all relevant legislative requirements.
- Ensures that adequate regard has been taken of any landowner and community concerns and that these are appropriately addressed through design and planning (where appropriate).
- Ensures that the best environmental options are selected for the linear components, including the power line alignment.
- Enables the Project construction activities to be undertaken without significant disruption to other land uses and activities in the area.

Construction Phase

Overall Goal: Undertake the construction phase in a way that:

- Ensures that construction activities are properly managed in respect of environmental aspects and impacts.
- Enables construction activities to be undertaken without significant disruption to other land uses and activities in the area, in particular concerning noise impacts, traffic and road use, and effects on local businesses and residents.
- Minimises the impact on the indigenous natural vegetation, and habitats of ecological value (i.e. drainage lines).
- Minimises impacts on fauna using the site.
- Minimises the impact on heritage site should they be discovered.
- Establishes an environmental baseline during construction activities on the site, where possible.

In order to meet this goal, the following impacts, responsible person have been identified, together with necessary actions and monitoring requirements. Refer to Table 10-1.

15.1.2 Construction Phase

Table 15-1: Impacts, Management/ Mitigation Measures during Pre-Construction and Construction Phase

Impact management outcomes:

- Ensure that environmental awareness training is implemented;
- Undertake responsible water usage;
- To ensure no pollution of surface and groundwater resources;
- To ensure no instances of erosion on or adjacent to the site is reported or identified;
- Ensure that the stormwater management plan is implemented;
- Minimal impacts on vegetation and habitats;
- Displacement of faunal community;
- Minimal visual impacts;
- Minimal impacts on wetlands, streams and rivers; and
- Prevent dust fallout exceedances from occurring within the dust monitoring network.

Id.	Impact	Mitigation / Management Measures	Responsible Person	Frequency and/or Time Period	Method of Monitoring
Pre-Construction and Construction Phase					
1.	Appointment of construction contractor	Ensure that unskilled labour required for the construction and installation of equipment are predominately South Africans from the surrounding communities.	Developer	Not applicable	Not applicable
2.	Environmental Awareness Training	All personnel must undergo Environmental Awareness Training. A signed register of attendance must be kept for proof. Discussions are required on sensitive environmental receptors within the project area (Channelled Valley Bottom wetland) to inform contractors and site staff of the presence of species, their identification, conservation status and importance, biology, habitat requirements and management requirements within the EA; All contractors and employees should undergo induction which is to include a component of environmental awareness. The induction is to include aspects such as the need to avoid littering, the reporting and cleaning of spills and leaks and general good “housekeeping”.	Developer, Health and Safety Officer, Contractor, ECO	Once-off, or as neccessary	Audit

Impact management outcomes:

- Ensure that environmental awareness training is implemented;
- Undertake responsible water usage;
- To ensure no pollution of surface and groundwater resources;
- To ensure no instances of erosion on or adjacent to the site is reported or identified;
- Ensure that the stormwater management plan is implemented;
- Minimal impacts on vegetation and habitats;
- Displacement of faunal community;
- Minimal visual impacts;
- Minimal impacts on wetlands, streams and rivers; and
- Prevent dust fallout exceedances from occurring within the dust monitoring network.

Id.	Impact	Mitigation / Management Measures	Responsible Person	Frequency and/or Time Period	Method of Monitoring
Pre-Construction and Construction Phase					
3.	Economic benefit to local economy	Ensure that unskilled labour required for the construction and installation of equipment are predominately South Africans from the surrounding communities.	Developer / Contractor	Not Applicable	Not Applicable.
4.	Increased employment opportunities and economic growth	Leverage this through procurement policies that favour local suppliers and businesses.	Developer / Contractor	Duration of Construction Phase.	Monthly ECO Audits.
5.	Creation of temporary skilled and unskilled job opportunities directly on the project	It is recommended that if practical, a local employment policy is adopted to maximise the opportunities made available to the local labour force (*Sourced from nearest towns or within the Nkangala District Municipality, and the Victor Khanye Local Municipality*). The recruitment selection process should seek to promote gender equality and should aim to optimise the employment of women wherever possible. Employment of youth and Black and Coloured people must be prioritized. Efforts need to be employed to enhance indirect local employment/entrepreneurship opportunities by supporting local entrepreneurs as far as possible, where appropriate.	Developer / Contractor	Duration of Construction Phase.	Monthly ECO Audits.

Impact management outcomes:

- Ensure that environmental awareness training is implemented;
- Undertake responsible water usage;
- To ensure no pollution of surface and groundwater resources;
- To ensure no instances of erosion on or adjacent to the site is reported or identified;
- Ensure that the stormwater management plan is implemented;
- Minimal impacts on vegetation and habitats;
- Displacement of faunal community;
- Minimal visual impacts;
- Minimal impacts on wetlands, streams and rivers; and
- Prevent dust fallout exceedances from occurring within the dust monitoring network.

Id.	Impact	Mitigation / Management Measures	Responsible Person	Frequency and/or Time Period	Method of Monitoring
Pre-Construction and Construction Phase					
		Implement training and on-the-job skills development programmes for temporary employees where feasible. Employ local contactors that are compliant with Broad Based Black Economic Empowerment (BBB-EE) criteria to the extent possible. Recruitment and employment practises must be in accordance with all labour legislation in South Africa. Vacancies should be advertised in the local media when they become available.			
6.	Increased demand for low-cost housing and municipal services	Prioritise employment of local people. Adequate arrangements for daily transport to and from the construction site must be in place before commencement of construction phase activities. All non-local construction workers should be assisted with transport back to their place of residence within one week of their temporary employment contracts coming to an end.	Developer / Contractor	Duration of Construction Phase.	Monthly ECO Audits.
7.	Strain on community health & safety	Prioritise employment of local people from the various communities in Nkangala	Developer / Contractor	Duration of Construction Phase.	Monthly ECO Audits.

Impact management outcomes:

- Ensure that environmental awareness training is implemented;
- Undertake responsible water usage;
- To ensure no pollution of surface and groundwater resources;
- To ensure no instances of erosion on or adjacent to the site is reported or identified;
- Ensure that the stormwater management plan is implemented;
- Minimal impacts on vegetation and habitats;
- Displacement of faunal community;
- Minimal visual impacts;
- Minimal impacts on wetlands, streams and rivers; and
- Prevent dust fallout exceedances from occurring within the dust monitoring network.

Id.	Impact	Mitigation / Management Measures	Responsible Person	Frequency and/or Time Period	Method of Monitoring
Pre-Construction and Construction Phase					
	services	District Municipality, and the Victor Khanye Local Municipality. The Applicant as well as any contractors that are appointed to undertake the construction phase activities should develop and agree a code of conduct which sets standards for acceptable behaviour and outlines behaviour and activities which could constitute grounds for dismissal. Any employee or contractor appointed by the Applicant to undertake construction phase activities that is found to be in breach of the code of conduct should be dismissed after following due process in accordance with prevailing labour legislation. Criminal activities should be reported to SAPS immediately for investigation and further action. The Applicant and contractor should agree and implement an HIV/AIDS / TB awareness programme. The Applicant should develop and implement an appropriate method of communication with the local community. A community liaison officer should be appointed during the construction phase to			

Impact management outcomes:

- Ensure that environmental awareness training is implemented;
- Undertake responsible water usage;
- To ensure no pollution of surface and groundwater resources;
- To ensure no instances of erosion on or adjacent to the site is reported or identified;
- Ensure that the stormwater management plan is implemented;
- Minimal impacts on vegetation and habitats;
- Displacement of faunal community;
- Minimal visual impacts;
- Minimal impacts on wetlands, streams and rivers; and
- Prevent dust fallout exceedances from occurring within the dust monitoring network.

Id.	Impact	Mitigation / Management Measures	Responsible Person	Frequency and/or Time Period	Method of Monitoring
Pre-Construction and Construction Phase					
		engage with local community members regarding any issues, complaints or grievances that they may have.			
8.	Influx of jobseekers	Prioritise employment of local people from the various communities in Nkangala District Municipality, and the Victor Khanye Local Municipality. Employment for 'walk-in' temporary / casual labourers at the proposed construction site should not be permitted.	Developer / Contractor	Duration of Construction Phase.	Bi-annual ECO Audits.
9.	Dust nuisance	Water sprays, especially on dry and windy days, on haul roads and where vegetation is being / has been cleared. Dust nuisance Complaints should be recorded in the complaints register at the construction site.	Contractor / EO / Developer / ECO	Duration of Construction Phase.	Complaints register must be kept at the construction site. No. of dust complaints received will be used to measure the effectiveness of the dust impact mitigation.
10.	Visual disturbance during construction	The construction area must at all times be neat and tidy. All litter must be collected and removed (daily) and disposed of appropriately. Equipment and construction vehicles must be stored or parked in designated areas.	Contractor / EO / ECO	Monthly monitoring within the duration of Construction Phase.	Bi-annual ECO Audits.

Impact management outcomes:

- Ensure that environmental awareness training is implemented;
- Undertake responsible water usage;
- To ensure no pollution of surface and groundwater resources;
- To ensure no instances of erosion on or adjacent to the site is reported or identified;
- Ensure that the stormwater management plan is implemented;
- Minimal impacts on vegetation and habitats;
- Displacement of faunal community;
- Minimal visual impacts;
- Minimal impacts on wetlands, streams and rivers; and
- Prevent dust fallout exceedances from occurring within the dust monitoring network.

Id.	Impact	Mitigation / Management Measures	Responsible Person	Frequency and/or Time Period	Method of Monitoring
Pre-Construction and Construction Phase					
		The construction camp must be screened with shade cloth. If construction is necessary during night-time, light sources should be directed inwards and downwards to prevent obtrusive lighting and light pollution. Dust suppression techniques should be implemented especially on windy days. Exposed soil stockpiles shall be covered, kept damp or protected using organic binding agents or alternative techniques that are not water intensive.			
11.	Possible sedimentation from uncovered areas	Vegetation clearance should be undertaken in phases, i.e. limited to working unit at a time.	Contractor / EO / ECO	Monthly monitoring within the duration of Construction Phase.	Bi- annual ECO Audits.
12.	Destruction and further loss and fragmentation of the vegetation community in the CBA	All development areas must be clearly demarcated, and restricted to the proposed development areas/corridors. Areas of indigenous vegetation outside of the direct project footprint, should under no circumstances be fragmented or disturbed further. Any materials may not be	Contractor / EO / ECO	Monthly monitoring within the duration of Construction Phase.	ECO Audits.

Impact management outcomes:

- Ensure that environmental awareness training is implemented;
- Undertake responsible water usage;
- To ensure no pollution of surface and groundwater resources;
- To ensure no instances of erosion on or adjacent to the site is reported or identified;
- Ensure that the stormwater management plan is implemented;
- Minimal impacts on vegetation and habitats;
- Displacement of faunal community;
- Minimal visual impacts;
- Minimal impacts on wetlands, streams and rivers; and
- Prevent dust fallout exceedances from occurring within the dust monitoring network.

Id.	Impact	Mitigation / Management Measures	Responsible Person	Frequency and/or Time Period	Method of Monitoring
Pre-Construction and Construction Phase					
		stored for extended periods of time and must be removed from the project area once the construction phase has been concluded. Use of re-usable/recyclable materials are recommended. The footprint area of the construction should be kept to a minimum. The footprint area must be clearly demarcated to avoid unnecessary disturbances to adjacent areas thereby causing further encroachment of invasive species. Areas of indigenous vegetation, even secondary communities outside of the direct project footprint, should under no circumstances be fragmented or disturbed further. Clearing of vegetation should be minimized and avoided where possible, especially in medium sensitivity areas. All vehicles and personnel must make use of the existing roads and walking paths, especially construction vehicles. No plant species whether indigenous or exotic should be brought into/taken from the project area, to prevent			

Impact management outcomes:

- Ensure that environmental awareness training is implemented;
- Undertake responsible water usage;
- To ensure no pollution of surface and groundwater resources;
- To ensure no instances of erosion on or adjacent to the site is reported or identified;
- Ensure that the stormwater management plan is implemented;
- Minimal impacts on vegetation and habitats;
- Displacement of faunal community;
- Minimal visual impacts;
- Minimal impacts on wetlands, streams and rivers; and
- Prevent dust fallout exceedances from occurring within the dust monitoring network.

Id.	Impact	Mitigation / Management Measures	Responsible Person	Frequency and/or Time Period	Method of Monitoring
Pre-Construction and Construction Phase					
		the spread of exotic or invasive species or the illegal collection of plants. Leaking equipment and vehicles must be repaired immediately or be removed from project area to facilitate repair. Natural areas remaining adjacent to the development footprint must be left to naturally regenerate. Ensure that fire and cutting control methods are not to be used to clear areas containing natural indigenous vegetation. The areas to be developed (or activity areas) must be specifically demarcated to prevent the movement of staff or equipment/vehicles into the surrounding environments. Signs must be put up to enforce this.			
13.	Displacement of faunal community due to habitat loss, direct mortalities and disturbance	Activities should as far as possibly take place within the 'low' sensitivity areas. Any activities that must take place within the 'medium' sensitivity areas must take special precautions against disturbing fauna species, as well as the habitat. Areas to be developed/disturbed must be specifically demarcated so	Contractor / EO / ECO	Duration of Construction Phase.	Bi-annual ECO Audits

Impact management outcomes:

- Ensure that environmental awareness training is implemented;
- Undertake responsible water usage;
- To ensure no pollution of surface and groundwater resources;
- To ensure no instances of erosion on or adjacent to the site is reported or identified;
- Ensure that the stormwater management plan is implemented;
- Minimal impacts on vegetation and habitats;
- Displacement of faunal community;
- Minimal visual impacts;
- Minimal impacts on wetlands, streams and rivers; and
- Prevent dust fallout exceedances from occurring within the dust monitoring network.

Id.	Impact	Mitigation / Management Measures	Responsible Person	Frequency and/or Time Period	Method of Monitoring
Pre-Construction and Construction Phase					
		that during the construction/activity phase, only the demarcated areas be impacted upon. Once the development layout has been confirmed, the open areas must be fenced off appropriately pre-construction in order to allow animals to move or be moved into these areas before breaking ground activities occur. Construction activities must take place systemically. A qualified ECO must be on site when construction begins. A site walk through is recommended by a suitably qualified ecologist prior to any construction activities, preferably during the wet season and any additional SSC should be noted. Should animals not move out of the area on their own, relevant specialists must be contacted to advise on how the species can be relocated. Noise must be kept to an absolute minimum during the evenings and at night to minimize all possible disturbances to amphibian species and nocturnal mammals. No trapping, killing, or			

Impact management outcomes:

- Ensure that environmental awareness training is implemented;
- Undertake responsible water usage;
- To ensure no pollution of surface and groundwater resources;
- To ensure no instances of erosion on or adjacent to the site is reported or identified;
- Ensure that the stormwater management plan is implemented;
- Minimal impacts on vegetation and habitats;
- Displacement of faunal community;
- Minimal visual impacts;
- Minimal impacts on wetlands, streams and rivers; and
- Prevent dust fallout exceedances from occurring within the dust monitoring network.

Id.	Impact	Mitigation / Management Measures	Responsible Person	Frequency and/or Time Period	Method of Monitoring
Pre-Construction and Construction Phase					
		poisoning of any wildlife is to be allowed. The duration of the construction should be minimized to as short term as possible, to reduce the period of disturbance on fauna. Outside lighting should be designed and limited to minimize impacts on fauna. Fluorescent and mercury vapor lighting should be avoided, and sodium vapor (yellow) lights should be used wherever possible. All construction and maintenance motor vehicle operators must undergo an environmental induction that includes instruction on the need to comply with speed limits, to respect all forms of wildlife. Speed limits must be enforced to ensure that road killings and erosion is limited. Speed bumps must be built to force slow speeds. Activities must be scheduled during the least sensitive periods, to avoid migration, nesting, and breeding seasons as far as possible. Signs must be put up in order to show the importance and sensitivity of surrounding areas and their functions.			

Impact management outcomes:

- Ensure that environmental awareness training is implemented;
- Undertake responsible water usage;
- To ensure no pollution of surface and groundwater resources;
- To ensure no instances of erosion on or adjacent to the site is reported or identified;
- Ensure that the stormwater management plan is implemented;
- Minimal impacts on vegetation and habitats;
- Displacement of faunal community;
- Minimal visual impacts;
- Minimal impacts on wetlands, streams and rivers; and
- Prevent dust fallout exceedances from occurring within the dust monitoring network.

Id.	Impact	Mitigation / Management Measures	Responsible Person	Frequency and/or Time Period	Method of Monitoring
Pre-Construction and Construction Phase					
		This especially pertains to the channelled valley bottom wetland area. Environmentally friendly dust suppressant products must be used. Any holes/deep excavations must be dug and planted in a progressive manner and should not be left open overnight. Should the holes be left overnight, they must be covered temporarily to ensure no small fauna species fall in and must be subsequently inspected prior to backfilling. The implementation of an Alien Invasive Plant Management Plan is very important, due to the presence of invasive plants on site. If left unchecked, will continue to grow and spread prolifically, leading to further and more significant deterioration to the health of the natural environment, within and nearby the project area. The Plan must especially pertain to any recently cleared and changed areas. It is recommended that all waste be removed from site on a weekly basis to prevent rodents and pests from entering the site and			

Impact management outcomes:

- Ensure that environmental awareness training is implemented;
- Undertake responsible water usage;
- To ensure no pollution of surface and groundwater resources;
- To ensure no instances of erosion on or adjacent to the site is reported or identified;
- Ensure that the stormwater management plan is implemented;
- Minimal impacts on vegetation and habitats;
- Displacement of faunal community;
- Minimal visual impacts;
- Minimal impacts on wetlands, streams and rivers; and
- Prevent dust fallout exceedances from occurring within the dust monitoring network.

Id.	Impact	Mitigation / Management Measures	Responsible Person	Frequency and/or Time Period	Method of Monitoring
Pre-Construction and Construction Phase					
		proliferating. A pest control plan must be put in place and implemented; it is imperative that poisons not be used. Dust-reducing mitigation measures must be put in place and be strictly adhered to, particularly for all dirt roads and any earth dumps. This includes the wetting of exposed soft soil surfaces and not conducting activities on windy days which will increase the likelihood of dust being generated. Only environmentally friendly suppressants may be used to avoid the pollution of water sources. Speed limits must be put in place to reduce erosion, and speed bumps should also be constructed. A dust monitoring programme must be developed and implemented for the construction area. The following must be undertaken with regards to waste management: • Waste management must be a priority and all waste must be collected and stored adequately. It is			

Impact management outcomes:

- Ensure that environmental awareness training is implemented;
- Undertake responsible water usage;
- To ensure no pollution of surface and groundwater resources;
- To ensure no instances of erosion on or adjacent to the site is reported or identified;
- Ensure that the stormwater management plan is implemented;
- Minimal impacts on vegetation and habitats;
- Displacement of faunal community;
- Minimal visual impacts;
- Minimal impacts on wetlands, streams and rivers; and
- Prevent dust fallout exceedances from occurring within the dust monitoring network.

Id.	Impact	Mitigation / Management Measures	Responsible Person	Frequency and/or Time Period	Method of Monitoring
Pre-Construction and Construction Phase					
		recommended that all waste be removed from site on a weekly basis to prevent rodents and pests entering the site. • Refuse bins must be emptied and secured. • Temporary storage of domestic waste shall be in covered waste skips. • Maximum domestic waste storage period must be 10 days. • Any litter, spills, fuels, chemical and human waste in and around the project area must be removed and disposed of timeously and responsibly. • It must be made an offence to litter or dump any material outside of specially demarcated and managed zones. Signs and protocols must be established to explain and enforce this. • A minimum of one toilet must be provided per 10 persons. Portable toilets must be regularly pumped dry to ensure that the			

Impact management outcomes:

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- Ensure that the stormwater management plan is implemented;
- Minimal impacts on vegetation and habitats;
- Displacement of faunal community;
- Minimal visual impacts;
- Minimal impacts on wetlands, streams and rivers; and
- Prevent dust fallout exceedances from occurring within the dust monitoring network.

Id.	Impact	Mitigation / Management Measures	Responsible Person	Frequency and/or Time Period	Method of Monitoring
Pre-Construction and Construction Phase					
		system does not degrade over time and spill into the surrounding area. • The Contractor should supply sealable and properly marked domestic waste collection bins and all solid waste collected shall be disposed of at a licensed disposal facility. • Under no circumstances may domestic waste be burned on site. Waste may never be stored in an open pit where it is susceptible to the elements such as wind and rain.			
14.	Clearing of vegetation to accommodate infrastructure and services	Limit the footprint to only areas necessary for the construction process. Utilise single access roads only. The footprint of the proposed development should be limited to the areas that are already transformed. All construction activities must be restricted to the development footprint area. This includes laydown and storage areas, ablutions, offices etc.; Rehabilitation of the areas	Contractor / EO / ECO	Monthly monitoring within the duration of Construction Phase.	Bi-annual ECO Audits

Impact management outcomes:

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Id.	Impact	Mitigation / Management Measures	Responsible Person	Frequency and/or Time Period	Method of Monitoring
Pre-Construction and Construction Phase					
		that are impacted by the development outside of the ultimate infrastructure footprint will aid in abating the ecological impacts.			
15.	Damage to plant life outside of the proposed development site	Construction activities should be restricted to the development footprint area and then the compliance in terms of footprint can be monitored by Environmental Control Officer (ECO). Areas which could be deemed as no go should be clearly marked.	Contractor / EO / ECO	Duration of Construction Phase.	Bi-annual ECO Audits
16.	Vehicle traffic congestion	Standard working hours to be implemented during the construction phase, and/or as any deviation that is approved. Construction vehicles must be roadworthy, and drivers must be qualified, obey traffic rules, follow speed limits and made aware of the potential road safety issues. All construction vehicles should be inspected regularly to ensure their road worthiness. Provision of adequate and strategically placed traffic warning signs and control measures along the main access roads to warn road	Contractor / Developer	Monthly monitoring within the duration of Construction Phase.	Bi-annual ECO Audits.

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- Ensure that the stormwater management plan is implemented;
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- Displacement of faunal community;
- Minimal visual impacts;
- Minimal impacts on wetlands, streams and rivers; and
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Id.	Impact	Mitigation / Management Measures	Responsible Person	Frequency and/or Time Period	Method of Monitoring
Pre-Construction and Construction Phase					
		users of the construction activities taking place for the duration of the construction phase. Warning signs must be visible at all times. Implement penalties for reckless driving for the drivers of heavy vehicles as a way to enforce compliance to traffic rules. All roads used by the project Developer and its contractors must be maintained in good working order during the construction phase. It is recommended that a Community Liaison Officer be appointed to implement the proposed grievance mechanism. A method of communication should be implemented whereby procedures to lodge complaints are set out in order for the local community to express any complaints or grievances with the construction process.			
17.	Destruction of vegetation and habitats/Land/soil pollution from chemical / hydrocarbon spills, litter and waste metals.	Establish a chemical storage area that is suitably designed to contain all spills. Ensure that hydrocarbons are stored in a bunded area with a capacity of 110% of storage volume.	Contractor / EO / ECO	Monthly monitoring within the duration of Construction Phase.	Bi-annual ECO Audits.

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- Minimal visual impacts;
- Minimal impacts on wetlands, streams and rivers; and
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Id.	Impact	Mitigation / Management Measures	Responsible Person	Frequency and/or Time Period	Method of Monitoring
Pre-Construction and Construction Phase					
		Ensure that the bunded area is suitably designed to allow for cleaning and prevent spillage to the environment. Ensure that all vehicles, storage, and usage areas have suitable spill kits. Develop a chemical and hydrocarbon spill procedure. Ensure that chemical and hydrocarbon usage is controlled. No servicing of vehicles onsite. Regular inspection and servicing of vehicles. Develop a spill management procedure for vehicles that may leak accidently. Develop a waste management plan. Ensure that concrete spills are cleaned up. Ensure litter is cleared regularly to designated waste areas.			
18.	Pollution may enter ground / surface water	Establish a chemical storage area that is suitably designed to contain all spills. Ensure that hydrocarbons are	Contractor / EO / ECO	Monthly monitoring within the duration of Construction	Bi-annual ECO Audits.

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- Ensure that the stormwater management plan is implemented;
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- Minimal visual impacts;
- Minimal impacts on wetlands, streams and rivers; and
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Id.	Impact	Mitigation / Management Measures	Responsible Person	Frequency and/or Time Period	Method of Monitoring
Pre-Construction and Construction Phase					
		stored in a bunded area with a capacity of 110% of storage volume. Ensure that the bunded area is suitably designed to allow for cleaning and prevent spillage to the environment. Ensure that all vehicles, storage, and usage areas have suitable spill kits. Develop a chemical and hydrocarbon spill procedure. Ensure that chemical and hydrocarbon usage is controlled. All machinery and equipment should be inspected regularly for faults and possible leaks, these should be serviced off-site.		Phase.	
19.	Nuisance impacts in terms of temporary increase in noise and dust, or the wear and tear on access roads to the site	Dust suppression measures must be implemented for heavy vehicles on a regular basis and ensuring that vehicles used to transport sand and building materials are fitted with tarpaulins or covers. Ensure all vehicles are road worthy, and drivers are qualified and are made aware of the potential noise and dust issues.	Contractor / EO / ECO	Duration of Construction Phase.	Complaints register must be kept at the construction site. No. of dust complaints received will be used to measure the effectiveness of the dust impact mitigation.

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- Minimal impacts on wetlands, streams and rivers; and
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Id.	Impact	Mitigation / Management Measures	Responsible Person	Frequency and/or Time Period	Method of Monitoring
Pre-Construction and Construction Phase					
		It is recommended that a Community Liaison Officer should be appointed. A method of communication should be implemented whereby procedures to lodge complaints are set out, in order for the local community to express any complaints or grievances with the construction process.			
20.	Erosion and loss of soil resources	Develop a storm water management plan prior to commencement with construction, that incorporates the following principles in the design of the site: • Soft or green engineering features should be incorporated into the management of stormwater. Only clean water may be discharged into the wetland areas. • Stormwater diversions and channels should be vegetated swales and	Contractor / EO / ECO	Monthly monitoring within the duration of Construction Phase.	Bi-annual ECO Audits.

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Pre-Construction and Construction Phase					
		impermeable material must be avoided. Litter traps / nets should be attached to stormwater outlets (discharge areas). These must be monitored and managed particularly after rainfall events. • Prevent concentration of stormwater flow at any point where the ground is susceptible to erosion. • Reduce stormwater flows as far as possible by the effective use of attenuating devices (such as swales, berms, silt fences). As construction progresses, the stormwater control measures must be monitored and adjusted to ensure complete erosion and pollution control at all			

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Id.	Impact	Mitigation / Management Measures	Responsible Person	Frequency and/or Time Period	Method of Monitoring
Pre-Construction and Construction Phase					
		times. • Minimise the area of exposure of bare soils to minimise the erosive forces of wind, water and all forms of traffic. • Plan and construct stormwater management systems to remove contaminants before they pollute surface waters or groundwater resources. • Contain soil erosion, whether induced by wind or water forces, by constructing protective works to trap sediment at appropriate locations. This applies particularly during construction. • Avoid situations where natural or artificial slopes may become saturated and unstable, both during and after the			

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Id.	Impact	Mitigation / Management Measures	Responsible Person	Frequency and/or Time Period	Method of Monitoring
Pre-Construction and Construction Phase					
		construction process. • Design and construct roads to avoid concentration of flow along and off the road. Where construction causes a change in the vegetative cover of the site that might result in soil erosion, the risk of soil erosion by stormwater must be minimised by the provision of appropriate artificial soil stabilisation mechanisms or re-vegetation of the area. Use silt traps where necessary. Use bumps, humps, and cut off drains to control water velocity of exposed soils. Stockpile soils from footings in demarcated areas. All removed soil and material stockpiles must be protected from erosion, stored on flat areas where run-off will be minimised, and be surrounded by bunds. Any exposed earth should be rehabilitated promptly by			

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- Displacement of faunal community;
- Minimal visual impacts;
- Minimal impacts on wetlands, streams and rivers; and
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Id.	Impact	Mitigation / Management Measures	Responsible Person	Frequency and/or Time Period	Method of Monitoring
Pre-Construction and Construction Phase					
		planting suitable vegetation (vigorous indigenous grasses) to protect the exposed soil. Use soil material from footings in rehabilitation of impacted areas wherever possible. Develop a spill management procedure for vehicles that may leak accidently.			
21.	Damage to equipment or containers during storage and installation	Inspection of packaging for damage. Risk assessment to be conducted. Effective scheduling to limit onsite storage of equipment - site to be ready to readily accept proposed installation of the infrastructure. Proper supervision is required. Adhere to Original Equipment Manufacturer (OEM) handling, transportation and storage instructions. Agreement / contract with HazMat company for first response, site clean-up and rehabilitation.	Contractor / EO / ECO	Monthly monitoring within the duration of Construction Phase.	Bi annual ECO Audits.
22.	Sedimentation,	Soil stock piling to be done at	Contractor /	Monthly	Bi annual

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- Displacement of faunal community;
- Minimal visual impacts;
- Minimal impacts on wetlands, streams and rivers; and
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Id.	Impact	Mitigation / Management Measures	Responsible Person	Frequency and/or Time Period	Method of Monitoring
Pre-Construction and Construction Phase					
	siltation, and increased turbidity in surface water	the designated area.	EO / ECO	monitoring within the duration of Construction Phase.	ECO Audits.
23.	Impact on heritage resources	If during construction, any possible finds such as stone tool scatters, artefacts or bone and fossil remains are made, the operations must be stopped, and a qualified archaeologist must be contacted for an assessment of the find and therefore chance find procedures must be implemented. Construction crews must be properly inducted to ensure they are fully aware of the procedures regarding chance finds as discussed below: • If during the pre-construction phase, construction, operations or closure phases of this project, any person employed by the developer, one of its subsidiaries, contractors and subcontractors, or service provider, finds any artefact of cultural significance or heritage site, this person must cease work at the site of	Contractors and Sub-contractors / EO / ECO	Duration of Construction Phase.	Bi annual ECO Audits.

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- Minimal impacts on wetlands, streams and rivers; and
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Id.	Impact	Mitigation / Management Measures	Responsible Person	Frequency and/or Time Period	Method of Monitoring
Pre-Construction and Construction Phase					
		the find and report this find to their immediate supervisor, and through their supervisor to the senior on-site manager. • It is the responsibility of the senior on-site Manager to make an initial assessment of the extent of the find and confirm the extent of the work stoppage in that area. • The senior on-site Manager will inform the ECO of the chance find procedure and its immediate impact on operations. The ECO will then contact a professional archaeologist for an assessment of the finds who will notify the SAHRA. • In the unlikely event of unmarked human burials, burial pits, potsherds or stone tools being uncovered during earthworks for the proposed development, these must be reported immediately to the South			

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- Minimal visual impacts;
- Minimal impacts on wetlands, streams and rivers; and
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Id.	Impact	Mitigation / Management Measures	Responsible Person	Frequency and/or Time Period	Method of Monitoring
Pre-Construction and Construction Phase					
		African Heritage Resources Agency (SAHRA) (Ms. Nokukhanya Khumalo (021 362 2535).			
24.	Impact on palaeontological resources	• If a chance find is made the person responsible for the find must immediately stop working and all work that could impact that finding must cease in the immediate vicinity of the find. • The person who made the find must immediately report the find to his/her direct supervisor which in turn must report the find to his/her manager and the ESO or site manager. The ESO or site manager must report the find to the relevant Heritage Agency (South African Heritage Research Agency, SAHRA). (Contact details: SAHRA, 111 Harrington Street, Cape Town. PO Box 4637, Cape Town 8000, South Africa. Tel: 021 462 4502. Fax: +27 (0)21 462 4509. Web: www.sahra.org.za). The	Contractor / EO / Developer / ECO	Duration of Construction Phase.	Bi-annual ECO Audits.

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- Displacement of faunal community;
- Minimal visual impacts;
- Minimal impacts on wetlands, streams and rivers; and
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Id.	Impact	Mitigation / Management Measures	Responsible Person	Frequency and/or Time Period	Method of Monitoring
Pre-Construction and Construction Phase					
		information to the Heritage Agency must include photographs of the find, from various angles, as well as the GPS co-ordinates. • A preliminary report must be submitted to the Heritage Agency within 24 hours of the find and must include the following: 1) date of the find; 2) a description of the discovery and a 3) description of the fossil and its context (depth and position of the fossil), GPS co-ordinates. • Photographs (the more the better) of the discovery must be of high quality, in focus, accompanied by a scale. It is also important to have photographs of the vertical section (side) where the fossil was found. • Upon receipt of the preliminary report, the Heritage Agency will inform the ESO (or site manager) whether a rescue excavation or			

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Pre-Construction and Construction Phase					
		rescue collection by a palaeontologist is necessary. • The site must be secured to protect it from any further damage. No attempt should be made to remove material from their environment. The exposed finds must be stabilized and covered by a plastic sheet or sand bags. The Heritage agency will also be able to advise on the most suitable method of protection of the find. • If the fossil cannot be stabilized the fossil may be collected with extreme care by the ESO. Fossils finds must be stored in tissue paper and in an appropriate box while due care must be taken to remove all fossil material from the rescue site. • Once the Heritage Agency has issued the written authorization, the developer may continue with the development on the affected area.			

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Id.	Impact	Mitigation / Management Measures	Responsible Person	Frequency and/or Time Period	Method of Monitoring
Pre-Construction and Construction Phase					
25.	Safety and security	• Waste streams must be identified and documented. • Accredited waste facilities to be contracted for accepting / recycling the waste. • Working hours should be kept between daylight hours during the construction phase, and/or as any deviation that is approved by the relevant authorities. • The perimeter of the construction site should be appropriately secured to prevent any unauthorised access to the site; the fencing of the site should be maintained throughout the construction periods. • Access in and out of the construction camp should be strictly controlled • No open fires are permitted outside of designated areas. • The Contractor must provide adequate firefighting equipment on site and provide firefighting training to selected construction staff.	Contractor / EO / Developer / ECO	Monthly monitoring within the duration of Construction Phase.	Bi-annual ECO Audits.

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- Minimal visual impacts;
- Minimal impacts on wetlands, streams and rivers; and
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Id.	Impact	Mitigation / Management Measures	Responsible Person	Frequency and/or Time Period	Method of Monitoring
Pre-Construction and Construction Phase					
		• A comprehensive employee induction programme would cover land access protocols, fire management and road safety. • The contractor should have personnel trained in first aid on site to deal with smaller incidents that require medical attention. • It is recommended that a Community Liaison Officer should be appointed to implement a grievance mechanism. A method of communication should be implemented whereby procedures to lodge complaints are set out in order for the local community to express any complaints or grievances with the construction process.			
26.	Loss of wetlands and a decrease in the functionality of the wetlands	• All excavations within the wetland's 35m buffer zone must be carried out by means of manual labour, instead of heavy vehicles. • The contractors used for the construction should have spill kits available prior to construction to	Developer / Contractor	Construction Phase	Bi-annual ECO Audits

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- Ensure that the stormwater management plan is implemented;
- Minimal impacts on vegetation and habitats;
- Displacement of faunal community;
- Minimal visual impacts;
- Minimal impacts on wetlands, streams and rivers; and
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Id.	Impact	Mitigation / Management Measures	Responsible Person	Frequency and/or Time Period	Method of Monitoring
Pre-Construction and Construction Phase					
		ensure that any fuel, oil or hazardous substance spills are cleaned-up and discarded correctly. • All construction activities must be restricted to the development footprint area. This includes laydown and storage areas, ablutions, offices etc. • During construction activities, all rubble generated must be removed from the site. • Construction vehicles and machinery must make use of existing access routes. • All chemicals and toxicants to be used for the construction must be stored in a bunded area. • All machinery and equipment should be inspected regularly for faults and possible leaks, these should be serviced off-site. • All contractors and employees should undergo induction which is to include a component of environmental awareness. The induction is to include			

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- Minimal impacts on vegetation and habitats;
- Displacement of faunal community;
- Minimal visual impacts;
- Minimal impacts on wetlands, streams and rivers; and
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Id.	Impact	Mitigation / Management Measures	Responsible Person	Frequency and/or Time Period	Method of Monitoring
Pre-Construction and Construction Phase					
		aspects such as the need to avoid littering, the reporting and cleaning of spills and leaks and general good "housekeeping". • Adequate sanitary facilities and ablutions on the servitude must be provided for all personnel throughout the project area. Use of these facilities must be enforced (these facilities must be kept clean so that they are a desired alternative to the surrounding vegetation). • All removed soil and material stockpiles must be protected from erosion, stored on flat areas where run-off will be minimised, and be surrounded by bunds. • Any exposed earth should be rehabilitated promptly by planting suitable vegetation (vigorous indigenous grasses) to protect the exposed soil. • No dumping of construction material on site may take place.			

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- Displacement of faunal community;
- Minimal visual impacts;
- Minimal impacts on wetlands, streams and rivers; and
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Id.	Impact	Mitigation / Management Measures	Responsible Person	Frequency and/or Time Period	Method of Monitoring
Pre-Construction and Construction Phase					
		• All waste generated on site during construction must be adequately managed. • Separation and recycling of different waste materials should be supported. • The first 300 mm of soil must be stockpiled separate from the soil excavated deeper than 300 mm. • No heavy machinery must be allowed within the delineated wetland. All excavations must be carried out via manual labour, instead of heavy machinery/vehicles. • Lighter vehicles (small trucks and other vehicles) required for the proposed activities should only be allowed to use existing roads (including dirt roads). • All excavations within the wetland's 35m buffer zone must be carried out by means of manual labour, instead of heavy vehicles.			
27.	Further deterioration / loss of ecological	The following rehabilitation measures must be implemented in accordance	Developer / Contractor	Post-construction	Bi annual ECO Audits

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- Ensure that the stormwater management plan is implemented;
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- Minimal visual impacts;
- Minimal impacts on wetlands, streams and rivers; and
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Id.	Impact	Mitigation / Management Measures	Responsible Person	Frequency and/or Time Period	Method of Monitoring
Pre-Construction and Construction Phase					
	integrity and functioning of the system	with the Wetland Rehabilitation Plan (Appendix B): • The contaminated silt/material that settled into the artificial drainage line and the channelled valley bottom wetland on site must be removed. • The areas excavated for the construction activities must be backfilled with topsoil to ensure successful rehabilitation. • The surface of this topsoil area outside of the delineated wetland must be slightly compacted to compensate for subsidence of this material. • Vegetation cover must be restored to decrease flow velocities, assimilate contaminants, increase biodiversity and minimise erosion. • The time of planting must be carried out as far as is practicable during the period most likely to produce beneficial results, but as soon as possible after the soil properties are estimated to be adequate. The seasonal period is			

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Id.	Impact	Mitigation / Management Measures	Responsible Person	Frequency and/or Time Period	Method of Monitoring
Pre-Construction and Construction Phase					
		from the beginning of April to the end of October. • It is recommended that all invasive species located within wetland, as well as the rehabilitation focus area affected by the proposed activities be controlled / removed. This is to improve the conditions of the wetland as well as to, most importantly, decrease competition between the re-vegetated *Cyperus* spp./ *Imperata cylindrica* and alien invasive species.			
28.	Rehabilitation of the wetland	The mitigation measures with regards to the following aspects of rehabilitation must be adhered to (as per the Wetland Rehabilitation Plan in Appendix B of the EMPr): • Erosion; • Establishing cover; • Fire; • Shaping; • Trimming; • Soiling and seeding; • Watering, weeding, cutting and replanting; • Planting/seeding of natural vegetation; and • Preparation for grassing.	Developer / Contractor	Post-construction	Bi annual ECO Audits
29.	Monitoring of the wetland rehabilitation activities	In terms of monitoring of the rehabilitation activities, the following must be undertaken: • Regular monitoring and			

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- Minimal impacts on wetlands, streams and rivers; and
- Prevent dust fallout exceedances from occurring within the dust monitoring network.

Id.	Impact	Mitigation / Management Measures	Responsible Person	Frequency and/or Time Period	Method of Monitoring
Pre-Construction and Construction Phase					
		maintenance (such as removing Alien Invasive Plants (AIP) and encroachment) must be undertaken for successful rehabilitation. • Monitoring must consist of photo points and documentation of observations. It is recommended seasonally for the first two years of establishment and at least annually thereafter. • General maintenance must involve AIP and weed control as well as thinning of encroachment. Continues weed control is critical to the success of revegetation and should be a high priority. Weeding around plants is necessary to avoid competition and stress. This must be carried out as required. • There must be AIP and weed control during the first two years after rehabilitation and the undesired species must be controlled from spreading. As with site preparation, removal of weed can be accomplished by mechanical means. Care must be taken not to damage the emerging			

Impact management outcomes:

- Ensure that environmental awareness training is implemented;
- Undertake responsible water usage;
- To ensure no pollution of surface and groundwater resources;
- To ensure no instances of erosion on or adjacent to the site is reported or identified;
- Ensure that the stormwater management plan is implemented;
- Minimal impacts on vegetation and habitats;
- Displacement of faunal community;
- Minimal visual impacts;
- Minimal impacts on wetlands, streams and rivers; and
- Prevent dust fallout exceedances from occurring within the dust monitoring network.

Id.	Impact	Mitigation / Management Measures	Responsible Person	Frequency and/or Time Period	Method of Monitoring
Pre-Construction and Construction Phase					
		plants or the soil layer. Stringent weed management may eventually increase the area's resistance to further weed invasion by favouring the growth and establishment from the seedbank. • If possible, the rehabilitated areas must be irrigated at regular intervals, taking care not to cause erosion or damage the soil surface by using an excessive force of water. • The rehabilitated area must be left undisturbed, and all access prohibited, except when maintenance is being undertaken. The Monitoring Plan (Table 3-1) of the Wetland Rehabilitation Plan (Appendix B) must be implemented to evaluate the success of the rehabilitation efforts in terms of vegetation cover, erosion, sedimentation, invasive plant species and solid waste management.			
30.	Management of waste	Waste management must be a priority and all waste must be collected and stored effectively. All solid waste	Developer / Health and Safety Officer /	Duration of Construction Phase.	Bi annual ECO Audits.

Impact management outcomes:

- Ensure that environmental awareness training is implemented;
- Undertake responsible water usage;
- To ensure no pollution of surface and groundwater resources;
- To ensure no instances of erosion on or adjacent to the site is reported or identified;
- Ensure that the stormwater management plan is implemented;
- Minimal impacts on vegetation and habitats;
- Displacement of faunal community;
- Minimal visual impacts;
- Minimal impacts on wetlands, streams and rivers; and
- Prevent dust fallout exceedances from occurring within the dust monitoring network.

Id.	Impact	Mitigation / Management Measures	Responsible Person	Frequency and/or Time Period	Method of Monitoring
Pre-Construction and Construction Phase					
		collected shall be disposed of at a licensed disposal facility; Refuse bins will be emptied and secured. Temporary storage of domestic waste shall be in covered waste skips. Maximum domestic waste storage period will be 10 days. Recycling is encouraged; All waste generated on site during construction must be adequately managed. Separation and recycling of different waste materials should be supported. Adequate sanitary facilities and ablutions on the servitude must be provided for all personnel throughout the project area. Use of these facilities must be enforced (these facilities must be kept clean so that they are a desired alternative to the surrounding vegetation); Portable toilets must be pumped dry to ensure the system does not degrade over time and spill into the surrounding area; Where a registered disposal facility is not available close to the project area, the Contractor shall provide a	Contractor		

Impact management outcomes:

- Ensure that environmental awareness training is implemented;
- Undertake responsible water usage;
- To ensure no pollution of surface and groundwater resources;
- To ensure no instances of erosion on or adjacent to the site is reported or identified;
- Ensure that the stormwater management plan is implemented;
- Minimal impacts on vegetation and habitats;
- Displacement of faunal community;
- Minimal visual impacts;
- Minimal impacts on wetlands, streams and rivers; and
- Prevent dust fallout exceedances from occurring within the dust monitoring network.

Id.	Impact	Mitigation / Management Measures	Responsible Person	Frequency and/or Time Period	Method of Monitoring
Pre-Construction and Construction Phase					
		method statement with regard to waste management. Under no circumstances may domestic waste be burned on site.			
31.	Storage and Handling of Dangerous Goods: Soil and water contamination due to the handling and storage of dangerous goods during the construction and operation phases.	Any spillages of dangerous substances must be contained as soon as possible, and remedial and clean-up actions initiated immediately. Regular inspections of the permanent bunded areas for storage of dangerous goods must be undertaken throughout the life cycle of the project. Appropriate spill kits must be available on site. Maintenance vehicles must have access to spill kits. An emergency spill response plan must be developed for implementation during the construction and the operational phase. Personnel should be suitably trained to attend to any spills that may occur. The Power Station's Fire Management Plan must be implementation during the construction and the operational phase. Personnel must be suitably trained to	Contractor / EO / Developer / ECO	Monthly monitoring within the duration of Construction Phase.	Bi annual ECO Audits.

Impact management outcomes:

- Ensure that environmental awareness training is implemented;
- Undertake responsible water usage;
- To ensure no pollution of surface and groundwater resources;
- To ensure no instances of erosion on or adjacent to the site is reported or identified;
- Ensure that the stormwater management plan is implemented;
- Minimal impacts on vegetation and habitats;
- Displacement of faunal community;
- Minimal visual impacts;
- Minimal impacts on wetlands, streams and rivers; and
- Prevent dust fallout exceedances from occurring within the dust monitoring network.

Id.	Impact	Mitigation / Management Measures	Responsible Person	Frequency and/or Time Period	Method of Monitoring
Pre-Construction and Construction Phase					
		manage any fires which may occur on site. Flammable substances must be stored in enclosed containers away from heat, sparks, open flames, or oxidizing materials. Develop a monitoring and leak detection procedure for monitoring of the chemical spillages.			

15.1.3 Operational Phase

Overall Goal: To ensure that the operation of the Project does not have unforeseen impacts on the environment and to ensure that all impacts are monitored, and the necessary corrective action taken in all cases. To address this goal, it is necessary to operate the proposed development in a way that:

- Ensures that operation activities are properly managed in respect of environmental aspects and impacts.
- Enables the proposed operation activities to be undertaken without significant disruption to other land uses in the area, regarding traffic and road use, and effects on local community.
- Minimises impacts on fauna/avifauna using the site.

The mitigation/management measures for the operational phase impacts are described in Table 15-2.

An operations manager must be appointed during operation whose duty it will be to ensure the implementation of the operation EMPr for operation activities and all infrastructure under the control of the facility owner. For all Eskom Holdings SOC Limited infrastructure, Eskom manages its operations through the implementation of the Environmental Management System ISO 14001:2004 and relevant in-house procedures. For any public road infrastructure, the Provincial Roads Authority and/or South African National Roads Agency Ltd (SANRAL) manage their infrastructure through the implementation of relevant departmental environmental management procedures.

Table 15-2: Impacts, Management/ Mitigation Measures during Operational Phase

Impact management outcomes:

- Undertake responsible water usage;
- To ensure no pollution of surface and groundwater resources;
- To ensure no instances of erosion on or adjacent to the site is reported or identified;
- Ensure that the stormwater management plan is implemented;
- Minimal impacts on wetlands, streams and rivers;
- Minimal impacts on vegetation and habitats;
- Minimal visual impacts;
- Prevent dust fallout exceedances from occurring within the dust monitoring network; and
- Prevent air emission exceedances of the National Ambient Air Quality Standards.

Id.	Impact	Mitigation / Management Measures	Responsible Person	Frequency and/or Time Period	Method of Monitoring
Operational Phase					
1.	Creation of employment, skills development, procurement and business opportunities	Prioritise employment of local people from the Victor Khanye Local Municipality, particularly for semi and unskilled job categories as far as possible. Employment of Coloured and Black African people; women; and youth should be prioritised. Engage with Victor Khanye Local Municipality to enquire about any district or local skills databases. Implement training and on-the-	Developer / Operations Manager	Duration of Operational Phase.	Compliance inspection by the authority.

Impact management outcomes:

- Undertake responsible water usage;
- To ensure no pollution of surface and groundwater resources;
- To ensure no instances of erosion on or adjacent to the site is reported or identified;
- Ensure that the stormwater management plan is implemented;
- Minimal impacts on wetlands, streams and rivers;
- Minimal impacts on vegetation and habitats;
- Minimal visual impacts;
- Prevent dust fallout exceedances from occurring within the dust monitoring network; and
- Prevent air emission exceedances of the National Ambient Air Quality Standards.

Id.	Impact	Mitigation / Management Measures	Responsible Person	Frequency and/or Time Period	Method of Monitoring
Operational Phase					
		job skills development programmes for temporary employees where feasible. Employ local contactors that are compliant with Broad Based Black Economic Empowerment (BBB-EE) criteria to the extent possible. Recruitment and employment practises must be in accordance with all labour legislation in South Africa. Vacancies should be advertised in the local media when they become available.			
2.	Surface water quality impairment	Stormwater infrastructure must be monitored for malfunction and leakages to ensure that spillage of contaminated	Developer / Operations Manager	Duration of Operational Phase.	Compliance inspection by the authority.

Impact management outcomes:

- Undertake responsible water usage;
- To ensure no pollution of surface and groundwater resources;
- To ensure no instances of erosion on or adjacent to the site is reported or identified;
- Ensure that the stormwater management plan is implemented;
- Minimal impacts on wetlands, streams and rivers;
- Minimal impacts on vegetation and habitats;
- Minimal visual impacts;
- Prevent dust fallout exceedances from occurring within the dust monitoring network; and
- Prevent air emission exceedances of the National Ambient Air Quality Standards.

Id.	Impact	Mitigation / Management Measures	Responsible Person	Frequency and/or Time Period	Method of Monitoring
Operational Phase					
		stormwater is prevented from entering into the wetland and watercourses.			
3.	Groundwater pollution	All areas that contain spilled ash must be cleaned up, post-construction. Stormwater infrastructure must be maintained as follows: • Avoid overflow of sumps • Undertake routine area inspections for spillages • Undertake regular clean up and maintenance • An Emergency Response Plan must be in place in the event of the occurrence of spillages.	Developer / Operations Manager	Duration of Operational Phase.	Compliance inspection by the authority.
4.	Pollution from litter, waste	Ensure that a site clean-up is undertaken at the end of every maintenance cycle to ensure	Developer / Operations Manager	Duration of Operational Phase.	Compliance inspection by the authority.

Impact management outcomes:

- Undertake responsible water usage;
- To ensure no pollution of surface and groundwater resources;
- To ensure no instances of erosion on or adjacent to the site is reported or identified;
- Ensure that the stormwater management plan is implemented;
- Minimal impacts on wetlands, streams and rivers;
- Minimal impacts on vegetation and habitats;
- Minimal visual impacts;
- Prevent dust fallout exceedances from occurring within the dust monitoring network; and
- Prevent air emission exceedances of the National Ambient Air Quality Standards.

Id.	Impact	Mitigation / Management Measures	Responsible Person	Frequency and/or Time Period	Method of Monitoring
		Operational Phase			
	metals, vehicle spills / hydrocarbon spills during maintenance activities	that no pollution has occurred. Where this has happened, appropriate remedial action is to be taken.			
5.	Pollution may enter ground / surface water	Ensure that all vehicles, storage, and usage areas have suitable spill kits. Develop a chemical and hydrocarbon spill procedure. Ensure that chemical and hydrocarbon usage is controlled.	Operations Manager / Developer	Duration of Operational Phase.	Compliance inspection by the authority.
6.	Loss and disturbance of	The implementation of an Alien Invasive Plant management	Developer	Duration of Operational Phase.	Compliance inspection by the

Impact management outcomes:

- Undertake responsible water usage;
- To ensure no pollution of surface and groundwater resources;
- To ensure no instances of erosion on or adjacent to the site is reported or identified;
- Ensure that the stormwater management plan is implemented;
- Minimal impacts on wetlands, streams and rivers;
- Minimal impacts on vegetation and habitats;
- Minimal visual impacts;
- Prevent dust fallout exceedances from occurring within the dust monitoring network; and
- Prevent air emission exceedances of the National Ambient Air Quality Standards.

Id.	Impact	Mitigation / Management Measures	Responsible Person	Frequency and/or Time Period	Method of Monitoring
		Operational Phase			
	floral and faunal species and communities	plan is very important, especially because of the invasive species identified on site which, if left unchecked, will continue to grow and spread prolifically leading to further and more significant deterioration to the health of the natural environment within and nearby to the project area. The plan must especially pertain to any recently cleared and changed areas. Areas of indigenous vegetation, even secondary communities outside of the direct project footprint, should under no circumstances be fragmented or disturbed further. Clearing of vegetation should be minimized and			authority.

Impact management outcomes:

- Undertake responsible water usage;
- To ensure no pollution of surface and groundwater resources;
- To ensure no instances of erosion on or adjacent to the site is reported or identified;
- Ensure that the stormwater management plan is implemented;
- Minimal impacts on wetlands, streams and rivers;
- Minimal impacts on vegetation and habitats;
- Minimal visual impacts;
- Prevent dust fallout exceedances from occurring within the dust monitoring network; and
- Prevent air emission exceedances of the National Ambient Air Quality Standards.

Id.	Impact	Mitigation / Management Measures	Responsible Person	Frequency and/or Time Period	Method of Monitoring
		Operational Phase			
		avoided where possible, especially in medium sensitivity areas. All vehicles and personnel must make use of the existing roads and walking paths, especially construction/operational vehicles. No plant species whether indigenous or exotic should be brought into/taken from the project area, to prevent the spread of exotic or invasive species or the illegal collection of plants. Leaking equipment and vehicles must be repaired immediately or be removed			

Impact management outcomes:

- Undertake responsible water usage;
- To ensure no pollution of surface and groundwater resources;
- To ensure no instances of erosion on or adjacent to the site is reported or identified;
- Ensure that the stormwater management plan is implemented;
- Minimal impacts on wetlands, streams and rivers;
- Minimal impacts on vegetation and habitats;
- Minimal visual impacts;
- Prevent dust fallout exceedances from occurring within the dust monitoring network; and
- Prevent air emission exceedances of the National Ambient Air Quality Standards.

Id.	Impact	Mitigation / Management Measures	Responsible Person	Frequency and/or Time Period	Method of Monitoring
Operational Phase					
		from project area to facilitate repair. All footprints to be rehabilitated progressively and landscaped after construction is complete. Rehabilitation of the disturbed areas existing in the project area must be made a priority. Topsoil must also be utilised, and any disturbed area must be re-vegetated with plant and grass species which are endemic to this vegetation type. Areas that are denuded during construction need to be re-vegetated with indigenous vegetation to prevent erosion			

Impact management outcomes:

- Undertake responsible water usage;
- To ensure no pollution of surface and groundwater resources;
- To ensure no instances of erosion on or adjacent to the site is reported or identified;
- Ensure that the stormwater management plan is implemented;
- Minimal impacts on wetlands, streams and rivers;
- Minimal impacts on vegetation and habitats;
- Minimal visual impacts;
- Prevent dust fallout exceedances from occurring within the dust monitoring network; and
- Prevent air emission exceedances of the National Ambient Air Quality Standards.

Id.	Impact	Mitigation / Management Measures	Responsible Person	Frequency and/or Time Period	Method of Monitoring
Operational Phase					
		during flood events. This will also reduce the likelihood of encroachment by alien invasive plant species. A pest control plan must be put in place and implemented, and it is imperative that poisons not be used. A dust monitoring programme must be developed and implemented for the area.			

15.1.4 Decommissioning Phase

The proposed stormwater infrastructure will be in operation at the Kusile Power Station for the lifespan of the power station. In the event that the Kusile Power Station will be decommissioned in the future, the installed infrastructure would require de-installation.

The infrastructure will be disassembled, removed from the site, transported, re-used/recycled. Before the transportation of the components of the stormwater infrastructure, it should be made sure that the infrastructure and its components are safe to transport. Refer to Table 15-3 for mitigation / management measures for the decommissioning phase.

The decommissioning of the stormwater infrastructure will have similar activities to those that are performed during construction. The decommissioning activities anticipated once the facility reached its end of life are the following:

- Disassembling of the components of the stormwater and associated infrastructure and appropriate disposal to landfill.
- Site preparation, removal of all equipment for disposal and re-use.
- Site Rehabilitation to acceptable level as per Environmental Management Programme (EMPr) guidelines.

a) Rehabilitation

Following decommissioning and removal of all project material from the site, the disturbed areas will be rehabilitated to pre-project land capability. Where possible, rehabilitation will be conducted concurrently with decommissioning. The following rehabilitation activities are relevant:

- The existing profiles of the land affected will be improved and stabilised thereby leaving profiles not incompatible with the topography of the area, which is essentially flat.
- Ripping of compacted soils will be done prior to adding topsoil, which will be done by mechanical means. It is expected that there will be a sufficient amount of topsoil and/or subsoil moved and stockpiled during the construction phase to facilitate rehabilitation.
- If required, potential areas or land for extracting topsoil or subsoil will be identified. The land capability characteristics of such areas should be similar to the affected soils (same texture, colour, permeability, etc.).
- Vegetation will be re-established. The plant species used will match those naturally occurring in the area. This will be conducted in consultation with a biodiversity specialist.

b) Aftercare and Maintenance

Following rehabilitation, a period of maintenance and aftercare will be required to ensure that rehabilitation is successful. In this regard, the following activities are relevant:

- Fertilisation of soil depending on soil fertility test results.
- Control and removal alien/invasive species.
- Implementation of erosion controls (if required).
- Auditing of vegetation recover and adaption of strategies where necessary.

Table 15-3: Impacts, Management/ Mitigation Measures during Decommissioning Phase

Id.	Impact	Mitigation / Management Measures	Responsible Person	Frequency and/or Time Period	Method of Monitoring
Decommissioning Phase					
Equipment associated with the proposed Project would only be decommissioned once it has reached the end of its life i.e end of the life of the Kusile Power Station. o Site Preparation Site preparation activities will include confirming the integrity of the access to the site to accommodate required equipment, preparation of the site (e.g. lay down areas, construction platform) and the mobilisation of construction equipment. o Disassemble and Remove Infrastructure Disassembled components will be reused, recycled, or disposed of in accordance with regulatory requirements or any other requirements deemed applicable by the Original Equipment Manufacturer. As with construction activities, reversing of site vehicles should be kept to a minimum to minimise the use of reverse warning sounds and wherever possible vehicles should be turned around without using reverse gear. The extent of land cleared of vegetation at any one time should be kept to a minimum. A dust suppression plan should be implemented during the decommissioning phase on all bare areas. Transportation of any abnormal loads away form site and high volumes of heavy trucks should be scheduled for low traffic times on the national roads to limit the impact of this on people travelling on the roads. The site should be re-vegetated with appropriate locally indigenous vegetation as soon as possible. o Creation of local employment associated with decommissioning activities. o Prioritise employment of local people from the Victor Khanye Local Municipality, particularly for semi and unskilled job categories as far as possible. o Ensure recruitment measures are aimed particularly at construction workers classified as designated employees in terms of the Employment Equity Act (black people, as defined in the Act, women, and disabled people). A local employment procedure and recruitment process should be developed in consultation with local authorities and representatives. Eskom should ensure that a transparent process of employment is followed to limit opportunities for conflict situations. o Ensure that the Labour Relations Amendment Act, 2002 (Act No. 12 of 2002) as well as the necessary policies and procedures are taken into consideration to ensure the correct procurement procedures. o Engage with Victor Khanye Local Municipality to enquire about any district or local skills databases. o Implement training and on-the-job skills development programmes for temporary employees where feasible. o Employ local contactors that are compliant with Broad Based Black Economic Empowerment (BBB-EE) criteria to the extent possible. o Vacancies should be advertised in the local media when they become available. o Loss of employment o Prior to a scheduled closure, engage with all relevant stakeholders such as the Victor Khanye Local Municipality and Labour Unions regarding				

Id.	Impact	Mitigation / Management Measures	Responsible Person	Frequency and/or Time Period	Method of Monitoring
Decommissioning Phase					
		the proposed closure and decommissioning timeframes and possible socio-economic interventions to ameliorate the impact on individuals and the broader community. ○ Provide counselling and guidance to employees who will need to be retrenched. ○ Provide assistance with claiming UIF and other state assistance if required. ○ Assistance with registering as a jobseeker (with the relevant local and district municipalities and employment agencies).			

16 MONITORING

This chapter deals with Compliance Monitoring as well as specific monitoring requirements, as per the Specialist Studies, during construction and operational phases. The key to a successful EMPr is appropriate monitoring and review to ensure effective functioning of the EMPr and to identify and implement corrective measures in a timely manner. An audit of the environmental monitoring and management actions undertaken is essential to ensure that it is effective in operation, is meeting specified goals, and performs in accordance with relevant regulations and standards.

Regular monitoring of all the environmental management measures and components shall be carried out by the Developer's PM and independent ECO to ensure that the provisions of this plan are adhered to. Ongoing and regular reporting of the progress of implementation of this Programme should be done. Various points of compliance will be identified with regard to the various impacts that the construction will have on the environment.

Prior to the start of construction activities, an audit schedule should be drawn up, on basis of the environmental authorisation requirements and with input from ECO. The audit schedule should include target dates for implementation of recommendations and timeframes for submission to the Developer's EM, Developer's appointed PM and DFFE. The audits should be timed to coincide with scheduled project meetings, where possible.

16.1 Auditing

The key to a successful EMPr is appropriate monitoring and review to ensure effective functioning of the EMPr and to identify and implement corrective measures in a timely manner. An audit of the environmental monitoring and management actions undertaken is essential to ensure that it is effective in operation, is meeting specified goals, and performs in accordance with relevant regulations and standards.

Regular monitoring of all the environmental management measures and components shall be carried out by the Developer (Eskom) and the ECO to ensure that the provisions of this plan are adhered to. Ongoing and regular reporting of the progress of implementation of this Programme should be done. Various points of compliance will be identified with regard to the various impacts that the construction will have on the environment.

Inspections and monitoring shall be carried out to assess the implementation of the EMPr. Visual inspections on all environmental aspects shall be carried out on a regular basis.

Prior to the start of construction activities, an audit schedule should be drawn up, on the basis of the EA requirements and with input from ECO. The audit schedule should include target dates for implementation of recommendations and timeframes for submission to the Developer's appointed PM and the DFFE. The audits should be timed to coincide with scheduled project meetings, where possible.

16.2 Site Documentation or Reporting

Site documentation standard shall be used to keep records on site. In addition, all non-compliances to the EA will be reported to the assigned PM within 24 hours. All documents as listed below shall be kept on site and be available for monitoring and auditing purposes. Site inspections by an Environmental Audit team may require access to this documentation for auditing purposes. The documentation shall be signed by all parties to ensure that such documents are legitimate. Regular monitoring of all site works by the ECO is imperative to ensure that all problems encountered are solved punctually and amicably. When the ECO is not available, the PM shall keep abreast of all works to ensure no problems arise.

The following documents must be kept on site:

- Access negotiations and physical access plans;
- Site instructions;
- Pre-construction audit report undertaken by ECO;
- Complaints register;
- Records of all remediation / rehabilitation activities;
- Copy of this EMPr;
- Copy of the Environmental Authorisation;
- Environmental Awareness Plan;
- Monthly compliance report;
- Environmental training records; and
- Emergency response procedures.

The monthly compliance report should include:

- Complaints received from Interested and Affected Parties (I&APs) and details of the actions taken;
- Environmental incidents, spills of hazardous substances, *etc*; and
- Environmental damage which requires rehabilitation.

16.3 Monitoring

16.3.1 Undertaking audits

The Developer or PM shall appoint a qualified and experienced ECO to ensure implementation of and adherence to the EMPr.

The ECO shall conduct Bi annual audits to ensure that the system for implementation of the EMPr is operating effectively. The audit shall check that a procedure is in place to ensure that:

- The EMPr and the Method Statements being used must be the up-to-date versions;
- Variations to the EMPr, Method Statements and non-compliances and corrective actions must documented; and
- Emergency procedures are in place and effectively communicated to personnel.

The audit programme shall consist of the following at a minimum:

- The ECO must conduct site inspections weekly and submit audit reports at Bi annual intervals, at a minimum or as per EA requirement.

16.3.2 Compliance with the EMPr

The Developer and/or its agents are deemed not to have complied with the EMPr and remedial action if:

- There is evidence of contravention of the EMPr clauses within the boundaries of the site or extensions;
- Environmental damage ensues due to negligence; and
- The Developer fails to comply with corrective or other instructions issued by the PM, within a time period specified by the PM.

16.4 Environmental Contact Person

To be confirmed prior commencement of the proposed development should DFFE grant an EA to proceed with the project.

16.5 Emergency Numbers

- Police: 10111
- Ambulance 10177
- Netcare 911 082 911

17 SITE REHABILITATION

17.1 Removal of structures and infrastructure

During and following the completion of the construction activities, the area must be rehabilitated by appropriate landscaping, levelling, topsoil dressing, land preparation, alien plant eradication

and vegetation establishment. All construction plant, equipment, storage containers and temporary fencing must be removed from site.

17.2 Waste and pollution control

- Waste minimisation, the re-use, recycling and recovery of waste must be promoted;
- Rubble, including surplus rock, foundations and batching plant aggregates will be removed from the construction site and firstly recycled and re-used, where possible, before disposed of at a registered landfill site;
- All waste storage containers will be removed from site on a regular basis;
- All portable sanitation facilities will be removed by a certified contractor. It must be ensured that no leaks or spillage from sanitation facilities occurs during the removal thereof; and
- All hazardous waste which is temporary stored on site, including the storage containers must be removed from site and disposed of at a registered hazardous landfill site.

17.3 Topsoil replacement and soil amelioration

- The principle of Progressive Reinstatement must be followed wherever possible. This includes the reinstatement of disturbed areas on an ongoing basis, immediately after the specified construction activities for that area are concluded;
- Execute top soiling activity prior to the rainy season or any expected wet weather conditions;
- Execute topsoil placement concurrently with construction where possible, or as soon as construction in an area has ceased;
- Replace and redistribute stockpiled topsoil together with herbaceous vegetation, overlying grass and other fine organic matter in all disturbed areas of the construction site, including temporary access routes and roads. Replace topsoil to the original depth. These areas will be quantified by the ECO;
- Place topsoil in the same area from where it was stripped. If there is insufficient topsoil available from a particular soil zone to produce the minimum specified depth, topsoil of similar quality may be brought from other areas of similar quality;
- The suitability of substitute material will be determined by means of a soil analysis addressing soil fraction, fertility, pH and drainage, and approved by the ECO; and
- Do not use topsoil suspected to be contaminated with the seed of alien vegetation.

18 CONCLUSION

It is the opinion of the EAP that the implementation of the management and mitigation measures provided in the EMPr is sufficient to manage the environmental impacts associated with the proposed project. This EMPr will furthermore contribute to realizing the following over-arching objectives set out to be reached using the document as an environmental management tool:

- Ensure that sufficient monetary provision, aligned with the significance of the environmental impact and scale of the project, is made to remediate and rehabilitate the environment impacted on by the construction activities;
- Verify environmental performance through information on impacts as they occur;
- Respond to unforeseen events and environmental incidents; and
- Provide feedback to drive continual improvement in environmental performance.

The effectiveness of this EMPr will to a large degree rest on adherence to and fulfilling the roles and responsibilities of each role player and stakeholder. The roles and responsibilities for management actions contained in the EMPr (refer to Section 9 of this document) and arrangements for coordination among the role players are clearly defined in this document.

ZITHOLELE CONSULTING (PTY) LTD

Ms. Natasha Lalie **Senior EAP**	Dr. Mathys Vosloo **Project Manager**	Dr. Mathys Vosloo **Project Associate**

APPENDIX A: DRAWINGS

APPENDIX B: WETLAND REHABILITATION PLAN

APPENDIX C: EAP CV's

Details of Independent Environmental Assessment Practitioner (EAP)

Zitholele Consulting offers Specialist Consulting Services in the fields of Engineering, Environmental Management, Waste Management, and Strategic Communication. The Zitholele team comprises of highly-skilled, experienced, professionally registered technical personnel and senior management members that are capable of undertaking large, complex, and multi-disciplinary assignments in both the public and private sectors. Zitholele is one of the top Environmental Management consultancies in South Africa, having undertaken Impact Assessments and other Environmental Management Services in the Industrial, Power, Agricultural, Water, and Waste sectors. Zitholele utilises international best practice methodologies for quantitative impact assessment, risk assessment and consideration of alternatives.

Zitholele has a formidable track record and comprises highly qualified and experienced technical staff viz, Environmental Scientists and Environmental Control Officers (ECO's). The team members have broad experience in terms of working on a range of environmental projects within the public and private sector across South Africa. Refer to the table below for the contact details of the EAP who prepared the amended EMPr.

Details of the Independent Environmental Assessment Practitioner (EAP)

Project EAP:	**Zitholele Consulting (Pty) Ltd**		
Contact Person:	Ms. Natasha Lalie		
Qualifications	Master of Science (Environment and Society), IAIASa Member (Member No: 6920) and Professional Registered EAP with Environmental Assessment Practitioners Association of South Africa (EAPASA) (Registration No: 2021/3611)		
Role in Project:	Project management and coordination Process management Specialist team management Public Participation Co-Ordinator and liaisons Compilation of Amended EMPr		
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Expertise to undertake the EMPr amendment process:	Ms. Natasha Lalie has been an Environmental Assessment Practitioner (EAP) for nineteen years. She has undertaken numerous Screening and Feasibility Studies, Basic Assessment Reports, Scoping Reports, Environmental Impact Reports (EIR's), Environmental Management Programmes (EMPr's) and Public Participation Processes, as required by the National Environmental Management Act, 1998 (Act No. 107 of 1998) as amended and the EIA Regulations of 2006, 2010 and 2014. She has also undertaken Integrated Water Use Licence Applications (IWULA's) for a number of projects, as required by the National Water Act, 1998 (Act No. 36 of 1998). She has been involved in a wide range of projects, which included Waste Management License Applications, industrial, township establishments, mixed-use development, solar PV developments, transmission power lines, road upgrades, infrastructure developments, change of land use, lodge developments, proposed bulk water pipelines, proposed transmission power lines, public transportation, proposed filling stations, shopping centre developments and so on. She has worked extensively in South Africa, particularly in KwaZulu-Natal, Eastern Cape and Gauteng.		