

Proposed Upgrade of Two Existing Ash Dams and the Construction of Two Rehabilitation Dams at the Majuba Power Station's Ash Disposal Facility

Draft Environmental Management Programme

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Acronyms:

ADF:	Ash Disposal Facility
CEMPr:	Construction Phase Environmental Management Programme
DEA:	Department of Environmental Affairs
DWS:	Department of Water and Sanitation
EA:	Environmental Authorisation
ECO:	Environmental Compliance / Control Officer
EIA:	Environmental Impact Assessment
EMPr:	Environmental Management Programme
EO:	Environmental Officer
GNR:	Government Notice Regulation
IAP:	Interested and/or Affected Party
MSDS:	Material Safety Data Sheet
NEMA:	National Environmental Management Act
OEMPr:	Operational Phase Environmental Management Programme
SAHRA:	South African Heritage Resource Agency
S&EIA:	Scoping and Environmental Impact Assessment



1 Introduction

1.1 Project Background

Advisian, a WorleyParsons (Pty) Ltd Group Company, was appointed by Eskom Holding SOC Ltd, as an independent Environmental Assessment Practitioner (EAP) to undertake the Scoping and Environmental Impact Reporting (S&EIA) process and associated Environmental Management Programme (EMPr) compilation, as per the requirements of the National Environmental Management Act, 1998 for the proposed upgrade of two existing ash dams and the construction of two rehabilitation dams at the Majuba Power Station's Ash Disposal Facility, Mpumalanga (refer to Figure 1 for project locality map).

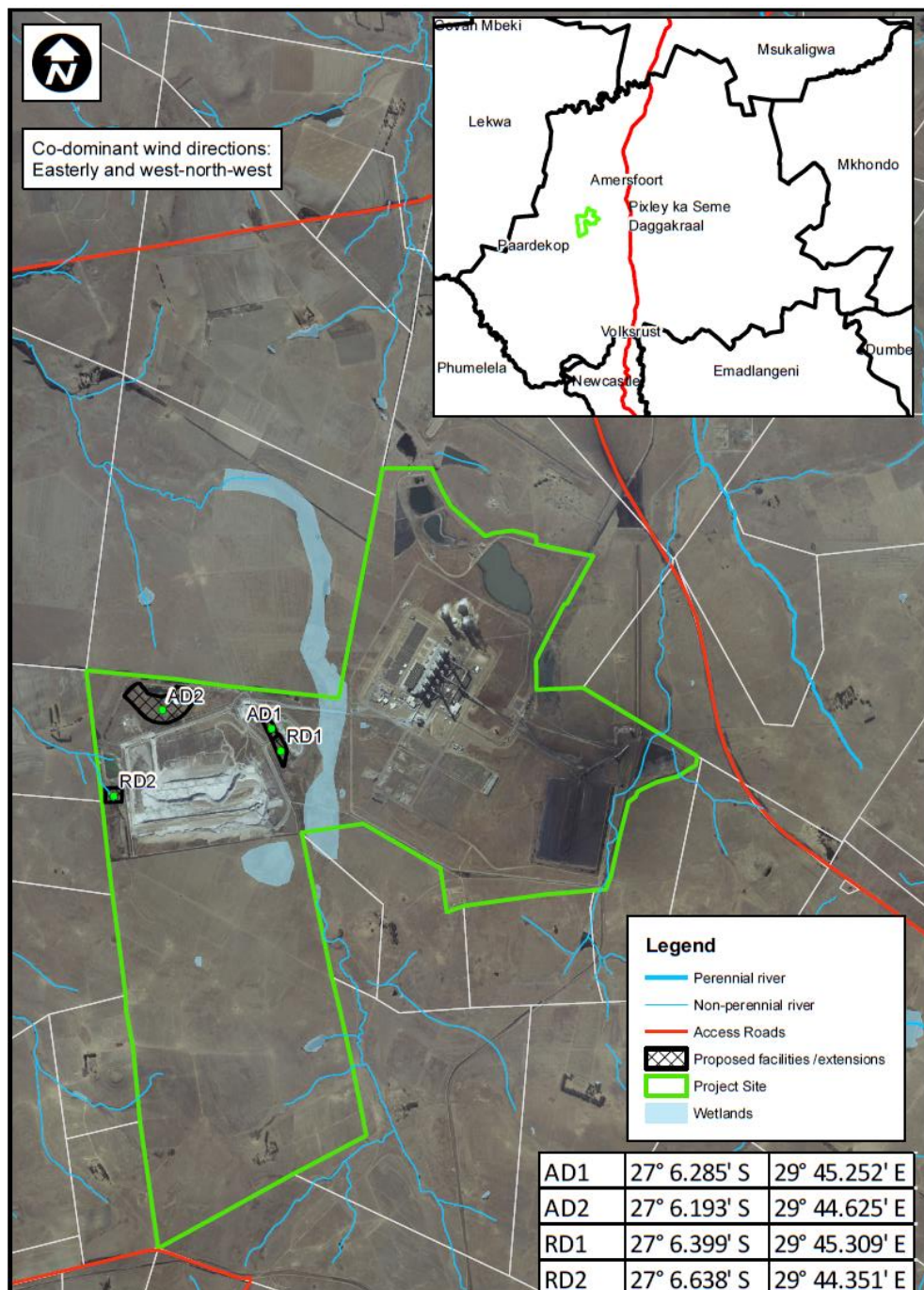


Figure 1: Project Locality Map



1.2 Objectives of the EMPr

An EMPr is intended to define the management measures required to promote positive environmental consequences and reduce adverse environmental impacts of a development. The EMPr specifies all the potential environmental impacts and, control and mitigatory measures. The EMPr forms a crucial part of the conditions for approval and ensures that the project proponent remains accountable for all environmental compliance issues.

This EMPr therefore specifies the framework within which project proponent must carry out the construction and operational phase activities related to the project. It is the responsibility of the project proponent to ensure that this EMPr is included in contractual agreements and the construction specification.

1.3 EMPr Content in accordance with NEMA

The 2014 EIA Regulations as amended on 07 April 2017 (Government Notice Regulation (GNR) 326), prescribes the required content of an EMPr. These requirements and where they are addressed in this report is summarised in Table 1 below:

Table 1: NEMA (2014) Legislative Requirements as detailed in GNR 326, Appendix 4

GNR 326	Description	Reference in the EMPr Report
a)	Details of (i) the EAP who prepared the EMPr; and (ii) the expertise of that EAP to prepare an EMPr, including a curriculum vitae;	Section 7.
b)	A detailed description of the aspects of the activity that are covered by the EMPr as identified by the project description;	Section 1.4, 1.5, 1.6.
c)	A map at an appropriate scale which superimposes the proposed activity, its associated structures, and infrastructure on the environmental sensitivities of the preferred site, indicating any areas that any areas that should be avoided, including buffers.	Appendix A.
d)	A description of the impact management objectives, including management statements, identifying the impacts and risks that need to be avoided, managed and mitigated as identified through the EIA process for all phases of the development including- (i) planning and design; (ii) pre-construction activities; (iii) construction activities; (iv) rehabilitation of the environment after construction and where applicable post closure; and (v) where relevant, operation activities;	Section 4, 5 and 6.
e)	A description and identification of impact management outcomes required for the aspects contemplated in paragraph (d);	Section 4, 5 and 6.
f)	A description of proposed impact management actions, identifying the manner in which the impact management objectives and	Section 3, 4, 5 and 6.



GNR 326	Description	Reference in the EMPr Report
	<p>outcomes contemplated in paragraphs (d) and e) will be achieved, and must, where applicable, include actions to</p> <p>(i) avoid, modify, remedy, control or stop any action, activity or process which causes pollution or environmental degradation;</p> <p>(ii) comply with any prescribed environmental management standards or practices;</p> <p>(iii) comply with any applicable provisions of the Act regarding closure, where applicable; and</p> <p>(iv) comply with any provisions of the Act regarding financial provisions for rehabilitation, where applicable</p>	
g)	The method of monitoring the implementation of the impact management actions contemplated in paragraph (f);	Section 3
h)	The frequency of monitoring the implementation of the impact management actions contemplated in paragraph (f);	Section 3
i)	An indication of the persons who will be responsible for the implementation of the impact management actions;	Section 3
j)	The time periods within which the impact management actions contemplated in paragraph (f) must be implemented;	Section 4, 5 and 6.
k)	The mechanism for monitoring compliance with the impact management actions contemplated in paragraph (f);	Section 3
l)	A programme for reporting on compliance, taking into account the requirement as prescribed by the Regulations;	Section 3
m)	<p>An environmental awareness plan describing the manner in which</p> <p>(i) the applicant intends to inform his or her employees of any environmental risk which may result from their work; and</p> <p>(ii) risks must be dealt with in order to avoid pollution or the degradation of the environment;</p>	Section 3
n)	Any specific information that may be required by the competent authority.	N/A

1.4 Scope of the Construction Phase EMPr

The aim of the Construction Environmental Management Programme (CEMPr) is to ensure that adequate controls are in place to address the environmental and social impacts for the proposed construction of the project.

The construction phase for the Ash Dams and Rehabilitation Dams will include the following primary activities:

- Contractor Selection and Performance
- Legal and Other Requirements
- Social Interaction



- Labour
- Employment – Local Preference
- Safety and Security
- General Procedures
- Emergency Response
- Fire Control
- Site Establishment and Management
- Noise
- Dust Control
- Waste Management
- Storage and Handling of Hazardous Substances
- Groundwater
- Heritage
- Water Quality
- Mitigation of impacts on Ecology

1.5 Scope of the Operational Phase EMPr

The aim of the Operational Environmental Management Programme (OEMPr) is to ensure that adequate controls are in place to address the environmental and social impacts related to the project's operation.

The operational phase will include the following primary activities:

- Labour
- Conduct of Employees
- Hazard and Risk
- Specialists' recommendations
 - Water Quality
 - Ecology Mitigation

1.6 Scope of a Closure Phase EMPr

The aim of a Closure Environmental Management Programme (CEMP) would be to ensure that rehabilitation of the site has been done adequately, are sustainable, being maintained and monitored. This EMPr document is an Operational EMPr and does not focus on the detail activities associated with the Closure Phase, which will only be known at the end of the operational phase.

The closure phase would include the following primary activities:

- General Rehabilitation Requirements
- Progress Manual
- Water Quality
- Air Quality
- Veld Fires
- Erosion Control



- Pollution Control
- Materials
 - Plants
 - Tree Stakes
 - Tree Ties
- Equipment
- Preliminary Works
 - Topsoil Stripping
 - Preparation for Planting
- Planting Procedure
 - Tree Planting
 - Scarifying
 - Seeding
 - Grass Species
- Care After Planting
- Maintenance
- General Principles for Environmental Management during Decommissioning

2 Legislation, Procedures and Standards

The provisions and obligations of the EMPr are legally binding to the Applicant, Engineer and all Contractors during the life of the project and that of all related contracts. In the event that any conflicts should occur between the provisions of the EMPr and that of the project specifications/standards, the provisions of the EMPr shall be subordinate. The requirements of this EMPr do not release the Applicant from the requirements of any legislation that may be applicable to the project.

2.1 Applicable Legislation

A list of Legislation applicable to the project (although not limited to those listed) has been provided below for guidance:

- National Environmental Management Act (Act Nr. 107 of 1998);
- National Environmental Management: Waste Act (Act Nr. 59 of 2008, as amended)
- National Heritage Resources Act (Act Nr. 25 of 1999);
- National Water Act (Act Nr. 36 of 1998)
- Occupational Health and Safety Act (Act Nr. 385 of 1993)
- Hazardous Substances Act (Act Nr. 63 of 1977)

The construction and operation, of the Ash Dams must be according to best industry practice, as identified in the project documentation. This EMPr, which forms an integral part of all Contract Documents, informs the Contractors/Responsible Persons as to his/her/their duties in the fulfilment of the project objectives, with particular reference to the prevention and mitigation of negative environmental impact caused by the activities associated with the project.

It is expected that the Contractors are conversant with all environmental legislation pertaining to the project. In addition, all Contractors must also take cognisance of Provincial and Local Government



Ordinances and Bylaws, which may be applicable to the project. Municipal By-Laws include Advertising and Signage, Solid Waste Disposal, Stormwater Management, Fire Safety, etc.

The EMPr is a dynamic document subject to similar influences and changes as are wrought by variations to the provisions of the project specification. Any substantial changes must be submitted to the relevant authorities in writing for approval.

This EMPr must be read in conjunction with existing Majuba operating procedures, including the Majuba Ash disposal facility Management Plan Document No.: ENG/31745 (as updated). Hard copies of procedures should be kept on site with the EMPr, including all associated permits and licences. Refer to **Appendix B** for the Majuba Environmental Management Procedures applicable to the Ash Disposal Facility.

Table 2: Existing Authorisations

Existing Authorisations	Relevant Land
Integrated Environmental Authorisation (IEA) DEA Ref.: 14/12/16/3/3/3/53 Date: 19/08/2015	Portion 5, 8, 9, and 12 of the farm Witkoppies 81 HS. Portion 2, 4 and 10 of the farm Mezig 79 HS
Exemption from IEA ADF Lining Requirement for a 4 year period DEA Ref: 14/12/16/3/3/3/53 Date: 24/06/2016	Portion 5, 8, 9, and 12 of the farm Witkoppies 81 HS. Portion 2, 4 and 10 of the farm Mezig 79 HS.
Water Use License (WUL) DWS Ref: 08/C11J/BCGI/4253 Date: 01/02/2016	Portion 1, 4, 5, 8, 9, 11, 12, 13, 14, and the Remainder of Portion 0 of the farm Witkoppies 81 HS. Portion 1 of the farm Roodekopjes 67 HS.

3 Implementation of the EMPr

3.1 Introduction

This document describes mitigation measures in detail, and is partly prescriptive, identifying specific people or organisations to undertake specific tasks in order to ensure that impacts on the environment are minimised during the lifecycle of this project. The EMPr is applicable to all works comprising the pre-construction, construction and operation of the Ash Dams and its associated infrastructure. It is an open-ended document implying that information gained during pre-construction, construction and operational activities and/or monitoring of procedures on site could lead to changes to the EMPr. This must allow for CEMPr changes to be approved by DEA, and OEMPr changes to be approved through the Eskom's EMS processes which aligns with the provision in recent IEAs where the DEA allows inclusion of new developments into EMS.

The appointed ECO (Environmental Control Officer) will monitor compliance with the EMPr and other Conditions of Approval as they relate to environmental matters. This EMPr gives direction and guidance to all responsible parties. The responsible parties are expected to co-operate closely to minimise or avoid unnecessary environmental impacts.

Non-compliance penalties are described in this EMPr and are thus to be included into the official contract documentation. Although these are not legislated, it is a standard procedure to ensure compliance of contractors to the measures of the EMPr, which is a document that has legal standing through the Environmental Authorisation by DEA. The Contractor is obliged to inform the ECO, Engineer, and Proponent immediately of events that may cause serious environmental damage or breach the



requirements of the EMPr. The ECO in turn will inform, if necessary, the Local Authority and / or DEA, of such events.

3.2 Commitment to the EMPr

Ensuring success of the implementation of this EMPr requires obtaining the commitment of the top management and all other management and worker levels of the organisation/s that will be responsible for its implementation

The Proponent, Engineer, and Contractors have a Duty of Care and required remediation of environmental damage in terms of Section 28 of NEMA. Every person who causes, has caused or may cause significant pollution or degradation of the environment must take reasonable measures to prevent such pollution or degradation from occurring, continuing or recurring, or, in so far as such harm to the environment is authorised by Law or cannot reasonably be avoided or stopped, to minimize and rectify pollution or degradation of the environment. The EMPr requires all involved with the construction and operation of the Ash Dams and associated infrastructure to act in accordance with "Duty of Care" throughout the various phases of the project.

3.3 Financial Provisions regarding the EMPr

Financing of all management measures is the direct responsibility of each Contractor appointed by the Proponent. It is therefore accepted that the costs incurred for implementing the required environmental controls to ensure compliance with local authority by-laws, Provincial and National legislation and the objectives or requirements specified in this EMPr would be provided for in the specific contract documents.

All responsibilities not defined in the EMPr or which fall outside of the tender specifications will be the responsibility of the Proponent.

3.3.1 Tender Documentation

The Proponent shall ensure that this EMPr is included within the tender documents for all contractors tendering to undertake any aspects of the construction phase of the project.

In the adjudication of any tenders to undertake any aspect of the construction of the proposed project, the applicant (or the applicants' agent/representative) must ensure that the costs of compliance with the EMPr have been adequately allowed for within the successful tenderer.

3.3.2 Contractor Environmental Cost Items

Some of the important cost items have been listed below to assist the Contractor in making provision for implementation of the Specifications:

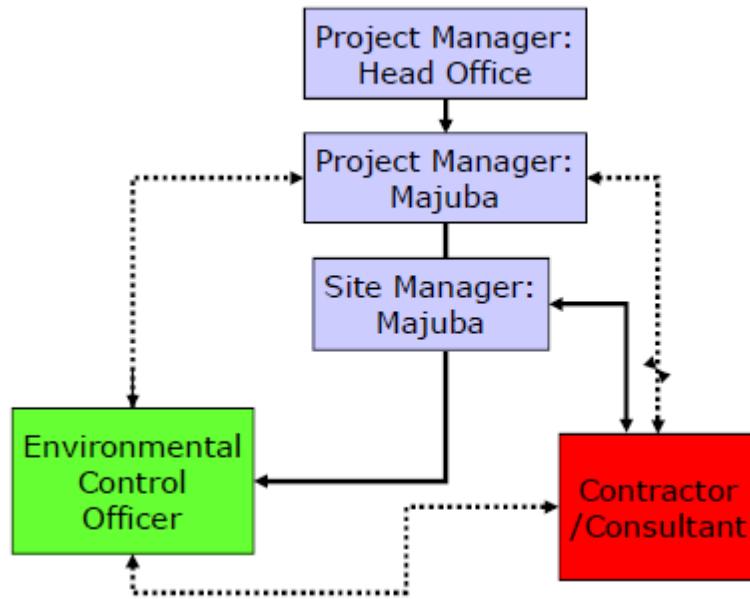
- The development and provision of all required site-specific Method Statements.
- The attendance of environmental training of all employees, also including toolbox talks.
- Protection of stock piles from blowing or washing away: The spraying or covering of stockpiles, including the supply of the spray or cover material or vegetation, as required.
- Storage of fuel and oils: The supply, construction, installation, transport, upkeep and removal of all facilities required for storage and management of fuel and oils.
- Cement laden water management: The supply, construction, installation, transport, upkeep and removal of all facilities required for the management of wastewater from concrete operations.
- Contaminated water management: The supply, construction, installation, transport, upkeep and removal of all facilities required for managing contaminated water.



- Storm water and flood management: The supply, construction, installation, transport, upkeep and removal of all facilities required for managing storm water run-off from the site and protection of works from flooding.
- Bunding and management of run-off from workshop areas and supply of drip trays for stationary and “parked” plant: The supply, construction, installation, transport, upkeep and removal of all facilities required for bunding and managing the run-off from workshop areas as well as all drip trays required.
- Dust management: The supply, application, transport, upkeep and removal of all materials required to ensure that dust is adequately controlled.
- Solid waste management: The supply, application, transport, upkeep and removal of all materials required to ensure that solid waste is adequately controlled in accordance with the specification (including the recycling program).
- Fire Control: The supply, transport, upkeep and removal of all material required for fire control.
- Eating areas: The supply, construction, installation, transport, upkeep and removal at the end of the construction of all eating areas structures.
- Ablutions: The supply, maintenance, regular emptying and removal of toilets.
- Site demarcation: The supply, installation and removal at the end of the construction of all temporary fences.
- Vegetation protection: The supply, installation and removal at the end of the construction of all vegetation protection fences.
- Vegetation protection and alien vegetation management.
- Rehabilitation of the site after construction activities has been completed, including indigenous re-vegetation.
- Contractors must ensure to include all cost items as per the EMPr, as the implementation of the EMPr will be a legal requirement.

3.4 Roles and Responsibilities

This document aims to identify and allocate responsibility to the various parties responsible for ensuring that environmental compliance is achieved. This section of the document will delineate the function and responsibility of each designation that plays a role in terms of the environmental management of this development. The organogram below shows the flow and roles, as are aligned with the ADF project, for consistency of management on the overall site.



The key role-players during the construction phase of the development, for the purposes of environmental management on site, include but are not limited to: The Applicant (Eskom), the Engineer, the Primary Contractors (direct appointments including civil works contractor, building contractor, landscape contractor etc.) the Environmental Control Officer, and representatives of the relevant Authorities.

3.4.1 Project Applicant / Proponent

For the purpose of this document the "Proponent" and its appointed facilitators, refers to those whom permission has been granted to proceed with the project/development (i.e, Eskom), and who is thus ultimately responsible for compliance with all conditions of approval of the development or any aspect thereof by any authority.



With respect to the pre-construction phase of the development, the Proponent is to:

- Incorporate environmental recommendations during the project planning and design as outlined in the pre-construction EMPr in order to minimise any environmental impacts throughout the project lifespan.
- Include all recommendations, as per the EMPr with all project related contracts to ensure that the total environmental impact of the proposed development is kept to a minimum as far as possible through all phases of the project.

With respect to the construction phase of the development, the Proponent is to:

- Ensure that all relevant approvals and permits have been obtained prior to the start of construction activities on site;
- Ensure that all applicable conditions of approval have been complied with;
- Fulfil all public relations responsibilities in conjunction with the municipality;
- Inform the relevant authorities of any site related environmental incidents that may occur;
- Attend site meetings when appropriate;



- Liaise with the Project, Site Manager and/or Engineer regarding environmental management on site;
- Assist the Project/Site Manager/Engineer in making decisions and finding solutions to environmental problems that may arise during the construction and operation phases;
- Ensure that rehabilitation is done in accordance with the EMPr once construction has been completed.

With respect to the operational phase of the development, the Proponent is to:

- Ensure that whomever is responsible for the operation of the development, adheres to and implements the operational phase EMPr; and
- Continuously seek to improve any negative environmental impacts which result from the operational phase.

With respect to the Closure phase of the development, the Proponent is to:

- Ensure that whomever is responsible for the rehabilitation of the site, adheres to the EMPr; and
- Aftercare of rehabilitated areas is followed to ensure continued stability and eventual self-sustainability
- Ensure the upkeep of a complete rehabilitation progress manual, including measures for pollution control
- To start and keep a progress manual fully documenting the progress made and significant factors influencing the rehabilitation process.

Financing of all control measures is the direct responsibility of the Proponent or each Contractor appointed by the Proponent. It is therefore accepted that the costs incurred for implementing the required environmental controls to ensure compliance with local authority by-laws, Provincial and National legislation, the Integrated Environmental Authorisation (IEA) and the objectives or requirements specified in this EMPr would be provided for in the specific tender documents.

All responsibilities not defined in the EMPr or which fall outside of the tender specifications will be the responsibility of the Proponent.

3.4.2 Project / Site Manager (Eskom)

The Site Manager's responsibilities include the following:

- Ensure that the requirements as set in the EMPr are adhered to;
- Direct the Site Foremen or Contractors whenever necessary to comply with the conditions of the EMPr;
- The Site Manager must attend site meetings where required to be able to report on, and respond to any environmental issues, and be issued with copies of minutes of such meetings;
- The Site Manager must obtain, review and approve method statements where applicable;
- Advise the project team on environmental issues within the defined work and surrounding areas;
- Collect and record all waste manifest data sheets;
- Collect and record all water use data sheets;
- Recommend corrective action where there is noncompliance with the EMPr;
- Keep an up to date diary of site activities;
- Ensure that external audits are conducted; and
- Compile an environmental report on completion of the construction phase.

**Daily, Ongoing
Record, collect
Report, approve,
direct & Instruct**



The Site Manager has the authority to stop works if, in his/her view there is a serious threat to, or impact on the natural and/or social environment as a result of the various activities. This authority is to be limited to emergency situations where consultation with the applicant and/or contractor is not immediately possible. In all such work stoppage situations the Site Manager is to inform the applicant and contractor of the reasons for the stoppage as soon as possible.

Upon failure by the contractor to show adequate consideration to the environmental aspects of this contract, the Site Manager may recommend having the contractor's representative or any employee/s removed from the site or suspend work until the matter is remedied.

3.4.3 The Engineer

For the purposes of this document, "The Engineer" refers to the engineer for the development, or any other person authorised by the Proponent (Eskom), to be responsible for the technical and contractual implementation of the works to be undertaken.

Daily, Ongoing
Assist ECO,
Review, order
Issue penalties

The responsibilities of the Engineer are to:

- Ensure that the requirements as set out in this EMP, IEA and by the relevant Authorities are adhered to and implemented;
- Respond to ECO's concerns whether the conditions of the EMP are being adhered to and promptly issuing instructions requested by the ECO, to the Contractor. All site instructions relating to environmental matters issued by the Engineer are to be copied to the ECO;
- Advise the ECO with technical details to assist the ECO in making decisions and finding solutions to environmental problems that may arise during the construction phase;
- Order the removal of person(s) and/or equipment not complying with the specifications (as required by the ECO or otherwise);
- Issue of penalties for transgressions of Environmental Specifications;
- Provide input into the ECO's ongoing review of the EMP;
- Has the authority to issue instructions and oversee the operations of the contractor?

3.4.4 The Contractor

For the purpose of this document "The Contractor" refers to any directly appointed (by the Proponent) company or individual undertaking the implementation of the works.

The Contractor is to:

- Ensure implementation of all applicable Environmental Specifications as per the EMP; Environmental Authorisation, including all additional requirements related with approved method statements, during all works on site, failing which penalties, as outlined in the Environmental Specifications may be imposed by the ECO via the Engineer;
- Ensure that all sub-contractors, employees, suppliers, agents appointed by the Contractor are fully aware of the environmental requirements detailed in the EMP and related to the project;
- Liaise closely with the Site Manager, Engineer and the ECO and ensure that the works on site are conducted in an environmentally sensitive manner;
- Inform the Site Manager, Engineer as well as the ECO of any environmental issues or incidents on site, e.g. dumping, pollution, spills, littering, damage to vegetation etc.;

Daily, Ongoing
Implementation
awareness
Inform, comply



- Carry out instructions issued by the Engineer, on request of the ECO, required to fulfil his/her compliance with the EMPr.

3.4.5 Environmental Officer (Contractor)

- The Contractor shall appoint an Environmental Officer who shall be responsible for undertaking a daily site inspection to monitor compliance with all Environmental Specification. The Contractor's EO is the primary person responsible for implementing and monitoring the EMPr on a daily basis. The EO needs to be part of the Project Team and be involved in all aspects of the planning. It is furthermore the responsibility of the EO to communicate the contents of the EA; EMPr; and Method Statements to all staff working for and / behalf of the contractor. The EO has to ensure that all the necessary authorisations/permits are in place and available at the site office for review.
- The person appointed as EO will have to be knowledgeable in the concepts of integrated environmental management, have a sound background on environmental legislation and be suitably qualified/experienced. It is not a requirement that the EO be independent from the contractor but needs to be appointed by Contractor.
- Environmentally educate and raise the awareness of the Contractor's staff throughout the construction phase on various applicable issues in the form of induction training and toolbox talks.
- The EO needs to ensure that all personnel working for and/or on behalf of the contractor understands the concept of environmental management and the various issues specific to the site they are working on.
- With regards to the IAPs' the EO will be the direct liaison between them and the contractor. Any and all complaints and/ or environmental complaints will be managed by the EO.
- The EO has to develop and implement an environmental control system on site whereby records will have kept on all matters environmental. Records need to include the following:
 - Induction and Environmental Awareness Training Register;
 - Complaints Register;
 - Stakeholder Liaison and communications register;
 - Legal register (The IEA, EMPr, Contractors Documentation);
 - All Method Statements;
 - Site Instructions;
 - Site layout plan;
 - Emergency Procedures and contact numbers;
 - Non-Compliance Register;
- Keep records of all activities/ incidents on site concerning the environment;
- Keep records of all waste manifests;
- Keep records of all water usage on site;
- Ensure that environmental incident notifications and reporting is distributed to the project management team.

Daily inspections
Implement
Monitor, Notify
Record, Register



3.4.6 Environmental Compliance Officer

During the construction phase of the project, the ECO (appointed by the Proponent or Engineer) is to:

- The ECO will be responsible for ensuring that all conditions as stipulated in the EA and EMPr are adhered to during the construction phase. It is the responsibility of the Proponent and/or Site Engineer to appoint an ECO. The ECO will operate independently to objectively monitor the implementation of the EMPr and the conditions stipulated in the IEA and all other applicable legislation.
- It is the responsibility of the ECO to monitor the degree of compliance to environmental legislation and the conditions stipulated in the IEA and EMPr by means of regular compliance audits.
- The ECO will be on site weekly within the first month; and thereafter bi-monthly or at any other predetermined frequency during the project;
- Undertake photographic monitoring of the construction site;
- Keep records of all activities/ incidents on site concerning the environment;
- The ECO will provide an annual environmental audit report on the construction activities to the Department of Environmental Affairs, or any other authority who may request it
- The ECO must also be contacted on an ad hoc basis if any emergencies occur;
- The ECO must attend site meetings where required to be able to report on, and respond to, any environmental issues, and be issued with copies of minutes of such meetings;
- The ECO must obtain, examine and approve method statements where applicable;
- The ECO must manage and keep a detailed photo record of all site visits;
- Advise the Proponent, Project / Site manager and Contractors on environmental issues within the defined work areas;
- Recommend corrective action where there is non-compliance with the EMPr;
- Keep an up to date diary of site activities;
- The ECO has the authority to stop works if in his / her opinion the operation imposes a serious threat to the environment or if an incident has occurred due to neglect or disregard.
- Any non-compliance recorded in terms of the conditions of the EMPr, IEA, constitutes as a breach of Contract allowing the ECO to suspend part or all of the works, as required.
- The ECO will be the official liaison between the Authorities and the project team and must handle all sensitive information originating from whistle-blowers and incidents and report these to the regulating authorities.
- In order for the ECO to perform his/her tasks accordingly, he/she needs to be suitably qualified / experienced.
- Ensure that the Contractor's legal register in place, containing the IEA, EMPr, WML, as well as all other applicable authorisations or licences. Hard copies must be available on site for review.
- Environmentally educate and raise the awareness of the Contractor and his staff as to the requirements of the EMPr (at the commencement of the construction phase).
- Review and approve construction method statements together with input from the Engineer;
- Advise/recommend on actions or issues impacting on the environment to the Engineer, who shall issue any required Site Instructions to the Contractor;
- Assist the Contractor in finding environmentally responsible solutions to problems or issues on site;

Weekly
Monitor, record
Photograph
Annual Audit
Site meetings
Ad Hoc Emergencies
Review, approve
Assist, advise,
inspect, recommend



- Issue non-compliance reports should the Contractor disregard required environmental management measures or not address issues on site causing direct or indirect environmental damage;
- Recommend to the Engineer the issuing of a penalty for any environmental damage caused on site, or non-compliance with the Environmental Specifications;
- Recommend to the Engineer the removal of person(s) and/or equipment not complying with the Specifications;
- Approve the temporary site closure checklists;
- Take immediate action on Site to stop works where significant and irreparable damage is being inflicted on the environment, and to inform the Engineer immediately of the occurrence and action taken;

The ECO has the authority to stop works if in his/her opinion there is a serious threat to or impact on the environment as a result of the construction and general operations. This authority is to be limited to emergency situations where consultation with the Project / Site Manager or Applicant is not possible immediately. In all such work stoppage situations the ECO is to inform the Project/Site Manager and Applicant of the reasons for the stoppage as soon as possible.

Upon failure by the Contractor or his employee to show adequate consideration to the environmental aspects of this contract, the ECO may recommend to the Project / Site Manager to have the Contractor's representative or any employee/s removed from the site or work suspended until the matter is remedied. No extension of time will be considered in the case of such suspensions and all costs will be borne by the responsible Contractor.

The ECO has the authority to recommend to DEA that works be stopped, if in his/her opinion serious harm to, or impact on the environment is imminent, is likely to occur or has occurred and such actual or potential harm or impact is in contravention of the construction phase of the EMP, and which is, or may be, caused by construction, or related works.

3.5 Environmental Management Team

The Project Management Team will consist of the Applicant, Project Engineer, Project/Site Manager, Environmental Control Officer (ECO), Construction Contractors and associated sub-contractors.

Table 3: Majuba Power Station - Environmental Officer

Project Proponent	Eskom Holdings SOC Limited
Contact Person:	Cornel Claassen
Postal Address:	Private Bag X9001 Volksrust
Telephone:	+27 (0)17 799 2410
Cell	+27 (0)83 261 3935
Email:	claassc@eskom.co.za



Table 4: Majuba Power Station - Manager

Project Site	Majuba Power Station
Contact Person:	Tebogo Lekalakala
Postal Address:	Private Bag 9001, Volksrust, 2470
Telephone:	017 799 2100
Fax:	017 799 2145
Email:	lekalaT@eskom.co.za

The specific names and contact details of the ECO and other persons responsible for the development and operation of the proposed Ash and Rehabilitation Dams will be made available to DEA and Eskom Role-players, before start of site clearance and construction of the new infrastructure.

3.6 Communication Structures

Communication is key to the successful implementation of the OEMP. The communication between any of the role players on site can be in any direction, but for ease of record keeping, it is practical to relate all questions, concerns and incidents to the ECO, who will be responsible for reporting to the Authorities as required. A representation of the typical communication structure is shown in Figure 2.

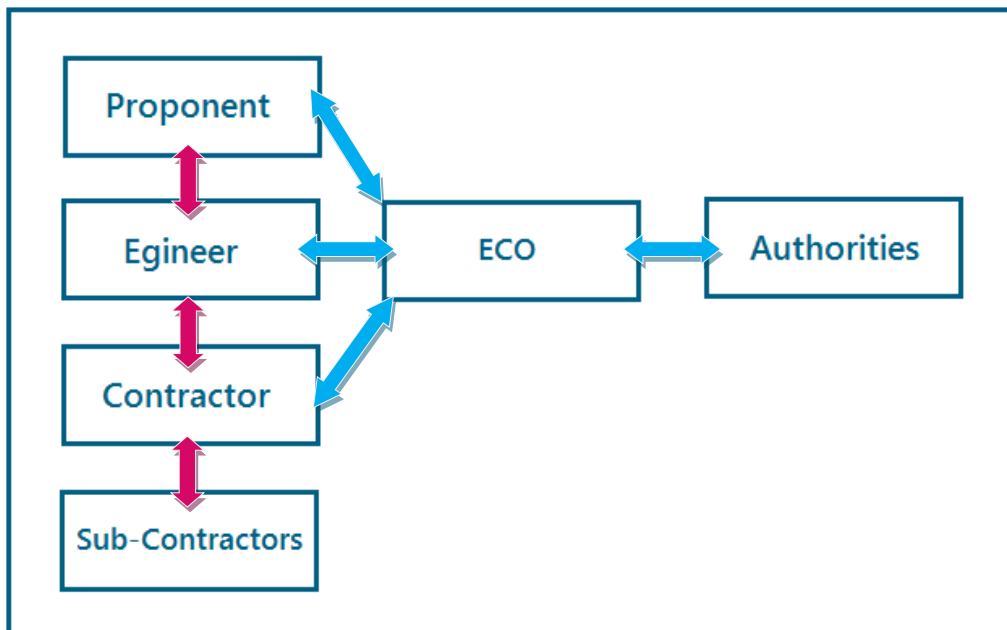


Figure 2: Site Communication and Reporting Structure

The following aspects will be required throughout the construction phase of the project:

3.6.1 Site Meetings

The ECO should meet with the project management team on a regular basis to facilitate the transfer of information and to update all parties on the environmental compliance of the project as a whole, and minute requirements.



The minutes of these meetings will form part of the construction phase of the EMPr records. These minutes will reflect environmental queries, agreed actions and dates of eventual compliance by the Contractor.

The following people should attend these environmental compliance meetings:

- Proponent's Representative;
- The Site Manager;
- The Engineer;
- The Contractor;
- The Contractor's EO; and
- The ECO.

3.6.2 Environmental Awareness Training/Induction

All Contractor teams involved in work on the development are to be inducted on their obligations towards environmental controls and methodologies in terms of this EMPr and conditions of the Environmental Authorisation prior to work commencing.

This environmental induction should take cognizance of the level of education, designation and language preferences of the staff. General site staff would commonly receive a basic environmental awareness course highlighting general environmental "do's and don'ts" and how they relate to the site. Management on site e.g. site agents and foremen, who require more detailed knowledge about the environmental sensitivities on site and the contents and application of the construction phase of the EMPr document itself, will benefit from a separate presentation dealing with these issues.

3.6.3 Toolbox Talks

The Contractor shall arrange for toolbox talks with site staff and sub-contractors with regards to environmental aspects of the construction activities on site as and when required to ensure environmental compliance.

3.6.4 Method Statement

The Contractor shall provide Method Statements for approval by the ECO and input from the Engineer or Site Manager prior to work commencing on aspects of the project deemed or identified to be of greater risk to the environment and/or which may not be covered in sufficient detail in the construction phase of the EMPr, when called upon to do so by the Engineer or ECO.

A Method Statement is a "live document" in that modifications are negotiated between the Contractor and the ECO/project management team, as circumstances unfold. All Method Statements will form part of the construction phase of the EMPr documentation and are subject to all terms and conditions contained within the construction phase of the EMPr.

Note that a Method Statement is a 'starting point' for understanding the nature of the intended actions to be carried out and allows for all parties to review and understand the procedures to be followed in order to minimise risk of harm to the environment.

A Method Statement describes the scope of the intended work in a step-by-step description in order for the ECO and the Engineer to understand the Contractors intentions. This will enable them to assist in devising any mitigation measures, which would minimize environmental impact during these tasks.



For each instance where it is requested that the Contractor submit a Method Statement to the satisfaction of the Engineer and ECO, the format should clearly indicate the following:

- **What** - a brief description of the work to be undertaken;
- **How** - a detailed description of the process of work, methods and materials;
- **Where** - a description and sketch / map of the locality of work (if applicable); and
- **When** - the sequencing of actions with due commencement dates and completion date estimates.
- **Who** – The person responsible for undertaking the works described in the Method Statement;
- **Why** – a description of why the activity is required.

A list of some of the Method Statements that the Contractor may need to submit during the course of the construction contract has been provided in Section 5, along with an indication of those which the ECO may require the Contractor to provide prior to the start of works on site.

3.6.5 Site Instruction Entries

The site instruction entries book will be used for the recording of general site instructions as they relate to the works on site. It will also be used for the issuing of stop-work orders, for the purposes of immediately halting any particular activities of the contractor *in lieu* of the environmental or social risk that they may pose.

3.6.6 ECO Site Records

The ECO will maintain a site records that relates to environmental issues as they occur on site for record keeping purposes in the form of audit reports. Comments from these records will form part of reports presented at site meetings by the ECO.

3.6.7 Dispute Resolution

Any disputes or disagreements between role players on Site (with regard to environmental management) will firstly be referred to the Engineer during the construction phase. The Engineer may engage the ECO in this regard. If no resolution on the matter is possible then the matter must be referred to the DEA for clarification.

3.6.8 Public Relations

The Contractor shall notify the ECO and the Engineer of any complaints lodged during the construction phase. The Contractor shall be responsible for maintaining a Complaints Register to record complaints received and action taken. This register will be made available to the ECO, the Engineer and the relevant Authority.

The Proponent shall be responsible for responding to third party or public queries and/or complaints relating to operations. In addition, the Proponent shall be responsible for dissemination of information to the community and the media (press releases, notice boards, etc.) if deemed necessary.

3.6.9 Social Responsibilities

The Developer and Contractors shall encourage and implement wherever possible the procurement of locally based labour, skills and materials.



4 Construction

4.1 Contractor Selection and Performance

Eskom must ensure that this EMPr forms part of any contractual agreements with subcontractors for the execution of the proposed project

- The contractor must monitor the performance of the construction team regularly to ensure compliance with the requirements of this EMPr

4.2 Legal and Other Requirements

- Eskom and the Contractor must comply with the relevant provisions of the applicable environmental legislation and associated regulations promulgated in terms of these laws.

4.3 Social Interaction

- All neighbours must be notified and advised of the timing of the intended construction activities.
- Majuba power station will deal with community complaints, in accordance with the station's communication strategy in terms of ISO 14001.
- Contractors must prevent and prohibit their employees from entering neighbouring land and homes, unless arrangements are made for this.
- All construction activities must take place within the demarcated footprint.
- Movement of construction personnel on site, outside of the demarcated development areas, must be strictly prohibited.

4.4 Labour

- Normal working hours must be maintained as far as possible.
- Night-time activities should be limited as far as possible, although it is recognised that the disposal itself will take place 24 hours a day, seven days a week.

4.5 Employment – Local Preference

- As far as possible, if additional employment is required for the continuous ash disposal facility, Eskom should encourage its contractors to give employment preference to residents of the Volkskrust, Amersfoort, Perdekop and Charlestown Areas in accordance with approved agreements and procedures.

4.6 Safety and Security

4.6.1 General Procedures

All provisions of the Occupational Health and Safety Act, 85 of 1993, and any other applicable legislation, must be adhered to by Eskom and its contractors.

4.6.2 Emergency Response

Contractors must comply with the Eskom Emergency Preparedness and Response Procedure.



4.6.3 Fire Control

Accidental fires should be prevented through proper sensitisation of the contractors and their workers towards the associated risks, dangers and damage of property. An emergency preparedness plan should be in place to fight accidental veld fires, should they occur. The adjacent land owners/users/managers should also be informed and/or involved. The use of open fires for cooking of food etc. by construction personnel should be strictly prohibited. Enclosed areas for food preparation must be provided. Use of branches of trees and shrubs for fire making purposes must be strictly prohibited.

Table 5: Fire Control Measures

Element	Management Measures
Sources	Open fires / flames on site
Controls	<ul style="list-style-type: none"> ▪ All construction personnel will receive training on fire hazards and techniques to extinguish any fire that may be initiated on the site. ▪ The equipment required to extinguish any fires that may be initiated by construction activities must be installed on the site. ▪ Flammable materials will be stored under conditions that will limit the potential for ignition and the spread of fires. ▪ Burning of vegetation cut during site clearing and establishment will not be permitted. All cleared vegetation will be removed to a landfill site designated by the ECO. ▪ The Contractor will supply fire-fighting equipment in proportion to the fire risk presented by the type of construction and other on-site activities and materials used on site. This equipment will be kept in good operating order. ▪ No fires must be allowed at the construction site. ▪ Any welding or other sources of heating of materials must be done in a controlled environment, wherever possible and under appropriate supervision, in such a manner as to minimise the risk of veld fires and/or injury to staff. ▪ The Contractor will take reasonable and active steps to avoid increasing the risk of fire through his activities on site. Accidental fires must be prevented through proper sensitisation of employees towards the associated risks, dangers and damage of property. ▪ The use of open fires for cooking of food, is prohibited. ▪ Restrict smoking activities to demarcated smoking areas.
Corrective Action	<ul style="list-style-type: none"> ▪ Report any fires which occur to the Fire department immediately
Specific Specialist Input (Ecologist)	<ul style="list-style-type: none"> ▪ An environmental induction for all staff members must be mandatory in which specific issues related to the potential of fire are addressed e.g. only smoking in designated areas, no open cooking fires etc. ▪ Rules of the Majuba Power Station regarding safety should be adhered to at all times.

4.7 Site Establishment and Management

4.7.1 Laydown area and Construction Staff

In the event that an external contractor is required for portions of the construction phase, the following will apply.



- Before establishing the laydown area or site camp the Contractor must produce a layout plan showing the positions of all structures, ablutions, vehicle wash areas, fuel and cement storage areas and other infrastructure for approval by the ECO. If possible, it is considered preferable to locate the site camp as close as possible to the construction site, preferably on Eskom Property.
- Construction staff must be adequately educated by the Environmental Control Officer or the Site Manager as to the provisions included in the EMPr and general environmentally friendly practice.
- The following activities must be prohibited at site camp(s), and by the construction staff in general:
 - Indiscriminate disposal of rubbish or rubble.
 - Littering of the site.
 - Spillage of potential pollutants, such as petroleum products.
 - Collection of firewood.
 - No fires allowed on site.
 - Interference with any wildlife, fauna or flora.
 - Use of any ablution facility other than those provided.
 - Burning of wastes and cleared vegetation under any circumstances.
 - Entering areas outside of the demarcated construction area without relevant permissions.

4.7.2 Sanitation

Table 6: Sanitation Control Measures

Element	Management Measures
Controls	<ul style="list-style-type: none"> ▪ A minimum of one chemical toilet must be provided per 10 persons per shift. ▪ Toilets must be strategically placed (easily accessible to workers) and will not be situated within 150m of any borehole or drainage line. ▪ Toilets must be secure, clean and functional throughout the construction period. ▪ All ablution activities must take place in these facilities, and the waste material must be stored and disposed of at the registered waste disposal site or collected by a suitable waste contractor on a regular basis. Safe disposal certificates are to be provided. ▪ The Contractor will ensure that no spillage occurs when the toilets are cleaned or emptied. ▪ All temporary/portable toilets must be secured to the ground to prevent them from toppling due to wind or any other cause. ▪ The Contractor will ensure that the entrances to toilets are adequately screened from public view. ▪ Discharge of waste from toilets into the environment and burying of waste is strictly prohibited. ▪ Suitable toilets will be provided for the staff at all points at which workmen are carrying out duties under the contract
Monitoring	<ul style="list-style-type: none"> ▪ The Contractor will monitor that toilet facilities are used by personnel and that use of non-designated areas is actively discouraged
Specific Specialist Input (Water Quality)	<ul style="list-style-type: none"> ▪ Chemical toilets to be located outside the designated buffer of nearby water resources.



4.7.3 Site Management

Table 7: General Site Management Measures

Element	Management Measures
Controls	<ul style="list-style-type: none"> The Contractor must take responsibility for the camp to conform to all contractual aspects and environmental standards applicable. This includes aspects related to stormwater management and waste management. The Contractor must provide adequate refuse bins that must be cleaned/emptied and the waste removed from site on a regular basis. The construction camp must be kept neat and tidy at all times. Water sources available for drinking water etc. must be pointed out by the ECO. It is not advisable that a contractor makes use of or collects water from any other source other than those pointed out to them as being suitable for use. No Food preparation on site.

4.7.4 Site Access

Table 8: Site Access Control Measures

Element	Management Measures
Controls	<ul style="list-style-type: none"> Access in and out of the site must be allowed only at one point, if possible, to minimise impacts during construction. Construction activities must be limited to areas which are deemed to be safe, and deemed as the minimum area needed for the construction activity. All sites that are identified by the Site Manager as being unsafe will be indicated as such with warning signs in all relevant languages and barricaded where applicable. Livestock/domestic animals will be not be permitted access to construction sites.
Specific Specialist Input	<p>Aquatic:</p> <ul style="list-style-type: none"> The footprint of the new and expanded dams should be clearly demarcated and access controlled such that construction vehicles and heavy machinery do not enter aquatic habitats that fall outside of the footprint of the dam. <p>Ecology</p> <ul style="list-style-type: none"> Existing barriers should be in place to keep fauna species away from the existing facilities. These fences should be maintained in order to ensure fauna species do not gain access to the construction site unnecessarily where they can be hurt or killed

4.7.5 Site Clearing and Soil handling

Table 9: Site Clearing Measures

Element	Management Measures
Controls	<ul style="list-style-type: none"> The size of area subjected to land clearance must be kept to a minimum. Only areas as instructed by the Site Manager must be cleared and grubbed, and these must be in line with Method statements. Cleared vegetation debris which has not been utilised or collected by local communities must be collected and disposed of to a suitable waste disposal site. It must not be burned on site. Topsoil can be used for rehabilitation as cover of ashing facilities.



Element	Management Measures
	<ul style="list-style-type: none"> ▪ No vegetation may be cut or collected from construction sites for burning or for any other purpose without the prior permission of the Site Manager. ▪ All vegetation not required to be removed must be protected against damage. <p>Soil handling</p> <ul style="list-style-type: none"> ▪ The Contractor is required to strip topsoil together with grass from all areas where permanent or temporary structures are located, construction related activities occur, and access roads are to be constructed. Topsoil must be stockpiled for later use. ▪ Topsoil is to be handled twice only - once to strip and stockpile, and secondly to replace, level, shape and scarify. ▪ Topsoil must not be compacted in any way, nor should any object be placed or stockpiled upon it. No vehicles may be allowed access onto the stockpiles after they have been placed ▪ Land to which topsoil has been applied will be vegetated as soon as possible after application. ▪ Stockpiled topsoil must be either vegetated with indigenous grasses or covered with a suitable fabric to prevent erosion and invasion by weeds. ▪ The location of spoil stockpile sites will be agreed by the ECO prior to the onset of any operations that will generate spoil materials. The Contractor will ensure that the material does not blow or wash away. ▪ Spoil dumps will be located <u>well away from natural drainage lines</u>. All waste material must be stored in accordance with the station's waste management procedures ▪ Spoil dumps will have slopes not greater than 1:2 (vertical to horizontal). Less steep slopes will be applied in conditions where erosion risks are indicated to be high. ▪ Spoil dumps will be smoothed and contoured and compacted to prevent ponding.
Specific Specialist Input	<p>Erosion</p> <ul style="list-style-type: none"> ▪ Earthworks and vegetation clearing should be left open for as short a time as possible during the construction phase <p>Ecology</p> <ul style="list-style-type: none"> ▪ Clearings associated with construction to occur in as small a footprint as possible. Surrounding vegetation outside the development footprint may not be disturbed; ▪ Lay down areas should be erected on already disturbed surfaces where no vegetation clearing or soil disturbance is required; ▪ Minimise all disturbances, especially regarding the construction phase, where possible; ▪ Vegetation clearing close to the watercourse should be prevented and where necessary, appropriate storm water management should be put in place to limit erosion potential of exposed soil.



4.7.6 Plant Repair, Maintenance & Cleaning

Table 10: Measures for Management of Plant Repair Maintenance and Cleaning

Element	Management Measures
Controls	<ul style="list-style-type: none"> ▪ No vehicle maintenance and repairs will be undertaken on site, except for emergency repairs only. ▪ Drip trays etc. are to be provided by the contractor, this also applies to the storage of vehicles overnight. ▪ Adequate collection facilities such as diversion mounds, ditches, drains, oil separation sumps and sedimentation ponds will be constructed at each location with a pollution potential. ▪ All emergency repair work away from bunded areas will make use of drip trays. ▪ Regular inspections will be carried out to detect leaks and spillages on vehicles and machinery.

4.7.7 Noise

Due to the location of the project area away from any residential land use, this impact is not of high significance.

Table 11: Noise Control Measures

Element	Management Measures
Sources	<p>Nuisance noise from construction activities affecting the surrounding areas, due to:</p> <ul style="list-style-type: none"> ▪ Site preparation and earthworks. ▪ Construction related transport. ▪ Building activities
Controls	<ul style="list-style-type: none"> ▪ Noise control measures must be implemented by the contractor. All noise levels must be controlled at the source, as much as possible, but must be within allowable limits at the site boundaries, so it does not impact on neighbours. ▪ All employees must be given the necessary Personal Protective Equipment (PPE) for ear protection, if necessary. ▪ Affected parties must be informed of any excessive noise factors. ▪ No loud music is allowed on site and in construction camps. ▪ A speed restriction of 40km/h will be imposed as a minimum requirement, on all construction vehicles on site, in order to limit additional noise generated by these vehicles. Final speed limits must be in line with the power stations rules. ▪ Noise from vehicles and on-site powered machinery and equipment will not exceed the manufacturer's specifications, based on the installation of noise attenuation measures ▪ All construction equipment must be maintained in good working order. ▪ Silencers on construction equipment will be maintained to ensure no deterioration in noise-dampening capacity. ▪ The Contractor will respond within 24 hours in the event of any complaints by local residents or others about disturbing noise. The noise source will be identified, and appropriate noise mitigation measures instituted in consultation with the affected party (ies). ▪ In the case of legitimate complaints, the noise level must be tested by a specialist



4.7.8 Dust Control

Due to the location of the project area away from any residential land use, this impact is not of high significance, however farmers have raised concerns in the past regarding dust from the larger site affecting their crops and animals.

Table 12: Dust Control Measures

Element	Management Measures
Sources	<p>Dust from construction activities can be caused by:</p> <ul style="list-style-type: none"> ▪ Land clearing activities such as dozing and scraping of vegetation and topsoil ▪ Excavation, grading / scraping and transport of material ▪ Loading and unloading of trucks ▪ Re-entrainment of deposited dust by vehicle movement ▪ Wind Erosion from stockpiles and unsealed roads and surfaces ▪ Wind erosion from exposed areas at ash disposal facility
Controls	<ul style="list-style-type: none"> ▪ Speed limits must be enforced in all areas, including public roads and private property to limit the levels of dust pollution ▪ Dust must be suppressed on access roads and on the ash disposal facility during dry periods by the regular application of water or a biodegradable soil stabilisation agent. Water used for this purpose must be used in quantities that will not result in the generation of run-off. ▪ Dust dispersion from construction activities, unsurfaced roads, spoil dumps and other construction locations will be limited and suppressed to the maximum extent practical. ▪ Spoil dumps must be positioned such that they are not vulnerable to wind erosion. ▪ Spoil and other dust-generating dumps which are left unused for 28 days or longer will be sprayed with water or chemically inert stabilisers to control dust, and treated with mulch and seeded. ▪ Any cleared areas must be watered to ensure that dust levels are minimised prior to sealing or re-vegetation ▪ Dust monitoring by qualified consultants must be undertaken if serious situations are observed. If monitoring results or complaints indicate inadequate compliance with the EMP, the source of the problem must be identified and existing procedures modified to ensure that the problem is rectified

4.7.9 Waste Management

Poor waste management practices could result in the contamination of the site or water sources. The inefficient use of resources will result in excessive waste generation.

Table 13: Waste Management Measures

Element	Management Measures
Sources	<ul style="list-style-type: none"> ▪ Packaging ▪ Construction wastes ▪ Waste dirt or rock from excavation ▪ Storage of oils and fuels ▪ Domestic waste from construction camp



Element	Management Measures
Controls	<ul style="list-style-type: none"> ▪ Waste Management on site is to be in accordance with Eskom’s existing waste management procedures. ▪ Where possible, construction wastes on site must be reused or recycled Disposal of waste must be in accordance with relevant legislative requirements. ▪ The Contractor must familiarise themselves with the definitions of waste and the handling, storage and transport of it as prescribed in the applicable environmental legislation. ▪ The contractor will appoint a person to manage and control waste. ▪ Integrated waste management on site will be carried out by applying, in order of preference, waste avoidance, reuse, recycling and disposal. ▪ Burning of waste material will not be permitted. ▪ The Contractor will provide and maintain adequate facilities for litter collection (e.g. bins) at strategic locations around the site camp. ▪ A high quality of housekeeping will be maintained on all construction sites to ensure that materials are not left where they can be washed or blown away to become litter. ▪ All waste (general and hazardous) generated during the construction phase may only be disposed of at appropriately licensed sites in terms of applicable Environmental legislation ▪ Littering must be prohibited. ▪ Illegal dumping must be prohibited.
Management	<ul style="list-style-type: none"> ▪ Litter collection at all construction sites will be undertaken at least once per working day. Work teams will be supplied with refuse bags which can be disposed of daily in skips at centralised locations. ▪ All waste containers will be emptied at least once a week. ▪ Waste documentation must be completed and kept onsite. ▪ Corrective actions · A complaints register must be maintained, in which any complaints from the community must be logged. All complaints must be investigated and, if appropriate, acted upon ▪ Corrective actions are required to be undertaken immediately after a complaint is made or a non-conformance is identified.

4.7.10 Storage and Handling of Hazardous Substances

Table 14: Waste Management Measures

Element	Management Measures
Sources	<ul style="list-style-type: none"> ▪ Release of contaminated water from contact with spilt chemicals ▪ Fuel source for on-site fires ▪ Generation of contaminated wastes from used chemical container
Controls	<ul style="list-style-type: none"> ▪ The contractor must store all hazardous substances (including oils, fuels, chemicals, etc.) in a manner prescribed in the relevant Acts and Regulations. ▪ Any spills will be rendered harmless and arrangements made for appropriate collection and disposal including cleaning materials, absorbents and contaminated soils. ▪ Ensure that spill kits are available on site to clean up spills and leaks. The contractor shall have to keep at an adequate number of bags of <i>zorb</i> (or other suitable product) in storage at all times. ▪ Ensure that only designated areas are used for the handling or storage of



Element	Management Measures
	<p>hazardous materials.</p> <ul style="list-style-type: none"> ▪ All hazardous materials must be stored at one location, to be approved by the ECO. ▪ Storage of all hazardous materials is to be safe, tamper proof and under strict control. ▪ Fuels, solvent and other wastes must be stored in vessels equipped with secondary containment structures and must be removed from the construction area for disposal in compliance with relevant legislation and regulations. ▪ The containers in which hazardous substances are kept must, in compliance with hazardous material management procedures, be removed from the site once empty. ▪ Hazardous products must be stored on adequately bunded surfaces in the designated hazardous material storage areas. ▪ All manufactured and/or imported hazardous materials must be stored in an appropriate manner in the Construction camp. Depending of the type of material, storage areas will be roofed with impervious material (e.g. cement and chemicals). ▪ Hazardous fluids must not be stored together with hazardous solids; instead fuels, lubricants, transmission and hydraulic fluids must be stored in a designated area for fluids. ▪ All hazardous material storage areas must be sited away from ecologically sensitive areas. ▪ Hazardous chemicals used during construction must be stored in containers. The relevant Material Safety Data Sheets (MSDS) must be available on site. ▪ The Contractor must provide adequate and approved facilities for the storage and recycling of used oil and contaminated hydrocarbons. ▪ Such facilities must be designed and situated with the intention of preventing pollution of the surrounding area and environment. ▪ The contractor must identify and maintain a register of all activities that involve the handling of potentially hazardous substances, as well as devise and supervise the implementation of protocols for the handling of these substances. This will include all fuels, oils, lubricants and grease. ▪ The contractor must ensure that all hazardous substances are handled in accordance with the manufacturer's specifications and legal requirements.
Management	<ul style="list-style-type: none"> ▪ Implement appropriate actions and measures to reduce, stop or contain a spill of potentially hazardous substances (e.g. fuel or lubricating oil). ▪ Implement appropriate actions and measures to reduce or prevent contamination of the ground and surface water as a result of a spill of potentially hazardous substances ▪ The contractor must ensure the observation and supervision of chemical storage and handling practises and vehicle maintenance throughout the construction phase. ▪ The contractor must arrange and supervise the implementation of clean-up operations and appropriate disposal of contaminated materials at the hazardous waste disposal site. ▪ A complaints register must be maintained, in which any complaints from the community must be logged. All complaints must be investigated and, if appropriate, acted upon. Keep written records detailing the type of spill, the corrective and remedial measures implemented in the stopping or reduction of the spill, and the cleanup of the spill. Such progress reporting is important



Element	Management Measures
	<p>for monitoring and auditing purposes and the written reports may afterwards be used for training purposes in an effort to prevent similar future occurrences.</p> <ul style="list-style-type: none"> ▪ Report the nature and extent of the spill to the ECO, and Site Manager as soon as reasonably possible, but within 24 hours. ▪ The ECO will prescribe measures to be implemented in order to prevent spills of potentially hazardous substances.

4.7.11 Groundwater

During the construction phase of the RD and AD dams' disposal facility the impacts of ash leachate (including surface water runoff and leakage from surface water impoundments) are expected to be limited due to the short duration of the construction phase. It is expected to consist of clearing part of the site, the installation of a liner, under-drain systems and related pipework, and construction of dam walls or bunds. The construction phase may also include the installation of piezometers for groundwater monitoring.

There is likely to be a plant and equipment on the site at this time, with the possibility of spills and leaks of hydrocarbons and other polluting fluids. Solid wastes left at the site can also give rise to polluting leachates following rain. Overall the contaminants from the two new RD and AD dams will be insignificant compared to the plumes or contaminants derived from the larger ADF.

Table 15: Management of Groundwater Impacts during Construction

Element	Management Measures
Groundwater	<ul style="list-style-type: none"> ▪ Prevent the disposal of any waste at the site (other than ash), particularly into any trenches / holes. Disturbing the surface layer / soil layer makes the aquifer more vulnerable to surface pollution. ▪ Prevent any leaks or spills of fuels, solvents or other polluting liquids. This could include the provision of separate, bunded (concrete floors) refuelling and fuel storage areas. ▪ Ensure that any systems for the draining of leachates and / or supernatant water from the ash disposal facility are in good working order and are installed correctly (these would include an underdrain system if planned, as well as toe-drains and related pipe-work). ▪ Sufficient ash or other material must be in place to protect the underdrain system (if installed) before any vehicle may drive over it. If possible, the underdrain systems should be checked for integrity once they have been completed. ▪ Systems for removing or preventing blockages in drains or pipework must be installed correctly. Blocked under-drains can cause leaks, and lead to additional groundwater pollution.

4.7.12 Heritage

No Heritage objects were identified. However, the possibility of the occurrence of subsurface finds cannot be excluded. Therefore, 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 therefor chance find procedures should be put in place as part of the EMP.



The “chance finds procedure” applies to the developer’s permanent employees, its subsidiaries, contractors and subcontractors, and service providers. The aim of this procedure is to establish monitoring and reporting procedures to ensure compliance with this policy and its associated procedures. Construction crews must be properly inducted to ensure they are fully aware of the procedures regarding chance finds.

Table 16: Management of Heritage Impacts during Construction

Element	Management Measures
Heritage chance find procedures	<ul style="list-style-type: none"> ▪ 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 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 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.

4.7.13 Water Quality

Table 17: Management of Water Quality Impacts during Construction

Element	Management Measures
Water Quality Impacts	<ul style="list-style-type: none"> ▪ Water contained in the Ash and Rehabilitation dams should be prevented from seeping, spilling or discharging into the receiving environment during construction activities. This could be achieved through pumping water out of the dams during excavation of the expanded areas, or alternatively, planning construction appropriately (e.g. through use of coffer dams); ▪ No vehicles or machinery are allowed within the buffer areas or watercourse, without the necessary permitting. Predetermined areas should be designated where vehicles and machinery are to be stored, repaired and refuelled within a bunded area; ▪ Implementation of rapid response emergency spill procedures to deal with spills immediately, including the provision of a spill kit and training of staff to deal with such instances; ▪ Vehicles and equipment must be regularly serviced and maintained; ▪ Any spillages must be cleaned up immediately to prevent further contamination; ▪ Routine water quality monitoring should be implemented in watercourses where regular sampling is possible. Results should be used to rapidly identify and remedy any potential sources of contamination; ▪ Chemical toilets to be provided on-site at 1 toilet per 10 persons; ▪ Chemical toilets to be located outside the designated buffer of nearby water resources.



Table 18: Management of Watercourse Contamination during Construction

Element	Management Plan
Watercourse contamination due to pollution	<ul style="list-style-type: none"> ▪ Zero tolerance for hydrocarbon spillage next to the watercourse. ▪ Ash dispersal impacts on the watercourse must be reduced to the minimum possible. ▪ No vehicles or machinery are allowed within the buffer areas or watercourse. Predetermined areas should be indicated where vehicles and machinery are to be stored, repaired and refuelled within a bunded area. ▪ Use of drip trays positioned under stationary vehicles to collect hydrocarbons. ▪ Implementation of rapid response emergency spill procedures to deal with spills immediately, including training of staff to deal with such instances. ▪ A comprehensive monitoring program on both avifauna and amphibians must be implemented on an annual basis.

4.7.14 Ecology

4.7.14.1 Land Habitat and Lifecycle Impacts

All vegetation will be removed from all areas where construction is to take place. All cleared areas will be stabilised as soon as possible in order to minimise the risk of erosion. In terms of the Environment Conservation Act (No 73 of 1989), the disposal of vegetation by burying or burning is prohibited. No vegetative matter will be burnt or removed for firewood by any Eskom employee or contractor prior to the necessary permission from the relevant authorities. The use of herbicides will only be allowed after a proper investigation into the necessity, the type to be used, the long-term effects and the effectiveness of the agent, and will be approved by the ECO in the method statements.

The Contractor will ensure:

- The areas needing to be cleared and the degree of clearing required must be determined and demarcated in consultation with the ECO before clearing begins.
- The ECO must be present during vegetation clearing.
- The Contractor will ensure that all works are undertaken in a manner, which minimises the impact on vegetation outside of the site area as designated in the construction site layout. However, it may be necessary in certain instances to remove or prune vegetation outside of the development in order to prevent possible damage to the facilities. This must be undertaken in consultation with the Site Manager.

Table 19: Management of Flora during Construction

Element	Management Measures
Loss of existing habitat due to loss of vegetation	<ul style="list-style-type: none"> ▪ Clearings associated with construction to occur in as small a footprint as possible. Surrounding vegetation outside the development footprint may not be disturbed; ▪ Lay down areas should only be erected on already disturbed surfaces where no vegetation clearing or soil disturbance is required; ▪ Minimise all disturbances, especially regarding the construction phase, where possible; ▪ Vegetation clearing close to the watercourse should be prevented and where necessary, appropriate storm water management should be put in place to



Element	Management Measures
	<p>limit erosion potential of exposed soil. Sedimentation trapping should be in place to prevent exposed soils from spilling into the watercourse;</p> <ul style="list-style-type: none"> ▪ The watercourse and its buffer areas should be demarcated and fenced off prior to construction to exclude the watercourse from development activities; ▪ Buffer zones are allocated to sensitive or important habitat features to alleviate the effect of habitat loss, habitat fragmentation, disturbances, increased isolation and edge effects. Suggested buffer zones for the watercourse/wetlands in the Aquatic Assessment report must be implemented where no construction or disturbances may take place. No vehicles or personal are allowed to enter these areas; ▪ Earthworks and vegetation clearing should be left open for as short a time as possible. Temporary erosion control measures during the construction phase should be implemented to limit erosion; ▪ Re-vegetation where required after clearance should commence immediately after the construction phase; ▪ Re-vegetation as part of the rehabilitation phase including the promotion of natural ecosystem processes is critical; ▪ Alien vegetation control should take place during all phases of the proposed operation; ▪ An environmental induction for all staff members must be mandatory in which specific issues related to the potential of fire are addressed e.g. only smoking in designated areas, no open cooking fires etc. Rules of the Majuba Power Station regarding safety should be adhered to at all times.

Table 20: Management of Impacts on Fauna during Construction

Element	Management Measures
Direct mortality of fauna	<ul style="list-style-type: none"> ▪ All vehicle speeds associated with the project should be monitored and should be limited to the lowest acceptable speed (maximum of 40 km/h) during the construction and operation phases, or as prescribed by the latest or previous Traffic Impact Assessment; ▪ The ECO should monitor live animal observations in order to monitor trends in animal populations and thus implement proactive adaptable mitigation of vehicle movements, especially in close proximity to the watercourses and wetlands; ▪ Road mortalities should be monitored by both vehicle operators (for personal incidents only) and the ECO (all road kill on a periodic monitoring basis as well as specific incidents) with trends being monitored and subject to review as part of the monthly reporting. Monitoring should occur via a logbook system where staff takes note of the date, time and location of the sighting/incident. This will allow determination of the locations where the greatest likelihood exists of causing road mortality and allow mitigation against it (e.g. fauna underpasses, and speed reductions mentioned above). Finally, mitigation should be adaptable to the onsite situation which may vary over time; ▪ Reduce direct mortalities by allowing for fauna to cross roads. Existing road underpasses should be managed and maintained in order to allow fauna to utilise them; ▪ All staff operating motor vehicles must undergo an environmental induction training course that includes instruction on the need to comply with speed



Element	Management Measures
	limits, to respect all forms of wildlife (especially reptiles and amphibians) and, wherever possible, prevent accidental road kills of fauna. Snakes should only be handled after inductions have taken place due to the risks of envenomation. Drivers not complying with speed limits should be subject to penalties;

Table 21: Management of Impacts on Ecological Life Cycles during Construction

Element	Management Measures
Disruption/alteration of ecological life cycles (breeding, migration, feeding) due to noise, dust and lighting [Construction & Operation]	<ul style="list-style-type: none"> ▪ Equipment with low noise emissions should be used, as much as possible; ▪ A dust monitoring system should be implemented during the construction phase; ▪ Water or dust control agents should be used in working areas. Roads and areas with significant ash deposits should be sprayed for dust suppression on a regular basis in designated susceptible areas during heavy usage; ▪ Reduce exterior lighting to that necessary for safe operation, and implement operational strategies to reduce spill light. Use down-lighting from non-UV lights where possible, as light emitted at one wavelength has a low level of attraction to insects. This will reduce the likelihood of attracting insects and their predators; ▪ Keep noise levels suppressed as per the local municipality or national standards. Do not unnecessarily disturb faunal species, especially during the breeding season and those with juveniles; ▪ Existing barriers should be in place that keep fauna species away from the existing facilities. These fences should be maintained in order to ensure fauna species do not gain access to the construction site unnecessarily where they can be hurt or killed; ▪ All staff should be subjected to an induction training program where appropriate conservation principles, safety procedures, snake bite avoidance and first aid treatment are taught. Several staff members should complete a snake handling course in order to safely remove snakes from construction areas.

4.7.14.2 Aquatic Habitat Impacts

Table 22: Management of Impacts on the Aquatic Habitat during Construction

Element	Management Measures
Disturbance of Aquatic Habitat	<ul style="list-style-type: none"> ▪ The footprint of the new and expanded dams should be clearly demarcated and access controlled such that construction vehicles and heavy machinery do not enter aquatic habitats that fall outside of the footprint of the dam



4.7.14.3 Erosion & Sedimentation Impacts

Table 23: Management of Erosion and Sedimentation during Construction

Element	Management Measures
Erosion and Sedimentation	<ul style="list-style-type: none"> ▪ Earthworks and vegetation clearing should be left open for as short a time as possible during the construction phase; ▪ Erosion control berms should be installed on slopes draining in direction of drainage lines. Installed erosion control measures will be appropriate to site conditions to handle a one-in-two-year storm event for temporary structures, and a one-in-fifty-year storm event for permanent structures which provide ongoing sediment control after a site has been rehabilitated. ▪ Revegetation after clearance should commence directly after the construction phase; and ▪ Before commencing with construction, the stormwater channels should be approved by the resident engineer and ECO, and alterations to the storm water management should allow for the use of detention ponds. Areas susceptible to erosion must be protected by installing the necessary temporary and/or permanent drainage works as soon as possible. ▪ Contingency plans will be in place for extreme storm events. ▪ Blocking of stormwater drainage systems must be prevented and storm water must be managed to prevent soil erosion. ▪ Natural stormwater run-off, which is not polluted by the site operations, must be diverted away from the ash disposal facility site.

5 Operation & Maintenance

5.1 Labour

5.1.1 Conduct of Employees

The following restrictions or constraints will be placed on the operation and maintenance staff in general:

- No indiscriminate disposal of rubbish or rubble.
- No littering of the servitude and substation areas and the surrounding areas.
- No collection of firewood.
- No interference with any fauna or flora.
- No use of facilities other than ablution facilities provided.
- All Eskom safety, health and environmental procedures will be complied with.

5.1.2 Hazard and Risk

When construction is complete, the Risk Management and Emergency Response Procedures at the power station must be updated to include the new ash disposal facility



Table 24: Risk and Hazard prevention and management measures

Element	Management Measures
Controls	<ul style="list-style-type: none"> ▪ Safety training. ▪ On-site and off-site emergency plans ▪ Monitoring ▪ Incident and safety reporting ▪ Community consultation and information ▪ Ensure that the risk and hazard control strategies are maintained up to date.
Monitoring	<ul style="list-style-type: none"> ▪ All monitoring will occur according to the risk management and emergency response procedures. ▪ A complaints register must be maintained, in which any complaints from the community must be logged. Complaints must be investigated and, if appropriate, acted upon.
Maintenance	<ul style="list-style-type: none"> ▪ Regular checks and drills must be conducted to
Corrective Actions/Reporting	<ul style="list-style-type: none"> ▪ If an emergency report or emergency drill indicates an error/omission in risk and hazard management procedures, then procedures must be altered or updated to ensure effective management. ▪ If an incident occurs, then emergency procedures must be enacted to ensure all impacts are minimized.

5.2 Specialists' recommendations

5.2.1 Water Quality

Table 25: Management (mitigation of) impacts on water quality during Operation

Element	Management Measures
Deterioration of water quality in downstream water resources due to seepage or accidental discharge of high salinity water from the dams;	<ul style="list-style-type: none"> ▪ Water levels at all dams should be monitored to be able to identify any potential risk of breaching the dam wall in time; Watercourses located downstream of return and ash dams should be monitored on a routine basis to detect any changes in ecological state and water quality. Monitoring should include the collection and analysis of water quality samples, assessment of habitat quality and where possible, biomonitoring, using recognised indicators such as diatoms (e.g. in the drainage line below RD2).

5.2.2 Ecology Mitigation

Table 26: Management (mitigation of) impacts on habitat during operation

Element	Management Measures
Loss of existing habitat due to loss of vegetation	<ul style="list-style-type: none"> ▪ Buffer zones are allocated to sensitive or important habitat features to alleviate the effect of habitat loss, habitat fragmentation, disturbances, increased isolation and edge effects. Suggested buffer zones for the watercourse/wetlands in the Aquatic Assessment report must be implemented where no disturbances may take place. No vehicles or personal are allowed to enter these areas; ▪ Re-vegetation where required after clearance should commence immediately after the construction phase;



Element	Management Measures
	<ul style="list-style-type: none"> Re-vegetation as part of the rehabilitation phase including the promotion of natural ecosystem processes is critical; Alien vegetation control should take place during all phases of the proposed operation; An environmental induction for all staff members must be mandatory in which specific issues related to the potential of fire are addressed e.g. only smoking in designated areas, no open cooking fires etc. Rules of the Majuba Power Station regarding safety should be adhered to at all times.

Table 27: Management (mitigation of) impacts on fauna during Operation

Element	Management Measures
direct mortality of fauna	<ul style="list-style-type: none"> All vehicle speeds associated with the project should be monitored and should be limited to the lowest acceptable speed (maximum of 40 km/h) during the construction and operation phases, or as prescribed by the latest or previous Traffic Impact Assessment; The ECO should monitor live animal observations in order to monitor trends in animal populations and thus implement proactive adaptable mitigation of vehicle movements, especially in close proximity to the watercourses and wetlands; Road mortalities should be monitored by both vehicle operators (for personal incidents only) and the ECO (all road kill on a periodic monitoring basis as well as specific incidents) with trends being monitored and subject to review as part of the monthly reporting. Monitoring should occur via a logbook system where staff takes note of the date, time and location of the sighting/incident. This will allow determination of the locations where the greatest likelihood exists of causing road mortality and allow mitigation against it (e.g. fauna underpasses, and speed reductions mentioned above). Finally, mitigation should be adaptable to the onsite situation which may vary over time; Reduce direct mortalities by allowing for fauna to cross roads. Existing road underpasses should be managed and maintained in order to allow fauna to utilise them; All staff operating motor vehicles must undergo an environmental induction training course that includes instruction on the need to comply with speed limits, to respect all forms of wildlife (especially reptiles and amphibians) and, wherever possible, prevent accidental road kills of fauna. Snakes should only be handled after inductions have taken place due to the risks of envenomation. Drivers not complying with speed limits should be subject to penalties;

Table 28: Management (mitigation of) impacts on ecological life cycles during Operation

Element	Management Measures
Disruption/alteration of ecological life cycles (breeding, migration, feeding) due to noise, dust and lighting	<ul style="list-style-type: none"> Equipment with low noise emissions must be used; A dust monitoring system should be implemented during the operational phase; Water or dust control agents should be used in working areas. Roads and areas with significant ash deposits should be sprayed for dust



Element	Management Measures
[Operation]	<p>suppression on a regular basis in designated susceptible areas during heavy usage;</p> <ul style="list-style-type: none"> ▪ Reduce exterior lighting to that necessary for safe operation and implement operational strategies to reduce spill light. Use down-lighting from non-UV lights where possible, as light emitted at one wavelength has a low level of attraction to insects. This will reduce the likelihood of attracting insects and their predators; ▪ Keep noise levels suppressed as per the local municipality or national standards. Do not unnecessarily disturb faunal species, especially during the breeding season and those with juveniles; ▪ Existing barriers should be in place that keep fauna species away from the existing facilities. These fences should be maintained in order to ensure fauna species do not gain access to the construction site unnecessarily where they can be hurt or killed; ▪ All staff should be subjected to an induction training program where appropriate conservation principles, safety procedures, snake bite avoidance and first aid treatment are taught. Several staff members should complete a snake handling course in order to safely remove snakes.

Alien Vegetation

Monitoring the potential spread of declared weeds and invasive alien vegetation to neighbouring land and protecting the agricultural resources and soil conservation works are regulated by the Conservation of Agricultural Resources Act (No 43 of 1983) and must be addressed on a continual basis, through an alien vegetation control and monitoring programme.

In view of the fact that the presence of declared weeds is illegal, the landowner/manager must comply with the following legally prescribed requirements (Conservation of Agricultural Resources Act (No 43 of 1983), as well as government notice GN R1048):

a. The landowner/manager must take steps to eradicate the declared weeds by using the methods prescribed in the regulations, namely

- *uprooting and burning, or*
- *the application of a suitable chemical weed-killer (herbicide), or*
- *any other method which will ensure their permanent eradication.*

b. One may not uproot or remove such plants and dump or discard them elsewhere to re-grow or to allow their seeds to be spread or blown onto other properties.

c. If the landowner/manager does not comply with the requirements under a) and b) above, he/she is guilty of a criminal offence.

The Contractor will remove all alien vegetation on the SIP Site as listed in the Conservation of Agricultural Resources Act (No 43 of 1983), or as directed by the Environmental Control Officer during the construction period. An alien control and monitoring procedure is in place at Eskom and must be complied with during the construction phase and operational phase.

Specialist recommendations are listed below:



Table 29: Management (mitigation of) impacts on native flora and flora during operation

Element	Management Measures
Introduction of alien and/or invasive flora affecting native flora and fauna	<ul style="list-style-type: none"> Continuous monitoring of the growth and spread of alien flora coupled with an adaptive management approach to identify suitable control mechanisms, preferably mechanical for such a small area. No chemical control should take place due to the close proximity of wetlands; No planting of alien invasive species as part of landscaping. Only trees indigenous to the vegetation unit and endemic to the area may be planted, even if for only visual purposes. This should be indicated prior to development and approved by the competent authority.

Table 30: Management (mitigation of) contamination of watercourse during operation

Element	Management Measures
Watercourse contamination due to pollution	<ul style="list-style-type: none"> Zero tolerance for hydrocarbon spillage next to the watercourse. Ash dispersal impacts on the watercourse must be reduced to the minimum possible. No vehicles or machinery are allowed within the buffer areas or watercourse. Predetermined areas should be indicated where vehicles and machinery are to be stored, repaired and refuelled within a bunded area. Use of drip trays positioned under stationary vehicles to collect hydrocarbons. Implementation of rapid response emergency spill procedures to deal with spills immediately, including training of staff to deal with such instances. A comprehensive monitoring program on both avifauna and amphibians must be implemented on an annual basis.

Table 31: Maintenance of Rehabilitated areas

Element	Management Measures
Maintenance of Rehabilitated areas	<ul style="list-style-type: none"> Monitoring of plant growth in rehabilitated areas will be conducted on a weekly basis during initial phases and on a monthly basis when plants have become firmly established. Vegetation must be replanted in areas where vegetation cover has decreased due to dieback, or has failed to successfully establish Noxious weeds and invasive and alien species will be controlled by pulling, cutting or any other means approved by the Site Manager. Bare patches will be replanted.



6 Closure & Rehabilitation

6.1 General Rehabilitation Requirements

The Contractor shall be required to adhere to any applicable South African Environmental legislation during the operation and management of the ash and rehabilitation dams. The responsibility shall remain with the Contractor to keep up to date with any applicable revisions or new environmental legislation that come into effect, during the contract period. In addition, the Contractor shall also comply with Eskom specific Policies, Procedures and Guidelines. Copies of the relevant Eskom documents can be obtained from the Project Manager.

This section comprises the proposed landscaping and revegetation procedures. The Contractor shall, in accordance with the requirements of this document be responsible for the:

- Gradual stripping and stockpiling of topsoil
- Gradual shaping of side slopes and top of the ash disposal facility
- Gradual spreading of topsoil to cover shaped ash disposal facility side slopes and top surface
- Planting of grass for erosion control on prepared slopes
- Establishment of veld grass on the prepared areas
- Establishment of indigenous trees and shrubs.
- Aftercare of rehabilitated areas to ensure continued stability and eventual self-sustainability
- The upkeep of a complete rehabilitation progress manual.

6.1.1 Progress Manual

The Contractor shall start and keep a Progress Manual fully documenting the progress made and significant factors influencing the rehabilitation process. The manual must be made available upon the Project Manager's request.

6.1.2 Water Quality

Eskom will monitor water quality of surrounding streams and groundwater. The Contractor shall be responsible for upkeep of solution trenches, stormwater channels, ash dams and other such structures to ensure that they remain effective in maintaining a zero-effluent discharge system. The Contractor shall keep in mind that the ash system forms a part of the entire Power Station water balance. All failures with regard to dams must be reported to the Project Manager and the Majuba environmental department. An assessment of the effect of the failure in terms of water quality and water balance must be determined between the Project Manager and the Contractor.

6.1.3 Air Quality

In general, windblown dust shall be continuously controlled by the Contractor by regular moisture conditioning of the exposed surfaces. The Contractor is also responsible for dust control on this surface and may use any effective method, which is acceptable to the Project Manager, to control dust blow-off from this area. Acceptable methods are surface wetting, chemical stabilization or protection with shade cloth.



The access roads to be watered sufficiently to prevent any dust blow off during the entire contract period. Should there be a suspicion that the air quality is in excess of the standard, then the Project Manager may arrange for the installation of dust monitors to verify the situation.

6.1.4 Veld Fires

Any veld fires during the first two growing seasons after rehabilitation can be disastrous. The Contractor shall take all the steps necessary to control fires and a veld fire management plan shall be submitted timeously to the Project Manager for approval. The existing fire breaks are to be maintained to prevent any spread of veld fires from the ash disposal facility area.

6.1.5 Erosion Control

The Contractor shall be responsible for the protection of all areas subject to erosion by providing any necessary drainage works, temporary or permanent and by taking all other reasonable precautions as may be necessary to prevent scouring of banks and other areas. Any erosion damage occurring during the operation of the facility shall be thoroughly repaired and the areas restored to their original condition as much as possible. Such repair work shall be carried out as soon as possible after damage was caused with all eroded topsoil reclaimed from drains and other areas where possible.

6.1.6 Pollution Control

The Contractor shall take all reasonable measures to minimize dust, mud on nearby roads and walkways and inconvenience to the public or others because of the construction of the works.

6.1.7 Materials

Whether the quality of material is specified or not, the Contractor shall at all times use material of the best possible quality and shall price his tender accordingly.

6.1.8 Plants / Flora

Plants shall be true to name, healthy and well rooted. Plants shall have a good form typical of their type unless specifically specified otherwise. Containerized plants shall not be root bound. Plants shall grow well and be free from scars or damage, insect pests, diseases or parasites.

Each plant shall be handled, packed and transported in the accepted industry manner for that species or variety and all the necessary precautions shall be taken to ensure that the plants will arrive at the site in a condition for successful growth.

During delivery to the site, plants shall be adequately protected from damage by sun, wind or other causes. Containers shall be in good condition and the soil shall be free from weeds.

Containerized plants not planted out immediately shall be stored and maintained in nursery like conditions i.e. including storage under shade cloth, well watered and inspected for routine maintenance until they are planted out.

The Contractor shall be prepared to find plants anywhere in the country. Only if the Project Manager is convinced beyond doubt that the plants specified cannot be obtained, will substitutes be considered. Substitutes will be decided on by the Project Manager, the Contractor will be informed in writing. The Contractor shall assure himself of the availability of specified plants before tendering.



Tree stakes shall, unless otherwise specified, be treated poles (round droppers) complying with SABS 457, 35 mm minimum diameter and 2 400 mm long. These shall be used of both single and multiple staking. Creosoted timber will not be accepted.

Tree ties for fixing trees to stakes shall be of plastic, rubber or other similar material which supports the tree in a substantial manner and shall be approved by the Project Manager. Ties shall be such to minimize abrasion and to allow for sufficient space around the tree trunk to permit growth.

6.1.9 Equipment

The Contractor shall provide sufficient plant and equipment of adequate capacity, suitable for the work and site conditions, to fulfil his obligations in terms of the operation. In all cases the most suitable equipment for the particular application shall be used in the interests of time saving and efficiency.

6.1.10 Preliminary Works

The rehabilitation of the ash disposal facility and other ashed areas to be rehabilitated shall take place in phases. Work shall commence as soon as an area becomes available for rehabilitation. The Contractor is to program accordingly.

6.1.11 Topsoil Stripping

Topsoil shall be stripped and stockpiled for future use from those areas to be ashed on. The process shall be gradual and in accordance with the ashing program. The depth of stripping is to vary according to the soil formation. The Contractor shall, in general, strip soils down to the hydromorphic horizon. Soil from the hydromorphic horizons (such as soil with a high clay percentage and/or wet soils) shall not be acceptable for use as topsoil. Only topsoil with up to but not exceeding 30% of coarse particles and stone shall be acceptable.

The stone or coarse particles shall also not exceed 250 mm in diameter. Where stripping takes place from areas which will not be ashed upon in the future the areas shall be contoured after stripping as to blend in smoothly with the existing levels. The areas shall be left without any slacks or hollows where water and contours can accumulate. Unless it is used immediately, the topsoil shall be stored in positions as indicated or approved by the Project Manager, in the following manner:

- Store the soil in heaps of maximum height 1500 mm
- Establish veld grass, or other vegetation as instructed, on heaps to be left for periods in excess of three months
- Take any further preventative steps necessary to protect the heaps from erosion.
- The Contractor shall manage his rehabilitation programme in such a manner that stripped topsoil is reused as soon as possible for rehabilitation purposes.

6.1.12 Planting Procedure

6.1.12.1 Tree Planting

To avoid erosion problems, trees shall not be planted on slopes in excess of 1:3. The trees shall be planted in groups of 3-5 plants ensuring a minimum coverage 50 plants/ha. Certain trees are sensitive to the direction of a slope and the planting plan shall take this into account. The following plant species shall be used:



Acacia karoo (Sweet Thorn) - Plant on east and west slopes

Diospyros (Blue Bush) - Plant on north lycoides slope

Rhuspyroides (Common Wild Currant) – Plant on any slope

Ziziphus (Buffalo Thorn) - Plant on north mucronata slope

Rhus lancea (Karee) - Plant on east and west slopes

6.1.12.2 Scarifying

The total area to be seeded or planted shall be scarified to a minimum depth of 20 mm. Scarification shall be done horizontally across slopes. Seeding shall take place directly following scarifying. In the event of the scarified surface becoming smooth again before seeding, the Contractor shall re-scarify to ensure a suitable seed bed.

6.1.12.3 Seeding

Seeding shall take place as early as possible during the growing season. The Contractor is expected to programme accordingly. The seed mixture to be used shall be made up as follows unless agreed differently with the Project Manager.

6.1.12.4 Grass Species

Aristida junciformis, Eragrostis racemosa, Eragrostis curvulas, Eragrostis chloromelas, Hermannia depressa, Berkheya setifera, Helichrysum callicomum, Themeda triandra, Calamagrostis epigeios, Agostis eriantha, Aristida bipatita, Tristachya contortus

Where specific grass seed cannot be obtained by the Contractor, he may replace it with another species in consultation and agreement with the Project Manager. No seeded sections shall be taken over prior to a successful germination rate of at least 70% (measured as 70% of the total area and/or 70% of any particular seeded area of at least 2 500m²) can be proven by the Contractor. In addition, there shall be no bare patches in excess of 500 mm in diameter or half a meter squared in area. Germination shall be regarded as successful when the grass sward is 5 mm above ground level and identifiable as of the types sown.

6.1.13 Care After Planting

The operator shall protect newly seeded/planted areas against undue traffic and/or other disturbances throughout the contract and maintenance periods.

6.1.14 Maintenance

The Contractor shall adequately maintain construction areas for a period of 6 months. Maintenance shall include:

- Continual repair of damage caused by erosion or any other cause.
- Erosion gullies exceeding 100 mm in width may be repaired by placing *Aristida spp* sods or clumps in the gullies that have begun to form so as to effectively stop them from developing.
- Maintenance of acceptable grass cover with reseeding/sodding as necessary.



- The Contractor shall be required to apply a top dressing of 150 kg/ha ammonium sulphate to seeded areas 4 to 6 weeks after germination under favourable growing conditions. (If in doubt the Contractor should discuss this aspect with the Project Manager).

6.2 General Principles for Environmental Management during Decommissioning

At this point of the project planning process, the necessity for and timing of the decommissioning of the facility is not known. It is assumed that de-commissioning will commence once the Life of the Power Station has been reached.


Decommissioning will be undertaken as required by the Power Station's closure objectives. These objectives may be required to be re-visited and supplemented closer to closure.

In order to minimise the extent of rehabilitation activities required during the decommissioning phase, Eskom will ensure that constant effort is applied to rehabilitation activities throughout the life of the Power Station.

7 Details of the Environmental Assessment Practitioners

Advisian was appointed as the Independent Environmental Assessment Practitioner (EAP) and has adequate experience within the required Environmental Impact Assessment (EIA) field to facilitate the required Scoping and Environmental Assessment Process. The persons involved in the project include:

Table 32: Project Team Members

Marinda le Roux		Environmental Assessment Practitioner
	<p>Marinda is a certified Environmental Assessment Practitioner (EAP) who holds a Master's degree in Town and Regional planning, and has 20+ years of experience of environmental management. Her fields of specialisation are environmental assessment and land use advice; project management and co-ordination of environmental aspects for engineering projects.</p> <p>Involvement included integration of specialist scientific studies and assessment of developments via feasibility studies, Basic Assessments and full EIAs. Marinda is experienced in project management and public participation of BAs and EIA's for electricity infrastructure, roads, landfills, dams and stormwater projects and private developments such as filling stations, Section 24G applications, biogas (air emissions), waste licensing, farm expansions and rezoning. Ms le Roux was the ECO responsible for compliance audits at Kusile Power Station, Red Farms Agripark, Pipeline construction at Lake Mzingazi at Richards Bay, the Eastern Cape Strategic Development Zone (IDZ) and Rainbow Chicken Farms.</p>	
Relevant Years of Experience	22 years	
Highest Qualification	MTRP (Town and Regional Planning), University of the Free State, 1992	
Professional Registration	Certified Environmental Practitioner, Registered Town and Regional Planner	
Office Address:	31 Allen Drive, Loevenstein, Bellville, 7530	
Telephone:	(010) 593 3936	



Marinda le Roux		Environmental Assessment Practitioner	
Email:	MarindaLeRoux.Advisian@outlook.com		

Liesel Hattingh		EAP (Public Participation)	
	<p>Liesel is an Environmental Consultant with experience gained in performing and supporting Basic Assessments; Environmental Impact Assessments; Environmental Compliance Monitoring and Auditing; and Environmental Feasibility Studies. Her experience includes the compilation of Environmental Management Plans for various projects; as well as Water Use License Applications.</p> <p>Liesel has been an onsite Environmental Compliance Officer (ECO) for more than two years on the Construction of the Metolong Downstream Conveyance System – Primary pipeline to Maseru, as well as the secondary pipeline to Teyateyaneng, Lesotho.</p> <p>Her experience also includes public participation under the National Environmental Management Act (NEMA) 107 of 1998, as amended.</p>		
Relevant Years of Experience	10 years		
Highest Qualification	BSc in Environmental Science		
Professional Registration	Member: International Association for Impact Assessment South Africa		
Office Address:	31 Allen Drive, Loevenstein, Bellville, 7530		
Telephone:	(010) 593 3937		
Email:	Liesel.Hattingh@advisian.com		

Rian Kuffner		GIS and Project Management	
	<p>Rian is a GIS Professional with experience in the fields of Engineering and Environmental Services and Town and Regional Planning.</p> <p>He has extensive experience in various engineering and environmental related projects, where he has been responsible for data capturing, modelling, spatial analysis, remote sensing, map production, managing of spatial data and report writing.</p> <p>He has also gained experience in the town and regional planning sector, being responsible for the compilation of spatial and attribute data and preparation of plans for projects such as spatial development frameworks (SDF's), structure plans and zoning schemes</p> <p>For the past couple of years, he has also been involved in projects in the water services sector, assisting with the compilation of Audit and Development Reports for various municipalities in the Western Cape</p> <p>He has been involved with projects for private clients, government departments and municipalities and has often been the principle contact between clients, sub-consultants and his company.</p>		
Relevant Years of Experience	14 years		
Highest Qualification	BA (Hons) GIS (Analysis and Decision Making), University of Stellenbosch, 2003. BA (Sport Science), University of Stellenbosch, 2002		
Office Address:	31 Allen Drive, Loevenstein, Bellville, 7530		
Telephone:	(010) 593 3936		



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Proposed Upgrade of Two Existing Ash Dams and the Construction of Two Rehabilitation Dams at the Majuba Power Station's Ash Disposal Facility
Draft Environmental Management Programme



Appendix A **Project Location and Design Layout Maps**





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**Proposed Upgrade of Two Existing Ash Dams and the Construction of Two
Rehabilitation Dams at the Majuba Power Station's Ash Disposal Facility**
Draft Environmental Management Programme



Appendix B **Majuba Environmental Management Procedures**

