



**Lebalelo Water User Association**  
**Clapham Dam Upgrades and associated infrastructure**  
**Final Environmental Management Programme**

January 2022

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Project Ref: 131-002

Prepared by: Suzanne van Rooy



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VERSION CONTROL

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Approved by: Alta van Dyk

Signed:

A handwritten signature in black ink, appearing to read "Alta van Dyk", is written over a light blue horizontal line.

Position: Environmental Specialist

Date: January 2022

# Table of Contents

<b>Table of Contents.....</b>	<b>ii</b>
<b>Abbreviations .....</b>	<b>iv</b>
<b>1 Introduction and Background.....</b>	<b>1</b>
1.1 Objectives of an EMPr.....	1
1.2 Content of the Environmental Management Programme .....	1
<b>2 Environmental Assessment Practitioner .....</b>	<b>3</b>
2.1 Details of the Environmental Assessment Practitioner .....	3
2.2 Expertise of the Environmental Assessment Practitioner .....	3
<b>3 Project Description.....</b>	<b>4</b>
3.1 Background to LWUA.....	4
3.2 Proposed upgrades .....	4
3.3 Emergency overflow pipeline .....	5
3.4 Outlet structure.....	5
3.5 Erosion protection of the Matadi River Embankment .....	6
3.6 Environmental related permits required.....	6
3.7 Sensitive areas .....	7
<b>4 Roles and Responsibilities .....</b>	<b>9</b>
4.1 Applicant.....	9
4.2 Construction Contractor.....	9
4.3 Environmental Control Officer .....	9
4.4 Operator .....	9
<b>5 Mitigation and/or management measures.....</b>	<b>11</b>
5.1 Construction related impacts.....	11
5.2 Operational related impacts .....	16
<b>6 Management Plans .....</b>	<b>18</b>
6.1 Heritage Chance Find Procedure.....	18
6.2 Paleontological Chance Find Procedure.....	18
6.3 Construction Camp Management.....	19
6.4 Waste Management Plan .....	19
<b>7 Monitoring.....</b>	<b>20</b>
7.1 General environmental monitoring .....	20

<b>8</b>	<b>Environmental Awareness .....</b>	<b>21</b>
8.1	<i>Environmental awareness training .....</i>	21
8.2	<i>Basic Rules of Conduct .....</i>	21
<b>9</b>	<b>Compliance with the EMPr .....</b>	<b>23</b>
9.1	<i>Site inspections .....</i>	23
9.2	<i>Site documentation.....</i>	23
9.3	<i>EMPr Performance Assessment .....</i>	23
9.4	<i>Incident Reporting .....</i>	24
9.5	<i>Emergency Procedures.....</i>	24
<b>10</b>	<b>Site rehabilitation.....</b>	<b>25</b>
10.1	<i>Removal of structures and infrastructures .....</i>	25
10.2	<i>Waste management .....</i>	25
10.3	<i>Rehabilitation.....</i>	25
<b>11</b>	<b>Annexures .....</b>	<b>26</b>
	<b>Annexure A: Curriculum Vitae of the EAP .....</b>	<b>27</b>

### *List of Tables*

Table 1:1: Requirements of and EMPr.....	1
Table 2:1: Details of the EAP.....	3
Table 3:1 Triggered listed activities for the Clapham Dam upgrades and associated activities .....	6
Table 3:2 List of Section 21 Water Uses to be applied for .....	7
Table 5:1: Mitigation measures to be implemented during the CONSTRUCTION PHASE of the Clapham Dam upgrades and associated infrastructure .....	12
Table 5:2: Mitigation measures to be implemented during the OPERATIONAL PHASE of the Clapham Dam upgrades and associated infrastructure .....	17
Table 9:1: Incident register .....	24

### *List of Figures*

Figure 3:1: Sensitive features around Clapham Dam and the proposed infrastructure.....	8
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## ***Abbreviations***

EAP	Environmental Assessment Practitioner
EIA	Environmental Impact Assessment
EMPr	Environmental Management Programme
LWUA	Lebalelo Water User Association
NEMA	National Environmental Management Act
NWA	National Water Act
SAHRA	South African Heritage Resource Agency

# 1 INTRODUCTION AND BACKGROUND

An Environmental Management Programme (EMPr) is a site-specific plan developed to ensure that all necessary measures are identified and implemented in order to protect the environment and comply with environmental legislation.

A site-specific EMPr has been prepared for the management of all activities related to Lebalelo Water User Association's (LWUA) proposed upgrades at Clapham Dam (and associated activities) in order to confirm the likely environmental issues that may arise from the activities, the likely harm that these activities may pose on the surrounding environment and how these activities will be managed as to minimise any harm to the environment.

## 1.1 Objectives of an EMPr

An EMPr is a plan or programme that sets out guidelines that describe how activities that have or could have an adverse impact on the environment, will be mitigated, controlled, and monitored and subsequently achieve a required operational and/or end state.

The purpose of the EMPr is to provide for preventative, corrective and best practice measures to ensure that activities are undertaken in an environmentally responsible manner and that such activities are sustainable in the long term. The primary objectives of the EMPr, include, but are not limited to the following:

- Describe actions that when implemented will achieve mitigation of environmental impacts, or result in approved management of activities thereby reducing the probability of impacts occurring;
- Define organisational and administrative arrangements for environmental management and monitoring, including defining the responsibilities of staff and co-ordination, liaison and reporting procedures;
- Ensuring that discussions are held with the site supervision staff, regarding pro-active environmental management, such that potential problems can be identified and mitigation measures adopted prior to any work being carried out;
- Define the procedures to be followed as to ensure environmental control, in the event of pollution occurring that may require actions.

## 1.2 Content of the Environmental Management Programme

The EMPr has been structured in accordance with the requirements as specified in the National Environmental Management Act (Act No. 107 of 1998) (NEMA) Environmental Impact Assessment (EIA) Regulations. Refer to Table 1:1

Table 1:1: Requirements of and EMPr

No	Description	Reference
1	An EMPr must comply with Section 24N of the Act and include-	
a)	details of: (i) the EAP who compiled the EMPr; and (ii) the expertise of the EAP to prepare an EMPr, including a curriculum vitae;	Chapter 2 Annexure A
b)	a detailed description of the aspects of the activity that are covered by the EMPr as identified by the project description;	Chapter 3
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 should be avoided, including buffers;	Figure 3.1

No	Description	Reference
d)	a description of the impact management outcomes, including management statements, identifying the impacts and risks that need to be avoided, managed and mitigated as identified through the environmental impact assessment process for all phases of the development including– <ul style="list-style-type: none"> <li>(i) planning and design;</li> <li>(ii) pre-construction activities;</li> <li>(iii) construction activities;</li> <li>(iv) rehabilitation of the environment after construction and in the case of a closure activity, closure; and</li> <li>(v) where relevant, operation activities;</li> </ul>	Chapter 5 Table 5.1 Table 5.2
f)	a description of proposed impact management actions, identifying the manner in which the impact management outcomes contemplated in paragraph (d) will be achieved, and must, where applicable, include actions to – <ul style="list-style-type: none"> <li>(i) avoid, modify, remedy, control or stop any action, activity or process which causes pollution or environmental degradation;</li> <li>(ii) comply with any prescribed environmental management standards or practices; and</li> <li>(iii) comply with any applicable provisions of the Act regarding closure, in the case of a closure activity;</li> </ul>	Chapter 5 Table 5.1 Table 5.2
g)	the method of monitoring the implementation of the impact management actions contemplated in paragraph (f);	Chapter 9 Table 5.1 Table 5.2
h)	the frequency of monitoring the implementation of the impact management actions contemplated in paragraph (f);	Chapter 9
i)	an indication of the persons who will be responsible for the implementation of the impact management actions;	Chapter 4 Table 5.1 Table 5.2
j)	the time periods within which the impact management actions contemplated in paragraph (f) must be implemented;	Chapter 9 Table 5.1 Table 5.2
k)	the mechanism for monitoring compliance with the impact management actions contemplated in paragraph (f);	Chapter 9
l)	a program for reporting on compliance, taking into account the requirements as prescribed by the Regulations;	Chapter 9
m)	an environmental awareness plan describing the manner in which— <ul style="list-style-type: none"> <li>(i) the applicant intends to inform his or her employees of any environmental risk which may result from their work; and</li> <li>(ii) risks must be dealt with in order to avoid pollution or the degradation of the environment; and</li> </ul>	Chapter 8
n)	any specific information that may be required by the competent authority.	Not applicable

## 2 ENVIRONMENTAL ASSESSMENT PRACTITIONER

### 2.1 Details of the Environmental Assessment Practitioner

Table 2:1 provides the details of the Environmental Assessment Practitioner (EAP) for the Clapham Dam upgrades and associated infrastructure project.

Table 2:1: Details of the EAP

<b>Environmental Assessment Practitioner</b>	Suzanne van Rooy
<b>Company</b>	Alta van Dyk Environmental Consultants cc
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### 2.2 Expertise of the Environmental Assessment Practitioner

Suzanne is a senior environmental scientist and has 13 years' experience as an environmental assessment practitioner, having worked largely in South Africa's mining sector. She is a professionally registered environmental scientist with the South African Council of Natural Scientific Professionals (registration number 400378/11). Her field of expertise includes the compilation of environmental impact assessments and environmental management programmes, environmental auditing and stakeholder engagement.

Refer to Annexure A for the Curriculum Vitae of the EAP.



## **3 PROJECT DESCRIPTION**

### **3.1 Background to LWUA**

The LWUA is a water management institution established in terms of Section 92 of the National Water Act (Act 36 of 1998) (NWA) and its area of operation and constitution were approved by the Minister of Water Affairs and Forestry (as it was known then) in terms of Section 92 (1) (a) of the NWA as confirmed in Government Gazette Notice No. 89 of 1 February 2002. The area of operation of the LWUA was extended in terms of Section 92 (1) (b) of the NWA by Government Gazette Notice Number 1110 of 18 November 2005 and the amended LWUA Constitution was approved by the then Minister of Water Affairs and Forestry on 4 October 2005.

The LWUA was established with the following mandate:

- To operate and maintain a pipeline scheme to supply bulk raw water from the Olifants River to satisfy the water requirements of its members on the Eastern Limb of the Bushveld Igneous Complex within its licensed conditions;
- To supply bulk raw water from the pipeline and any extension thereof from the Olifants River to satisfy the requirements of other users within its licence conditions;
- As a Corporate Social Responsibility undertaking to continue with its support to the Department of Water and Sanitation (DWS) and the Sekhukhune District Municipality in the operation and maintenance of their potable water schemes, provided that the schemes are situated within the area of operation of the LWUA; and
- To protect the LWUA infrastructure.

The LWUA was established to supply raw water to mines along the Eastern Limb of the Bushveld Igneous Complex. The main aim of the project was to supply water to a number of existing and planned new mines in the area, and as a spin-off, to provide additional capacity in the water supply scheme to meet the requirements of the rural population in the area. Only raw water is provided by LWUA, and the responsibility of treatment to drinking water standards lies with the distribution authority. The water is abstracted from the Olifants River via the Flag Boshielo Dam and abstracted at the Havercroft weir. The users receiving the water from the pipeline make up the LWUA. The Lebalelo water supply forms part of the Olifants River Water Resource Development Project (ORWRDP). The water is currently sourced from the Olifants River via the Flag Boshielo Dam, with abstraction at the Havercroft weir, and in future will be from the Steelpoort River via De Hoop Dam.

The current pipeline runs from the Havercroft weir to the R37, and along the R37 to Clapham Dam where raw water is stored. From Clapham Dam, the pipeline runs to Marula Platinum Mine.

Several developments have taken place around LWUA's Clapham Dam since its construction in 2002. LWUA wishes to take precautionary measures, should the Clapham Dam overflow due to failure of inflow control measures or where all of the pumps are out of order and the gravity feed to Marula Mine is not functional. Precautionary measures will ensure that water is handled in a controlled and safe manner to prevent damage to surrounding public and private property, and in the worst case, loss of life.

### **3.2 Proposed upgrades**

The upgrades at the existing Clapham Dam involves the following:

- New overflow structure (at Clapham Storage Dam);
- Inlet Structure (at Clapham Storage Dam);
- Repair of the damaged Clapham Storage Dam embankment undermined by rodents;

- Extension of scour outlet pipes along the bulk raw water pipelines in the vicinity of the Clapham Storage Dam to prevent damage to private properties when pipelines have to be scoured for maintenance purposes;
- Overflow pipeline to be constructed along the existing LWUA pipeline (~700m);
- Manholes located along the overflow pipeline route (7 manholes);
- Outlet structure in close vicinity of the Matadi River;
- Channel from the outlet structure to the Matadi River;
- Erosion protection of the riverbank at proposed outlet (approximately 70m long);
- Extension of concrete encasing around the existing LWUA pipeline and repair of damaged corrosion protection of the pipeline crossing the Matadi River; and
- Erosion protection of the pipeline crossing the Matadi River.

The construction phase for the project is expected to last 5 months.

### **3.3 Emergency overflow pipeline**

The envisaged pipeline route will follow the existing bulk raw water pipeline that provides water to Marula Mine and the work will consist of pipe trench excavation to line and level, bedding preparation, laying of pipes to line and level between manholes, backfilling and compaction. The pipeline route remains within the existing servitude of the bulk raw water pipeline to Marula Mine.

Excavations of the pipeline trench will be carried out using an excavator and the material stockpiled along the trench for later use for backfilling after the pipe has been laid.

Once the trench has been backfilled the pipe bedding will be trimmed and prepared to receive the pipes. Pipes will be laid using mechanical equipment to lift it and place it in position. After laying of the pipes the pipe blanket will be constructed using selected material from the excavated material and compacted by hand and making use of walk behind self-propelled compaction equipment.

After completion of the fill blanket around the pipe the bulk backfilling will be done using the excavated material and compacted with walk behind self-propelled compaction equipment. The total length of the pipeline is approximately 642m.

### **3.4 Outlet structure**

The outlet structure will consist of a combination of reinforced concrete and gabions and will entail the following work:

- Excavation for the reinforced concrete headwall at the end of the pipeline.
- Casting of a blinding layer to provide a clean and solid work area for the fixing of reinforcement.
- Fixing of reinforcement in the headwall of the outlet structure and erection of shuttering.
- Casting of concrete
- Backfilling around the outlet structure and shaping of the area to receive the gabion baskets for the erosion protection.

At the end of the pipeline, in close vicinity of the river, the excavations for the outlet structure will be carried out and the material stockpile at the site of the outlet structure. The floor area of the outlet will again be prepared and compacted using hand tools after which the 50mm thick blinding layer will be constructed.

Following the above the steel reinforcement for the outlet structure will be fixed and once approved the shuttering will be erected. After inspection and approval, the concrete will be cast making use of concrete from a ready-mix plant in the area.

After the concrete has reached sufficient strength, the shutters will be stripped off and the concrete finished off. Backfilling around the structure will then be done using hand tools and compaction equipment with any excess material spread and finished off neatly over the area around the structure.

### 3.5 Erosion protection of the Matadi River Embankment

Due to the erodibility of the material and to protect the river embankment where the water will be discharged into the river, it is proposed that gabions be used to protect the embankment of the river and to prevent erosion at the pipe outlet. The gabions will also help to dissipate energy and to slow down the water after being discharged. The pipeline route will be chosen such that the outlet of the overflow is downstream of the bulk raw water pipeline crossing through the river to prevent erosion damage to the bulk raw water pipeline in case of an overflow.

Erosion protection will be provided from the outlet structure up to the river by constructing a channel using gabion mattresses and boxes. Stone for the gabions will be obtained from the mines in the vicinity.

The bulk excavations for the gabions will be done using mechanical equipment after which it will be levelled and trimmed to line and level followed by compaction of the top layer before the gabions structure can be constructed.

### 3.6 Environmental related permits required

Triggered listed activities in terms of the NEMA EIA Regulations are shown in Table 3:1. Activities in Listing 1 and 3 are triggered by the proposed development, and therefore a Basic Assessment environmental authorisation process is followed.

**Table 3:1 Triggered listed activities for the Clapham Dam upgrades and associated activities**

List and activity number	Listed activity	Description of activity
Listing 1, Activity 19	The infilling or depositing of any material of more than 10m <sup>3</sup> into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 10m <sup>3</sup> from a watercourse;	Construction of the outlet structure, associated channel and erosion protection on the riverbed in the Matadi River will require the moving of more than 10m <sup>3</sup> of soil.
Listing 3, Activity 12	The clearance of an area of 300m <sup>2</sup> or more of indigenous vegetation except where such clearance of indigenous vegetation is required for maintenance purposes undertaken in accordance with a maintenance managements plan.	Natural riparian vegetation will be cleared during the construction of the outlet structure, associated channel and erosion protection on the riverbed of the Matadi River.
Listing 3, Activity 14	The development of- (i) dams or weirs, where the dam or weir, including infrastructure and water surface area, exceeds 10 square metres; or (ii) <u>infrastructure or structures with a physical footprint of 10 square metres or more;</u> where such development occurs- (a) <u>within a watercourse;</u> (b) in front of a development setback; or	The outlet structure, associated channel and erosion protection on the riverbed in the Matadi River is greater than 10m <sup>2</sup> .

List and activity number	Listed activity	Description of activity
	(c) if no development setback exists, within 32 metres of a watercourse, measured from the edge of a watercourse.	

In addition, a Water Use Licence Application will be submitted in terms of the National Water Act (Act No. 36 of 1998) (NWA) as Section 21 water uses are triggered. Table 3:2 provides a list of the Section 21 water uses triggered by the proposed project.

**Table 3:2 List of Section 21 Water Uses to be applied for**

Section 21 Water Use	Activity which requires the Water Use Licence
(c) – impeding or diverting the flow of water in a watercourse	<ul style="list-style-type: none"> <li>All infrastructure within a horizontal distance of 100m from the edge of the watercourse</li> </ul>
(i) – altering the bed, banks, course or characteristics of a watercourse	<ul style="list-style-type: none"> <li>Construction of the gabion embankment, outlet channel and a section of the overflow pipeline</li> </ul>

### 3.7 Sensitive areas

The following sensitive areas in proximity of the proposed Clapham Dam upgrades and associated infrastructure project have been identified:

- Matadi River; and
- Cemetery.

Refer to Figure 3:1 for the location of the sensitive features.




	<p><b>CLAPHAM DAM UPGRADES AND ASSOCIATED INFRASTRUCTURE</b></p> <p><b>SENSITIVE FEATURES</b></p>	<p><b>Figure 3.1</b></p>
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Figure 3.1: Sensitive features around Clapham Dam and the proposed infrastructure

## **4 ROLES AND RESPONSIBILITIES**

The roles and responsibilities indicate which team member(s) are responsible for implementation of the identified mitigation measures, management plan and monitoring. The following parties will have roles and responsibilities in the implementation of this EMPr.

- Applicant (LWUA);
- Construction Contractor;
- Environmental Control Officer;
- Operator (LWUA)

The roles and responsibilities of each party is described in the sections below.

### **4.1 Applicant**

LWUA is the applicant and will therefore be the entity monitoring the implementation of the EMPr and compliance with the authorisation. The following roles and responsibilities are assigned to the applicant:

- Ensure compliance with the conditions in the EMPr and environmental authorisation during all phases of the project;
- Ensure that contractors and operators undertake to adhere to all the provisions of the EMPr;
- Ensure that environmental monitoring takes place;
- Ensure that independent environmental audits are undertaken;
- Ensure that all monitoring and audit reports are submitted to the competent authority.

### **4.2 Construction Contractor**

During the construction phase, the construction contractor will:

- Be responsible to have the EMPr available on site at all times;
- Ensure that all mitigation measures for which they are responsible, are implemented as described in this EMPr; and
- Ensure that all problems identified during environmental inspections, are addressed and rectified as soon as reasonably possible.

### **4.3 Environmental Control Officer**

During the construction phase, the Environmental Control Officer (ECO) will undertake:

- Inspections/audits of environmental protection requirements as per the EMPr;
- Sampling and data capture in accordance with the environmental monitoring program and analysis of results; and
- Assistance with the preparation of environmental monitoring reporting.

### **4.4 Operator**

During the operational phase, the day-to-day operator of LWUA will:

- Be familiar with the contents and commitments documented in the EMPr;

- Will adhere to the management obligations;
- Ensure that all problems identified during inspections, are addressed, and rectified as soon as reasonably possible.
- Implement LWUA Management policies, procedures, and management plans;
- Review and analysis of monitoring results and preparation of reports to management and stakeholders;
- Planning of and carrying out environmental training programs for employees and contractors;
- Obtaining and maintaining all necessary environmental permits in liaison with the legal manager; and
- Management of the environmental related components of the grievance mechanism.

## **5 MITIGATION AND/OR MANAGEMENT MEASURES**

### **5.1 Construction related impacts**

A variety of potential impacts are associated with the construction activities for this project. These impacts can be categorised as general construction related impacts as well as construction impacts specifically related to this site. The construction phase is expected to last 5 months. General best practice rules to construction should be followed at all times. In addition to this the specific mitigation measures and recommendations as highlighted by the Basic Assessment Report for this specific site is shown below.

During the construction phase of the project, the following possible impacts may occur:

- Vegetation clearance due to the development of the outlet structure and erosion protection along the Matadi River.
- Loss and contamination of soils and
- Management of sewage generated by the construction crew through portable toilet facilities.
- Construction water requirements in support of potable water for the construction crews as well as water to be used for the mixing of concrete on site.
- Management of general waste generated through the construction activities i.e., food and packaging waste, paints, building rubble.
- Spillages and leaks from construction equipment i.e. vehicles and machinery, storage and use of lubricants, oils and chemicals.
- Establishment of alien and invasive plant species not previously present in the area due to soil and vegetation disturbance.
- Increased noise and dust emissions due to construction activities.

Mitigation measures to be implemented during the construction phase is presented in Table 5:1.



Table 5.1: Mitigation measures to be implemented during the CONSTRUCTION PHASE of the Clapham Dam upgrades and associated infrastructure

CONSTRUCTION PHASE									
Activity that may cause an impact	Environmental/Social aspect	Management outcome	Potential Environmental Impact	Significance before mitigation	Significance after mitigation	Management Measure	Responsible person	Frequency and/or time period	Method of monitoring
Clearance of vegetation for construction of outlet channel and gabion embankment	Soils	Conservation of soils a resource	Loss of soils due to erosion from cleared surfaces	Medium (-)	Low (-)	Topsoil should be stripped and stockpiled for use during rehabilitation of the site after construction is completed.	Construction contractor	Once off	Site inspection report, EMPr Performance Assessment
						Where possible, construction activities should take place during the dry months in order to minimise erosion from rainwater run-off.	LWUA/Construction contractor	Not applicable	Site inspection report, EMPr Performance Assessment
						Install erosion control measures (e.g. berms, soil traps, stormwater management measures, temporary diversion of upstream run-off from the construction and laydown area) to divert stormwater away from areas that are susceptible to erosion.	Construction contractor	Once off	Site inspection report, EMPr Performance Assessment
						A rehabilitation strategy focused on revegetation must be initiated after the construction phase.	Environmental manager/ Construction contractor	End of construction	EMPr Performance Assessment
Establishment of contractor laydown areas Construction of outlet channel and gabion embankment			Contamination of soils resources due to construction activities	Medium (-)	Low (-)	Prevent any spills from occurring. Machines must be parked within hard park areas or dedicated storage areas and must be checked daily for fluid leaks.	Construction contractor	Throughout construction phase	Site inspection report, EMPr Performance Assessment
						Develop leak/spill procedure to clean up/remedy hydrocarbon spills.	Environmental manager/ Construction contractor	Once off	Site inspection report, EMPr Performance Assessment
						Construction vehicles must not be parked within 100m from Matadi river.	Construction contractor	Throughout construction phase	Site inspection report, EMPr Performance Assessment
						Spills to be cleared and remediated immediately as per the leak/spill procedure.	Construction contractor	As required	Site inspection report, EMPr Performance Assessment
						Spill kits to be available on site at all times.	Construction contractor	Throughout construction phase	Site inspection report, EMPr Performance Assessment
Vegetation clearing for laydown area and construction of outlet channel and gabion embankment	Biodiversity	Limit the disturbance and destruction of vegetation, fauna and habitat Minimise and prevent the spread of alien and/or invasive species	Loss of natural riparian vegetation	Medium (-)	Low (-)	Clearing of vegetation should be limited to the footprint of the laydown area, outlet channel and gabion embankment area. No additional areas are allowed to be cleared beyond this footprint.	Construction contractor	Once off	Site inspection report, EMPr Performance Assessment
						Construction vehicles must make use of existing gravel roads, no new roads are to be constructed.	Construction contractor	Throughout construction phase	Site inspection report, EMPr Performance Assessment
						Cleared areas must be revegetated with indigenous vegetation	Construction contractor	During rehabilitation	Site inspection report, EMPr Performance Assessment
		Spread and/or establishment of alien and/or invasive species	Medium (-)	Low (-)	Alien/invasive vegetation must be cleared and destroyed immediately.	Construction contractor	Weekly	Site inspection report, EMPr Performance Assessment	
					Cleared areas must be rehabilitated with indigenous vegetation.	Construction contractor	Weekly	Site inspection report, EMPr Performance Assessment	

CONSTRUCTION PHASE									
Activity that may cause an impact	Environmental/Social aspect	Management outcome	Potential Environmental Impact	Significance before mitigation	Significance after mitigation	Management Measure	Responsible person	Frequency and/or time period	Method of monitoring
Construction of outlet channel and gabion embankment			Introduction of nuisance vectors (pests) such as flies and rodents	Low (-)	Low (-)	Ensure the correct handling, storage and operation of general waste generated on the construction site.	Environmental manager/ Construction contractor	Weekly	Site inspection report, EMPr Performance Assessment
						General waste bins to be provided and cleaned when required and removed to a permitted waste disposal facility.	Construction contractor	Weekly	Site inspection report, EMPr Performance Assessment
						Remove general waste generated frequently as to prevent the development of a breeding habitat for nuisance pests such as flies and attracting rodents.	Construction contractor	Weekly	Site inspection report, EMPr Performance Assessment
Establishment of contractor laydown area Construction of outlet channel and gabion embankment	Surface water	Minimise the potential for surface water pollution Conservation of water	Impacts on surface water quality due to seepage from a potential pollution source area	Medium (-)	Low (-)	Locate laydown area at least 100m from the Matadi River.	Construction contractor	Once off	Site inspection report, EMPr Performance Assessment
						Fence off laydown area and restrict all activities to fenced area.	Construction contractor	Throughout construction phase	Site inspection report, EMPr Performance Assessment
						Implement a stormwater management plan for the laydown area.	Construction contractor	Throughout construction phase	Site inspection report, EMPr Performance Assessment
						Rehabilitate and re-vegetate all disturbed areas outside the laydown area as soon as possible.	Construction contractor	Throughout construction phase	Site inspection report, EMPr Performance Assessment
						Provide portable sanitation facilities for construction workers, which will not be located within 100m of the Matadi River	Construction contractor	Throughout construction phase	Site inspection report, EMPr Performance Assessment
						Undertake surface water monitoring as per the requirements of the Water Use Licence/General Authorisation.	Environmental manager	As required	Site inspection report, EMPr Performance Assessment
			Increased sedimentation into riverbed due to run-off and erosion from exposed surfaces	Medium (-)	Low (-)	Soil erosion must be prevented at all times and the contractor shall control soil erosion until an acceptable vegetation cover has been achieved or suitable alternative is implemented.	Construction contractor	Throughout construction phase	Site inspection report, EMPr Performance Assessment
The contractor must ensure that adequate erosion control measures are implemented in the affected areas and other high-risk areas, including at existing structures or activities with particular attention to erosion control at steep slopes and drainage lines.	Construction contractor	Throughout construction phase	Site inspection report, EMPr Performance Assessment						
Construction activities	Heritage resources	Protect and preserve heritage resources	Impact on the graves and cemeteries	Low (-)	Low (-)	The recorded cemetery should be indicated on development plans.	Construction contractor	Throughout construction phase	Site inspection report, EMPr Performance Assessment
						Graveyard to be remain fenced off and clearly demarcated. All construction activities should be well outside of the fenced area.	Construction contractor	Throughout construction phase	Site inspection report, EMPr Performance Assessment
						The graveyard must be accessible to descendants at all times.	Environmental manager/ Construction contractor	Throughout construction phase	Site inspection report, EMPr Performance Assessment

CONSTRUCTION PHASE										
Activity that may cause an impact	Environmental/Social aspect	Management outcome	Potential Environmental Impact	Significance before mitigation	Significance after mitigation	Management Measure	Responsible person	Frequency and/or time period	Method of monitoring	
						Dust control around the graveyard must be implemented.	Construction contractor	Daily	Site inspection report, EMPr Performance Assessment	
						Implementation of a chance find procedure for the project (archaeology and palaeontology), should any heritage features be uncovered or excavated during the construction phase.	Environmental manager/Construction contractor	As required	Site inspection report, EMPr Performance Assessment	
Construction of outlet channel and gabion embankment	Noise	Minimise the generation of noise	General rise in ambient noise levels	Medium (-)	Low (-)	Ensure high level of equipment maintenance, especially intake and exhaust mufflers.	Construction contractor	Monthly	Site inspection report, EMPr Performance Assessment	
						Replace pure tone (beeping) with broadband (hissing) reversing alarms.	Construction contractor	As required	Site inspection report, EMPr Performance Assessment	
						Construction activities will only take place during daylight hours.	Construction contractor	Throughout construction phase	Site inspection report, EMPr Performance Assessment	
Construction of outlet channel and gabion embankment	Air quality	Minimise atmospheric emissions and dust generation	Increased dust fallout	Low (-)	Low (-)	Apply dust suppressants to gravel roads used.	Construction contractor	Daily	Site inspection report, EMPr Performance Assessment	
						Set speed limits to 30km/h on gravel roads to minimise the creation of fugitive dust within the project boundary.	Construction contractor	Throughout construction phase	Site inspection report, EMPr Performance Assessment	
Construction of outlet channel and gabion embankment	Socio-economic	Maximise employment opportunities and social benefits	Benefits resulting from employment and income opportunities created by the construction of the outlet channel and gabion structures	Low (+)	Medium (+)	Develop a clear and concise employment policy prioritising local employment.	LWUA	Once off	Site inspection report, EMPr Performance Assessment	
						Employ local works if qualified applicants with the appropriate skills are available.	Construction contractor	Throughout construction phase	Site inspection report, EMPr Performance Assessment	
						Purchase goods and services at a local level if available.	Construction contractor	Throughout construction phase	Site inspection report, EMPr Performance Assessment	
			Reduce the risk of potential incidences	Social incidences	Medium (-)	Low (-)	No site staff, other than security personnel will be housed on site.	Construction contractor	Throughout construction phase	Site inspection report, EMPr Performance Assessment
							Security personnel must be supplied with adequate protective clothing, ablution facilities, water and refuse collection facilities, facilities for cooking and heating so that open fires are not necessary.	Construction contractor	Throughout construction phase	Site inspection report, EMPr Performance Assessment
							The site and crew are to be managed in strict accordance with the OHS Act and the National Building Regulations.	Construction contractor	Throughout construction phase	Site inspection report, EMPr Performance Assessment
							Ensure that all emergency procedures are in place prior to commencing work. Emergency procedures must include (but not be limited to) fire, spills, contamination of the ground, accidents to employees, use of hazardous substances and materials, etc.	Construction contractor	Throughout construction phase	Site inspection report, EMPr Performance Assessment

CONSTRUCTION PHASE									
Activity that may cause an impact	Environmental/Social aspect	Management outcome	Potential Environmental Impact	Significance before mitigation	Significance after mitigation	Management Measure	Responsible person	Frequency and/or time period	Method of monitoring
						Ensure that lists of all emergency telephone numbers/contact persons are kept up to date and that all numbers and names are posted at relevant locations throughout the construction site.	Construction contractor	Throughout construction phase	Site inspection report, EMPr Performance Assessment

## 5.2 Operational related impacts

During the Operational Phase, the management of overflow pipeline and associated infrastructure will fall under the responsibility LWUA. Impacts will be limited to the maintenance of gabion embankment and outlet channel and other infrastructure.

During the operational phase of the project, the following possible impacts may occur:

- Increased sedimentation into riverbed due to run-off and erosion from exposed surfaces.
- Spread of alien and/or invasive species.
- Protection of properties and infrastructure.

Mitigation measures to be implemented during the operational phase is presented in Table 5:2

Table 5:2: Mitigation measures to be implemented during the OPERATIONAL PHASE of the Clapham Dam upgrades and associated infrastructure

OPERATIONAL PHASE									
Activity that may cause an impact	Environmental/Social aspect	Management outcome	Potential Environmental Impact	Significance before mitigation	Significance after mitigation	Management Measure	Responsible person	Frequency and/or time period	Method of monitoring
Maintenance of gabion embankment on banks of Matadi River	Soils	Conservation of soils as a resource	Protection of soil resources	Low (+)	Medium (+)	Ensure that the gabion embankment is properly maintained in order to minimise soil erosion.	Operator	Duration of operational phase	Maintenance Reports
Maintenance of gabion embankment and outlet channel	Biodiversity	Minimise and prevent the spread of alien and/or invasive species	Spread of alien and/or invasive species	Medium (-)	Low (-)	Alien/invasive vegetation must be cleared and destroyed immediately.	Operator	Duration of operational phase	Maintenance Reports
						Ensure that re-vegetation of cleared areas is established and free of alien/invasive species.	Operator	Duration of operational phase	Maintenance Reports
Maintenance of gabion embankment and outlet channel	Surface water	Minimise the potential for surface water pollution Conservation of water	Increased sedimentation into riverbed due to run-off and erosion from exposed surfaces	Low (-)	Low (-)	Ensure that the gabion embankment is properly maintained in order to minimise soil erosion.	Operator	Duration of operational phase	Maintenance Reports
Maintenance of Clapham Dam overflow infrastructure	Social	Ensure the safety of residents and properties in the area	Protection of properties and infrastructure	Low (+)	Medium (+)	Ensure that the overflow infrastructure and flood protection measures is well-maintained in working order.	Operator	Duration of operational phase	Maintenance Reports

## **6 MANAGEMENT PLANS**

The following management plans are detailed in the sections below:

- Heritage chance find procedure;
- Paleontological chance find procedure;
- Construction camp management; and
- Waste management plan.

### **6.1 Heritage Chance Find Procedure**

The possibility of the occurrence of subsurface archaeological 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 EMPr. A short summary of chance find procedures is discussed below.

This 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 as discussed below.

- If during the pre-construction phase, construction, operations or closure phases of this project, any person employed by the developer, one of its subsidiaries, contractors and subcontractors, or service provider, finds any artefact of cultural significance or heritage site, this person must cease work at the site of 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 Environmental Manager of the chance find and its immediate impact on operations. The Environmental Manager will then contact a professional archaeologist for an assessment of the finds who will notify the South African Heritage Resource Agency (SAHRA).

### **6.2 Paleontological Chance Find Procedure**

The following procedure is only required if fossils are seen on the surface and when excavations/drilling commence.

- When excavations begin the rocks and must be given a cursory inspection by the environmental officer or designated person. Any fossiliferous material (plants, insects, bone, coal) should be put aside in a suitably protected place. This way the mining activities will not be interrupted.
- Photographs of similar fossil plants must be provided to the developer to assist in recognizing the fossil plants in the shales and mudstones. This information will be built into the training and awareness plan and procedures.
- Photographs of the putative fossils can be sent to the palaeontologist for a preliminary assessment.
- If there is any possible fossil material found by the developer/environmental officer then the qualified palaeontologist sub-contracted for this project, should visit the site to inspect the selected material and check the dumps where feasible.

- Fossil plants or vertebrates that are considered to be of good quality or scientific interest by the palaeontologist must be removed, catalogued and housed in a suitable institution where they can be made available for further study. Before the fossils are removed from the site a SAHRA permit must be obtained. Annual reports must be submitted to SAHRA as required by the relevant permits.
- If no good fossil material is recovered, then no site inspections by the palaeontologist will not be necessary. A final report by the palaeontologist must be sent to SAHRA once the project has been completed and only if there are fossils.
- If no fossils are found and the excavations have finished, then no further monitoring is required.

### 6.3 Construction Camp Management

The following management measures will be implemented at the construction camp/laydown area:

- The construction laydown area will be located adjacent to the Clapham Dam pump station.
- Demarcate the construction camp/laydown area.
- Adequate portable ablution facilities for construction crews will be provided by the Construction Contractor and will be located at least 100m from the edge of the Matadi River.
- No servicing of vehicles by the construction contractor may take place at the construction camp/laydown area.
- All vehicles must make use of the existing roads.
- No uncontrolled discharges from the construction camp shall be permitted.
- Correct storage, handling and operation of the waste handling, management and storage area and laydown areas.

### 6.4 Waste Management Plan

The following waste management measures will be implemented:

- The contractors must provide and maintain a method statement for “solid waste management”. The method statement must provide information on proposed licensed facility to be utilised and details of proposed record keeping for auditing purposes. Waste management must be a priority and all waste must be collected and stored effectively.
- Bins must be clearly marked for ease of management.
- Sufficient closed containers must be strategically located around the construction site to handle the amount of litter, wastes, rubbish, debris, and builder’s wastes generated on the site.
- Monitoring of litter, spills, fuels, chemicals and human waste in and around the project area.
- A minimum of one toilet must be provided per 10 persons during construction. Portable toilets must be pumped dry to ensure the system does not degrade over time and spill into the surrounding area.
- The Contractor/Operator should supply sealable and properly marked domestic waste collection bins and all solid waste collected shall be disposed of at a licensed disposal facility.
- Where a registered disposal facility is not available close to the project area, the Contractor/Operator shall provide a method statement with regard to waste management. Under no circumstances may domestic waste be burned or buried on site without the necessary approvals.
- General waste generated shall be removed on a frequent basis to prevent the development of a breeding habitat for nuisance pests such as flies and attracting rodents.
- Procedures for firefighting equipment that need to be checked and tested are aligned with the firefighting policy and procedure.



## **7 MONITORING**

### **7.1 General environmental monitoring**

A monitoring programme will be implemented for the duration of the construction of the Clapham Dam upgrades and associated infrastructure. This programme will include (but is not limited to):

- Establishing a baseline through the taking of photographs of identified environmental aspects and potential impact on the area;
- Monitoring of the spread of alien invasive species around the site;
- Monitoring of stormwater management structures and the effectiveness thereof; and
- Ensuring that re-vegetation is taking place at rehabilitated construction areas.
- Surface water monitoring will be undertaken as per the requirements of the Water Use Licence/General Authorisation.

## **8 ENVIRONMENTAL AWARENESS**

Environmental awareness is an essential part of the implementation of the EMPr during the construction and operational phases of the project. The purpose of environmental awareness is to make contractors and employees mindful of the environmental sensitivities around the site, the potential environmental impacts as well as the mitigation measures that need to be implemented.

### **8.1 Environmental awareness training**

Environmental awareness training must be implemented during the construction and operational phases of the development. The Construction Contractor will be responsible for compiling the material required for the training, and should include, as a minimum, the following:

- Environmental legal requirements and obligations;
- Environmental sensitive areas;
- Heritage features and the associated chance find procedure should any archaeological finds be made;
- Details of the waste management procedures
- Emergency procedures;
- Relevant mitigation measures to be carried out as listed in the EMPr

All personnel, contractors to undergo environmental awareness training. A signed register of attendance must be kept for proof. Discussions are required on sensitive environmental receptors within the project area to inform contractors and site staff of the presence of protected species, their identification, conservation status and importance, biology, habitat requirements and management requirements the Environmental Authorisation and within the EMPr.

### **8.2 Basic Rules of Conduct**

The following list represents the basic Do's and Don'ts towards environmental awareness, which all participants in this project must consider whilst carrying out their tasks. These are not exhaustive and serve as a quick reference aid. NOTE: ALL new site personnel must attend an environmental awareness/induction presentation.

#### **DO:**

- Clear your work areas of litter and building rubble at the end of each day – use the waste bins provided and prevent litter from being blown away by wind.
- Report all fuel or oil spills immediately and stop the spill from continuing.
- Store hazardous materials in a lockable bunded area
- Dispose of cigarettes and matches carefully, so to prevent veld fires (arson and littering is an offence).
- Confine work and storage of equipment to within the immediate work area.
- Use all safety equipment and comply with all safety procedures.
- Ensure a working fire extinguisher is immediately at hand if any “HOT WORK” is undertaken e.g. welding, grinding, gas cutting etc.
- Prevent excessive dust and noise.

#### **DO NOT:**

- Do not litter - report dirty or full facilities, i.e. full dustbins and dirty or blocked chemical toilets.

- Do not make any fires.
- Do not enter any fenced off or demarcated areas.
- Do not allow waste, litter, oils or foreign materials into any storm water channels or drains or watercourses.
- Do not litter or leave food lying around.
- Do not feed the animals.

## **9 COMPLIANCE WITH THE EMPr**

The implementation of the management measures specified in Table 5:1 and Table 5:2 will be monitored as detailed in the following sections.

### **9.1 Site inspections**

During the construction phase, the Construction Contractor must appoint a suitably qualified person to undertake visual site inspections supported by photographic evidence. The frequency of these visual site inspections must be weekly. The weekly visual inspection findings must be collated into a monthly compliance report to report on the compliance of the construction phase mitigation measures. The monthly site inspection reports should cover the following:

- routine observations of behaviours and practices;
- noting of unusual events, incidents and accidents (natural and human triggered);
- brief statement whether or not conditions of the EMPr are being met; and where it is reportable to authorities;
- possible reasons why conditions are not being met; and
- Corrective action plans.

The monthly report should be submitted to the LWUA and Construction Contractor. Copies of the inspection reports should be kept on site.

It is recommended that photographs are taken of the site prior to, during and immediately after construction as a visual reference. These photographs should be stored with other records related to this EMPr. If captured in digital format, hard copies, in colour, must be kept with all other records relevant to the implementation of this EMPr.

### **9.2 Site documentation**

All documents listed below shall be kept on site and be available for auditing purposes. Site inspections undertaken for the internal and external EMPr performance assessment may require access to these documentation.

The following documentation must be kept on site:

- Copy of this EMPr;
- Copy of the environmental authorisation;
- Method statements;
- Complaints register;
- Records of all remediation/rehabilitation activities;
- Records of all incident reports;
- Environmental Awareness Plan;
- Monthly site inspection reports; and
- Emergency response procedures.

### **9.3 EMPr Performance Assessment**

During the construction phase and subsequent rehabilitation phase, monthly EMPr Performance Assessments as per the NEMA EIA Regulations must be undertaken by the independent Environmental

Control Officer (ECO). These reports will be approved/signed-off by both the applicant and Construction Contractor. These reports must be submitted to the competent authority on a monthly basis.

Once rehabilitation is completed, a close-out EMP Performance Assessment will be undertaken to confirm that all required rehabilitation activities have been met prior to the contractor leaving site.

### 9.4 Incident Reporting

An environmental incident is an unwanted event that has an actual or potential (near-hit) negative impact on the environment, affecting the quality of air, land or water, fauna or flora, and / or causing stakeholder concern. A causal link must be able to be made between an operational activity and the event. Environmental Incidents is monitored to establish the following:

- Which repeat incidents occur;
- Has the incident been investigated and the root cause been identified;
- Effectiveness of implementation of preventative and corrective actions; and
- To monitor trends to check the effectiveness of the mitigation measures.

**Table 9:1: Incident register**

Name of person reporting the incident	Information on the incident	Date of incident identified	Actions taken as to address the incident	Date of rectification	Signature

### 9.5 Emergency Procedures

The purpose of this procedure is to:

- document the mechanism by which potential emergency situations and accidents will be identified during the construction phase that can have an impact on the environment; and
- Provide guidelines on the response to actual emergency situations and accidents to prevent or mitigate associated environmental impacts that may occur.

An environmental emergency situation or accident is an unexpected, sudden occurrence with the potential to endanger people or seriously damage the environment, either immediately or with a delayed effect.

Potential emergencies shall be identified, and response plans shall be developed for all identified emergencies. These include the following:

- how potential emergency situations and accidents will be identified;
- a guideline for developing emergency preparedness and response procedures, for use by the contractor to address section-specific emergencies, stating how to respond to potential emergencies that might have an impact on the environment;
- the process to be followed in the case where an emergency situation or accident occurs;
- when potential emergency situations or accidents and their associated procedures will be reviewed; and
- The frequency at which the procedures shall be tested.

## **10 SITE REHABILITATION**

### **10.1 Removal of structures and infrastructures**

Following the completion of the construction activities, the area affected must be rehabilitated by undertaking alien plant eradication, replacement of removed topsoil, landscaping and levelling, and re-vegetation establishment. All construction equipment, containers and fencing erected by the contractor must be removed.

### **10.2 Waste management**

The following actions should be implemented when construction is completed:

- Any rubble, excavated rock or construction material will be removed from the construction site and disposed of at a registered landfill site, if it cannot be recycled or re-used;
- All waste storage containers such as skips must be emptied and removed from site;
- All portable sanitation facilities will be removed by a registered contractor. No leaks or spillages from sanitation facilities will be allowed during the removal thereof;
- Any hazardous waste temporarily stored on site need to be removed and disposed of at a registered hazardous waste facility.

### **10.3 Rehabilitation**

- Landscaped areas should be vegetated with species naturally occurring in the area.
- As much vegetation growth as possible should be promoted within the proposed development area in order to protect soils.
- All areas of disturbed and compacted soil need to be ripped and reprofiled before rehabilitation.


## ***11 ANNEXURES***

***ANNEXURE A: CURRICULUM VITAE OF THE EAP***



Name:	Suzanne	Surname	Van Rooy
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## CURRICULUM VITAE

<b>Personal Information:</b>	Surname	<b>Van Rooy</b>
	First names	<b>Suzanne</b>
	Date of birth	1982-05-06
	Gender	Female
	Nationality	RSA
<b>Contact Details:</b>	Telephone number (land line)	012 940 9457
	Cell Number	078 196 6002
	Email Address	suzanne@avde.co.za
<b>Signature:</b>		

### Expertise:

<b>Date August 2020 to present</b>	Area of expertise	Project management, environmental authorisations, stakeholder engagement, environmental compliance and performance assessments, environmental feasibility, water use licensing
	Employers Name	Alta van Dyk Environmental Consultants cc
	Employer's locality and contact details	4 Garcia Peak Midlands Estate Centurion 1692 012 940 9457
	Main Activities and Responsibilities	Environmental Assessment Practitioner (EAP) Project Manager Project Planning Project Financing
<b>Date 1 September 2009 – 31 July 2020</b>	Area of expertise	Environmental authorisations, stakeholder engagement, environmental compliance and performance assessments, environmental feasibility, water use licensing
	Employers Name	SRK Consulting (South Africa) (Pty) Ltd
	Employer's locality and contact details	265 Oxford Road Illovo 2196 011 441 1111
	Main Activities and Responsibilities	Environmental Assessment Practitioner (EAP) Project Manager Project Planning Project Financing
<b>Date 7 May 2007 31 August 2009</b>	Area of expertise	Environmental authorisations, stakeholder engagement, environmental compliance and performance assessments, closure costing, bio-monitoring
	Employers Name	GCS (Pty) Ltd
	Employer's locality and contact details	63 Wessel Road Rivonia 2191 011 803 5726

Name:	Suzanne	Surname	Van Rooy
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Main Activities and Responsibilities	Environmental Assessment Practitioner (EAP) Project Manager Project Planning Project Financing
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### Years of professional experience

Years of experience as substantiated in the individual CV.

13 Years	Water and Environmental Fields
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### Qualifications:

<b>Qualification Awarded</b>	<b>MPhil Environmental Management</b>
Name of Institution	Stellenbosch University
Date awarded	2013
<b>Qualification Awarded</b>	<b>Post Graduate Certificate in Education</b>
Name of Institution	University of Johannesburg
Date awarded	2007
<b>Qualification Awarded</b>	<b>B.Sc Honours Aquatic Health</b>
Name of Institution	University of Johannesburg
Date awarded	2005
<b>Qualification Awarded</b>	<b>B.Sc Natural and Environmental Sciences (Geography and Zoology)</b>
Name of Institution	University of Johannesburg
Date awarded	2004

### Membership of Professional Bodies:

<b>Professional body</b>	<b>South African Council for Natural Scientific Professions (SACNASP)</b>
Details of membership	400378/11 Registered as a Professional Natural Scientist
Dates	31 August 2011 to present
<b>Professional body</b>	<b>International Association for Impact Assessment South Africa</b>
Details of membership	Membership - 5894
Dates	Since 2018

**Language skills:** one (1) for low to five (5) for high).

Language	Reading	Speaking	Writing
English	5	5	5
Afrikaans (Mother Tongue)	5	5	5

**Computing skills -** (1) for low to five (5) for high).

Word	Excel	Power Point	Microsoft Projects
5	5	4	3

Name:	Suzanne	Surname	Van Rooy
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**Recent Project Experience: Environmental Authorisations**

<b>Client</b>	<b>Lebalelo Water User Association</b>
Project	SE2 pipeline and associated infrastructure
Responsibility	Environmental Scientist, project manager, environmental authorisation process and water use licence application, including coordination of specialists and public participation
Year	2021
<b>Client</b>	<b>Lebalelo Water User Association</b>
Project	Clapham Dam upgrades and associated infrastructure
Responsibility	Environmental Scientist, project manager, environmental authorisation process and water use licence application, including coordination of specialists and public participation
Year	2021
<b>Client</b>	<b>KTN Consulting Engineers</b>
Project	Delmore Park Ext 8 Bulk Services
Responsibility	Environmental Scientist, project manager, environmental authorisation process and water use licence application, including coordination of specialists and public participation
Year	2020 - 2021
<b>Client</b>	<b>De Beers Consolidated Mines</b>
Project	Venetia Limpopo Nature Reserve Lodge
Responsibility	Environmental Scientist, project manager, environmental authorisation process and water use licence application, including coordination of specialists and public participation
Year	2020 - 2021
<b>Client</b>	<b>Anglo Operations (Pty) Ltd</b>
Project	Permitting and Environmental feasibility reporting for the Elders Colliery Project (underground coal mine)
Responsibility	Environmental Scientist, project manager, compilation of the permitting and environmental chapters in support of the feasibility report
Year	2020
<b>Client</b>	<b>Kudumane Manganese Resources</b>
Project	Environmental permitting gap analysis for Kudumane's proposed river diversion
Responsibility	Project management, environmental and water authorisation gap analysis
Year	2020
<b>Client</b>	<b>AngloGold Ashanti</b>
Project	Environmental authorisation for Siguiri Mine's Block 2 project

Name:	Suzanne	Surname	Van Rooy
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Responsibility	Environmental Scientist, project management, specialist coordination compilation of the Environmental and Social Impact Assessment Report
Year	2019 - 2020
<b>Client</b>	<b>GAUFF Engineering</b>
Project	Development of an Environmental and Social Action Plan for the proposed Bukasa Port's environmental authorisation
Responsibility	Project coordinator, assistance in compilation of the Environmental and Social Action Plan
Year	2019
<b>Client</b>	<b>Anglo Operations (Pty) Ltd</b>
Project	Permitting and Environmental feasibility reporting for the Elders Colliery Project (underground coal mine)
Responsibility	Environmental Scientist, project management, compilation of the permitting and environmental chapters in support of the feasibility report
Year	2019
<b>Client</b>	<b>Anglo American Coal</b>
Project	Environmental feasibility reporting for the SACE Lifex Complex that entails the open cast mining of previously underground coal mines
Responsibility	Environmental Scientist, compilation of the permitting and environmental chapters in support of the feasibility report
Year	2019
<b>Client</b>	<b>Anglo Operations (Pty) Ltd</b>
Project	Environmental authorisation process for the Khwezela Colliery borrow pits project, two borrow pits were required to provide material for construction for reclamation of the Landau 3 Mineral Residue Deposit (MRD)
Responsibility	Environmental scientist, specialist coordination, compilation of Basic Assessment Reports, project management, public participation
Year	2018
<b>Client</b>	<b>AngloGold Ashanti</b>
Project	Specialist environmental and social baseline assessment for Siguiri Gold Mine Block 2, a proposed open cast mine project
Responsibility	Project management, specialist coordination, compilation of baseline report
Year	2018
<b>Client</b>	<b>Harmony Gold Mining Company</b>
Project	Harmony acquiring several assets from AngloGold Ashanti's Vaal River Operations, requiring the compilation of an EMP for the acquired assets

Name:	Suzanne	Surname	Van Rooy
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Responsibility	Environmental Scientist, compilation of EMP
Year	2017
<b>Client</b>	<b>DRA Global</b>
Project	Environmental authorisation gap analysis for Sasol's proposed destoning plant
Responsibility	Environmental scientist, permitting gap analysis
Year	2017
<b>Client</b>	<b>Anglo Operations (Pty) Ltd</b>
Project	Environmental authorisation process for the reclamation of the Landau 3 Mineral Residue Deposit (MRD) to facilitate Eskom's powerline relocation
Responsibility	Environmental scientist, specialist coordination, compilation of Scoping Report, compilation of EIA/EMP report, project management, public participation
Year	2017
<b>Client</b>	<b>Air Liquide</b>
Project	Investigation regarding the feasibility of a phytoremediation plant for Air Liquide's excess water at their plant in eMalahleni
Responsibility	Environmental scientist, project management
Year	2017
<b>Client</b>	<b>DRA Global</b>
Project	Feasibility study for Anglo American Platinum's Amandelbult Mine's proposed Merensky chrome recovery plant
Responsibility	Environmental scientist, report compilation, compilation of the permitting and environmental chapters in support of the feasibility report
Year	2017
<b>Client</b>	<b>Modikwa Platinum Mine</b>
Project	Basic assessment process for the upgrade of the Matimatjatji gravel road to tar road at Modikwa Platinum Mine
Responsibility	Environmental Scientist, compilation of Basic Assessment Report and associated Environmental Management Programme
Year	2017
<b>Client</b>	<b>Southern African Power Pool (SAPP)</b>
Project	Environmental and Social Management Framework (ESMF) for SAPP
Responsibility	Environmental Scientist, development of a generic terms of reference for several specialists for various power producing entities
Year	2016
<b>Client</b>	<b>Anglo Operations (Pty) Ltd</b>

Name:	Suzanne	Surname	Van Rooy
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Project	Environmental authorisation process for an open cast coal mine (Navigation Pit) and dragline walkway
Responsibility	Environmental Scientist, compilation of Stakeholder Engagement Plan (SEP) and Government and Social Affairs (GSA) report
Year	2016
<b>Client</b>	<b>Anglo Operations (Pty) Ltd</b>
Project	Environmental authorisation process for the Setlabotsha proposed underground coal mine
Responsibility	Environmental Scientist, specialist coordination, compilation of Scoping Report, compilation of EIA/EMP report, project management, public participation
Year	2016
<b>Client</b>	<b>Anglo Operations (Pty) Ltd</b>
Project	Environmental authorisation process for the Elders Colliery underground coal mine and overland conveyor
Responsibility	Environmental Scientist, specialist coordination, compilation of Scoping Report, compilation of EIA/EMP report, project management, public participation
Year	2015 - 2016
<b>Client</b>	<b>Falcon Oil and Gas</b>
Project	Environmental authorisation process for a petroleum exploration right to undertake a seismic survey
Responsibility	Environmental Scientist, public participation
Year	2015
<b>Client</b>	<b>Anglo American Platinum</b>
Project	Environmental authorisation process for the Der Brochen EMP consolidation and amendment to include an open cast mining and tailings storage facility
Responsibility	Environmental Scientist, project manager, specialist coordination, compilation of Scoping Report, compilation of EIA/EMP report, public participation
Year	2014 - 2015
<b>Client</b>	<b>Anglo American Platinum</b>
Project	Environmental authorisation process for the raising of the existing Helena tailings storage facility
Responsibility	Environmental Scientist, project manager, compilation of Scoping Report, EIA/EMP report, public participation, specialist coordination
Year	2014
<b>Client</b>	<b>Anglo American Coal</b>

Name:	Suzanne	Surname	Van Rooy
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Project	Environmental authorisation process for the construction of a powerline at Kriel Colliery's Block F
Responsibility	Environmental Scientist, compilation of a Basic Assessment Report
Year	2013
<b>Client</b>	<b>Anglo Operations (Pty) Ltd</b>
Project	Environmental authorisation process for the Elders Colliery underground coal mine and associated mini open-pit
Responsibility	Environmental Scientist, specialist coordination, compilation of Scoping Report, compilation of EIA/EMP report, public participation, project management
Year	2012 - 2013
<b>Client</b>	<b>Platinum Mile Resources</b>
Project	Investigation for a tailings pipeline route for Platinum Mile Resources
Responsibility	Environmental Scientist, project coordinator, field work, report compilation
Year	2012
<b>Client</b>	<b>Nkomati Mine</b>
Project	Environmental authorisation process for a sewage treatment plant at Nkomati Mine
Responsibility	Environmental Scientist, application for basic assessment, public participation, compilation of a Basic Assessment Report
Year	2011
<b>Client</b>	<b>Aquarius Platinum</b>
Project	Environmental authorisation process to extend underground mining at the existing K5 Shaft
Responsibility	Environmental Scientist, compilation of Scoping Report, compilation of EIA/EMP report
Year	2010
<b>Client</b>	<b>Aquarius Platinum</b>
Project	Environmental authorisation process for the rehabilitation of the Marikana open pit by depositing tailings material in pit
Responsibility	Environmental scientist, specialist coordination, public participation
Year	2010
<b>Client</b>	<b>Anglo American Platinum</b>
Project	Environmental authorisation process for the K6 shaft to undertake underground platinum mining
Responsibility	Environmental Scientist, project management, site audits, environmental training, environmental management progress reports
Year	2010

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<b>Client</b>	<b>Coca Cola</b>
Project	Source vulnerability assessment of freshwater for Coca Cola's factory in Bloemfontein
Responsibility	Environmental Scientist, research, report compilation
Year	2009
<b>Client</b>	<b>Simmer and Jack</b>
Project	Environmental authorisation process for an underground gold mine (historical Rietfontein Mine)
Responsibility	Environmental Scientist, project management, mining right application, compilation of Scoping Report, compilation of EIA/EMP report, specialist coordination, public participation
Year	2009
<b>Client</b>	<b>Simmer and Jack</b>
Project	Environmental authorisation process to open cast mining of surface deposits and heap leaching of mined ore (PTDs)
Responsibility	Environmental Scientist, project management, mining right application, compilation of Scoping Report, specialist coordination, public participation
Year	2009
<b>Client</b>	<b>Simmer and Jack</b>
Project	Environmental authorisation process for open cast mining of surface deposits and heap leaching of mined ore
Responsibility	Environmental Scientist, project management, mining right application, compilation of Scoping Report, compilation of EIA/EMP report, specialist coordination, public participation
Year	2009
<b>Client</b>	<b>Simmer and Jack</b>
Project	Environmental authorisation process for the underground mining of the historical Beta Mine
Responsibility	Environmental Scientist, project management, mining right application, compilation of Scoping Report, compilation of EIA/EMP report, specialist coordination, public participation
Year	2008 - 2009
<b>Client</b>	<b>Simmer and Jack</b>
Project	Environmental authorisation process for open cast mining of surface deposits and heap leaching of mined ore
Responsibility	Environmental Scientist, project management, mining right application, compilation of Scoping Report, compilation of EIA/EMP report, specialist coordination, public participation
Year	2008



Name:	Suzanne	Surname	Van Rooy
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<b>Client</b>	<b>Simmer and Jack</b>
Project	Environmental authorisation process for the heap leaching of an historical tailings dam (Glynn's Lydenburg)
Responsibility	Environmental Scientist, project management, mining right application, compilation of Scoping Report, compilation of EIA/EMP report, specialist coordination, public participation
Year	2008
<b>Client</b>	<b>Simmer and Jack</b>
Project	Environmental authorisation process for the rehabilitation of a historical tailings dams (Elandsdrift) by means of heap leaching
Responsibility	Environmental Scientist, project management, compilation of EIA/EMP report, specialist coordination, public participation
Year	2007

#### Recent Project Experience: Environmental Management Programme and Water Use Licence Audits

<b>Client</b>	<b>Anglo American Platinum</b>
Project	Amandelbult Water Use Licence Audit
Responsibility	Lead auditor, reporting
Year	2021
<b>Client</b>	<b>Anglo American Platinum</b>
Project	Der Brochen EMP Performance Assessment
Responsibility	Environmental Scientist, lead auditor, reporting, project management
Year	2016
<b>Client</b>	<b>Eskom</b>
Project	Lethabo Power Station Water Use Licence Audit
Responsibility	Environmental Scientist, auditor, reporting
Year	2012
<b>Client</b>	<b>Sasol Nitro</b>
Project	Sasol Nitro Phalaborwa Water Use Licence Audit
Responsibility	Environmental Scientist, auditor, reporting
Year	2011
<b>Client</b>	<b>Aquarius Platinum</b>
Project	Kroondal and Marikana Mines EMP Performance Assessment
Responsibility	Environmental Scientist, auditor, reporting
Year	2011
<b>Client</b>	<b>Aquarius Platinum</b>
Project	K6 Shaft EMP Performance Assessment
Responsibility	Environmental Scientist, auditor, reporting

Name:	Suzanne	Surname	Van Rooy
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Year	2010, 2012
<b>Client</b>	<b>Impala Platinum</b>
Project	Marula Platinum Annual EMP Audit
Responsibility	Environmental Scientist, auditor, reporting
Year	2010
<b>Client</b>	<b>Anglo American Platinum</b>
Project	Polokwane Metallurgical Complex Water Use Licence compliance audit
Responsibility	Environmental Scientist, auditor, reporting
Year	2010
<b>Client</b>	<b>Aquarius Platinum</b>
Project	Kroondal Mine EMP Performance Assessment
Responsibility	Environmental Scientist, auditor, reporting
Year	2009

### Recent Project Experience: Water Use Licences

<b>Client</b>	<b>Lebalelo Water User Association</b>
Project	SE2 pipeline and associated infrastructure
Responsibility	Water use licence application
Year	2021
<b>Client</b>	<b>Lebalelo Water User Association</b>
Project	Clapham Dam upgrades and associated infrastructure
Responsibility	Water use licence application
Year	2021
	<b>Isanti Glass</b>
Project	Water Use Licence Application for a natural gas pipeline
Responsibility	Environmental Scientist, project manager, water use licence application process
Year	2020
<b>Client</b>	<b>Anglo Operations (Pty) Ltd</b>
Project	General Authorisation for Elders Colliery
Responsibility	Project Manager
Year	2019
<b>Client</b>	<b>Anglo American Coal</b>
Project	General Authorisation for South African Coal Estates (SACE) Lifex Complex
Responsibility	Compilation of general authorisation report for the drilling of geochemical, geological and geotechnical boreholes
Year	2019
<b>Client</b>	<b>Optimum Coal</b>
Project	Updating of the existing Optimum Colliery's Integrated Water and Waste Management Plan

Name:	Suzanne	Surname	Van Rooy
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Responsibility	Environmental Scientist, compilation of an Integrated Water and Waste Management Plan
Year	2013
<b>Client</b>	<b>Imperial Properties</b>
Project	Preparation of a Water Use Licence Application for Imperial Properties' Kia Motor Vehicle Dealership
Responsibility	Environmental Scientist, Compilation of Water Use Licence Application, specialist coordination
Year	2011