



Hout Bay Cemetery Expansion onto Remainder Erf 1459, along Hughenden Street, Hout Bay, Cape Town, Western Cape Province

Environmental Management Programme

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	EMPR: Hout Bay Cemetery Expansion
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Abbreviations

BA	Basic Assessment
BAR	Basic Assessment Report
CA	Competent Authority
CoCT	City of Cape Town
DEA&DP	Department of Environmental Affairs and Development Planning
DFFE	National Department of Forestry Fisheries and the Environment
DWS	Department of Water and Sanitation
EA	Environmental Authorisation
EAP	Environmental Assessment Practitioner
EIA	Environmental Impact Assessment
EIRF	Environmental Incident Report File
ECO	Environmental Control Officer
EMPr	Environmental Management Programme
ESO	Environmental Site Officer
EWT	Endangered Wildlife Trust
GA	General Authorisation
GN	Government Notice
IDP	Integrated Development Plan
NEMA	National Environmental Management Act (Act No. 107 of 1998)
NFA	National Forests Act (Act No. 84 of 1998)
NWA	National Water Act (Act No. 36 of 1998)
OHS	Occupational Health and Safety
OHSA	Occupational Health and Safety Act (Act No. 85 of 1993)
PPP	Public Participation Plan
SE	Site Engineer
SuDS	Sustainable Drainage Systems
WUA	Water Use Authorisation
WUL	Water Use Licence
WULA	Water Use Licence Authorisation

1 Introduction

1.1 Background

Zutari (Pty) Ltd (hereafter referred to as Zutari) has been appointed by the City of Cape Town (CoCT) as the independent Environmental Assessment Practitioner (EAP) to undertake the application for Environmental Authorisation (EA) under the National Environmental Management Act, No. 107 of 1998 (NEMA) and its 2014 Environmental Impact Assessment (EIA) Regulations (General Notice R982 of 2014).

This project entails the extension of the existing Hout Bay Cemetery. The extension of the cemetery exceeds 2500 m², therefore the EA application follows the Basic Assessment (BA) process through the compilation of a Basic Assessment Report (BAR) and includes all required specialist studies, as identified by the National Environmental Screening Tool, to support the BAR.

The CoCT is facing a shortage of suitable and well-located burial space across the city. The Recreation and Parks Department is responsible for the provision of burial space within the CoCT. The department has identified certain parcels of land across the city which could potentially be developed into a cemetery. The Hout Bay cemetery is one of the identified cemeteries to be expanded. The expansion of the cemetery is proposed in response to the need for more cemeteries in Cape Town, which has limited appropriate land available for such utilisation.

This Environmental Management Programme Report (EMPr) has been prepared in accordance with Section 24N(2) and (3) of NEMA and forms part of the BAR submitted to the Competent Authority (CA) for approval.

1.2 Project description

The existing Hout Bay cemetery is located on erven RE/ 1460, RE/1461 and RE/1462, Hout Bay, Cape Town. It is proposed to extend the cemetery onto the adjacent RE 1459 (Erf 2596), located along Hughenden Street in Hout Bay, Cape Town. The project is referred to as the "Hout Bay Cemetery Expansion".

The proposed expansion of the cemetery will cover an area of approximately 8326 m² (0.8 hectares) and comprise of typical cemetery infrastructures such as, *inter alia*:

- Burial blocks
- Internal roads to be used as pathways for pedestrians and for vehicle access, if required.
- Parking provided by the existing parking area and new parking area to be allocated on the extension site.
- New guard house with controlled security access
- Church
- Ablution facilities
- Stormwater infrastructure
- Fencing

The cemetery will include a staff facility (guard house), toilets and parking area to ensure that the cemetery is sensitive to the sense of place of the surrounding area. Vehicular access to the extended cemetery will be from Hughenden Street. The burial site electrical, sewer and water infrastructure will tie into the existing municipal infrastructure.

Refer to Figure 1 indicating the location of the site and Figure 2 for the site layout plan. The enlarged site layout plan is attached as Annexure 3 for better legibility.

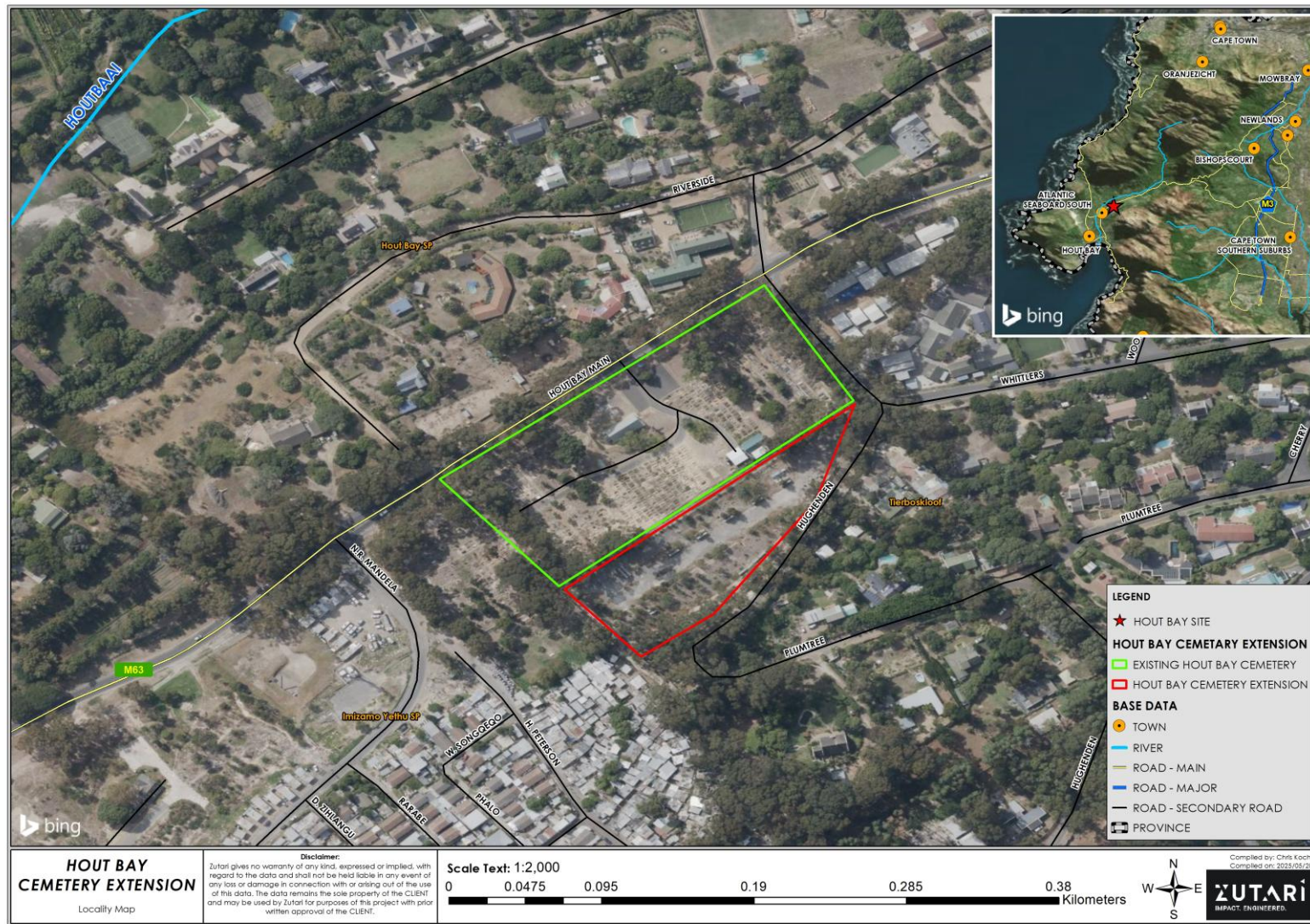


Figure 1: Hout Bay Cemetery Expansion Locality Plan



Figure 2: Hout Bay Cemetery Expansion Site Preliminary Layout Plan

2 Purpose of the EMPr

The EMPr has been included as an appendix to the BAR to provide a link between the impacts identified in the Basic Assessment Process (undertaken in terms of the EIA Regulations (Government Notice no. R. 982 of 2014) and the actual environmental management on the ground during project implementation and operation. It is highly unlikely that the cemetery would be decommissioned in future, and as such, this EMPr does not include mitigation measures relating to decommissioning. The purpose of this document is to provide for environmental management throughout the various life-cycle stages of the proposed development, including:

- ▶ Planning and design;
- ▶ Pre-construction and construction; and
- ▶ Operation.

The EMPr is a working document which the proponent (the holder of the EA for the project, if granted) and any of their consultants and contractors must refer to during implementation phases of the project and against which their environmental performance must be appraised.

Note that this EMPr should remain flexible to accommodate changes in project planning. However, the Department of Environmental Management and Development Planning (DEA&DP) must be notified of any significant changes or deviations through the appropriate EMPr amendment procedures outlined in the EIA Regulations, 2014. Such notification must include motivation/justification for the deviation and provide DEA&DP the opportunity to review and comment on the amended conditions of the EA and the EMPr. Significant deviations may require an amendment to the EA, which involves following a specific set of procedures outlined in Regulations 27 – 33 of the EIA Regulations, 2014.

3 Legal requirements for an EMPr

Appendix 4 of the NEMA EIA Regulations 2014 (as amended) specifies the requirements of an EMPr. The table below serves as a guide to how the requirements detailed in Appendix 4 have been adhered to:

Table 1: Requirements of an Environmental Management Programme (EMPr) as detailed in Appendix 4 of the NEMA EIA Regulations 2014 (as amended).

Fines	Requirement	Reference
1(a)	(i) details of the EAP who prepared the EMPr; and	Section 4.3
	(ii) details of the expertise of that EAP to prepare an EMPr, including a curriculum vitae	Annexure 1
1(b)	a detailed description of the aspects of the activity that are covered by the EMPr as identified by the project description;	Section 1.2 and Section 2
1(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;	Section 1.2 and Annexure 2
1(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 environmental impact assessment process for all phases of the development, including -	Sections 4, 5 & 6
	(i) (i) planning and design;	Section 5
	(ii) (ii) pre-construction activities;	Section 5
	(iii) (iii) construction activities;	Section 5
	(iv) (iv) rehabilitation of the environment after construction and, where applicable, post closure;	Sections 5 & 6
	(v) (v) where relevant, operational activities;	Section 5

1(e)	a description and identification of impact management outcomes required for the aspects contemplated in paragraph (d)	Sections 5 & 6
1(f)	a description of proposed impact management actions, identifying the manner in which the impact management objectives and outcomes contemplated in paragraphs (d) and (e) will be achieved, and must, where applicable, include actions to -	Sections 5 & 6
	(i) avoid, modify, remedy, control or stop any action, activity or process which causes pollution or environmental degradation;	Sections 5 & 6
	(ii) comply with any prescribed environmental management standards or practices;	Sections 5 & 6
	(iii) comply with any applicable provisions of the Act regarding closure, where applicable; and	N/A
	(iv) comply with any provisions of the Act regarding financial provisions for rehabilitation, where applicable;	N/A
1(g)	The method of monitoring the implementation of the impact management actions contemplated in paragraph (f);	Sections 5 & 6
1(h)	the frequency of monitoring the implementation of the impact management actions contemplated in paragraph (f)	Sections 5 & 6
1(i)	an indication of the persons who will be responsible for the implementation of the impact management actions;	Sections 5 & 6
1(j)	the time periods within which the impact management actions contemplated in paragraph (f) must be implemented;	Sections 5 & 6
1(k)	the mechanism for monitoring compliance with the impact management actions contemplated in paragraph (f);	Sections 5 & 6
1(l)	a program for reporting on compliance, taking into account the requirements as prescribed by the Regulations;	Section 4
1(m)	an environmental awareness plan describing the manner in which -	Section 5
	(i) the applicant intends to inform his or her employees of any environmental risk which may result from their work; and	Section 5
	(ii) risks must be dealt with in order to avoid pollution or the degradation of the environment; and	Section 5
1(n)	any specific information that may be required by the competent authority.	None to date.

The Department of Environmental Affairs & Development Planning's (DEA&DP¹) *Guideline for Environmental Management Plans* (2005) aims to inform and guide the preparation and implementation of EMPs. The requirements outlined within the guideline, as well as the requirements specified in Appendix 4 of the EIA Regulations 2014 (as amended) (Table 1 above) have been considered in compiling this document. The DEA&DP guideline defines EMPs as:

“an environmental management tool used to ensure that undue or reasonably avoidable adverse impacts of the construction, operation and decommissioning of a project are prevented; and that the positive benefits of the project are enhanced”

The EMP must address the potential environmental impacts of the proposed activity on the environment throughout the project life-cycle including an assessment of the effectiveness of monitoring and management arrangements after implementation. The Department requires that the EMP be submitted together with the Assessment Report so that it can be considered simultaneously.

This document should be seen in an iterative context allowing for amendments throughout the life-cycle of the project, allowing for adjustments as new information is made available, unforeseen situations arise or conditions warrant adaptation.

Sections 24N (2) and (3) of the NEMA listing the requirements of an EMP are given in Table 2.

Table 2: Section 24N (2) and (3) of the NEMA, listing the requirements of an EMP.

- 24N.(2)** *the environmental management programme must contain-*
- (a) *information on any proposed management, mitigation, protection or remedial measures that will be undertaken to address the environmental impacts that have been identified in a report contemplated in subsection 24(1A), including environmental impacts or objectives in respect of –*
 - (i) *planning and design;*
 - (ii) *pre-construction and construction activities;*
 - (iii) *the operation or undertaking of the activity in question;*
 - (iv) *the rehabilitation of the environment; and*
 - (v) *closure, where relevant.*
 - (b) *details of –*
 - (i) *the person who prepared the environmental management programme; and*
 - (ii) *the expertise of that person to prepare an environmental management programme*
 - (c) *a detailed description of the aspects of the activity that are covered by the draft environmental management plan;*
 - (d) *information identifying the persons who will be responsible for the implementation of the measures contemplated in paragraph (a);*
 - (e) *information in respect of the mechanisms proposed for monitoring compliance with the environmental management programme and for reporting on the compliance.*
 - (f) *as far as is reasonably practicable, measures to rehabilitate the environment affected by the undertaking of any listed activity or specified activity to its natural or predetermined state or to a land use which conforms to the generally accepted principle of sustainable development; and*
 - (g) *a description of the manner in which it intends to*
 - (i) *modify, remedy, control, or stop any action, activity or process which causes pollution or environmental degradation;*
 - (ii) *remedy the cause of pollution or degradation and mitigation of pollutants; and*
 - (iii) *comply with any prescribed environmental management standards or practices.*
- (3)** *the environmental management programme must, where appropriate-*
- (a) *set out time periods within which the measures contemplated in the environmental management programme must be implemented;*
 - (b) *contain measures regulating responsibilities for any environmental damage, pollution, pumping and treatment of extraneous water or ecological degradation as a result of prospecting or mining operations or related mining activities which may occur inside and outside the boundaries of the prospecting area or mining area in question; and*
 - (c) *develop an environmental awareness plan describing the manner in which-*
 - (i) *the applicant intends to inform his or her employees of any environmental risk which may result from their work; and*
 - (ii) *risks must be dealt with in order to avoid pollution or the degradation of the environment.*

3.1 NEMA Listed Activities

The NEMA provides the framework for environmental decision-making in the country, and specifically, the EIA Regulations (2014) serve as the instrument through which development decisions are made. South Africa has rigorous and comprehensive environmental legislation aimed at preventing degradation of the environment. Section 28(1) of NEMA places a “*duty of care and remediation of environmental damage*” on every person who causes, has caused, or may cause significant environmental degradation. This is a far-reaching obligation, and accordingly, those parties responsible for the degradation of the environment have a legal duty to avoid, minimise or mitigate such impacts.

This has resulted in a set of Listed Activities that can be triggered by developments of a certain nature and/or taking place in sensitive environments, e.g., close to watercourses. Table 3 below contains the listed activities applicable to this project.

Table 3 Potential listed activities and motivation in reference to potential applicability

Activity No(s):	Basic Assessment Activity(ies) as set out in Listing Notice 1	Describe the portion of the proposed development to which the applicable listed activity relates.
44	The expansion of cemeteries by 2 500 square metres or more.	The project is the expansion of the Hout Bay cemetery. The approximate area of the proposed cemetery is 8326m ² (0.8ha).
Activity No(s):	Provide the relevant Basic Assessment Activity(ies) as set out in Listing Notice 3	Describe the portion of the proposed development to which the applicable listed activity relates.
12	Activity 12 – The clearance of an area of 300 square meters or more of indigenous vegetation except where such clearance of indigenous vegetation is required for maintenance purposes undertaken in accordance with a maintenance management plan. i. Western Cape i. <u>Within any critically endangered or endangered ecosystem listed in terms of section 52 of the NEMBA or prior to the publication of such a list, within an area that has been identified as critically endangered in the National Spatial Biodiversity Assessment 2004;</u> ii. Within critical biodiversity areas identified in bioregional plans; iii. Within the littoral active zone or 100 metres inland from high water mark of the sea or an estuarine functional zone, whichever distance is the greater, excluding where such removal will occur behind the development setback line on erven in urban areas; iv. <u>On land, where, at the time of the coming into effect of this Notice or thereafter such land was zoned open space, conservation or had an equivalent zoning;</u> or v. On land designated for protection or conservation purposes in an Environmental Management Framework adopted in the prescribed manner, or a Spatial Development Framework adopted by the MEC or Minister.	The extension is proposed for a site of approximately 8,326 square meters. Although the site is currently degraded, it contains both cleared and vegetated areas. The site is located within the Critically Endangered Peninsula Granite Fynbos vegetation type. Therefore, despite its degraded state, the development will involve the clearance of more than 300 m² of this Critically Endangered Peninsula Granite Fynbos. The DEA&DP confirmed in their response to the submitted Notice of Intent (NOI) that this activity requires authorisation.

3.2 National Water Act (NWA, 1998)

The Department of Water and Sanitation (DWS) is the custodian of South Africa's water resources and therefore assumes public trusteeship of water resources, which includes watercourses, surface water, estuaries, and aquifers. The National Water Act (Act No. 36 of 1998) (NWA) aims to protect water resources through:

- ▶ The maintenance of the quality of the water resource to the extent that the water resources may be used in an ecologically sustainable way;
- ▶ The prevention of the degradation of the water resource;
- ▶ The rehabilitation of the water resource;
- ▶ A watercourse means;
 - A river or spring;
 - A natural channel in which water flows regularly or intermittently;
 - A wetland, lake or dam into which, or from which, water flows; and
 - Any collection of water which the Minister may, by notice in the Gazette, declare to be a watercourse, and a reference to a watercourse includes, where relevant, its bed and banks.

No activity may take place within a watercourse unless it is authorised by the DWS. According to Section 21 (c) and (i) of the NWA, a WUL is required for any activities that impede or divert the flow of water in

a watercourse or alter the bed, banks, course or characteristics of a watercourse. The regulated area of a watercourse for section 21(c) or (i) of the NWA water uses means:

- a. *The outer edge of the 1 in 100-year flood line and/or delineated riparian habitat, whichever is the greatest distance, measured from the middle of the watercourse of a river, spring, natural channel, lake or dam;*
- b. *In the absence of a determined 1 in 100-year flood line or riparian area, the area within 100 m from the edge of a watercourse where the edge of the watercourse is the first identifiable annual bank fill flood bench (subject to compliance with section 144 of the Act); or*
- c. *A 500 m radius from the delineated boundary (extent) of any wetland or pan.*

Water uses that occur within the regulated area of a watercourse must be assessed using the DWS Risk Assessment Matrix prescribed in GN R 509 of 2016² to determine whether activities may be approved under a General Authorisation (GA) or Water Use Licence (WUL):

- ▶ GA – this applies to Low-risk activities according to the Risk Assessment Matrix, or
- ▶ WUL – this applies to Medium or High-risk activities according to the Risk Assessment Matrix.

Although the proposed development is located within 500 metres of a watercourse, it has been classified as a low-risk activity with no significant direct impact on groundwater or surface water resources. The DWS has concluded that the project does not constitute a water use under the NWA and therefore does not require a Water Use Authorisation (WUA).

4 Project Team

The City of Cape Town is the applicant for the application and landowner for RE 1459 (Erf 2596).

4.1 Applicant

CITY OF CAPE TOWN	
Civic Centre, 12 Hertzog Boulevard Cape Town 8001	Siraaj Slamang Tel: (021) 400 3281 (landline) Email: Siraaj.slamang@capetown.gov.za

4.2 Competent authority

This EMPr is being submitted to the following competent authority for authorisation.

DEPARTMENT OF ENVIRONMENTAL AFFAIRS AND DEVELOPMENT PLANNING (DEA&DP)
Department Environmental Affairs and Development Planning City of Cape Town Civic Centre 12 Hertzog Boulevard Cape Town 8001

² General Authorisation in terms of Section 39 of the National Water Act, 1998 (Act No. 36 of 1998) for Water Uses as defined in Section 21(c) or Section 21(i).

4.3 Environmental Assessment Practitioner

Zutari has selected a team of experienced specialists and multi-disciplinary practitioners to execute this project in a professional manner. Please refer to Table 1 2 - Table 1 5 for the project team. Full CVs of the EAP and Project Management team are available in Annexure A. Specialist CVs are included in the respective specialist reports in Annexure D.

ZUTARI (PTY) LTD	
Ms Xanté Eberhardt Registered EAP (Reg no. 2021/3103)	XANTÉ EBERHARDT is a professional registered environmental assessment practitioner and project manager with more than 14 years' experience. Xanté has completed several project management courses to enhance her project management skills and has played an integral role in the project management of several projects. Activities have included report writing, client liaison, budget, resource management and time management. She has successfully applied for environmental authorisations for several projects, as well as assisted with the motivation for non-environmental impact assessment (EIA) letters from the relevant authorities. She has also completed a course in procurement and was responsible for handling all procurement for Zutari's North-West offices, where her duties included tender compilation and evaluation for clients, as well as tendering for new projects. Xanté obtained a Bachelor of Science Honours in Environmental Sciences and Management from the North-West University in 2009. She is also an Environmental Assessment Practitioner (EAP) with the Environmental Assessment Practitioners Association of South Africa (EAPASA) and a member of the International Association for Impact Assessment South Africa (IAIASa). In 2013, Xanté was elected to be on Zutari's Skills Development and Employment Equity Forum.
Ms Margaret Phiri Registered EAP (Reg no. 2023/7270)	TISETSO MARGARET PHIRI is a professional registered environmental assessment practitioner with 6 years of experience in environmental consulting and an environmental control officer related projects. She has been appointed as an environmental consultant and also has expertise in undertaking Integrated Water Use License Applications (IWULA). Margaret has expertise in environmental impact assessments (EIAs); water use license applications (WULAs); environmental management programmes (EMPrs); environmental monitoring, compliance and enforcement, and related water quality monitoring (ground and surface); environmental and social impact assessment (ESIAs); environmental and social due diligence (ESDD); Part 1 and Part 2 Environmental Authorisation (EA) amendment applications; and Water Use Licence (WUL) amendment applications. She also has academic and corporate experience in Geographical Information System (GIS). Margaret holds a Master of Science (MSc) in Environmental Management from the University of Johannesburg. She is registered as a professional Environmental Assessment Practitioner (EAP) with the Environmental Assessment Practitioners' Association of South Africa (EAPASA registration no. 2023/7270) and as a professional Natural Scientist with the South African Council for Scientific Natural Professions (SACNASP).

	registration no. 123524). Additionally, she is a member of the International Association for Impact Assessment South Africa (IAIAsa member no. 7608) and the Institute of Waste Management of Southern Africa (IWMSA member no. 10124825).
Ms Tanushri Govender	TANUSHRI GOVENDER has approximately 2 years of experience as an environmental scientist at Zutari.
Registered Candidate EAP (Reg no. 2024/8429)	Tanushri has worked on several projects including Water Use Licence Applications (WULAs), Basic Assessment Reports (BARs), Maintenance Management Plans (MMPs) and has acted as Environmental Control Officer on several projects. Tanushri obtained a Master of Science in Environmental and Water Science from the University of the Western Cape in 2022. She is registered as a Candidate Environmental Assessment Practitioner (EAP) with the Environmental Assessment Practitioners Association of South Africa (EAPASA).

5 Project Phasing

5.1 Pre-construction

The pre-construction phase includes activities such as:

- ▶ Pre-construction monitoring;
- ▶ Appointment of the contractor/consultants;
- ▶ Contractor develops code of conduct for employees;
- ▶ Appointment of an Environmental Control Officer (ECO) and the relevant contractors and consultants;
- ▶ Pre-construction environmental workshop/induction training of all employees;
- ▶ Site demarcation;
- ▶ Establishment of a site camp;
- ▶ Demarcation of areas such as fuel areas and plant rescue (when applicable);
- ▶ Finalising of detailed design;
- ▶ Finalisation of any additional management and monitoring plans.

5.2 Construction

The construction phase commences with earthworks and thereafter includes all activities relating to the construction of the proposed development.

This phase includes commissioning contractors/subcontractors to site; establishment of internal access roads and construction roads; transportation of equipment; materials and components to the site; establishment of workshops, materials storage areas, waste areas, temporary laydown areas and equipment camps; earthworks and bulk services construction (where required).

5.3 Operation (includes rehabilitation of the environment after construction)

The operational phase commences when the proposed development is used for its intended purposes.

Site rehabilitation will be implemented to prepare the site for operations. Construction materials, equipment and waste will be removed from the site and rehabilitation will take place. Some of the rehabilitation will be undergoing throughout the operation phase, for example revegetation of cleared areas and maintenance of landscaped areas.

5.4 Decommissioning

The decommissioning phase refers to the demolition of the development, should that ever be necessary. As mentioned, it is highly unlikely that the cemetery would be decommissioned in future, and as such, this EMPr does not include mitigation measures relating to decommissioning.

Decommissioning usually takes place many years after the commencement of the operational phase. Should the cemetery reach closure, it is essential for the applicant or the person responsible for environmental management and compliance monitoring at that time to contact the CA to determine the legal requirements before starting the decommissioning process.

6 Implementation of the EMPr

6.1 Roles and responsibilities during the construction phase

6.1.1 Applicant / Proponent

The Proponent/Applicant refers to the holder of the Environmental Authorisation (EA) who will assume overall responsibility for the administration and implementation of the EA and EMPr. The Proponent will be responsible for the following tasks, amongst others:

- ▶ Ensure that all conditions of approval as contained in the EA are adhered to;
- ▶ Ensure that the requirements as set out in this EMPr are adhered to and implemented;
- ▶ Ensure all authorisations, permits, consents are in place and any other legal requirements are settled before any action is undertaken that requires these to be in place;
- ▶ Provide resources and appoint external contractors as required for the implementation of this EMPr;
- ▶ Review and update the EMPr to include relevant conditions of the EA (if applicable) or where necessary;
- ▶ Provide all principal contractors working on the project with a copy of this EMPr as part of tender contract documentation to allow the contractors to cost for their requirements within their respective construction contracts; and
- ▶ Ensure close liaison with local municipal managers, local councillors and other stakeholders involved in socio-economic development to ensure that the project is integrated into wider socio-economic development strategies and plans for the area.

6.1.2 Site Engineer (SE) and/or Contract Manager

The term “Engineer” in the context of the EMPr refers to the company or companies so named in the Contract Data, whose function it is to administer the Contract as an agent to the Proponent. The term “Engineer” may also refer to “Employer’s Agent” or “Project Manager” depending on the construction contract.

The Contract Manager is a natural person nominated by the Engineer, who shall observe the execution of the Works, examine and test materials and workmanship, and deliver and receive communications

to/from the Contractor. “Contract Manager” may also refer to “Employer’s Agent Representative” or “Supervisor”, depending on the construction contract.

The role of the Site Engineer and/or Contract Manager, pertaining to environmental matters, may include:

- ▶ Acting as an agent to the Proponent on matters relating to the environment, and compliance with the EMPr;
- ▶ Ensure compliance and monitoring of all Health, Safety and Environmental aspects as they relate to the project and in accordance with the relevant legislation.
- ▶ Receive and review ECO Reports, ensure that issues raised in these reports are addressed and report them to management as required;
- ▶ Approving, in consultation with the ECO, the Contractor’s Method Statements required in terms of the EMPr;
- ▶ Ensuring that the Contractor is well-versed in the contents of the EMPr and that their conduct is proactive and effective in terms of environmental management and protection measures;
- ▶ Ensuring the Contractor is aware of its responsibilities in terms of the EMPr, including (but not limited to):
 - Appointing an environmental officer/s to assist with the EMPr implementation.
 - Maintaining a register of public complaints, a record of how these are responded to and the timeframe provided for this.
 - Supporting the ECO in their role and responsibilities.
- ▶ Issue instructions to cease work where such an instruction is warranted; and
- ▶ Issuing relevant fines or disciplinary action that may be applicable.

6.1.3 Contractor

The Contractor must ensure that all of its sub-contractors, employees, etc., are fully aware of the environmental issues detailed in this EMPr. The Contractor shall liaise closely with the SE/Contract Manager and the ECO and must ensure that the works on site are conducted in an environmentally sensitive (prevent actions that may cause environmental harm) and safe manner and in accordance with the requirements of the EMPr, at all times.

The contractor must ensure compliance of all site personnel/visitors to the EMPr and other conditions of the EA, where relevant.

6.1.4 Environmental Control Officer (ECO)

The Applicant shall appoint a suitably qualified and independent Environmental Control Officer (ECO) to monitor the Contractor’s compliance in terms of this EMPr and the conditions of the EA and address environmental site issues. The ECO shall work in close relation with the Contractor’s appointed Environmental Site Officer (ESO). The ECO must be a suitably qualified (National Diploma / Degree in Natural Science or an equivalent qualification), independent environmental manager, with adequate environmental knowledge to understand and monitor the implementation of the EMPr and must be knowledgeable in licencing and permitting requirements (issued and required) applicable to the site.

The duties of the ECO include, but are not limited to:

- ▶ Liaison with the Applicant/Proponent, Site Engineer and/or Contract Manager and DEA&DP;
- ▶ Conduct environmental induction training with the contractor prior to commencement of work;
- ▶ Undertake routine monitoring of the Contractor’s activities for compliance with the various environmental requirements contained in the EMPr, any specific conditions of authorisation contained in the EA, and per the ECO Schedule in Section 6.2.1, including:

- Compilation of ECO Reports on the findings of the inspections, as well as on any emergency or unforeseen situations in which the expertise of the ECO has been consulted; and
 - Submission of ECO reports to the project team, DEA&DP and the Applicant/Proponent (or any other authority/body deemed necessary by the project team);
- ▶ Attendance of relevant site meetings with the engineer, contractor and other relevant project team members at least once a month or as may be required, depending on circumstances or any issues that need to be discussed;
 - ▶ Conduct and/or oversee environmental induction and awareness training with the Contractor and staff;
 - ▶ Monitoring compliance with the various environmental conditions/requirements contained in the EA and EMPr (refer to Section 6.2 for Compliance Monitoring);
 - ▶ Review the Contractor's Method Statements (from an environmental perspective) required in terms of this EMPr, prior to the proposed activities taking place;
 - ▶ Encourage the proactive and effective implementation and management of environmental protection measures;
 - ▶ Monitoring that the appropriate remedial action is implemented in the event of non-compliance and capturing proof of such in the subsequent ECO Report;
 - ▶ Monitor that a register of public complaints is maintained by the Contractor and that any and all public comments or issues are appropriately and timeously reported and addressed;
 - ▶ Recording and reporting of environmental incidents;
 - ▶ Consult with the SE/Contract Manager and Contractor should any non-compliances meriting a potential 'stop-work' instruction be observed;
 - ▶ Providing ad-hoc environmental advice, including opinions on environmental legal requirements, to the Proponent and the Contractor regarding issues that may arise during the Contract; and
 - ▶ Assist the contractor with obtaining other environmental permits, should any be outstanding.

6.1.5 Competent Authority

DEA&DP is the competent authority responsible for issuing the EA and compliance with the conditions of authorisation contained in the EA and relevant environmental legislation. Its responsibilities include, amongst others:

- ▶ Overall enforcement of the EA and its conditions of authorisation;
- ▶ Review the EMPr and any required updates or revisions;
- ▶ Undertake compliance inspection site visits, if deemed necessary;
- ▶ Review ECO and audit reports;
- ▶ Review incident reports; and
- ▶ Enforcement of the legal mechanisms, should any contraventions of the EMPr or EA occur.

6.2 Compliance Monitoring & Reporting

6.2.1 ECO Schedule

Routine Compliance Inspections and Reports:

The Contractor shall allow the ECO (and any officials from DEA&DP, should the need arise) access to the site for the purposes of compliance monitoring. The ECO shall undertake routine monitoring of the Contractor's activities for compliance with the various environmental requirements contained in the EMPr, including but not limited to:

- ▶ Undertaking routine compliance inspections monthly for the duration of construction, or at the defined intervals as provided in the conditions of the EA if these are more frequent.

- ▶ Documenting the findings of each of the inspections. This may take the form of a diary entries, a checklist, a report or similar, but must include dated photographic evidence of any identified issues (where possible). Any findings of non-compliance must be clearly communicated to the Contractor, together with timeframes for the implementation of remedial action and close out.
- ▶ Weekly ECO inspection visits during the initial clearing and earthwork activities and a report that summarises the findings of the compliance inspections. The weekly inspections can be moved to monthly at the discretion of the ECO, but it is anticipated that weekly inspections would be required for the first month of clearing and earth moving activities.
- ▶ Monthly site visits during the construction period and a report that summarises the findings of the compliance inspections undertaken, as well as progress on any remedial action that was required during the month in question. In the event of non-compliance, the report may include:
 - Relevant/supporting documentation or evidence of the non-compliance (e.g. minutes of any meetings held to discuss the non-compliance, email/written correspondence on the matter, dated photographic evidence);
 - Remedial action required to remedy non-compliance or prevent repeat occurrences, including responsible persons and deadlines for such action;
 - Dates of eventual compliance or close-out by the Contractor on previous non-compliance findings.
- ▶ Making reports available to the Contract Manager and the Contractor, and to DEA&DP on request.
- ▶ Participating in at least one monthly progress meeting with the project team, including the Contract Manager, the Contractor, and the ESO (or their representatives), or submitting monthly reports as required.

Environmental Emergencies, Incidents or Events:

Should there be environmental emergencies or incidents, then the ECO may also elect to inspect the site. The ECO shall ensure that any entries in the Environmental Incident Report File and Complaints Register are tabled at the monthly progress meeting and appropriately addressed.

6.2.2 Disciplinary Action, Penalties and Fines

Where a transgression occurs for any reason (including negligence, disregard for the requirements of the EMP, or ignoring instruction from the ECO, SE/Contract Manager or Competent Authority), this could result in disciplinary action (e.g. a time penalty or a monetary fine, withholding payment certificates if in accordance with the terms of Contract, or legal action). The terms of the Contract shall include mechanisms for disciplinary action (such as the issuing of penalties and fines), and the recovery of any monies due (including for any remedial costs where these were borne by a third party). The construction terms of the contract will dictate the terms of any disciplinary actions.

6.3 Environmental Incident Report File

The Contractor shall maintain an Environmental Incident Report File (EIRF) on site to document environmental incidents, emergencies or accidents occurring as a result of the construction activities, and any resulting action taken to remedy the harm, and/or prevent repeat occurrences.

- ▶ The EIRF must have numbered pages. Any missing pages must be accounted for by the Contractor.
- ▶ Entries made shall be tabled during monthly site meetings.
- ▶ The EIRF shall be made available to the SE/Contract Manager, the ECO, the Project Company, and/or any authority at any time if requested.

The EIRF must document:

- ▶ The exact nature and root cause of the environmental incident;

- ▶ Evidence (e.g. photos) of the nature of the incident;
- ▶ The management team or contractor responsible for the activity;
- ▶ The timing and duration of the event;
- ▶ Witnesses to the event; and
- ▶ The exact response action applied, including a list of those notified of the incident.

The Contractor shall ensure that the environmental incidents and resulting actions are recorded in the EIRF and that these are brought to the attention of the ECO as soon as practically possible. The procedure for dealing with an environmental incident shall include that:

- ▶ The EIRF is to be filled in by the ESO in the event of an environmental incident or emergency.
- ▶ The ESO is to immediately inform the Contractor and ECO of any environmental emergency for a decision on remedial action. However, the inability of the ESO to contact the Contractor or ECO shall not be a reason for withholding immediate remedial action where the ESO judges this to be necessary.
- ▶ The ECO shall document all incidents/emergencies in the monthly compliance report, together with the remedial action taken, as described in the EIRF.
- ▶ The ECO shall monitor that the necessary procedures and responses are followed by the Contractor to close out any entries in the EIRF within the specified timeframe.
- ▶ Once an incident or emergency has been adequately addressed to the satisfaction of the ECO, the ESO may close out the entry in the EIRF.

6.4 Complaints Register

The Contractor shall keep a Complaints Register on site to allow the general public to document any comments on or complaints regarding the activities of the site:

- ▶ The Complaints Register must have numbered pages. Any missing pages must be accounted for by the Contractor.
- ▶ Entries made shall be tabled during monthly site meetings.
- ▶ The Complaints Register shall be made available to the SE/Contract Manager, the ECO, the Project Company, and/or any authority at any time if requested.

The Complaints Register shall include a section for the documentation of the action taken to address the complaint. The procedure for dealing with public complaints shall include:

- ▶ All complaints shall be investigated, and a response shall be given to the complainant within 28 calendar days;
- ▶ The ESO shall document the action taken to investigate and address (if required) the complaint, as well as the response given (including timeframes);
- ▶ The ECO shall monitor that the complaints have been responded to; and
- ▶ The ECO shall ensure that any public issues have been brought to the attention of the relevant authorities by the Contractor if so required, and appropriately addressed.

6.5 Method Statements

An environmental Method Statement is a written submission by the Contractor to the SE/Contract Manager, to the satisfaction of the ECO, in response to a condition of approval and/or a requirement of the EMP, or a request by the ECO or SE/Contract Manager. The Method Statement describes the plant, materials, labour and method that the Contractor proposes to use to carry out an activity, in such detail that the SE/Contract Manager and ECO are able to assess whether the Contractor's proposal is in accordance with the Scope of Work and/or will produce results in accordance with the EMP.

Method Statements are required in terms of this EMP (either specified below, or for any activities that are proposed as variations to the standard construction practices detailed or referred to in the Contract Documents, or for any activities requiring special attention as specified in this EMP and/or requested

by the ECO or SE/Contract Manager as well as any requirements of permits or licenses such as a Water Use License).

The Contractor shall not commence any activity until the Method Statement in respect thereof has been approved and shall, except in the case of emergency activities, allow a period of one week for consideration of the Method Statement by the SE/Contract Manager and ECO. Changes may be requested if the proposal does not comply with the specification or if, in the reasonable opinion of the SE/Contract Manager and/or ECO, the proposal may result in, or carries a greater than reasonable risk of, damage to the environment more than that permitted by the EMPr.

Approval of the Method Statement shall not absolve the Contractor from any of his obligations or responsibilities in terms of the Contract.

Approved Method Statements shall be readily available on the site and shall be communicated to all relevant personnel. The Contractor shall carry out the works in accordance with the approved Method Statement.

If changes to the original approved Method Statements are proposed, amended Method Statements shall be submitted to the ECO for approval.

6.5.1 Required Method Statements

The following required Method Statements (as relevant and if not already required in terms of the Contract) are to be provided and approved prior to the Contractor's arrival on site:

- ▶ **Emergency preparedness** – which shall address procedures and equipment for medical emergencies, runaway fires, environmental incidents, site evacuation and staff assembly.
- ▶ **Site establishment** – which shall address Contractor's camp/s, lay-down or storage areas, site access and required infrastructure.
- ▶ **Ablution facilities** – which shall address washing facilities (including methods for managing grey water) and toilets (including the number of, location and method of securing portable/chemical toilets to the ground (if not trailer versions), the proposed service providers to remove and dispose of resultant waste and their service schedule).
- ▶ **Hazardous Chemical Substances** (as defined in the Regulations for Hazardous Chemical Substances in GN 179 (25 August 1995)), hydrocarbon substances (which include all fuels and oils) or dangerous goods to be used, which shall address the storage, handling and disposal procedures of the materials.
- ▶ **Hydrocarbon spills** – which shall address the procedures, reporting and training required to address accidental spills.
- ▶ **Concrete Mixing and batching plants** – which shall address locations, bunding, and cement-laden water management.
- ▶ **Waste Management** – which shall address the type of waste anticipated; the storage, handling, reuse, recycling and/or disposal procedures proposed, together with the facilities proposed to receive such waste.

The following required Method Statements (where relevant and if not already required in terms of the Contract) must be provided at least 14 calendar days prior to the commencement date of the subject works or activity:

- ▶ No-Go area demarcation and access control within the approved development site/servitudes;
- ▶ Workshop and plant servicing;
- ▶ Vegetation clearing – including methods and areas for clearing and felling;
- ▶ Stockpile management – including proposed locations and erosion management; and
- ▶ Working in watercourses or wetlands - access, crossings, dewatering activities.

6.5.2 Additional Method Statements (on request)

Method Statements may also be requested by the ECO or SE/Contract Manager as the need arises. The Contractor shall submit additional Method Statements that arise within such reasonable time as the ECO or SE/Contract Manager shall specify.

6.5.3 Content

Method Statements shall include the following:

- Who:** Nominated representative and their assigned responsibilities (in relevant instances).
- What:** A brief description of the activity to be undertaken (and in relevant instances, the proposed variation from or deviation to the Contract Documentation, or this EMPr).
- How:** A detailed description of the work, methods, materials, or process proposed (and in relevant instances any reinstatement/rehabilitation requirements).
- Where:** A description/sketch map of the locality of work or layout proposed.
- When:** The sequencing of actions with due commencement dates and completion date estimates.

The Contractor (and, where relevant, applicable subcontractors) must sign Method Statements to confirm their understanding of its requirements and commitment to their implementation.

6.6 Environmental Awareness training and staff induction

The Contractor shall ensure that all staff receive site environmental awareness and staff induction training in appropriate languages, as well as any refresher courses, pertaining to their role on the project, including:

- ▶ All personnel (including subcontractors) shall receive induction training on the Code of Conduct and project-specific environmental awareness relating to the conditions of the EA and EMPr prior to commencing construction.
- ▶ All personnel shall receive induction training on the emergency procedures to be followed in the event of an emergency (e.g. staff assembly and site evacuation, medical emergencies, the locations and basic use of fire extinguishers, first aid kits and spills kits, and the use of safety equipment (where relevant)).
- ▶ All personnel (including subcontractors) shall receive regular toolbox talks and refresher courses on the induction material, and project-specific environmental awareness for the duration of the contract, including “lessons learnt” to prevent recurring issues.

The SE/Contract Manager and Contractor will conduct environmental induction training with personnel and must address, amongst others:

- ▶ Explanation of the environmental process that preceded the EA and why it was important to conduct the environmental process;
- ▶ Explanation of the conditions of authorisation contained in the EA;
- ▶ The sensitive environmental features located within and around the site;
- ▶ The reasons why mitigation measures are required and the benefits of implementing these measures;
- ▶ The EMPr and its contents (e.g. no-go areas, animals, littering, etc.); and
- ▶ The role of the ECO.

6.7 Temporary site closure

If the site is closed for a period exceeding one week during the construction or decommissioning phase, the Contractor, in consultation with the ECO, shall carry out the following checklist procedure.

- ▶ Hazardous materials stores
 - Outlet secure/locked
 - Bund(s) empty (where applicable)
 - Fire extinguishers serviced and accessible
 - Emergency and responsible personnel contact details are displayed on site
 - Adequate ventilation in hazardous substance stores
- ▶ Safety
 - All trenches and manholes secured and closed
 - Fencing and barriers in place
 - Material packs (e.g. pile of pipes) secured
 - Access gates locked and secured
- ▶ Erosion
 - Wind and dust mitigation in place
 - Slopes and stockpiles at a stable angle
 - Open soil re-vegetated or stabilised
- ▶ Water contamination and pollution
 - Cement and hazardous materials stores secured
 - Toilets are empty and secured
 - Refuse bins empty and secured
 - Drip trays empty and secured (where possible)
 - Structures vulnerable to high winds are secured

6.8 Record Keeping

All records and documents relating to the implementation of this EMPr shall be retained, shall be easily retrievable for the duration of the Contract, and shall be filed by the Contractor for a minimum of 12 months after cessation of activities. These records and documents must be made available to the SE/Contract Manager, ECO and/or Competent Authority upon request.

These records and documents shall include (but shall not be limited to) the most recent versions of:

- ▶ The EA.
- ▶ Permits, licenses and registrations;
- ▶ The EMPr and any associated management plans;
- ▶ EIRF and Complaints Register;
- ▶ Approved Method Statements;
- ▶ Staff induction and environmental training material and attendance registers;
- ▶ Checklists for temporary site closure;
- ▶ Monthly compliance reports prepared by the ECO;
- ▶ Incident reports;
- ▶ Certificates of waste disposal;
- ▶ Disciplinary action (including time penalties or monetary fines) for environmental transgressions; and
- ▶ Independent Environmental Audits.

7 Environmental Impacts

7.1 Impacts assessed as part of the BAR Process

During the BAR process, the various specialists identified several impacts to be assessed and proposed mitigatory measures to manage the various potential impacts. The outcome and intent of the impact management recommendations, i.e., the mitigation measures, are to reduce the level of impact on the environment to acceptable levels. The preferred method would be to avoid impacts. However, this is not always possible.

The various identified impacts were assessed as part of the BAR and were assigned an impact rating (significance) for both pre- and post-mitigation.

Table 4: Summary of potential impacts identified and their respective significance ratings pre- and post-mitigation

Aspect	Impact	Pre-mitigation	Post-mitigation
Pre-construction			
No impacts have been identified for the pre-construction phase.			
Construction			
Soil disturbance and instability	Site preparation activities may disrupt soil and vegetation, increasing erosion, topsoil loss, and the spread of invasive species, while improper grave excavations could compromise ground stability.	Low (-)	Negligible (-) / Very low (-)
Landscape and Visual	The presence of construction signs, vehicles and equipment will result in poor visual impacts on site.	Medium (-)	Negligible (-) / Very low (-)
Socio-economic	Noise and dust generated by construction vehicles and activities could inconvenience to surrounding community.	Low (-)	Negligible (-) / Very low (-)
No-go	Inclusive of all the above aspects.	Neutral	Neutral
Operation			
Terrestrial	Alien invasive species spread and establishment.	Low (-)	Negligible (-) / Very low (-)
Stormwater	Risk of stormwater run-off due to impermeable surfaces.	Low (-)	Negligible (-) / Very low (-)
Geohydrology	Potential contamination of groundwater	Low (-)	Negligible (-) / Very low (-)

7.2 Specialists Environmental Impact Statements

7.2.1 Aquatic

The aquatic compliance statement confirmed that there are no watercourses or wetlands present on the site, and therefore no direct impacts under the National Environmental Management Act (NEMA) or the National Water Act (NWA). The proposed development footprint lies outside the 100-metre buffer zone of the Hout Bay River and, while it is near, but not within, the 500-metre regulated buffer zone of wetlands, site conditions and the nature of the development suggest a minimal likelihood of impact.

However, two potential indirect impacts were identified:

- Stormwater runoff management (due to its location within a Strategic Water Source Area, but the presence of compacted surfaces, separation from nearby watercourses, and limited hydrological change from added impervious areas help minimise potential runoff impacts) and

-
- Groundwater contamination (due to decomposition products, although site-specific factors like low vulnerability, limited soil infiltration, and distance from surface water features help reduce this risk)

The only environmental concerns relate to stormwater and groundwater, both of which are considered to pose low significance. These findings have informed the inclusion of appropriate stormwater management and pollution prevention measures in the construction phase to ensure minimal environmental impact.

7.2.2 Terrestrial biodiversity

The following results were observed:

- There are no CBAs or ESAs overlapping the project site;
- Project area is not located in a PA or NPAES focus area;
- Project area is not located in an important bird area; and
- The project area is located broadly in a nationally threatened ecosystem, namely the Peninsula Granite Fynbos which is considered critically endangered.

Despite its location within a threatened vegetation type, the site visit confirmed that the site is already highly degraded and altered, which significantly reduces its ecological value. As a result, the proposed cemetery expansion is expected to have an insignificant impact on terrestrial biodiversity.

7.2.3 Landscape and Visual Impact Assessment

The findings of the Visual Assessment on the proposed development are as follows:

- Similar type of infrastructure on the adjacent site (extension of the existing cemetery). The proposed infrastructure is not a dominant and significant component in the landscape and blends in well with existing urban forms, colours and textures. It therefore achieves a visual congruence to the surrounding environment;
- The greatest negative landscape and visual impacts, albeit still minor – negligible will be during the construction phase which are temporary;
- The small visual envelope due to the nature of the development (a cemetery with no significant height);
- The dispersed dense tree stands, tree lined avenues and built infrastructure offer sufficient screening from most areas within the study area (except for residents residing directly next to the site);
- The specific site is derelict, and the extension of the existing cemetery will enhance the overall visual quality within the immediate vicinity of the residential area, especially while traveling along Hughenden Street;
- The proposed site is only visible to a minor group of people – residents living on the urban fringe of Constantiaberg (driving down Hughenden Street) and visitors to the existing cemetery;
- The site is not visible from major roads within the sub region i.e. M63 (Hout Bay Main Road); and
- Due to the urban context long expansive views towards the site is limited.

The overall landscape and visual impact is expected to be minor positive and from a visual perspective it is not fatally flawed. The only negligible negative impact expected is during the construction phase and will be temporary.

7.2.4 Agriculture

The agricultural compliance statement found that the proposed development is acceptable because it leads to no loss of future agricultural production potential.

The agricultural assessment also disputes the high sensitivity classification of the assessed area by the screening tool and rates the entire assessed area as being of medium agricultural sensitivity.

Although the climate and terrain may allow for viable crop production, other factors constrain the potential of the site to practically deliver agricultural produce and therefore limit its agricultural production potential. These factors include:

- its location, which has been transformed by expanding urbanisation, leaves it surrounded largely by non-agricultural land uses;
- The fact that land use planning in the spatial development framework designates the site for non-agricultural use; and
- Municipal ownership of the land which would also discourage the necessary investment to establish cropland.

Therefore, it was concluded that the site will never be viably utilised for agricultural production and its potential is therefore assessed here as non-existent.

7.2.5 Groundwater

The findings from the groundwater impact assessment are as follows:

- Several small-scale groundwater users are present, especially in residential areas north of the site;
- Groundwater abstraction likely occurs from the secondary fractured aquifer, as the primary aquifer is unproductive for large-scale use;
- The primary aquifer is perched and has limited connectivity with the deeper fractured aquifer;
- Borehole samples down-gradient of the cemetery show ideal to good water quality, indicating no historical contamination from cemetery activities;
- Groundwater quality in the area falls within the ideal range (0–70 mS/m);
- The primary aquifer is highly vulnerable to surface contamination due to its sandy, permeable nature;
- Any contamination would likely follow the groundwater flow direction (southeast to northwest), toward the Hout Bay River;
- Grave sites were used as trial pits; all observed graves (2m deep) were dry;
- Surface soils consist of dry, unconsolidated, fine- to medium-grained sand with small quartz grains and occasional roots;
- Historical data shows the water table in the primary aquifer is deeper than 2m below ground level; and
- The proposed cemetery extension is at a higher elevation, suggesting an even deeper water table beneath the new area.

While the cemetery is a potential source of contamination, the depth of the water table (more than 1m below burial depth) breaks the source-pathway-receptor link. Therefore, the overall risk to groundwater resources is considered low. Despite the low risk, appropriate screening measures must be implemented to prevent any impact on the aquifer. The assessment concluded that the site is suited for use as a cemetery, given the lack of shallow groundwater.

7.2.6 Geotechnical

The findings of the geotechnical investigation are presented as:

- The ground is covered with mixed, loose material (fill and transported soils), but beneath that are stable natural soils that are suitable for construction;
- No groundwater was found during testing, but temporary water buildup (a perched water table) could occur after heavy or prolonged rain;
- Only the transported soil can be used for building foundations or roadbeds, but it must first be properly selected, treated, and compacted to a high standard (95% Modified Proctor Density);
- Regular construction machinery can dig safely down to 2.5 meters below ground level, but manual digging might be difficult in the loose fill material;
- Support measures like shoring or sloped sides will be needed to prevent soil collapse in deep excavations; and
- The soil beneath the surface must be treated and compacted to at least half a meter deep to make it strong enough for construction.
- Although the site has been classified as having 'poor' suitability, the implementation of recommended mitigation measures can effectively reduce potential negative impacts.

7.2.7 Traffic

The traffic impact statement showed that:

- The proposed extension of the cemetery will generate a maximum of 6.59 trips on a Saturday;
- Vehicular access via Hout Bay Main road and Hughenden Street. Due to level changes across the site there will not be a vehicular link between the existing and extended portion of the cemetery;
- Pedestrians will gain access from the exiting vehicular access to the site extension;
- There is an existing Public Transport embayment along Hout Bay main road which is deemed to be sufficient;
- Number of parking bays required (existing + extended portion of the cemetery):
- The existing parking lot can accommodate 14 parking bays which is the required amount; and
- The existing parking lot with the on-street parking bays are sufficient.

Considering that the extended portion of the cemetery will only generate 6.59 trips the impact the extension has on the road network is negligible. The existing road network has sufficient capacity to accommodate the additional trips.

7.2.8 Socio-Economic Impact

The socio-economic impact assessment found that the proposed expansion of Hout Bay Cemetery presents an opportunity to address both immediate and future burial needs. The project is expected to create several positive impacts during the construction and operational phases, i.e., local procurement, employment, household income, burial space, etc. However, there are potential negative impacts related to traffic, safety, security, noise, and visual disturbances, which could affect the quality of life for local residents. These impacts must be carefully managed to ensure minimal disruption to the community.

The proximity to the existing cemetery allows for efficient utilization of resources and infrastructure, minimizing the need for new construction and reducing potential environmental disruption. While site

alternatives were not considered, due to the lack of suitable undeveloped City-owned land in the area, the proposed site aligns well with the city's broader spatial development goals.

Overall, the assessment concluded that the proposed development is seen as appropriate and feasible from a socio-economic perspective. The benefits of the expansion, including job creation, improved access to burial services, and better planning for future generations, outweigh the potential negative impacts. As such, the expansion of the Hout Bay Cemetery should be authorized, with appropriate mitigation measures.

8 Environmental Management and Mitigation

This chapter sets out the necessary practical mitigation measures to be undertaken to address the activities and potential impacts identified and assessed in the BAR. The sections below provide the mitigation measures for each project phase, i.e. pre-construction, construction, operation and decommissioning.

In the sections below, tables provide the following information:

Mitigation measures	Measures provided by the EAP and specialists aim to reduce potential negative impacts and enhance potential positive impacts. These measures have been broken into rows that separate responsibility and refer to different site actions, e.g., site demarcation and vegetation clearing. General best practice measures are also included.
Responsibility	Which role-players is responsible for the specific mitigation?
Timeframe	When the actions must take place.
Monitoring method and frequency	Monitoring activities required by the ECO or other responsible party.

8.1 Pre-construction phase

Mitigation measures (impact management actions)	Responsibility	Implementation Timeframe	Monitoring
SPECIALIST MITIGATION MEASURES			
Geotechnical			
➤ Geotechnical investigation indicated the site is classified as “Poor” according to the Hall method of cemetery evaluation. Therefore, development of the site may accordingly warrant more detailed assessment of site levels, terracing and drainage prior to finalising the cemetery expansion. ➤ Detailed Geotechnical Assessment must be conducted, and recommendations and/or mitigation measures therein appended to the EMPr.	Proponent/Engineer	Once-off during the design phase.	EAP
Landscape and Visual			
➤ The concrete palisade fence along Hughenden Street in the south, the eastern periphery as well as between the existing cemetery and proposed site, must be removed and replaced with a clear vu type fence as this will ensure a visually seamless flow. If it cannot be removed, hedge type vegetation (or larger shrubs) must be planted next to and in conjunction with the concrete palisade fence.	Proponent/Engineer	Once-off during the design phase.	ECO
➤ Small structures such as low walls, pillars etc. to match the aesthetics of the existing cemetery (coherent architectural style), designs of such structures must be modest and should fit in with the aesthetics of the original entrance gate along the M63 (Hout Bay Main Road).	Proponent/Engineer	Once-off during the design phase.	ECO
Traffic			
➤ Due to the high volumes of traffic along Hout Bay Main Road, it is recommended that a right turn lane is provided at the access to the existing cemetery off Hout Bay Main Road.	Proponent/Engineer	Once-off during the design phase.	EAP ECO
➤ A pedestrian link be provided to allow visitor to use the parking lot on ERF 1461-RE existing cemetery) and then walk to the extended portion of the cemetery.	Proponent/Engineer	Once-off during the design phase.	EAP ECO

Mitigation measures (impact management actions)	Responsibility	Implementation Timeframe	Monitoring
Socio-Economic			
➤ Where possible, the local labour supply should be considered for employment opportunities to increase the positive impact on the area’s economy.	Proponent/Engineer	Once-off during the design phase.	ECO
➤ Use local suppliers where feasible and arrange with the local SMMEs to provide transport, catering, and other services to the construction crews.	Proponent/Engineer	Once-off during the design phase.	ECO
➤ Sub-contract to local companies particularly SMMEs and BBBEE compliant enterprises where possible.	Proponent/Engineer	Once-off during the design phase.	ECO
GENERAL			
Compliance and auditing			
➤ Appoint a suitably qualified independent ECO. This person must have appropriate experience in environmental management and a good understanding of local fauna and flora. The ECO must be able to make clear recommendations about the management of disturbed areas.	Proponent/ECO	Tender For the duration of the construction period	ECO- as per schedule
➤ Make provision for environmental auditing at project completion to assess the effectiveness of monitoring and management arrangements undertaken during the course of the project. The audit report should be submitted to the client, engineer, ECO, and competent authority.	Proponent/Engineer	Project completion	Independent auditor
Method statements			
➤ Method Statements must be submitted and approved prior to site establishment commencing. ➤ The content and required actions of the Method Statements must be communicated to site staff through the compulsory induction training. ➤ Refer to Section 6.5 for the list of Method Statements required.	Submitted by Contractor, approved by ECO	Prior to site establishment	ECO- as per schedule
Monitoring method and frequency			
➤ Prior to the start of the construction period, the appointed ECO must confirm that the above-mentioned measures have been considered and, where possible, implemented.			

Mitigation measures (impact management actions)	Responsibility	Implementation Timeframe	Monitoring
➤ The ECO shall undertake a pre-construction audit with a photographic record of the condition of vegetation and existing impacts within the construction footprint. This will be considered as the baseline for the project.			ECO- as per schedule
➤ An approved construction footprint will be issued by the Engineer as a formal drawing. The Contractor shall request a formal revision of the drawing should a larger working/ construction area be required. The revision may only be issued subject to consultation with and written agreement from the ECO. The contract documentation shall make allowance for penalties in the case of negligence by the Contractor to comply with the requirements of the EMPr and to remain within the approved construction footprint.			
Code of conduct			
➤ The Contractor must develop a project-specific Code of Conduct in consultation with representatives from the applicant. The code must identify which types of behaviour and activities are unacceptable. Construction workers in breach of the code must be dismissed or subject to strict disciplinary action. All dismissals must comply with the South African labour legislation. The Code of Conduct must be signed by the proponent and contractor before contractors move onto the site. The Code of Conduct shall, as a minimum, include the following considerations: ○ No workers are permitted to trespass onto adjacent properties. ○ Employees of this project who are found guilty of stealing livestock and/ or damaging farm infrastructure must be dismissed and charged. ○ Waste management measures must be followed (detailed in the Management of Construction Camp. Any employee found to be littering either on site or whilst being transported to and from the site must be fined. ○ Should a fire event be proven to be caused by a member of the project team and/or construction activities, the appointed Contractor will be liable to compensate the farm for any damage caused to their farm. ○ All vehicles must be roadworthy, and drivers must be qualified and licensed. The drivers must be made aware of the potential road safety issues and the need for strict speed limits. • Contractors appointed by the proponent must ensure that all workers are informed at the outset of the construction phase of the conditions contained in the Code of Conduct, specifically consequences of stock theft and trespassing on adjacent farms.	Contractor/ Monitoring Forum	Project lifecycle	ECO- as per schedule

Mitigation measures (impact management actions)	Responsibility	Implementation Timeframe	Monitoring
Training and Awareness			
➤ Pre-construction environmental induction for all construction staff on site must be undertaken to ensure that basic environmental principles are adhered to. This includes awareness of harm caused by littering, appropriate handling of pollution and chemical spills, avoiding fire hazards, minimising wildlife interactions, remaining within demarcated construction areas, etc. ➤ Appropriate emergency training (e.g. firefighting) must be given to the team prior to the construction period. ➤ The need to implement a training and skills development programme for local workers must be investigated prior to the initiation of the construction phase. The aim of the programme would be to maximise local employment opportunities. ➤ The Contractor must provide appropriate fire-fighting equipment on site and ensure that selected construction staff are appropriately trained for fighting fires.	Contractor/ ECO	During site establishment	ECO- as per schedule
Monitoring			
➤ Prior to the start of construction, the appointed ECO must confirm that the above-mentioned measures have been considered, and, where possible, implemented.			ECO- as per schedule
➤ All relevant Method Statements must be provided to the ECO for review and approval prior to construction commencing.			ECO- as per schedule

8.2 Construction Phase

Mitigation measures (impact management actions)	Responsibility	Implementation Timeframe	Monitoring
SPECIALIST MITIGATION MEASURES			
Landscape and Visual			
➤ Make use of existing access roads so that it minimizes modification of the topography (existing road entrance road and existing cemetery parking).	Contractor	Construction	ECO- as per schedule

➤ Construction signage should not be obtrusive and must be placed with caution in strategic locations as required.	Contractor	Construction	ECO- as per schedule
➤ Ensure ongoing housekeeping to maintain a tidy construction area, this includes the timeously removal of rubble which should be dumped at a registered facility.	Contractor	Construction	ECO- as per schedule
➤ Material laydown area/s must be placed in an area where existing vegetation and/or built structures are able to provide the most effective screening.	Contractor	Construction	ECO- as per schedule
➤ Do not deface, paint, damage or mark any natural feature (e.g., rocks, etc.) situated on or around the site for survey or any other purposes unless agreed beforehand.	Contractor	Construction	ECO- as per schedule
➤ Retain the avenue of gum trees along Hughenden Street (visual screening mechanism and heritage resource) as well as the clumps of large trees between the existing cemetery and proposed site.	Contractor	Construction	ECO- as per schedule
➤ Retain existing trees on site where feasible.	Contractor	Construction	ECO- as per schedule
➤ Avoid construction of additional ablution and administration facilities.	Contractor	Construction	ECO- as per schedule
Terrestrial (Fauna & Flora) and Aquatic Ecology			
➤ The impact should be restricted to the smallest footprint possible.	Contractor	Construction	ECO- as per schedule
➤ Compliance with industry best practice standards related to potential hydrocarbon pollution from spills must be adhered to.	Contractor	Construction	ECO- as per schedule
➤ Vegetation and soil removal should be limited to the smallest footprint possible and should only be removed where necessary.	Contractor	Construction	ECO- as per schedule
➤ Implementation of erosion control measures.	Contractor	Construction	ECO- as per schedule
➤ Appropriate storage and handling of potential contaminants.	Contractor	Construction	ECO- as per schedule
➤ Ensure appropriate stormwater management during construction.	Contractor	Construction	ECO- as per schedule
Socio-Economic			

Dust and noise: ➤ Implement dust suppression measures as needed, ensuring that appropriate equipment and procedures are readily available on site. ➤ Avoid leaving large areas of exposed, unvegetated land; any cleared areas must be promptly rehabilitated with suitable vegetative cover. ➤ Regulate noise levels by developing and enforcing standard operating procedures.	Contractor	Construction	ECO- as per schedule
Heritage (Including Archaeology)			
➤ Should any heritage resources, including evidence of graves and human burials, archaeological material and paleontological material be discovered during the execution of the activities above, all works must be stopped immediately, and Heritage Western Cape must be notified without delay, as detailed in Chance Find Protocol in Section 11 below.	Contractor / SE / ECO	Construction	ECO- as per schedule
GENERAL			
Site establishment			
➤ The contractor must submit a Method Statement indicating the exact location, extent and construction details of the construction camp, and the impact mitigation measures the contractor proposes to put in place to the ECO for approval – refer to Section 6.5 for more detail and guidance relating to method statements.	Contractor	Construction	ECO- as per schedule
➤ The contractor shall establish the construction camp on site in a manner that does not adversely affect the environment.	Contractor	Construction	ECO- as per schedule
➤ The construction footprint area must be limited to the minimum that is necessary.	Contractor	Construction	ECO- as per schedule
➤ Deliveries must be scheduled outside of peak congestion periods, where possible.	Contractor	Construction	ECO- as per schedule
➤ Vehicular access is restricted to designated roadways on site.	Contractor	Construction	ECO- as per schedule

Vegetation clearing and topsoil			
➤ Cleared vegetation may not be disposed of as waste at a landfill site. ➤ As much as possible, vegetation clearing will occur in a phased manner in accordance with the construction programme to minimise impacts when rainfall does occur. ➤ Where possible, a low cover of vegetation must remain within the construction footprint to bind the soil and prevent erosion. ➤ To facilitate revegetation of denuded areas, topsoil will be stockpiled with seed banks intact as far as possible, for use in the rehabilitation phase. ➤ Disturbance of vegetation and topsoil must be kept to a practical minimum. ➤ Strip and stockpile topsoil from all areas where soil will be disturbed below the surface.	Contractor / ESO / ECO	Construction Phase	ECO- as per schedule
Stormwater management			
➤ Where required (such as areas where water may accumulate), implement an effective system of stormwater run-off control using berms (raised, low walls of soil) and ditches. ➤ The system must effectively collect and safely disseminate any run-off water from all hardened surfaces and must prevent any potential downslope erosion. ➤ Site inspection must assess the effectiveness of the run-off control system and specifically record the occurrence (or not) of any erosion on site or downstream. ➤ Temporary cut-off channels and berms where required. ➤ Routing of run-off towards the existing watercourse and current drainage routes. ➤ Erosion protection by means of gabions, Reno mattresses, Geofabric and/or any combination thereof – per guidance of the ECO	Contractor	Monthly during construction	ECO- as per schedule
Dust management			
➤ Clear only areas necessary for undertaking planned works.	Contractor	Project Lifecycle	ECO- as per schedule
➤ Appropriate dust suppression measures shall be used when dust generation is unavoidable, e.g., dampening with non-potable water, particularly during	Contractor	Project Lifecycle	ECO- as per schedule

prolonged periods of dry weather in summer. Such measures shall also include the use of temporary stabilising measures, e.g., chemical soil binders, straw, brush packs, chipping, etc.			
➤ As far as possible, stockpile dust-generating materials away from areas where dust will be a nuisance or hazard.	Contractor/ ESO	Project Lifecycle	ECO- as per schedule
Ablution facilities			
➤ Appropriate ablution facilities must be provided for construction workers during construction. ➤ Toilets shall be secured to the ground. ➤ The Contractor shall ensure that all chemical toilets are cleaned and emptied regularly, especially prior to any temporary site closure or long weekend. ➤ Proof of disposal of portable toilet content at a wastewater treatment works must be retained on site.	Contractor	Construction phase	ECO- as per schedule
Management against erosion and sedimentation			
➤ Any stormwater within the site must be handled in a suitable manner, i.e. trap sediments and reduce flow velocities. ➤ Windbreaks and sediment traps may be necessary to prevent erosion and soil movement if there are topsoil or other soil waste heaps present during the wet season. ➤ Erosion channels formed during the construction phase must be backfilled and consolidated, and the areas must be restored to a proper, stable condition. ➤ No excavated holes or trenches must be left open for extended periods. ➤ Brush packing can be used in erosion channels or at drainage outlets. Alien vegetation may not be used for the purposes of brush packing. ➤ Flows will thus be allowed to dissipate over a broad area covered by natural vegetation. ➤ The Contractor shall undertake reasonable measures to prevent soil erosion of the rehabilitated areas	Contractor	Construction phase	ECO- as per schedule

Waste management			
➤ Potential sources of waste pollution must be used responsibly and strictly managed on-site. An integrated waste management approach in accordance with the Waste Management Hierarchy must be implemented on site. This should aim to avoid, reduce, reuse, recycle, recover and treat waste where possible, where disposal is the last resort.	Contractor	Construction phase	ECO- as per schedule
➤ General waste: ○ No waste is to be buried on the site. ○ Waste may not be burned on site. ○ All waste shall be disposed of at a licensed waste disposal facility. ○ All waste storage areas on site must be kept tidy. ○ All waste stored on site shall be secured so that it is not blown off-site by the wind.	Contractor	Construction phase	ECO- as per schedule
➤ Sufficient weather- and vermin-proof bins shall be provided for the disposal of solid waste. ➤ The Contractor shall remove the refuse collected from the working areas at least once a week.	Contractor	Construction phase	ECO- as per schedule
➤ Hazardous wastes, e.g. used oils, shall be separated from general wastes, stored separately in appropriate containers and disposed of at a licensed hazardous waste disposal facility or certified recycling facility.	Contractor	Construction phase	ECO- as per schedule
➤ Ensure that a suitable drainage system is in place to divert stormwater away from construction footprint areas.	Contractor	Construction phase	ECO- as per schedule
Spoil management			
➤ Any subsurface spoils from excavation must be disposed of so that they will not bury the topsoil of agricultural land. ➤ Any additional overburden must be respread below the topsoil layer and not mixed with it.	Contractor	Construction phase completion	ECO- as per schedule

Alien plant management			
➤ All alien plant regrowth, which is currently limited within the greater region, must be monitored, and should it occur, these plants will be eradicated. ➤ Imported material shall be free of weeds, litter and contaminants.	Contractor	Construction phase	ECO- as per schedule ESO
Storage of construction material and stockpiling			
➤ New construction material will be stored in demarcated areas on the affected properties prior to the commencement of construction.	Contractor	Construction phase	ECO- as per schedule
➤ All manufactured and/or imported material must be stored within the demarcated area, and, if so required, out of the rain. All lay down areas outside of the construction camp must be subject to the Engineer and the ECO's approval in such a way as not to cause a nuisance or environmental damage.	Contractor	Construction phase	ECO- as per schedule
➤ Contractors will not be allowed to store new construction material on the sides of the access road, or within natural vegetation or next to the existing access road	Contractor	Construction phase	ECO- as per schedule
Fuel storage and dispensing			
➤ Fuel shall be stored in accordance with relevant SABS specifications, and all fuel storage tanks shall be provided with adequate bunding (110% of the largest tank). (The bund floor shall be impermeable and sloped to a sump to enable removal of spilt fuel and contaminated water.) ➤ Adequate fire-fighting equipment shall be provided at fuel storage and dispensing areas	Contractor	Construction phase	ECO- as per schedule
➤ In the event of a spill, the Contractor must immediately notify the ECO and submit an Incident Report. ➤ In the event of a fuel spill, all unusable fuel and contaminated soil shall be removed and disposed of at a licensed hazardous waste facility.	Contractor	Construction phase	ECO- as per schedule

Noise management			
➤ Limit working times to 8:00 -17:00 on weekdays and 8:00 – 14:00 on Saturdays. No work shall occur on Sundays. ➤ No sound amplification equipment such as sirens, loud hailers or hooters may be used on site, after normal working hours, except in emergencies	Contractor	Construction phase	ECO- as per schedule
Traffic			
➤ Regulations relating to traffic management shall be adhered to. ➤ All roads used for access during construction shall be left in an acceptable condition on completion of the project. ➤ Wherever possible, the transportation of bulk equipment or materials shall not be conducted during peak traffic times, before 9h00 and after 16h00. ➤ Appropriate traffic/ pedestrian management measures shall be put in place, including: ○ Sign boards and flagmen to slow traffic down and to alert the public of the potential dangers presented by the construction activities. ○ Other measures, as stipulated in the relevant contract specification.	Contractor	Construction phase	ECO- as per schedule
Safety and Security			
➤ Telephone numbers of emergency services, including the local firefighting service, shall be posted conspicuously in the Contractor's office near the telephone. In the event of an emergency, the Contractor shall contact the emergency service in the area.	Contractor	Construction phase	ECO- as per schedule
Community relations			
➤ The Contractor shall recognise that the site is visible to the public. As such, the construction camp shall be kept neat and clean at all times. Site equipment and materials will be kept away from other property entrances.	Contractor	Construction phase	ECO- as per schedule

➤ The Contractor shall erect signage on the site that provides the contact details of the person(s) that the public can contact in case of complaints or incidents.	Contractor	Construction phase	ECO- as per schedule
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8.3 Operational Phase

Mitigation measures (impact management actions)	Responsibility	Implementation Timeframe	Monitoring
Specialist Mitigation Measures			
Terrestrial and Aquatic			
➤ Disturbed soils are prone to alien invasive species establishment, thus the site should be monitored for alien species germination along with the necessary removal and management thereof. Implement an Alien Invasive Plant Species Management Plan.	Proponent	Operation phase	On-going
➤ Implement the Stormwater Management Plan, which include inspections and maintenance on the following components: ○ Attenuation pond overland inlet strip ○ Attenuation Pond Forebay ○ Attenuation Pond Filterbed ○ Attenuation pond grassblock access for vehicles ○ Attenuation pond Gabian walls ○ Attenuation pond Outlet structure ○ Attenuation Pond Embankment ○ Attenuation pond outfall culvert over SWMH6 ○ Stormwater system in internal roads (applies to all sections of development)	Proponent	Operation phase	On-going

Please see Annexure 4 for full details regarding the Stormwater Operation and Maintenance Manual.			
GROUNDWATER			
➤ Monitoring wells are required in order to detect any potential contamination as quickly as possible. It is recommended that a third piezometer be installed up-gradient of the site to continue groundwater monitoring.	Proponent	Operation phase	On-going
➤ Monthly groundwater monitoring is recommended.	Proponent	Operation phase	On-going
➤ To mitigate the risk of contamination of groundwater due to the decomposition of Human Remains: ○ Ensure burial occurs sufficiently above water table depth to enable natural attenuation in the vadose zone (region between surface and water table). Harmful bacteria, viruses and pathogens tend to die off during final stages of decomposition and therefore tend to not persist in the environment. ○ Limit groundwater use of the shallow aquifer immediately down-gradient /downstream of the site. ○ Monitoring wells are required in order to detect any potential contamination as quickly as possible.	Proponent	Operation phase	On-going
To avoid groundwater contamination due to, paints and varnishes, the following should be implemented: ➤ standardise coffin size with ordinary dimensions. ➤ Coffin materials should primarily consist of untreated wood and/or other biodegradable materials. ➤ Refrain from using excessive ornamental metals, plastics, paints varnishes, etc. ➤ Where possible, all jewellery, watches, batteries, excessive cosmetics, and other such materials should be removed prior to burial. It is harder to remove dentures and pace makers.	Proponent	Operation phase	On-going
To prevent the potential leaching of chemicals used in the embalming process (formaldehyde) into the groundwater:	Proponent	Operation phase	On-going

○ Regular groundwater testing near burial sites can help detect and address contamination early.			
Socio-economic			
➤ Regulate noise on site and compile standard operational procedures.	Proponent	Operation phase	On-going
➤ No megaphones or sound amplifiers will be allowed.	Proponent	Operation phase	On-going
➤ With regards to safety during the operational phase, the following should be implemented: • Impermeable parameter fence • Controlled entrance gate • Regular paroles • Control of persons entering: ○ Tight control of burial ceremonies and grave visits ○ Tight control of recreation activities	Proponent	Operation phase	On-going
General Mitigation Measures			
➤ Alien vegetation management must be ongoing within the development area as well as the public open space areas.	Proponent	Operation phase	On-going
➤ Where erosion has occurred, determine an appropriate method of rehabilitation, such as revegetation with indigenous plants to stabilise soil or silt fences on slopes.	Proponent	Operation phase	On-going
➤ Any operational waste generated from funerals should be placed in bins with lids and collected as part of the CoCT refuse collection system.	Proponent	Operation phase	On- going
➤ Periodically (biannually) inspect and clean the stormwater system. ➤ Cleaning of channels: ○ Sand, litter and refuse must be removed from channels monthly or as required.	Proponent	Operation phase	On-going

➤ The project developer is to use locally sourced inputs where feasible in order to maximise the benefit to the economy.	Proponent	Operation phase	On-going
➤ Implementation of Sustainable Drainage Systems (SuDS) by the respective erf developer/end users to attenuate stormwater onsite and reduce volumes of stormwater input watercourses, as far as practically possible.	Erf developer/end user	Operation phase	On-going

9 Procedures for Environmental Incidents

This section provides some of the environmental procedures to be undertaken in case of incidents. It defines the processes, practices, reporting methods and documented information to rectify and clear these incidents before they become large-scale and spread to neighbouring (unaffected) environments.

9.1 Leakages and Spills

- ▶ Notify ECO and PM immediately;
- ▶ Any environmental incidents must be reported within 24 hours to the relevant authority;
- ▶ Identify source of the problem;
- ▶ Stop leak, if safe to do so;
- ▶ Contain spilt material, using spills kit or sand;
- ▶ Remove spilt material and place in a sealed container for disposal (if possible);
- ▶ Spill material must be placed separately in a closed leak-proof storage container “hazardous material bin”. The waste must be removed by an approved or registered hazardous waste handling company for disposal in an approved or licensed hazardous waste disposal facility;
- ▶ Safe disposal certificates must be placed in the environmental file kept on site at all times; and
- ▶ ECO to follow Incident Management Plan.

9.2 Failure of Erosion/Sediment Control Devices

- ▶ Notify ECO and PM immediately;
- ▶ Prevent further escape of soil/sediment;
- ▶ Contain escaped material using silt fence, hay bales, pipes, etc.;
- ▶ Repair or replace the failed device as appropriate;
- ▶ Dig/scrape up escaped material; take care not to damage vegetation;
- ▶ Return escaped material to the area where it originated from;
- ▶ ECO to follow Incident Management Plan; and
- ▶ Monitor for effectiveness until re-establishment.

9.3 Bank/Slope Failure

- ▶ Notify ECO and PM immediately;
- ▶ Stabilise toe of slope to prevent sediment escape using aggregate bags, silt fence, logs, hay bales, pipes, etc.;
- ▶ ECO to follow Incident Management Plan;
- ▶ Divert water upslope from failed bank/slope;
- ▶ Protect area from further collapse as appropriate;
- ▶ Restore as advised by ECO; and
- ▶ Monitor for effectiveness until stabilised.

10 Discovery of Rare or Endangered Species

- ▶ Notify ECO and PM immediately. If required consult with EAP and Botanist.
- ▶ Cease work in the area of discovery;
- ▶ If a plant is found, mark location of plants;
- ▶ If an animal, mark the location where sighted, take pictures if possible;
- ▶ ECO to identify or arrange for identification of species, and or the rescue and relocation of the species if possible;
- ▶ If confirmed significant, ECO to liaise with CapeNature or Endangered Wildlife Trust (EWT); and
- ▶ Recommence work when cleared by ECO.

11 Discovery of Archaeological or Heritage finds

- ▶ Notify ECO immediately;
- ▶ If concentrations of historical and archaeological heritage material and/or human remains (including graves and burials) are uncovered during construction, all work must cease immediately and be reported to the provincial heritage authority Heritage Western Cape (HWC):
- ▶ Do not disturb the area of the find;
- ▶ ECO to arrange an appraisal of the specimen;
- ▶ If confirmed significant, ECO to liaise and report to the provincial heritage authority (Heritage Western Cape)
 - Heritage Western Cape
 - Tell: 021 483 5959
 - Email: hwc.hwc@westerncape.gov.za / ceoheritage@westerncape.gov.za
- ▶ With confirmation from the heritage authority, heritage aspecialists and the ECO construction can be cleared to proceed or recommence.

12 Health and Safety

The relevant H&S requirements for this type of work as detailed in the Occupational Health and Safety Act, 1993 (Act No. 85 of 1993) (OHS Act) must be complied with. CoCT must ensure the implementation of operational, maintenance, and Safety, Health, and Environmental (SHE) standards. These standards will establish procedures and protocols to manage compliance with the OHS as a minimum, while also aligning with international best practices. This includes managing risks related to fire, injuries, floods and the surfacing of graves, manual handling, equipment use, hazardous substances, and potential biological hazards etc.

13 Non-Compliance and Penalties

The ECO must monitor compliance with this EMP, and report results in monthly ECO reports (or as stipulated in the EA) to the project team (CoCT, PM, Site Engineer etc.] and the CA (DEA&DP). Significant non-compliances that may pose detrimental impacts to the environment must be reported to the CA in line with Section 28 of NEMA which establishes a duty of care for the environment.

Penalties/fines must be issued at the discretion of the PM or Engineer as per the penalties' agreement between the PM/Engineer and Contractor. The ECO to take up any non-compliance issues that may result in a fine/penalty with the PM/Engineer.

The nature of the project activities may, even with the best of intentions, inevitably cause some form of environmental degradation. The costs of having to make good on such environmental degradation is usually sufficient punishment without the need to look to other punitive measures. The implementation of a penalty system therefore requires careful consideration. The following issues need to be considered in such a decision:

- (i) Penalties would typically be warranted by persistent negligence on the part of the Contractor or failure to respond adequately to environmental considerations;
- (ii) Removal from site would typically be warranted where a particular staff member or piece of equipment is the cause of persistent environmental damage following previous warnings; and
- (iii) Suspension of the works would only be warranted under rare circumstances where the Contractor's actions have caused or are likely to cause significant environmental degradation.

The type and extent of the corrective measures required to address non-compliance depend on the nature of the transgression and the Contractor's history of compliance with environmental obligations. When deciding on the nature of any punitive actions, it must be recognised that effective implementation

of the EMPr is dependent on the quality of the working relationships between the key role-players. Accordingly, an excessive response to non-compliance, particularly for a minor or unintentional transgression, may cause environmental degradation in the long term due to its effect in eroding the Contractor's commitment to meeting their environmental responsibilities. Other mechanisms, such as an expanded environmental induction programme, may prove more effective to control non-compliance in the long-term than purely punitive measures.

14 Conclusion

In conclusion, it should be noted that the EMPr should be regarded as a living document and changes should be made to the EMPr as required by project evolution, while retaining the underlying principles and objectives on which the document is based. Any amendments to the outcomes of the EMPr will require formal approval via an Amendment Application from the DEA&DP.

The compilation of the EMPr has incorporated environmental management best practice principles, impacts and mitigation measures from the BAR and all environmental specialist assessment reports (i.e., included as Appendix G of the BAR). The recommendations of this EMPr should be implemented at all times throughout the project life cycle as described in this document and other supporting documentation.

Annexure 1

EAP CVs



Xanté Eberhardt

Environmental Specialist

Summary

Xanté is a professional environmental assessment practitioner and project manager with more than 14 years' experience. In this time, she has gained extensive experience in project management and environmental management.

Xanté has completed several project management courses to enhance her project management skills and has played an integral role in the project management of several projects. Activities have included report writing, client liaison, budget, resource management and time management. She has successfully applied for environmental authorisations for several projects, as well as assisted with the motivation for non-environmental impact assessment (EIA) letters from the relevant authorities.

She has also completed a course in procurement and was responsible for handling all procurement for Zutari's North West offices, where her duties included tender compilation and evaluation for clients, as well as tendering for new projects.

Xanté obtained a Bachelor of Science Honours in Environmental Sciences and Management from the North-West University in 2009. She is also an Environmental Assessment Practitioner (EAP) with the Environmental Assessment Practitioners Association of South Africa (EAPASA) and a member of the International Association for Impact Assessment South Africa (IAIASa). In 2013, Xanté was elected to be on Zutari's Skills Development and Employment Equity Forum.

Qualifications

BSc (Hons) Environmental Sciences and Management
BSc Environmental and Biological Sciences

Professional registrations

Environmental Assessment Practitioner (EAP), Environmental Assessment Practitioners Association of South Africa (EAPASA)
Member, International Association for Impact Assessment South Africa (IAIASa)

Specialisation

Project and environmental management; environmental assessment practitioner

Years in industry

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Relevant experience

Business planning for the City of Cape Town's Transport Directorate, South Africa, Western Cape, City of Cape Town, 12/2019 - 12/2027, Environmental Assessment Practitioner

Zutari was appointed for the transport planning, urban design, business case development, and project management for projects and tasks undertaken by the City of Cape Town's Transport Directorate. Each project, task, and transversal project was assigned technical specialists in the transport, planning, contractual, business, and strategic management arenas. The projects undertaken included projects in business planning, contract management, operations, industry transition and regulations, fleet and facilities management, and infrastructure projects. The transversal projects related to human settlements, strategic assets, and urban planning and design. These included an urban renewal framework for the Bellville central business district (CBD) under Urban Catalytic projects, economic forecasting for the 2040 land use model for urban planning, known as OneCape2040, business case for various city-owned facilities, and a feasibility study of the city's inclusionary housing policy for human settlements. Responsible to acquire environmental authorisations.

Upgrading of Road D53, South Africa, North West, North West Department of Public Works and Roads (DPWR), 10/2019 - 12/2025, Environmental Advisor/Project Administrator

Zutari was appointed as the engineering consultant for the upgrading of Road D53 - Dwarsberg to Derdepoort. Responsible for general project administration and management as well as for the evaluation/review of environmental reports for further authorisation.

EIA for desalination PIP site, South Africa, Western Cape, City of Cape Town, 09/2023 - 12/2025, Environmental Assessment Practitioner

Zutari was appointed to acquire the environmental authorisation for the construction of a sea water desalination plant at the PIP site in the Cape Town Harbour. Responsible for scoping and environmental impact

assessment application completion in order to acquire the required environmental authorisation for the implementation of the proposed project.

Upgrading of Road D327 from Ganyesa to Vragas - Phase 1, 2 and 3, South Africa, North West, North West Department of Public Works and Roads (DPWR), 09/2012 - 09/2025, Environmental Control Officer (ECO)/Project Administrator

The project involved the upgrading of 57 km of Road D327, from Ganyesa to Vragas to Madinonyane, from gravel to surfaced standards. Services included a scoping report, preliminary design, detailed design, contract documentation and site supervision. Responsible for general project administration and management and environmental control officer (ECO) duties.

Sannieshof wastewater treatment plant (WWTP), South Africa, North West, Ngaka Modiri Molema District Municipality (NMMDM), 03/2018 - 06/2025, Environmental Consultant and Advisor/Project Administrator

The project involves the extension of the wastewater treatment capacity in Sannieshof and surrounding areas to address future treatment requirements. This includes the new Agisanang pump station which will address future treatment and conveyance requirements. It comprises the construction of a new inlet works, a biological reactor, secondary settling tanks, wash-water pump station, sludge recycle pump station and the refurbishment of the Agisanang raw sewage pump station. It also entails a treated effluent outfall pipeline, MCC building, flow diversion and collection chambers, interconnecting pipework, internal roads, stormwater, fencing and minor modifications to existing structures. Responsible for the evaluation/review of environmental reports for further authorisation as well as acquiring non-listed activity confirmation from READ and general project administration and management.

Upgrading of Road D933 from Lichtenburg to Gelukspan, South Africa, North West, North West Department of Public Works and Roads (DPWR), 08/2013 - 06/2025, Environmental Advisor/Project Administrator

Zutari was appointed as the engineering consultant for the upgrading of the road network near Sephaku Cement's new factory. The project entailed the construction of Road D933 and the connecting Road D2095 in the Ngaka Modiri Molema district. The scope of works comprised formalising the horizontal alignment, incorporating minor improvements to the road geometry and vertical alignments to ensure acceptable safety standards at the required design speeds for the road users. This included constructing pavement layers, surfaced lanes and gravel shoulders as well as stormwater drainage structures, road markings and signage. Responsible for general project administration and management as well as for the evaluation/review of environmental reports for further authorisation.

Wynberg regional recreational hub, South Africa, Western Cape, City of Cape Town, 02/2024 - 06/2025, Environmental Assessment Practitioner

Zutari was appointed for the professional services required for the feasibility study required to implement the proposed regional recreational sports hub in Wynberg. Responsibilities included screening for any environmental authorisation required and acquiring the environmental authorisations required for the implementation of the proposed hub.

Land-based treatment for marine outfalls sewers, South Africa, Western Cape, City of Cape Town, 07/2023 - 06/2025, Environmental Assessment Practitioner

The project is aimed at addressing the marine outfalls' shortcomings at Green Point, Camps Bay and Hout Bay in terms of infrastructure, final wastewater quality, regulatory requirements, environmental impact and public approval. Responsibilities include screening for the proposed project implementation options, looking into potential environmental impacts and triggers and advising on the way forward to obtain the required environmental authorisations. Involvement in the next phase will include acquiring the relevant environmental authorisations from all competent authorities.

Road D3429 Bona Bona, South Africa, North West, North West Department of Public Works and Roads (DPWR), 06/2022 - 06/2025, Project Administrator and Manager, Environmental Assessment Practitioner,

Zutari was appointed for the design and contract administration for the reseal of Road D3429, for approximately 10 km from Morokweng to Bona-Bona. Responsible for project administration and management, as well as for review of the environmental requirements.

Hout Bay cemetery, South Africa, Western Cape, City of Cape Town, 02/2024 - 02/2025, Environmental Assessment Practitioner

Zutari was appointed for the professional services required for the feasibility study required to expand the Hout Bay cemetery. Responsibilities included screening for any environmental authorisation required and acquiring the environmental authorisations required for the expansion of the cemetery.

Klip Road cemetery, South Africa, Western Cape, City of Cape Town, 02/2024 - 02/2025, Environmental Assessment Practitioner

Zutari was appointed for the professional services required for the feasibility study required to expand the Klip Road cemetery. Responsibilities included screening for any environmental authorisation required and acquiring the environmental authorisations required for the expansion of the cemetery.

Welgemeend NGK Primary School, South Africa, Western Cape, MLC Consulting, 12/2023 - 12/2024, Environmental Assessment Practitioner

Design and supply of a wastewater treatment disposal facility for installation at Welgemeend NGK Primary School. Responsibilities include due diligence on existing environmental authorisations in place for project implementation and guidance on correct implementation.

Hans Strijdom building upgrades, South Africa, Western Cape, MDA Consultants , 02/2024 - 12/2024, Environmental Assessment Practitioner

Environmental and waste management plan for the Hans Strijdom green building upgrades. Responsible for development and implementation monitoring of the environmental and waste management plans for the Hans Strijdom green building upgrades.

Sibanye 147 MW wind farm, South Africa, Northern Cape, Emoyeni Project Management, 02/2022 - 12/2024, Environmental Assessment Practitioner

ACED – Sibanye 147 MW Umsinde wind farm Responsible for due diligence review of all existing authorisations and further requirements for project implementation.

Business planning support for Cape Town Transport, South Africa, Western Cape, City of Cape Town, 06/2023 - 10/2024, Environmental Assessment Practitioner

Business planning for Lucullus Road, Maroela Road, Waarburgh Road and Amadeus Drive at Joostenberg Vlake, Drie Heuwel and Fisantkraal, situated on various properties within the jurisdiction of the City of Cape Town, Western Cape. Responsible for environmental authorization for the proposed road upgrades and extensions in Joostenberg Vlake (Lucullus, Amadeus, Maroela and Waarburgh roads).

Stellenbosch road transport safety master plan (RTSMP), South Africa, Western Cape, Stellenbosch Local Municipality, 07/2023 - 10/2024, Environmental Assessment Practitioner

Zutari was appointed to produce a RTSMP to be read in conjunction with the 2015 Master Plan. As part of the appointment, Zutari was also requested for the design and construction implementation of the required road upgrades and extension of Wildebosch and Trumali roads. Responsibilities included environmental authorization for the proposed road upgrades and extensions in Stellenbosch.

Gordon's Bay landfill, South Africa, Western Cape, Western Cape Department of Transport and Public Works, 03/2024 - 10/2024, Environmental Assessment Practitioner

Zutari was appointed for the design and construction monitoring the required road upgrades of Trunk Road 2 between De Beers and Sir Lowry's Pass. Responsible for reviewing existing environmental authorisations for project implementation, identifying outstanding requirements and acquiring the correct authorisations in terms of NEMA and NEMWA.

Molteno Reservoir, South Africa, Western Cape, City of Cape Town, 03/2024 - 10/2024, Environmental Assessment Practitioner

Zutari was appointed for the preparation of concept design, cost estimate and preliminary design report for building and infrastructure upgrades at the Molteno Reservoir. Responsible for screening for any environmental authorisation required. Next phase is DEA&DP checklist with motivation for non-triggered activities confirmation.

Tygerberg Reservoir, South Africa, Western Cape, City of Cape Town, 03/2024 - 10/2024, Environmental Assessment Practitioner

Zutari was appointed for the preparation of concept design, cost estimate and preliminary design report for building and infrastructure upgrades at the Tygerberg Reservoir. Responsibilities include screening for any environmental authorisation required. Next phase involvement is DEA&DP checklist with motivation for non-triggered activities confirmation.

Ceres solar PV plant, South Africa, Western Cape, Witzenberg Local Municipality, 09/2023 - 09/2024, Project Leader, Environmental Assessment Practitioner

Zutari was appointed to acquire the environmental authorisation for the construction of a solar PV plant just outside of Ceres. Responsible for screening for any environmental authorisation required and acquiring the environmental authorisations required for the implementation of the proposed hub.

Ceres rivers maintenance and management plan (MMP), South Africa, Western Cape, Witzenberg Local Municipality, 10/2023 - 06/2024, Project Leader/Environmental Assessment Practitioner

Development and authorisation of a river maintenance and management plan for the Breede, Titus and Modder Rivers in Ceres. Responsible for environmental authorisation (incl. PPP and MMP application process), water use authorisation, project administration and management.

Al-Farsha Island connector private military company due diligence, Saudi Arabia, NEOM, 12/2023 - 05/2024,

Al-Farsha Island (AFI) connector pre-design concept reviews. Responsible for review of environmental policies and

strategies for AFI implementation.

Princess Vlei, South Africa, Western Cape, City of Cape Town, 11/2023 - 03/2024, Environmental Assessment Practitioner

Upgrade of Princess Vlei by developing a circulatory trail around the Princess Vlei. Responsibilities include due diligence on existing environmental authorisations in place for project implementation and assistance with correct implementation of the authorisations.

Tulbagh Lower Reservoir no. 3, South Africa, Western Cape, Witzenberg Local Municipality, 06/2023 - 12/2023, Environmental Assessment Practitioner

The Witzenberg Municipality proposes the construction of a 3MI Reservoir adjacent to the existing 1.2MI Reservoir in Tulbagh in order to provide sufficient storage for the estimated future water demand of Tulbagh. Responsibilities include screening for any environmental authorisation required and memo on duty of care and basic environmental management programme (EMPr) for implementation.

Platteklouf Reservoir, South Africa, Western Cape, City of Cape Town, 09/2023 - 10/2023, Environmental Assessment Practitioner

Zutari was appointed for the preparation of Stage 2 concept design, cost estimate and preliminary design report for building and infrastructure upgrades at the Platteklouf Reservoir. Responsibilities included screening for any environmental authorisation required. DEA&DP checklist with motivation for non-triggered activities confirmation.

Flood damage assessment, South Africa, North West, North West Department of Public Works and Roads , 09/2023 - 10/2023, Environmental Advisor, Project Administrator and Manager

Zutari was appointed to assess damage to roads after floods. Responsible for project administration and management, as well as for review of environmental impacts and requirements.

Site enablement for Sea Point East, South Africa, Western Cape, Western Cape Department of Infrastructure , 07/2023 - 09/2023, Environmental Assessment Practitioner

Zutari was appointed to commence with site enablement on the former Tafelberg School site in Sea Point East. Responsibilities include due diligence on all existing approval and requirements. Also responsible for Department of Environmental Affairs & Development Planning (DEA&DP) checklist with motivation for non-triggered activities confirmation.

Newlands Reservoir – building and infrastructure upgrades, South Africa, Western Cape, City of Cape Town, 07/2023 - 08/2023, Environmental Assessment Practitioner

Zutari was appointed for the preparation of Stage 2 concept design, cost estimate and preliminary design report for building and infrastructure upgrades at the Newlands Reservoir. Responsibilities included screening for any environmental authorisation required. DEA&DP checklist with motivation for non-triggered activities confirmation.

Glen Garry Reservoir, South Africa, Western Cape, City of Cape Town, 07/2023 - 08/2023, Environmental Assessment Practitioner

Zutari was appointed for the preparation of Stage 2 concept design, cost estimate and preliminary design report for building and infrastructure upgrades at the Glen Garry Reservoir. Responsibilities included screening for any environmental authorisation required. DEA&DP checklist with motivation for non-triggered activities confirmation.

Langebaan treated sewage effluent (TSE) pipeline, South Africa, Western Cape, Municipality of Saldanha Bay, 09/2022 - 08/2023, Environmental Assessment Practitioner

Zutari was appointed to undertake a screening for the proposed project, look into potential environmental impacts and triggers and advise on the way forward to obtain environmental authorisation. Responsibilities included screening for the proposed project implementation options, looking into potential environmental impacts and triggers and advising on the way forward to obtain the required environmental authorisations.

Diversion study for Lourens River Diversion, South Africa, Western Cape, City of Cape Town, 11/2021 - 06/2023, Environmental Assessment Practitioner

Zutari was appointed to undertake a diversion study for the Lourens River Diversion. Responsible to acquire environmental authorisations.

Spruit River maintenance and management plan (MMP), South Africa, Western Cape, Witzenberg Local Municipality, 10/2022 - 06/2023, Project Leader, Environmental Assessment Practitioner

Development and authorisation of a river maintenance and management plan for the Spruit River in Wellington. Responsible for environmental authorisation (incl. public participation plan (PPP) and MMP application process), water-use authorisation, project administration and management.

MR331 Still Bay and Groot Jongensfontein, South Africa, Western Cape, Western Cape Department of Transport and Public Works, 01/2023 - 06/2023, Environmental Assessment Practitioner

Periodic maintenance of MR331, incl evaluation of all road-related infrastructure and resurfacing of approximately 10 km of road between Still Bay and Groot Jongensfontein. Responsibilities include screening for any environmental authorisation required, environmental authorisation (incl. PPP and MMP application process), water-use authorisation.

Kleinzee seawater reverse osmosis (SWRO) feasibility study, South Africa, Western Cape, De Beers Consolidated Mines, 03/2023 - 06/2023, Environmental Assessment Practitioner

Zutari was appointed to undertake a screening for the proposed project, looking into potential environmental impacts & triggers and advising on the way forward to obtain environmental authorisation. Responsibilities included screening for the proposed project implementation options, looking into potential environmental impacts and triggers and advising on the way forward to obtain the required environmental authorisations.

Improvement and management of gravel roads, South Africa, Western Cape, Western Cape Department of Transport and Public Works, 05/2020 - 05/2023, Environmental Assessment Practitioner

Zutari was appointed to assist with the material supply and planning, design and control aspects for the maintenance of gravel roads in the Central Karoo and Eden District Municipalities. Services include engineering geology, environmental studies, materials source identification and project management. Responsible for EA management and project administration and management.

Wynberg Reservoir, South Africa, Western Cape, City of Cape Town, 02/2023 - 03/2023, Environmental Assessment Practitioner

Zutari was appointed for the preparation of Stage 2 concept design, cost estimate and preliminary design report for building and infrastructure upgrades at the Wynberg Reservoir. Responsibilities included screening for any environmental authorisation required. DEA&DP checklist with motivation for non-triggered activities confirmation.

Rehabilitation of Kleinplaas Dam, South Africa, Western Cape, City of Cape Town, 03/2022 - 09/2022, Environmental Assessment Practitioner

Zutari was appointed as the engineering consultant for the reseal of the Kleinplaas Dam. Responsible to acquire environmental authorisations.

Zeerust wastewater treatment works (WWTW), South Africa, North West, Ngaka Modiri Molema District Municipality (NMMDM), 08/2009 - 07/2022, Environmental Advisor/Project Administrator

Zutari has been appointed to assess the current and future state of the Zeerust wastewater treatment works (WWTW) after concerns were raised concerning the plant's non-compliance with the statutory standards. The upgrading strategy was divided into an immediate, medium-term and long-term strategy. The upgrading strategy involves refurbishing the existing WWTW, constructing a new activated sludge (AS) biological reactor and associated secondary settling tanks (SSTs) beside the existing Orbal biological reactor and constructing a new biological reactor with a capacity of 5 Ml/d in the place of the existing Orbal reactor. Responsible for the evaluation/review of environmental reports for further authorisation as well as general project administration and management.

Maintenance of Trunk Road 2, Section 2 (TR2/2), South Africa, Western Cape, Western Cape Department of Transport and Public Works, 07/2019 - 07/2022, Environmental Assessment Practitioner

Zutari was appointed to provide full professional services, as defined by the Engineering Council of South Africa (ECSA), for the periodic maintenance of 8.54 km of Trunk Road 2, Section 2 (TR2/2), a provincial dual carriageway road near Somerset West. Responsible for review and assistance.

Upgrading of the water supply scheme in Madibogo, South Africa, North West, Ngaka Modiri Molema District Municipality (NMMDM), 09/2009 - 12/2019, Environmental Advisor/Project Administrator

The project involves investigating options to upgrade the bulk water supply in Madibogo and address the bulk conveyance, storage and treatment of water sourced from boreholes as well as verifying the yield of existing and new boreholes, gathering detailed water quality data to refine the treatment process and a geotechnical investigation. Zutari identified supply zones and finalised pipeline routes, pump duties, pipe diameters and placement of isolating valves for system flexibility as well as determined the electrical installation and control philosophy of the borehole wellfields and designed three new reservoirs of 2 000 m³ to allow for power outages and maintenance on the borehole pumps. Responsible for evaluation/review of environmental reports for further authorisation. Also responsible for general project administration and management.

P124-1 Road construction Phase 2, South Africa, North West, Department of Public Works, Roads and Transport (DPWRT), 03/2017 - 10/2019, Project Administrator/Environmental Advisor

Zutari was appointed to preliminary investigation (scoping report), preliminary design, detailed design, tender documentation and supervision of the development of phase 2 of road P124-1 between Mabeskraal and Derdepoort, comprising approximately 19 km of road P124-1 from Dwarsberg to the Limpopo Provincial border. Responsible for general project administration and management. Also responsible for evaluation/review of environmental reports for further authorisation.

Municipal Infrastructure Support Agent (MISA) water conservation and demand management plans, South Africa, North West, Municipal Infrastructure Support Agent (MISA), 11/2018 - 07/2019, Project Administrator

Zutari was appointed to develop water conservation and demand management (WC&DM) plans for the Ngaka Modiri Molema District Municipality (NMMDM). Responsible for project administration and management.

Zeerust police station repairs, South Africa, North West, North West Provincial Government Department of Public Works, 10/2007 - 07/2019, Project Administrator

Zutari was appointed to undertake repairs to the Zeerust police station. Responsible for general project administration and management.

North West Province aviation master plan, South Africa, North West, Department of Community Safety & Transport Management (DCS&TM), 04/2017 - 07/2019, Project Administrator

The project entailed master planning for the network of airports and airfields in the North-West Province. The environmental scope of work involved screening of each airport to determine the environmental opportunities and constraints regarding potential expansion at each of these airports or airfields. Responsible for general project administration and management.

Matlosana mining town human settlements transformation plan, South Africa, North West, Housing Development Agency (HDA), 08/2018 - 03/2019, Environmental Advisor

Zutari was appointed for the diagnostic analysis of the human settlements distresses of the mining towns in the City of Matlosana Municipality and development of a Human Settlements Spatial Transformation Plan with transformation interventions and an integrated project pipeline. Responsible for acquiring environmental data for KOSH mine towns with town planners.

Ellaton housing development, South Africa, North West, Manapendlo Social Housing Institution, 11/2014 - 12/2018, Environmental Consultant/Project Administrator

Zutari was appointed for the planning, design and construction monitoring services for the low cost/economical housing development in Ellaton. The scope works also included the design of sewer, potable water and electricity reticulation systems. Responsible for general project administration and management as well as environmental authorisation application, public participation, basic assessment report (BAR) and environmental management plan (EMP).

Basic assessment report (BAR) for the Matlosana Substation, South Africa, North West, City of Matlosana, 05/2016 - 12/2017, Project Leader/Environmental Consultant

Zutari was appointed for the environmental authorisation and basic assessment report (BAR) for the new 88/11 kV substation in Manzilpark, Klerksdorp. Responsible for acquiring non-listed activity confirmation from READ, as well as general project administration and management.

Vuk'Uphile contractor development programme, South Africa, North West, North West Department of Public Works and Roads (DPWR), 09/2013 - 09/2017, Project Administrator

As part of the Expanded Public Works Programme (EPWP), the Department of Public Works (DPW) initiated the Vuk'uphile learnership programme, aimed at developing emerging contractors into skilled contractors able to execute labour-intensive projects. Zutari was appointed for the project management and implementation of the programme for contractor and supervisor development, including for the planning, implementation and close-out of the projects on which the contractors/supervisors were developed. The contractors/supervisors were developed in civil engineering; general building; road marking and signage; landscaping, irrigation and horticultural work and mechanical and electrical maintenance. Responsible for project administration, including meeting minutes and document control.

Technical assessment of Housing Development Agency (HDA) catalytic projects, South Africa, North West, Housing Development Agency (HDA), 09/2015 - 11/2016, Environmental Advisor

The project comprised a technical assessment of specific human settlement projects for the Housing Development Agency (HDA). The assessment included a technical, institutional, financial and legal assessment of 30 catalytic projects. Responsible for the evaluation/review of environmental reports for further decision making.

Relining of water pipeline in Promosa, South Africa, North West, Tlokwe City Local Municipality, 01/2013 - 07/2016, Project Administrator and Manager

Zutari was appointed for design and construction supervision services for the relining of existing infrastructure to prolong lifetime and minimise service disruption. Responsible for project administration, including project plan, meeting minutes, invoicing and report writing.

Fibre optic cable installations in Orkney, Potchefstroom and Klerksdorp, South Africa, North West, Dark Fibre Africa (DFA), 06/2011 - 05/2016, Project Administrator

Zutari was appointed in a joint venture (JV) with PH Bagale for the installation of underground and overhead optic fibre cabling, wayleave applications and undertaking fibre optic cable route surveys. Responsible for project

administration, including project plan, meeting minutes, invoicing and report writing.

Construction of Jouberton Police Station, South Africa, North West, Department of Public Works (DPW), 03/2007 - 03/2016, Project Administrator

Zutari was appointed for the design and site supervision of a new police station and single quarters in Jouberton, Klerksdorp. Responsible for project administration, including project plan, meeting minutes, invoicing and report writing.

Water supply line to Muranti reservoir, South Africa, North West, City of Matlosana, 03/2010 - 12/2015, Project Administrator

The project comprised a water supply line from Endpoint to Muranti Reservoir, Phase 2. Responsible for project administration, including project plan, meeting minutes, invoicing and report writing.

Design and construction of a new solid waste landfill site north of Bloemhof, South Africa, North West, Dr Ruth Segomotsi Mompati District Municipality, 03/2011 - 10/2015, Environmental Advisor/Project Administrator

There was a lack of a proper solid waste landfill site for the inhabitants under the jurisdiction of the Lekwa Teemane Local Municipality. Zutari was appointed to perform a baseline geohydrological study at a location reserved for the construction of the new solid waste landfill site, 2 km north of Bloemhof. The investigation formed part of several specialist studies required for inclusion in the documentation for obtaining environmental authorisations (EAs); and was carried out according to guidelines published in the Minimum Requirements for Waste Disposal by Landfill, Second Edition (1998). Responsible for project administration, including project plan, meeting minutes, invoicing and report writing. Also responsible for performing field work.

Design and construction of a new solid waste landfill north of Christiana, South Africa, North West, Dr Ruth Segomotsi Mompati District Municipality, 03/2011 - 10/2015, Environmental Advisor/Project Administrator

There was a lack of a proper solid waste landfill site for the inhabitants under the jurisdiction of the Lekwa Teemane Local Municipality. Zutari was appointed to perform a baseline geohydrological study at a location reserved for the construction of the new solid waste landfill site, 1.3 km north of Christiana. The investigation formed part of several specialist studies required for inclusion in the documentation for obtaining environmental authorisations (EAs); and was carried out according to guidelines published in the Minimum Requirements for Waste Disposal by Landfill, Second Edition (1998). Responsible for project administration, including project plan, meeting minutes, invoicing and report writing. Also responsible for performing field work.

New Magalies Water Scientific Services Laboratory, South Africa, North West, Magalies Water, 10/2012 - 10/2015, Project Administrator and Manager

Procurement and design of a new laboratory building for Magalies Water Scientific Services Laboratory. Responsible for project administration and management.

Visual assessment of reservoirs, South Africa, North West, AngloGold Ashanti, 10/2012 - 10/2015, Project Administrator and Manager

Specifications and documentation for maintenance repairs of 13 steel reservoirs to prolong lifespan and grant easier access. Responsible for project administration and management.

Sewer connections upgrade at Ikageng, South Africa, North West, Tlokwe City Local Municipality, 01/2013 - 07/2015, Project Administrator and Manager

Zutari was appointed for design and construction supervision services for the replacement of existing infrastructure to prolong lifetime and minimise service disruption. Responsible for project administration, including project plan, meeting minutes, invoicing and report writing.

Environmental impact assessment (EIA) for red meat abattoirs, South Africa, North West, Department of Agriculture, Conservation, Environment and Rural Development (DACERD), 10/2013 - 03/2015, Project Leader/Environmental Specialist

The project comprised a basic assessment report (BAR) for the Department of Agriculture, Conservation, Environment and Rural Development (DACERD) to establish three red meat abattoirs. Responsible for the environmental authorisation application, public participation, BAR and environmental management plan (EMP).

Abution facilities for Kopanang gold mine, South Africa, North West, AngloGold Ashanti, 09/2009 - 02/2015, Project Administrator

Zutari was appointed for the compilation of specifications and construction supervision of structural repairs at Kopanang Residences. Responsible for project administration, including project plan, meeting minutes, invoicing and report writing.

Basic assessment report (BAR) for the Sebele rare species breeding project, South Africa, North West, North West Parks and Tourism Board, 05/2014 - 12/2014, Project Leader/Environmental Specialist

Zutari was appointed to undertake a basic assessment report (BAR), public participation process (PPP) and

environmental management plan (EMP) for the environmental authorisation of the proposed Sebele rare species breeding camp and lodge. Responsible for the environmental authorisation application, public participation, BAR and EMP.

Sannieshof wastewater treatment plant (WWTP), South Africa, North West, Ngaka Modiri Molema District Municipality (NMMDM), 07/2009 - 12/2014, Environmental Consultant and Advisor/Project Administrator

Zutari was appointed to design, procure and manage the construction of a new wastewater treatment plant (WWTP) to replace the existing oxidation pond system at Sannieshof. Responsible for the evaluation/review of environmental reports for further authorisation as well as acquiring non-listed activity confirmation from READ and general project administration and management.

Upgrade of equipment at pump stations, South Africa, North West, City of Matlosana, 01/2012 - 12/2014, Project Administrator and Manager

Detail design and construction supervision for the upgrade of mechanical and electrical equipment at pump stations in Klerksdorp which supply water to reservoirs. Responsible for project administration, including project plan, meeting minutes, invoicing and report writing.

Rehabilitation and construction of roads in Vryburg, South Africa, North West, Naledi Local Municipality, 10/2012 - 12/2014, Project Administrator and Manager

Detail design and construction supervision for the rehabilitation of residential roads in Vryburg. Responsible for project administration and management.

Upgrading of the Benji Oliphant and Meteor Roads, South Africa, North West, City of Matlosana, 01/2010 - 07/2014, Project Administrator

Zutari was appointed the design and construction supervision for the upgrading of the Benji Oliphant and Meteor Road including the National Route 12 (N12) intersection. The existing intersection was not capable of handling the existing traffic volumes and was in a state of deterioration. The upgrading has ensured better traffic flow and the capability to handle higher volumes of traffic flow. Responsible for project administration, including project plan, meeting minutes, invoicing and report writing.

Widening of Chief Albert Luthuli Street, South Africa, North West, Tlokwe City Local Municipality, 01/2013 - 07/2014, Project Administrator and Manager

Zutari was appointed for design and construction supervision services for the upgrading of Chief Albert Luthuli Street from two to four lanes in order to accommodate increasing traffic. Responsible for project administration, including project plan, meeting minutes, invoicing and report writing.

Potchefstroom hawker stalls and central taxi rank upgrade, South Africa, North West, Tlokwe City Local Municipality, 01/2013 - 07/2014, Project Administrator and Manager

Zutari was appointed for the planning and design to improve the layout and operations of hawker stalls and a taxi rank on Sol Plaatjie Street in Potchefstroom, as well as for re-routing traffic flow. Responsible for project administration, including project plan, meeting minutes, invoicing and report writing.

Refurbishment and upgrading of the Mmabatho College of Nursing (MMACON), South Africa, North West, North West Department of Health, 11/2011 - 06/2014, Project Administrator

The project entailed the refurbishment and upgrading of the Mmabatho College of Nursing (MMACON) due to the influx of nursing students. The nursing college in Mahikeng only provided for the training of 600 nurses, but needed to train 1 200. The work included the provision of lecture halls, a library, simulation rooms, administration offices, a kitchen, a dining hall, student accommodation and services. Zutari's scope of works included project management; design of civil, structural, electrical, wet services, and information and communications technology (ICT) and quantity surveying (QS) services. Responsible for Sciforma and assisting with project planning and budgeting.

Link roads for the West Rand District Municipality (WRDM), South Africa, Gauteng, West Rand District Municipality (WRDM), 09/2008 - 05/2013, Environmental Advisor/Project Administrator

Zutari was appointed for the design, procurement process and supervision for the construction of roads between Rietvallei 241 IQ and Rietvallei Extension 2 and between Toekomsrust and Rietvallei Extension 3. Responsible for project administration, including project plan, meeting minutes, invoicing and report writing. Also responsible for the evaluation/review of environmental reports for further authorisation.

Ablution facilities for the Great Noligwa gold mine, South Africa, North West, AngloGold Ashanti, 04/2011 - 04/2013, Project Administrator

Zutari was appointed for the compilation of specifications and construction supervision of structural repairs at Noligwa Residences. Responsible for project administration, including project plan, meeting minutes, invoicing and report writing.

Pipeline from the African Explosives Limited (AEL) reservoir to Noligwa bridge, South Africa, North West, AngloGold Ashanti, 06/2010 - 11/2012, Project Administrator

The project entailed the installation of a new 600 mm diameter glass-fibre reinforced polyester (GRP) potable water pipeline, connecting the African Explosives Limited (AEL) reservoir to the existing Nologwa bridge pipeline near the Great Nologwa gold mine. Zutari was appointed for the design and site supervision. Responsible for project administration, including project plan, meeting minutes, invoicing and report writing.

AngloGold Vaal Reefs stormwater plan, South Africa, North West, AngloGold Ashanti, 10/2010 - 04/2012, Project Administrator/Environmental Specialist

Zutari was appointed to do a clean surface water evaluation in both the West Wits and Vaal River mine lease areas. This study formed part of an integrated stormwater master plan in which both clean and dirty runoff would eventually be addressed to comply with Regulation 704. Responsible for project administration, including project plan, meeting minutes, invoicing and report writing. Also responsible for performing field work and data capturing.

Upgrading of Road D53 to bituminous standards, South Africa, North West, Department of Transport and Community Safety, 06/2008 - 04/2012, Project Administrator/Environmental Advisor

The project entailed the upgrading of 9.4 km of Road D53 between P124-1 and Molatedi from gravel to bituminous standards by means of labour-intensive construction (LIC) methods. Zutari's scope of works included the compilation of a scoping report (assessment) followed by the detailed design, tender documentation and supervision. Sub-consultants have been engaged for survey, environmental impact assessment (EIA) and geotechnical investigations. Responsible for general project administration and management as well as reviewing environmental legislative requirements.

Construction of the Jouberton main stormwater channel, Phases 1 and 2, South Africa, North West, City of Matlosana, 01/2010 - 07/2011, Project Administrator

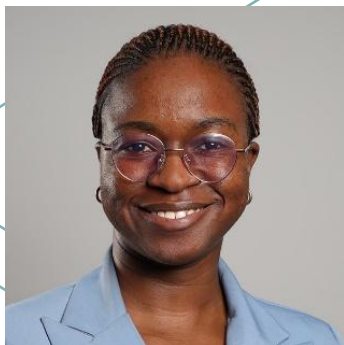
Zutari was appointed for the construction of a main stormwater channel in Jouberton. The first phase of the project entailed the construction of 1 000 m of the 3 000 m open stormwater channel. Phase 2 of the project entailed the completion of the project, namely the construction of the final 2 000 m of the stormwater channel. Responsible for project administration, including project plan, meeting minutes, invoicing and report writing.

Consulting engineering services for Road P124-1: Mabeskraal to Derdepoort, South Africa, North West, North West Department of Public Works and Roads (DPWR), 07/2004 - 04/2010, Environmental Advisor/Project Administrator

The project entailed the preliminary investigation (scoping report), preliminary and detailed design, tender documentation and supervision of the development of Phase 2 of Road P124-1 between Mabeskraal and Derdepoort, comprising approximately 19 km of Road 124-1 from Dwarsberg to the Limpopo provincial border. Responsible for general project administration and management as well as for the evaluation/review of environmental reports for further authorisation.

Rehabilitation of a section of National Route 12 (N12) at Broadbend Street in Wolmaranstad, South Africa, North West, Dr Kenneth Kaunda District Municipality, 11/2008 - 06/2009, Project Administrator

Zutari was appointed for the rehabilitation of a 2 km x 17 m section of Broadbend Street along National Route 12 (N12) in Wolmaranstad, from conception to close-out. Zutari also capacitated a firm, King & Associates, who was brought on board to benefit from skills transfer in terms of the rehabilitation of national roads. Responsible for project administration, including project plan, meeting minutes, invoicing and report writing.



Margaret Phiri

Junior Environmental Consultant

Summary

Margaret is a junior environmental consultant at Zutari. She specialises in environmental consulting and has experience as an environmental consultant and an environmental control officer (ECO). She has expertise in undertaking Integrated Water Use Licence Applications (IWULA); operating and compilation of applications on the Department of Water and Sanitation (DWS) Electronic Water Use Licence Application and Authorisation System (e-WULAAS); the compilation, auditing and reviewing of Environmental Impact Assessment (EIA) reports, Environmental Management Programmes (EMPrs) and environmental monitoring reports; compliance and enforcement; Environmental Impact Assessment (EIA), Basic Assessments (BA), General Authorisations (GA) Reports, water quality monitoring (ground and surface); environmental compliance; compilation of Part 1 and Part 2 Environmental Authorisation (EA) amendment applications; compilation of Environmental and Social Impact Assessment (ESIA) reports; compilation of Due Diligence reports; conducting Water Use Licence (WUL) amendment applications and General Authorisation (GA) amendment applications; conducting monthly Environmental Compliance Officer (ECO) Audits and compilation of ECO audit reports. She also has academic and corporate experience in Geographical Information System (GIS).

Moreover, she has experience in comprehensive project management that includes meeting with clients, sourcing information and liaising with project team; compiling of fee proposals and reporting; conducting and facilitating environmental awareness programmes; coordinating public participation process (PPP) and stakeholder engagement; environmental incidents investigations and reporting; implementation and facilitation of alien invasive removal campaigns, and client liaison and environmental reporting.

Projects she has worked on in South Africa have included renewable energy facilities (solar), renewable energy transmission/distribution, fuel storage facilities, wastewater treatment works (WWTWs)/sewage treatment plants (STP), mixed-use developments (MUD), residential, golf estates, commercial and industrial developments, external civil services, bulk pipelines, road construction and upgrades, abattoirs, routine road maintenance.

Relevant experience

Basic Assessment (BA) and Water Use Licence Application (WULA) for the Hout Bay Cemetery Extension, South Africa, Western Cape, City of Cape Town, 10/2024 – current, Environmental Assessment Practitioner (EAP)

Zutari has been appointed to undertake the Basic Assessment and Water Use Licence Application processes for the proposed extension of Hout Bay Cemetery in Hout Bay, Cape Town. The project includes undertaking the Public Participation Process (PPP), consultation with authorities, interested and affected parties (I&APs) and landowners, and compilation of BA and WULA reports and associated Environmental Management Programmes. Responsible for compilation of BAR, WULA, PPP, as well as compiling the EMPrs.

Basic Assessment (BA) and Water Use Licence Application (WULA) for the Klip Road Cemetery Extension, South Africa, Western Cape, City of Cape Town, 10/2024 – current, Environmental Assessment Practitioner (EAP)

Zutari has been appointed to undertake the Basic Assessment and Water Use Licence Application processes for the proposed extension of Klip Road Cemetery in Grassy Park, Cape Town. The project includes undertaking the Public Participation Process (PPP), consultation with authorities, interested and affected parties (I&APs) and landowners, and compilation of BA and WULA reports and associated Environmental Management Programmes (EMPrs). Responsible for compilation of BAR, WULA, PPP, as well as compiling the EMPrs.

Qualifications

MSc Environmental Management (cum laude)

BSc Geography (Honours) (cum laude)

BSc Life and Environmental Sciences (Majors: Geography and Environmental Management)

Professional registrations

Environmental Assessment Practitioner (EAP), Environmental Assessment Practitioners Association of South Africa (EAPASA)

Professional Natural Scientist, South African Council for Natural Scientific Professions (SACNASP) Member, International Association for Impact Assessment South Africa (IAIASa)

Specialisation

Environmental consulting/environmental management

Years in industry

6

Basic Assessment (BA) process for four (4) hybrid Renewable Energy Facilities referred to as the Rooipoort Renewable Energy Project, South Africa, North West, Cainmani (Pty) Ltd, 01/2024 – current, Environmental Assessment Practitioner (EAP) (placed on hold)

Zutari has been appointed to conduct five (5) Basic Assessment processes for four Solar photovoltaic (PV) plants and a Grid connection. The project includes undertaking the Public Participation Process (PPP), consultation with authorities, interested and affected parties (I&APs) and landowners, and compilation of BA reports and associated Environmental Management Programmes (EMPrs). Responsible for compilation of five BARs, PPP, as well as compiling the EMPrs.

Scoping and Environmental Impact Assessment (EIA) for Ventersdorp Solar Energy Facility, South Africa, North West Province, Cainmani (Pty) Ltd, 02/2024 – current, Environmental Assessment Practitioner (EAP) (placed on hold)

Zutari has been appointed to conduct Scoping and Environmental Impact Assessment (Scoping & EIA) processes for the proposed solar facility. The facility will include solar photovoltaic energy generation infrastructure, a battery energy storage system and the required grid connection, including on-site substation and overhead powerlines. The project includes undertaking the relevant Public Participation Process (PPP), consultation with authorities, interested and affected parties (I&APs) and landowners, and compilation of the Scoping and EIA reports and associated Environmental Management Programmes (EMPrs). Responsible for compilation of Scoping and EIA reports, PPP, as well as compiling the EMPrs.

Scoping and Environmental Impact Assessment (EIA) for Greylingstad Solar Energy Facility, South Africa, Mpumalanga Province, Cainmani (Pty) Ltd, 02/2024 – current, Environmental Assessment Practitioner (EAP)

Zutari has been appointed to conduct Scoping and Environmental Impact Assessment (Scoping & EIA) processes for the proposed solar facility. The facility will include solar photovoltaic energy generation infrastructure, a battery energy storage system and the required grid connection, including on-site substation and overhead powerlines. The projects includes undertaking the relevant Public Participation Process (PPP), consultation with authorities, interested and affected parties (I&APs) and landowners, and compilation of the Scoping and EIA reports and associated Environmental Management Programmes (EMPrs). Responsible for the initial consultation, initial project planning, and providing support to the project team.

Environmental & Social Screening Report for the proposed Euphorbia-Invergwali-Zaka and Vulcanvale-Wexford Wind Energy Facilities (WEFs), Cennergi, South Africa, Eastern Cape Province, 10/2024 – 10/2024, Junior Environmental Consultant

Zutari was appointed to undertake an environmental and social (E&S) screening and fatal flaw analysis for the proposed Euphorbia-Invergwali-Zaka and Vulcanvale-Wexford Wind Energy Facilities (WEFs) in the Eastern Cape. Responsible for writing the environmental and social (E&S) screening and fatal flaw analysis report.

Environmental Screening as part of consulting engineering services contract for the special maintenance of structures on the National Routes N2, N3, N11, R22 R61 and R69 in Kwazulu-Natal, South African National Roads Agency Limited (SANRAL), South Africa, KwaZulu-Natal, 10/2024 - 10/2024, Junior Environmental Consultant

Zutari was appointed to advise the environmental obligations of maintenance activities proposed at several SANRAL bridges through an environmental screening study. Responsible for writing of environmental obligations/screening chapter for the engineering detailed design report.

Technical due diligence for the Turffontein Solar 1 Photovoltaic (PV) Facility, Gauteng and North West Provinces, South Africa, Turffontein Solar 1 (Pty) Ltd, 05/2024 - 05/2024, Junior Environmental Consultant

Zutari was appointed to advise the Turffontein Solar 1 PV Solar Energy Facility of up to 240 MW and associated infrastructure of its current condition through a technical due diligence study. Responsible for writing of environmental due diligence chapter for the due diligence report.

Technical due diligence for the Varkenslaagte Solar Photovoltaic (PV) Facility, Gauteng Province, South Africa, Varkenslaagte (Pty) Ltd, 05/2024 - 05/2024, Junior Environmental Consultant

Zutari was appointed to advise the Varkenslaagte Solar PV Facility of up to 220 MW and associated infrastructure of its current condition through a technical due diligence study. Responsible for writing of environmental due diligence chapter for the due diligence report.

Technical due diligence for the Phala Solar Photovoltaic (PV) Facility, Limpopo Province, South Africa, NOA (Pty) Ltd, 04/2024 - 04/2024, Junior Environmental Consultant

Zutari was appointed to advise the Phala Solar PV Facility of up to 350 MW and associated infrastructure of its current condition through a technical due diligence study. Responsible for writing of environmental due diligence chapter for the due diligence report.

Environmental and Social Impact Assessment (ESIA), including International Finance Corporation (IFC) and the Equator Principles (EPs) for the Heineken "Project Bisoke" Greenfields Brewery, Rwanda, Bralirwa, 03/2014 - 03/2014, Project Support

The project comprises a feasibility study and environmental and social impact assessment (ESIA) for the establishment of the Heineken "Project Bisoke" Greenfields Brewery in Rwamagana District, Rwanda. The ESIA includes the Brewery, Water Abstraction & Discharge Pipes. Provided support to the team for reviewing the EIA deliverables of a local consultant appointed to undertake the EIA, to ensure compliance with the requirements of the International Finance Corporation (IFC) and the Equator Principles (EPs) and writing the ESIA.

Water Use Authorisation (WUA) - General Authorisation (GA) for the proposed Ceres Photovoltaic (PV) and Gridline infrastructure, South Africa, Western Cape Province, Witzenberg Local Municipality, 01/2024 – current, Junior Environmental Consultant

Zutari has been appointed to conduct the Water Use Authorisation (WUA) through a General Authorisation (GA) process for the proposed Ceres Photovoltaic (PV) and Gridline infrastructure. These services are to ensure authorisation is obtained in line with the National Water Act, 1998 (Act No. 36 of 1998) and ensure project compliance with other legislation such as National Environmental Management Act (Act No. 107 of 1998) (NEMA). Responsible for WUA project management, including consulting with the Department of Water and Sanitation (DWS), GA reports and other administrative information as required by the DWS, and loading of the application onto the DWS Electronic Water Use Licence Application and Authorisation System (e-WULAAS).

Water Use Authorisation (WUA) – Water Use Licence Application (WULA) for the proposed Ceres River Maintenance and Management Plan (MMP), South Africa, Western Cape Province, Witzenberg Local Municipality, 06/2023 – current, Junior Environmental Consultant

Zutari has been appointed to conduct the Water Use Authorisation (WUA) through a Water Use Licence Application (WULA) process for the proposed Ceres River Maintenance and Management Plan (MMP). These services are to ensure authorisation is obtained in line with the National Water Act, 1998 (Act No. 36 of 1998) and ensure project compliance with other legislation such as National Environmental Management Act (Act No. 107 of 1998) (NEMA). Responsible for WUA project management, including consulting with the Department of Water and Sanitation (DWS), WULA summary report, WULA technical report, Public Participation Process (PPP) and other administrative information as required by the DWS, and loading of the application onto the DWS Electronic Water Use Licence Application and Authorisation System (e-WULAAS).

Water Use Authorisation (WUA) – Water Use Licence Application (WULA) for Vopak South Africa Developments (VSAD), South Africa, Gauteng Province, 02/2024 - current, Junior Environmental Consultant

Zutari has been appointed to conduct the Water Use Authorisation (WUA) through a Water Use Licence Application (WULA) process for the Vopak Lesedi Stormwater Project. These services are to ensure authorisation is obtained in line with the National Water Act, 1998 (Act No. 36 of 1998) and ensure project compliance with other legislation such as National Environmental Management Act (Act No. 107 of 1998) (NEMA). Responsible for WUA project management, including consulting with the Department of Water and Sanitation (DWS), WULA summary report, WULA technical report, Public Participation Process (PPP) and other administrative information as required by the DWS, and loading of the application onto the DWS Electronic Water Use Licence Application and Authorisation System (e-WULAAS).

Water Use Authorisation (WUA) – Water Use Licence Application (WUL) Amendment for Kathu Solar Park (Rf) Pty Ltd, South Africa, Northern Cape Province, 03/2024 - current, Junior Environmental Consultant

Zutari has been appointed to conduct the Water Use Authorisation (WUA) through a Water Use Licence (WUL) Amendment process for the proposed Solar Photovoltaic (PV) Augmentation (SPA) at the existing Kathu Solar Park (KSP) facility. These services are to ensure authorisation is obtained in line with the National Water Act, 1998 (Act No. 36 of 1998) and ensure project compliance with other legislation such as National Environmental Management Act (Act No. 107 of 1998) (NEMA). Responsible for WUA project management, including consulting with the Department of Water and Sanitation (DWS), WULA summary report, WULA technical report, Public Participation Process (PPP) and other administrative information as required by the DWS, and loading of the application onto the DWS Electronic Water Use Licence Application and Authorisation System (e-WULAAS).

Water Use Authorisation (WUA) – Water Use Licence Application (WULA) for Department of Water and Sanitation (DWS), South Africa, Gauteng Province, 03/2024 - current, Junior Environmental Consultant

Zutari has been appointed to conduct the Water Use Authorisation (WUA) through a Water Use Licence Application (WULA) process for the proposed Greater Mangaung Water Augmentation Project – Xhariep Pipeline. These services are to ensure authorisation is obtained in line with the National Water Act, 1998 (Act No. 36 of 1998) and ensure project compliance with other legislation such as National Environmental Management Act (Act No. 107 of 1998) (NEMA). Responsible for WUA project management, including consulting with the Department of Water and Sanitation (DWS), WULA summary report, WULA technical report, Public Participation Process (PPP) and other administrative information as required by the DWS, and loading of the application onto the DWS Electronic Water Use Licence Application and Authorisation System (e-WULAAS).

Vopak Lesedi Terminal Updated Environmental Management Programme (EMPr), Vopak South Africa Developments (VSAD), South Africa, Gauteng Province, 02/2024 - 02/2024, Junior Environmental Consultant

Zutari was appointed to update to compile a site-specific Environmental Management Programme (EMPr), for the proposed Bulk Fuel Storage Expansion (BFSE) for the Vopak Terminal Lesedi. Responsible for compiling the site

specific EMPr.

Routine Road Maintenance (RRM) of SANRAL's National Routes, South Africa, Multi-Regional SA, South African National Roads Agency Limited (SANRAL), 08/2021 - 11/2023, Internal Environmental Officer (EO)

The project entailed Routine Road Maintenance (RRM) on SANRAL's routes. Responsible for internal environmental reports, daily site walks and daily environmental reporting, conducting inductions and toolbox talks.

Construction and operation of the proposed Mooiplaats Industrial Development, South Africa, Gauteng, Geiger Enterprises (Pty) Ltd, 07/2023 - 11/2023, Project Manager/EAP in training

The project included a Basic Assessment Report (BAR) and Environmental Management Programme (EMPr). Responsible for compiling the fee proposal, liaising with client, professional team and stakeholders. Also responsible for coordinating the project scope, Public Participation Process (PPP), compilation of the BAR and EMPr, coordinating public participation and submission to competent authority.

Construction and operation of the proposed Groblersdal Mixed Use Development, South Africa, Limpopo, Twin City (Pty) Ltd, 01/2022 - 11/2023, Project Manager/EAP in training

The project included a Basic Assessment Report (BAR) and Environmental Management Programme (EMPr). Responsible for compiling the fee proposal, liaising with client, professional team and stakeholders. Also responsible for coordinating the project scope, Public Participation Process (PPP), compilation of the IAR and EMPr, coordinating public participation and submission to competent authority.

Monthly Environmental Control Officer (ECO) for Mooikloof Eco Estate Development, South Africa, Gauteng, Balwin Properties Limited, 01/2021 - 11/2023, Environmental Control Officer (ECO)

The project involved a monthly ECO audit and reporting. Responsible for conducting site inspections and ensuring environmental compliance; compiling monthly ECO reports; and submission to client and competent authority.

Monthly Environmental Control Officer (ECO) for The Hills wastewater treatment plant, South Africa, Gauteng, Balwin Properties Limited, 01/2021 - 11/2023, Environmental Control Officer (ECO)

The project involved a monthly ECO audit and reporting. Responsible for conducting site inspections and ensuring environmental compliance; compiling monthly ECO reports; and submission to client and competent authority.

Monthly Environmental Control Officer (ECO) for the Zwavelpoort sewer pipeline and rising main, South Africa, Gauteng, Balwin Properties Limited, 02/2022 - 11/2023, Environmental Control Officer (ECO)

The project entailed a monthly ECO audit and reporting. Responsible for conducting site inspections and ensuring environmental compliance; compiling monthly ECO reports; and submission to client and competent authority.

Expansion of the Groblersdal Regional Shopping Centre, South Africa, Limpopo, Twin City Pty (Ltd), 08/2023 - 08/2023, Project Manager/Lead EAP

The project involved Part 2 amendment application forms, impact assessment reports and Environmental Management Programme (EMPr). Responsible for compiling the fee proposal, liaising with client, professional team and stakeholders. Also responsible for coordinating the project scope, compilation of the IAR and EMPr, coordinating public participation and submission to competent authority.

Water Use Licence Application (WULA) for the Farm Waterval 5 IR (Waterfall Development), South Africa, Gauteng, Waterfall Management Company, 09/2020 - 08/2023, Environmental Compliance Officer (ECO)

The project comprised the compilation of a Water Use Licence Application (WULA) for the Farm Waterval 5 IR (Waterfall Development). Responsible for managing and compilation of the Water Use Licence Application (WULA), as well as liaison with the client and project team for information.

Construction and operation of the proposed Erasmus Park Mixed Use Development, South Africa, Gauteng, Castle Gate (Pty) Ltd, 02/2023 - 07/2023, Project Manager/Lead EAP

The project included a Basic Assessment Report (BAR) and Environmental Management Programme (EMPr). Responsible for compiling the fee proposal, liaising with client, professional team and stakeholders. Also responsible for coordinating the project scope, compilation of the IAR and EMPr, coordinating public participation and submission to competent authority.

Water Use Licence Application (WULA) for the Waterfall Fields mixed-use development, South Africa, Gauteng, Balwin Properties Limited, 01/2022 - 07/2023, Environmental Compliance Officer (ECO)

The project involved the compilation of a Water Use Licence Application (WULA) for the Waterfall Fields mixed-use development (Munyaka Development). Responsible for managing and compilation of the Water Use Licence Application (WULA). This included liaison with the client and project team for information, as well as compilation of the Water Use Licence Application (WULA).

Waterfall Fields Mixed Use Development – Jukskei View X118 Munyaka Development, South Africa, Gauteng, Balwin Properties Limited, 06/2022 - 06/2022, Project Manager/Lead EAP

The project entailed Part 2 amendment application forms, impact assessment reports and Environmental Management Programme (EMPr). Responsible for compiling the fee proposal, liaising with client, professional team and stakeholders. Also responsible for coordinating the project scope, compilation of the IAR and EMPr, coordinating public participation and submission to competent authority.

EAPASA

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Highveld Techno Park
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Environmental Assessment Practitioners Association of South Africa

Advancing environmental assessment practice in South Africa



Email: registrar@eapasa.org / Website: www.eapasa.org

Ms Tiisetso Phiri
2442 Block B Extension 2
Letlhabile
Brits
0264

Sent by email to: margaretphiri837@gmail.com

Dear Ms Phiri

Registered Environmental Assessment Practitioner: Number 2023/7270

Tiisetso Margaret Phiri : South African ID 9308200709085

The Environmental Assessment Practitioners Association of South Africa (EAPASA) herewith certifies that Tiisetso Margaret Phiri is a Registered Environmental Assessment Practitioner (EAP) in accordance with the prescribed criteria of Regulation 15.(1) of the Section 24H Registration Authority Regulations (Regulation No. 849, Gazette No. 40154 of 22 July 2016, of the National Environmental Management Act (NEMA), Act No. 107 of 1998, as amended).

Your registration is duly authorised by EAPASA as the single Registration Authority for EAPs in South Africa (appointed as per Regulation No. 104, Gazette No. 41434 of 8 February 2018, in terms of section 24H(3)(a) of the NEMA). Your status as a Registered EAP is displayed in the 'EAP Register' - please find your name and contact email address at

<https://registration.eapasa.org/registered-practitioners>

Your registration is effective for a period of five years from 31 May 2024, and expires on 31 May 2029. The renewal of your registration in 2029 will be contingent on you having met the requirements of EAPASA's Continuing Professional Development (CPD) policy during each year of registration.

As a Registered EAP you are required to uphold the EAPASA Code of Ethical Conduct and Practice in your professional endeavours, towards the goal of quality assurance in environmental assessment practice.

Please accept my congratulations on your registration.

Best regards

Dr Patrick Sithole
Registrar

Date: 31 May 2024

Board Members: Ms Snowy Makhudu (Chairperson), Dr Khangwelo Desmond Musetsho (Vice-Chairperson),
Mr Zama Dlamini, Ms Jacqui Hex, Ms Minnette Le Roux, Ms Thato Moeeng,
Ms Jennifer Molwantwa, Mr Phumudzo Nethwadzi, Mr Danie Neumann,
Mr Khathutshelo Tshipala, Ms Letlhogonolo Tungamirai
Registrar: Dr Patrick Sithole
NPO Reg. No. 122-986



herewith certifies that
Tiisetso Margaret Phiri
Registration Number: 123524
is a registered scientist

in terms of section 20(3) of the Natural Scientific Professions Act, 2003
(Act 27 of 2003)
in the following field(s) of practice (Schedule 1 of the Act)
Environmental Science (Professional Natural Scientist)

Effective **9 September 2020**

Expires **31 March 2026**



A handwritten signature in black ink, appearing to read 'S. Mapho'.

Chairperson

A handwritten signature in black ink, appearing to read 'N. Maseko'.

Chief Executive Officer





Tanushri Govender

Graduate Environmental Scientist

Summary

Tanushri is a graduate environmental scientist and holds a Master's degree in Environmental and Water Science. She has contributed to various projects in the Eastern Cape, including those requiring Water Use Licences, assisting with Basic Assessment Reports (BAR), Scoping and EIR reports, coordinating Public Participation Processes (PPP), and serving as Environmental Control Officer (ECO) on several projects. She also has a strong understanding and capability of Geographic Information Systems (GIS). She has a strong theoretical and holistic background in environmental systems which has allowed her to gain an in-depth understanding of the interactions between the environment and socio-economic impacts.

Relevant experience

Woodlands Water Security, South Africa, Eastern Cape, Woodlands Dairy (Pty) Ltd, 02/2024 - 12/2024, Water Use Licence Application

After drought like conditions worsened in Kouga Municipality, Woodlands Dairy (Pty) Ltd proposed drilling boreholes to alleviate Municipal water supply strain on the Churchill Dam. As a result, water demand on the existing municipal supply will be reduced, which would benefit all municipal supply users and The Dairy can continue to operate, which will provide security for around 1600 employees as well as the community initiatives supported by The Dairy. Responsible for conducting the water use license application (WULA) summary report, Integrated Waste Water Management Plan (IWWMP) and compiling technical documentation for submission.

Environmental advisory services, South Africa, Eastern Cape, PSA Sand Mine, 02/2024 - 06/2024, ECO

Assess current status and submit outstanding information to DME to comply with requirements for Mining licence, survey current mining area, revise mine plan, compile closure plan and rehabilitation plan and submit any additional applications (as required). Reviewed and updated PSA labour and social plan for the 2022/2023 financial year. Also assisted with ECO services.

Sandile water security, South Africa, Eastern Cape, Amatola Water, 02/2024- current, Water Use Licence Application

Amatola Water is an essential water services utility provider in the Eastern Cape and is proposing to construct a new rising main pipeline from the Sandile Water Treatment Works (WTW) to the Burnshill Reservoir and the British Ridge Reservoir. A new reticulation has also been proposed, due to community pressure, and this will come off the bulk rising main pipeline. The proposed pipelines will contribute towards the national water service delivery target and the project will carry significant benefits to the receiving communities with little to no negative impacts. Responsible for Water Use Licence Application (WULA) from phase 1 to phase 3 and assisting with the Basic Assessment Report for the proposed reticulation.

Nahoon Bulk Outfall Sewer, South Africa, Eastern Cape, Buffalo City Metropolitan Municipality, 03/2024-current, Basic Assessment Report (BAR) and Water Use Licence Application

Buffalo City Metropolitan Municipality aims to upgrade the Nahoon Bulk Outfall Sewer (NBOS) pipeline in East London due to significant increase in sewage overflows from the NBOS. Preliminary engineering investigations have been carried out and it was determined that the primary cause of the NBOS pipeline failure is due to the small pipe diameter and extremely flat slopes especially at the end of the line. Therefore, the project involves the upgrade to a new and larger diameter bulk outfall sewer pipeline from the iHlanza Pump Station along the Nahoon River. Responsible for Water Use License Application (from phase 1 to phase 3) and assisting with the Basic Assessment Report.

Qualifications

MSc Environmental and Water Science

BSc (Hons) Environmental and Water Science

BSc Environmental and Water Science

Professional registrations

Candidate Natural Scientist (Environmental Science) with the South African Council for Natural Scientific Professions (SACNASP)

Candidate Environmental Assessment Practitioner with the Environmental Assessment Practitioners Association of South Africa (EAPASA)

Specialisation

Environmental Science

Years in industry

1

PG Bison Solar, South Africa, Mkhondo, PG Bison, 05/2024-09/2024, Water Use Licence Application

PG Bison is proposing to install solar panels at their Mkhondo factory so that they have a secure supply of energy and are not reliant on the Eskom grid. One of the sites required for the ground-based solar panels becomes partially water-logged when wet, creating temporary seep wetlands. PG Bison is therefore applying for a WUL to be allowed to construct within the seasonally wet area. An application for a WUL was lodged for Section 21 (c) and (i). Responsible for drafting Water Use Licence Summary Report, compiling application forms and technical documents for submission and all required maps.

Lower Sundays River Water User Association, South Africa, Eastern Cape, 08/2024-current, Basic Assessment Report (BAR)

The Lower Sundays River Water User Association (LSRWUA) appointed Zutari (Pty) Ltd. to develop an environmental Maintenance Management Plan (eMMP) for the existing canal infrastructure in the Sundays River Valley. The plan aims to ensure efficient water distribution for irrigation while preventing blockages and mitigating environmental risks. The eMMP will undergo a Basic Assessment under the National Environmental Management Act (NEMA). Responsibilities included managing geographic databases, contributing to the eMMP report, and facilitating public participation processes.

Stettynskloof Dam Hydrology Study, South Africa, Cape Town, 08/2024-08/2024, project GIS analyst

Zutari was appointed in June 2024 as sub-consultant by Ingérop to assist with the assessment of the impact of various individual scenarios of increased storage in the Holsloot (either through raising of Stettynskloof Dam or combining a raised Stettynskloof with a new dam in an easterly tributary of the Holsloot) on the downstream system, i.e. downstream users as well as the Ecological Water Requirements (EWRs). Managed all geospatial aspects of the study, including map generation and spatial analysis.

KwaNomzamo Waste Water Treatment Works, South Africa, Eastern Cape, Kouga Local Municipality, 2024-current, ECO services

The Kwanomzamo Wastewater Treatment Works (WWTW) is situated in Humansdorp, approximately 15km north of St Francis Bay in the Eastern Cape. Zutari was appointed for the upgrading of the Kwanomzamo WWTW including all civil, electrical and mechanical works. Responsibilities include monthly ECO audits and reporting.

Ndlambe Bulk Water Supply, South Africa, Eastern Cape, Ndlambe Local Municipality, 12/2024-current, Water Use Licence Application

The Ndlambe Bulk Water Supply Project aims to address severe water shortages in the Ndlambe Local Municipality. The project consists of a long-term solution and a short-term "Quick Wins" initiative to improve water security. As part of the Quick Wins approach, groundwater resources were developed through borehole drilling and equipping to supplement Port Alfred's municipal water supply. Responsible for the Water Use License (WUL) renewal process.

Eastern Cape Freeway Management System, South Africa, Eastern Cape, South African National Road Agency Limited (SANRAL), 02/2025-05/2025, Designated Environmental Officer (DEO)

SANRAL has implemented a Freeway Management System (FMS), which includes the installation of camera masts along the N2, extending from Baywest to Motherwell. Responsibilities included being the designated environmental control officer (DEO) to assist the Contractor with abiding by environmental regulations and laws as set out in the Environmental Authorisation and Environmental Management Programme (EMPr) issued by the Department of Economic Development Environmental Affairs and Tourism (DEDEAT).

Oceanview Residential Development, South Africa, Eastern Cape, Kouga Local Municipality, 04/2025 – current, Scoping Report and EIR

Kouga Local Municipality aims to develop a residential hub for the lower income community of Oceanview situated in Jeffreys Bay. The development consists of residential houses, roads, community and commercial spaces and associated civil works. Responsible for Scoping and EIR process.

Addo Canal Fence Safety, South Africa, Eastern Cape, Lower Sundays River Water Users Association, 05/2025-07/2025, ECO services

The Lower Sundays River Water Users Association (LSRWUA) plans to construct a secure fence along the main canal that passes through the informal settlement in Addo. This initiative follows incidents of drowning and damage to the canal, highlighting the need for improved safety and protection. The project aims to safeguard the community while ensuring the long-term sustainability of the canal, which is vital to the farmers who depend on it. Responsibilities included environmental auditing and reporting once a month.

Gill Marcus Reservoir and feeder lines, South Africa, Eastern Cape, Kouga Local Municipality, 05/2025 -07/2025, ECO services

Kouga Local Municipality plans on upgrading their bulk water services in the informal settlement of Kruisfontein, situated near Humansdorp. Works involve elevating the existing reservoir and constructing pipelines to strategic points to service the community. Responsibilities include monthly environmental auditing and reporting.

Hout Bay and Klip Road Cemetery Expansion, South Africa, Western Cape, City of Cape Town, 09/2025 – current, Basic Assessment Report (BAR)

The City of Cape Town (CoCT) is experiencing a significant shortage of burial space as a result of the City's rapidly growing population. To address this, the Recreation and Parks Department has identified several suitable sites across the City for potential expansion. The existing Hout Bay and Klip Road cemeteries have been considered appropriate for expansion due to the availability of adjacent vacant land. As the proposed developments require Environmental Authorisation, a Basic Assessment Report (BAR) is being prepared. Responsible for compiling the BAR.

**Environmental Assessment
Practitioners Association
of South Africa**



Registration No. 2024/8429

Herewith certifies that
TANUSHRI GOVENDER
is registered as an
Candidate Environmental Assessment Practitioner

**Registered in accordance with the prescribed criteria of Regulation 15. (1)
of the Section 24H Registration Authority Regulations
(Regulation No. 849, Gazette No. 40154 of 22 July 2016, of the
National Environmental Management Act (NEMA), Act No. 107 of 1998, as amended).**

Effective: 01 March 2025

Expires: 31 March 2026

Chairperson

Registrar



Annexure 2

Sensitivity Map



Cape Town Municipality
Houtbay Cemetery
Habitat Sensitivity

Legend

 Cemetery extension

Habitat sensitivity

 Very Low

Annexure 3

Site Layout Plan

[illegible]

Annexure 4

Stormwater Management Plan

TABLE C1: STORMWATER MAINTENANCE SCHEDULE

COMPONENT	INSPECTIONS [I]			ROUTINE MAINTENANCE [R]		CORRECTIVE AND IRREGULAR MAINTENANCE [C]		ANNUAL SPREAD OF MAINTENANCE ACTIVITIES (I=INSPECTION; R=ROUTINE; OTHER AS SPECIFIED)														
		ACTIVITY	FREQUENCY (months)		ACTIVITY	FREQUENCY (months)		ACTIVITY	FREQUENCY (months)		J	F	M	A	M	J	J	A	S	O	N	D
Attenuation pond overland inlet strip	1.1	Inspect inlet strip for any obstructions	3	1.1	Remove obstructions	3	1.1	Inspect for damage and repair or replace.	As required		I, R			I, R			I, R			I, R		
Attenuation Pond Forebay	2.1	Inspect forebays for sediment, litter and weeds	3	2.1	Remove sediment, litter and weeds and dispose off site.	3	2.1	Inspect for damage to base or gabion wall and repair.	As required		I, R			I, R			I, R			I, R		
Attenuation Pond Filterbed	3.1	Inspect infiltration bed surfaces for silting and ponding, record dewatering timeof the facility and assess, stating water levels in underdrain (if applicable) to determine if immediate maintenance is required.	3	3.1	Remove silt, litter, surface debris and weeds.	3	3.1	Infill holes and depressions. Replace portions of filterbed which is noted to be non-functioning.	As required		I, R			I, R			I, R			I, R		
	3.2	Check operation of underdrains by inspection of flows after rain.	3	3.2	Rod underdrains to remove sediment and other blockages.	3	3.2	Replace damaged underdrains including stone/geotextile surround.	As required		I, R			I, R			I, R			I, R		
	3.3	Assess plants for diseases, infection, poor growth, invasive species.	3	3.3	Replace diseased, infected and invasive plants. Add plants to maintain coverage.	As required	3.3	As for routine maintenance.	As required		I, R			I, R			I, R			I, R		
	3.4	Inspect inlets and outlets for any blockages	3	3.4	Remove litter, debris and weeds.	3	3.4	Repair structural damage.	As required		I, R			I, R			I, R			I, R		
Attenuation pond grassblock access for vehicles	4.1	Inspect for functionality	3	4.1	Remove surface debris and weeds.	3	4.1	Repair structural damage.	As required		I, R			I, R			I, R			I, R		
Attenuation pond Gabion walls	5.1	Inspect gabion perimeter & forebay walls	3	5.1	Check integrity of wall and repair damage or sagging.		5.1	Repair structural damage.	As required		I, R			I, R			I, R			I, R		
Attenuation pond Outlet structure	6.1	Inspect for blockages of the 3 orifices.	3	6.1	Remove any obstructions. Repair wear and tear.	3	6.1	Repair structural damage.	As required		I, R			I, R			I, R			I, R		
	6.2	Inspect for blockages in the 300dia outlet pipe.	3	6.2	Remove any obstructions. Repair wear and tear.	3	6.2	Repair structural damage.	As required		I, R			I, R			I, R			I, R		
	6.3	Ensure that the steel hinged grid can open and close.	3	6.3	Attend to access problems.	3	6.3	Repair structural damage.	As required		I, R			I, R			I, R			I, R		

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TABLE C1 (continued): STORMWATER MAINTENANCE SCHEDULE

Component	Inspections [I]			Routine Maintenance [R]			Corrective and Irregular Maintenance [C]			Annual Spread of Maintenance Activities (I=Inspection; R=Routine; Other as Specified)												
		Activity	Frequency (months)		Activity	Frequency (months)		Activity	Frequency (months)		J	F	M	A	M	J	J	A	S	O	N	D
Attenuation Pond Embankment	7.1	Take note of depressions, subsidence or erosion.	3	7.1	Check that embankment dimensions and elevations comply with original design.	6	7.1	Assess routine maintenance report and storm damage and repair to original specifications.	As required		I, R			I			I, R			I		
	7.2	Take note of vegetative cover on inside and outslopes	3	7.2	Replace diseased, infected and invasive plants. Add plants to maintain coverage.	6	7.2	Assess routine maintenance report and storm damage and repair to original specifications.	As required		I, R			I			I, R			I		
Attenuation pond outfall culvert over SWMH6	8.1	Inspect for functionality & buildup of sediment	3	8.1	Note condition of culvert and patch any defects.	6	8.1	Repair structural damage.	As required		I, R			I			I, R			I		
Stormwater system in internal roads (applies to all sections of development)	9.1	Remove manhole covers and note condition.	3	9.1	Ensure that covers fit well and that manholes are in good condition. Repair if damage is serious.	6	9.1	Repair or replace damaged manholes and covers	As required		I, R			I			I, R			I		
	9.2	Note condition of kerb inlets	3	9.2	Ensure that covers fit well and that manholes are in good condition. Repair if damage is serious.	6	9.2	Repair or replace damaged kerb inlets.	As required		I, R			I			I, R			I		
	9.3	Note condition of	3	9.3	Ensure that covers fit	6	9.3	Repair or replace	As required		I, R			I			I, R			I		

In diversity there is beauty and there is strength.

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