Appendix F: Environmental Management Programme (EMPr)

Appendix F-1: Construction EMPr

CEN INTEGRATED ENVIRONMENTAL MANAGEMENT UNIT

Environmental and Rural Development Specialist

CONSTRUCTION ENVIRONMENTAL MANAGEMENT PROGRAMME

OCEAN VIEW COLLECTOR SEWER,
KOUGA LOCAL MUNICIPALITY, EASTERN CAPE

DEDEAT Reference Number:
EC08/C/LN3/M/14-2025

8 May 2025

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REVISIONS TO THE CONSTRUCTION ENVIRONMENTAL MANAGEMENT PROGRAMME

Version	Date	Comment
0	08-05-2025	CEMPr included in Draft Basic Assessment Report

Glossary of Terms

Term	Explanation
Ambient (air)	Current surrounding atmospheric condition
dB(A) (decibels A-scale)	A frequency-weighted noise unit used for traffic and industrial noise measurement
Environment	The surroundings in which an organisation operates, including air, water, land, natural resources, flora, fauna, humans, and their interrelation
Environmental Aspect	An element of an organisation's activities, products or services that can interact with the environment
Environmental Impact	Any change to the environment, whether adverse or beneficial, wholly or partially resulting from an organisation's activities, products or services
Environmental Impact Assessment (EIA)	A study of the environmental consequences of a proposed course of action. An environmental evaluation or assessment is a study of the environmental effects of a decision, activity or undertaking. It is most often used within an IEM Planning process as a decision support tool to compare different options
Environmental Management System	The part of the overall management system that includes organisational structure, project activities, responsibilities, practices, procedures, processes and resources for developing, implementing, achieving, reviewing and maintaining the environmental policy
Exotic	Any plant species not falling under the indigenous definition.
Integrated Environmental Management (IEM)	A process that involves the authorities and public, and integrates environmental issues with all aspects of Planning
Invasive	Tending to displace, or increase in cover relative to, surrounding vegetation.
Palaeontology	(study of) life in geological past, fossils

Checklist in terms of Appendix 4 of the EIA Regulations, 2014, as amended

Content Requirement for an Environmental Management Programme (Appendix 4 of the EIA Regulations, 2014, as amended)	Relevant Section in this EMPr
1 (1) An EMPr must comply with section 24N of the Act and include—	
(a) details of– (i) the EAP who prepared the EMPr; and (ii) the expertise of that EAP to prepare an EMPr, including a curriculum vitae	Chapter 1, Appendix C
(b) a detailed description of the aspects of the activity that are covered by the EMPr as identified by the project description	Chapter 2
(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	Chapter 2
(d) a description of the impact management outcomes, including management statements, identifying the impacts and risks that need to be avoided, managed and mitigated as identified through the environmental impact assessment process for all phases of the development including— (i) planning and design; (ii) pre-construction activities; (iii) construction activities; (iv) rehabilitation of the environment after construction and where applicable post closure; and (v) where relevant, operation activities;	Chapters 3 and 4
(f) a description of proposed impact management actions, identifying the manner in which the impact management outcomes contemplated in paragraph (d) will be achieved, and must, where applicable, include actions to — (i) avoid, modify, remedy, control or stop any action, activity or process which causes pollution or environmental degradation; (ii) comply with any prescribed environmental management standards or practices; (iii) comply with any applicable provisions of the Act regarding closure, where applicable; and (iv) comply with any provisions of the Act regarding financial provision for rehabilitation, where applicable;	Chapters 3 and 4
(g) the method of monitoring the implementation of the impact management actions contemplated in paragraph (f);	Chapters 3 and 4
(h) the frequency of monitoring the implementation of the impact management actions contemplated in paragraph (f);	Chapters 3 and 4
(i) an indication of the persons who will be responsible for the implementation of the impact management actions	Chapters 3 and 4
(j) the time periods within which the impact management actions	Chapters 3 and 4

Content Requirement for an Environmental Management Programme (Appendix 4 of the EIA Regulations, 2014, as amended)	**Relevant Section in this EMPr**
contemplated in paragraph (f) must be implemented	
(k) the mechanism for monitoring compliance with the impact management actions contemplated in paragraph (f);	Chapters 3 and 4
(l) a program for reporting on compliance, taking into account the requirements as prescribed by the Regulations;	Chapters 3 and 4
(m) 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; and	Chapter 4
(n) any specific information that may be required by the competent authority	N/A

Chapter 1: Introduction to the Construction Environmental Management Programme

1.1 Background

CEN IEM Unit has been appointed by VST Consulting Engineers (Pty) Ltd on behalf of the Kouga Local Municipality to undertake the Environmental Impact Assessment (EIA) process as the independent Environmental Assessment Practitioner (EAP) for the proposed Ocean View Collector Sewer.

The applicant for an Environmental Authorisation is Kouga Local Municipality (KLM).

1.2 Purpose of the Construction Environmental Management Programme

The purpose of the Construction Environmental Management Programme (CEMPr) is to provide a framework for the management of environmental impacts associated with the construction of the Ocean View Collector Sewer. The CEMPr is to serve as a management tool for the management of the Kouga Local Municipality and contractors responsible for the construction activities.

This CEMPr is a framework programme and outlines procedures and actions to be carried out during the construction phase. It is aimed at minimising and managing environmental impacts that may arise during the construction phase of the project.

The CEMPr identifies and clarifies the roles and responsibilities of key role-players in the implementation of the specific requirements of the CEMPr. The CEMPr further outlines the monitoring, reporting, auditing and review requirements.

The purpose of this CEMPr is to describe:

- How adverse environmental impacts will be managed.
- How environmental damage or degradation will be mitigated.
- Monitoring requirements to ensure the above measures are successful.

1.3 Scope of the Construction Environmental Management Programme

The CEMPr is specific to the construction of the Ocean View Collector Sewer.

The specific aims of the CEMPr are to:

- Formulate procedures to rectify impacts created through the construction of the Ocean View Collector Sewer; and minimise potential secondary environmental impacts.
- Recommend methods to ensure compliance with the CEMPr, including record keeping.
- Provide environmental guidelines to ensure environmentally acceptable practices are followed during the construction phase of the project.

The successful implementation of this CEMPr is dependent on integrating it into the project's management system. Without regular checks on performance and corrections of deviations from the environmental objectives, procedures and targets, the CEMPr will fall into disuse and become ineffective. The CEMPr, therefore, includes various elements of an Environmental Management System such as objectives and targets, the allocation of responsibilities, checking of corrective action, regular audits, and management review of the system.

The CEMPr should be viewed as a dynamic document, which may require periodic updating and / or revision.

The CEMPr is to be kept on-site at all times and made available to the public upon request.

1.4 Methodology

A Basic Assessment was undertaken for the proposed Ocean View Collector Sewer under the EIA Regulations, 2014, as amended. This CEMPr has been drafted during the Basic Assessment phase and includes the mitigation measures recommended in the Basic Assessment Report.

A step-wise approach is used to develop and implement a CEMPr:

- Potential impacts must be identified, and their significance assessed – this is undertaken in the Basic Assessment Report (BAR).
- Suitable mitigation measures need to be defined – these have been provided for each identified impact in the BAR.
- A system to ensure that the necessary mitigation is being implemented must be established.
- The effectiveness of the recommended management systems and measures must be monitored.
- The representatives of the developer must be in a position to verify the work undertaken and to monitor the environmental management process.

1.5 Details of the Environmental Assessment Practitioner

EAP company:	CEN Integrated Environmental Management Unit
Environmental Assessment Practitioner (EAP)	Lucille Behrens
Professional Registration	Registered EAP with EAPASA, 2016/38
Years of Experience	19

Refer to **Appendix C** for the EAP's *Curriculum Vitae*.

1.6 Structure of Construction Environmental Management Programme

Chapter 1 of this CEMPr serves to introduce the scope of the CEMPr. The purpose of the CEMPr is explained. The CEMPr is designed to manage and mitigate identified environmental impacts.

Chapter 2 identifies and briefly describes the details of the project.

Chapter 3 briefly discusses environmental policy. It presents a suggested organisational structure for the project to ensure that responsibilities are allocated and there is adequate control over the work.

Chapter 4 outlines the environmental management requirements for construction activities, including environmental monitoring requirements to facilitate the implementation, management and regular auditing of the CEMPr.

Chapter 2: Description of Project

2.1 Overview

The overall proposed Ocean View Collector Sewer project will consist of sewer pipelines ranging from 160mm to 315mm in diameter over a total length of approximately 1500m:

a) The pipeline along Rolihlanhla Street is a new pipeline within the road verge / reserve, with diameters of 160 – 200mm and over a length of approximately 650m.

b) The pipeline then turns and runs along Dolphin Drive for approximately 700m, with diameters ranging from 200 – 315mm. This section of the pipeline will be located adjacent to the existing sewer pipeline, within the road reserve / verge.

c) The 315mm diameter pipeline then turns in a north westerly direction from Dolphin Drive and follows an existing gravel road for approximately 150m and then turns and ties into the existing sewer pumpstation.

The portions of the proposed sewer collector pipeline along Rolihlanhla Street and Dolphin Drive do not trigger EIA listed activities for the bulk transportation of sewage as the pipeline diameter is under the threshold of 360mm and exclusions of being located within road reserves and urban areas; and are not located within watercourse areas.

The relevant portion of the collector sewer for the application of an Environmental Authorisation and subject to the EIA is the proposed 315mm diameter sewer collector pipeline, from Dolphin Drive to the Ocean View sewer pumpstation, over a distance of approximately 150m. This portion of the sewer collector pipeline is located within 32m of a watercourse and on public open space, thereby triggering listed activities in terms of the EIA Regulations, 2014 as amended; and as a result an Environmental Authorisation is required.

The existing sewer network blocks frequently and a collector sewer within the road reserve is proposed to reduce the flow in the midblock sewer reticulation area of Ocean View.

No capacity increase is proposed for the existing Ocean View Sewer Pumpstation.

The sewage will then be pumped via pumpstations to discharge into the Jeffreys Bay Waste Water Treatment Works.

2.2 Location of the Project

The collector sewer from Dolphin Drive to the Ocean View Sewer Pumpstation is located on Portion 125 of Farm Estate Klein Zeekoe River No. 335 of the Ocean View area of Jeffreys Bay, in Ward 14, in the Kouga Local Municipality, Sarah Baartman District Municipality, Eastern Cape.

2.3 Description of the Project

The relevant portion of the proposed collector sewer for the application of an Environmental Authorisation and subject to the EIA is the proposed 315mm diameter sewer collector pipeline, from Dolphin Drive to the Ocean View sewer pumpstation, over a distance of approximately 150m.

The 315mm diameter pipeline will follow an existing gravel road in a north westerly direction, from Dolphin Drive to the Ocean View Sewer Pumpstation. The proposed collector sewer will then turn in a southerly direction into the existing Ocean View sewer pumpstation, and will tie into the existing sewer infrastructure.

The proposed Ocean View Collector Sewer (315mm diameter) will cater for velocities between a minimum of 0.667m/s and a maximum of 3.0m/s for the gravity sewer.

2.4 Site Description

The area surrounding the Ocean View Pump Station is largely transformed. The area has a few small, isolated pockets of near-natural Humansdorp Shale Renosterveld (Endangered Ecosystem) between the Ocean View pump station and Dolphin Drive to the south. These small pockets are generally degraded and ecologically insignificant and also bisected by several access tracks, pathways and other sewer lines. The collector sewer will follow an existing gravel track. The Ocean View Collector Sewer is located within an Ecological Support Area (ESA1) corridor, in terms of the Eastern Cape Biodiversity Conservation Plan (ECBSP, 2019). The site is located within degraded / transformed habitat. No Endangered or Critically Endangered flora species were confirmed to be present nor are known to be present in the affected area. Eight (8) alien invasive and other weed species were noted within the site and surrounding area. Of these, six (6) species were noted as a listed alien invasive species, either as a Category 1b or Category 2. The site is largely considered to have a low sensitivity due to the disturbed and transformed nature. A small section near the Ocean View Pump Station is designated moderate sensitivity as it will be in proximity to some remnant Humansdorp Shale Renosterveld (Pote, 2024).

The proposed Ocean View Collector Sewer is located near localised watercourses which have no direct connection to any mainstem systems or estuaries within the K90G Kabeljous quaternary catchment. The wetland areas are fragmented, contain higher levels of solid waste and grazed frequently; resulting in a reduction in wetland species diversity (plants). The Present Ecological Score (PES) is Class D - Largely modified and Ecological Importance and Sensitivity is Low. There are no Strategic Water Source Areas mapped near the site. The southwestern end of the sewer alignment is located within a Wetland Cluster. The Eastern Cape Biodiversity Conservation Plan (ECBCP, 2019) indicates the site is located within an Aquatic Ecological Support Area (ESA 1). No endemic, conservation worthy species or species of special concern (Listed or Protected) were observed or have been recorded within the proposed route areas. The proposed Ocean View Collector Sewer is located outside riverine / wetland areas and are currently within highly transformed areas (Colloty, 2024).

No archaeological sites/materials were observed during the investigation of the proposed study area. No known graves or buildings / structures older than 60 years along the proposed pipeline route. The proposed development area appears to be of low archaeological sensitivity, and it is therefore unlikely that any significant archaeological remains will be found on the property. The proposed development may therefore proceed as planned (Reichert, 2024).

The study site is underlain by the Ceres Subgroup of the Bokkeveld Group of the Cape Supergroup. The Ceres Subgroup is well known for its invertebrate benthic marine fossils and is marked as very sensitive from a palaeontological point of view. The area is covered with a soil layer and vegetation. The area is underlain by an extremely jointed and fractured rock, with rock cleavage cutting through bedding planes. This decreases the chance of any fossil finds. Although possible, it is unlikely that any significant fossils will be found, damaged, or lost during construction (Wilken, 2024).

Refer to **Figure 1** for the Environmental Sensitivity Map.

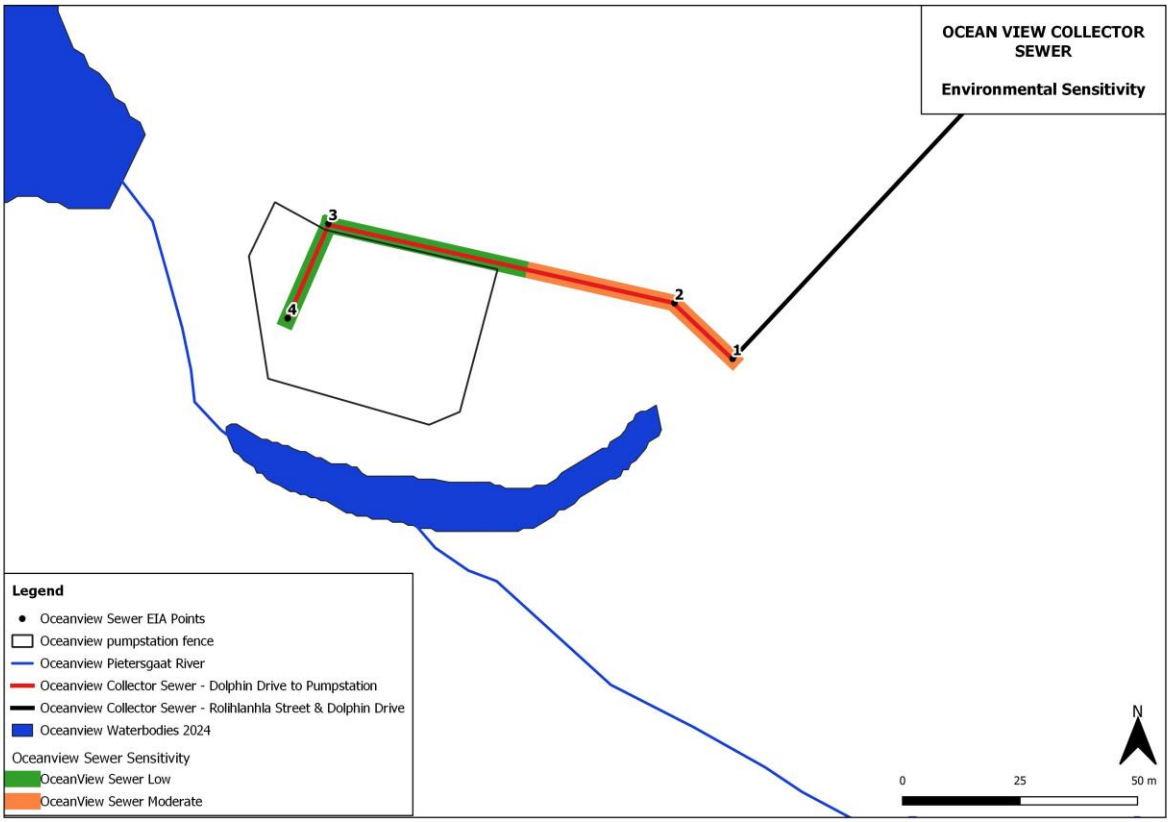

Figure 1: Environmental Sensitivity Map

Chapter 3: Organisational Requirements

3.1 Introduction

The developer and their appointed managers must ensure permanent staff, maintenance staff and contractors are aware of their environmental objectives and policy.

3.2 Environmental Commitment

All persons involved with the construction of the Ocean View Collector Sewer must be made aware of the environmental goals and policy for the construction of the infrastructure and encouraged to develop a commitment to compliance with the environmental legislation and to being good neighbours.

3.3 Background to Environmental Policy

An environmental policy is a statement of the environmental values of an organisation. It conveys these environmental values to employees, demonstrates to stakeholders the importance that senior management attaches to environmental protection and management, and provides a guiding framework for conducting the organisation's business in an environmentally compatible manner.

The philosophy behind the CEMPr is for it to become an effective means of managing environmental performance by:

- Enabling the identification of critical environmental issues:
- Developing action programmes and setting targets;
- Ensuring environmental performance;
- Raising environmental awareness amongst management, staff and the community which it serves; and,
- Providing appropriate training.

The purpose of the CEMPr is to translate environmental policy into practice by putting in place workable systems, structures and tools to achieve integrated and consistent environmental management of all environmental initiatives.

This CEMPr suggests certain detailed objectives, which are applicable to the construction of the Ocean View Collector Sewer. It is important that Kouga Local Municipality's operational managers review these detailed policies and if in agreement, adopt them as firm policy.

3.4 Environmental Policy

The following is a recommended environmental policy:

We aim to conduct all our activities in an environmentally responsible manner.

We are committed to:

- *Practising and promoting sustainable development during day-to-day execution of duties which have an impact on the environment, whether directly or indirectly.*
- *Establishing and maintaining compliance with all applicable legislation, regulatory requirements and industry standards for protection of the environment as a minimum condition and go beyond those requirements wherever practicable.*
- *Educating, informing and motivating our employees and contractors to ensure our activities and operations are conducted in an environmentally responsible manner through*

development and implementation of an Environmental Training Program and the provision of advice as required.

- *Actively communicate with employees, government agencies and the public with regard to environmental management and contribute to the development of laws and regulations which may affect our business.*
- *Prevent pollution, ensure efficient use of resources and minimise waste through promotion and implementation of cleaner operation principles and technology.*
- *Research, support and implement new technology and practices which improve environmental performance where practicable.*
- *Pursue continuous improvement in environmental performance through development and implementation of objectives and targets, reviewing Policy and Procedures and regularly monitoring and auditing our performance.*
- *Conduct periodic reviews of the effectiveness of this Environmental Policy, update this Policy when necessary and re-issue it to employees and the public as appropriate.*

3.5 Organisational Overview

All managers involved should be obliged to familiarise themselves with the adopted Environmental Policy.

Managers should be familiar with the requirements of the CEMPr and should execute all construction activities in an environmentally responsible manner.

Ultimate responsibility and public accountability for the CEMPr and general environmental management during the construction phase resides with the management of Kouga Local Municipality.

The Contractors are responsible for implementing and managing the CEMPr during the construction phase. It is recommended that the Contractors appoint a member of their team as the Contractor's Environmental Officer who is responsible for ensuring that the requirements of the CEMPr are implemented on a day to day basis.

Where procedures in the CEMPr and methods delineated in relevant Method Statements (applicable to construction) are persistently transgressed and appropriate corrective action is not implemented, the Developer or his representative may order the suspension of related activities or impose a fine on the transgressor.

3.6 Roles and Responsibilities

This section defines the roles of the key parties involved in the implementation of the CEMPr and mitigation measures.

3.6.1 Kouga Local Municipality (Developer / Authorisation Holder)

Kouga Local Municipality has the overall accountability and responsibility for environmental management during the construction and decommissioning phases of the development. Further it is their responsibility to ensure that the conditions of the relevant licenses and the mitigation measures in this CEMPr are communicated to, implemented and complied with by the Contractors.

Kouga Local Municipality or its representative will be responsible for.

- Reviewing and approving any Method Statements that may be required for construction activities.
- Reviewing and approving management plans that may be required for the construction phase.

- Reviewing and approving any environmental monitoring programmes that may be required for the construction phase.
- Advising on actions to be taken in the event of incidents or public complaints.
- Providing the results of environmental reports to the relevant authority as and when required.
- Ensuring any required audits are undertaken on a timely basis and that the results of the audits are communicated to all construction personnel.

3.6.2 Authorities

The authorities are responsible for the timely processing and issuing of the necessary permits and authorisations required for the construction of the Ocean View Collector Sewer. Where necessary, the authorities will assist the Kouga Local Municipality in understanding and meeting the specified requirements.

The authorities may perform random inspections to ensure compliance with the conditions. In such case, the Kouga Local Municipality will assist the authorities in every possible way so as to facilitate the inspection. In case of long-term non-compliance, the Kouga Local Municipality will be required to provide an action plan with corrective measures for approval by the authorities.

3.6.3 Contractors and Sub-Contractors

The Contractor and sub-contractors are responsible to the Developer or his representative for the effective implementation of the CEMPr within their respective line functions.

Specific responsibilities include:

- Appointing a Contractor's Environmental Officer who is responsible for ensuring that the requirements of the CEMPr are implemented on a day to day basis.
- The full implementation of all of the requirements of the CEMPr in terms of the approved method statements.
- Ensuring that all sub-contractors are familiar with and implement the CEMPr.
- Identifying procedures applicable to the activities they perform and / or control. Compiling method statements to meet the procedures and targets.
- Implementing corrective and preventive actions.
- Reviewing of the CEMPr implementation and effectiveness at site meetings with the Developer or his representative and the Environmental Control Officer (ECO).
- Maintaining and submitting records of waste disposal activities and corrective actions taken to rectify environmental problems on site.
- Keeping of a complaints and incidents register on site.

3.6.4 Environmental Control Officer

An ECO is to be appointed by the Developer or his representative to advise and assist the project team where necessary and to monitor the implementation of the CEMPr. The ECO reports to the Developer or his representative. The ECO role is to be fulfilled by a person with previous experience in environmental management and compliance monitoring regarding construction processes.

The ECO's duties include:

1. Supporting and advising the Developer or his representative, with regards to the review of Method Statements, auditing, monitoring and corrective and preventive action.
2. Undertaking monthly environmental compliance site monitoring for the duration of the construction phase.
3. Recommending environmentally appropriate solutions to environmental problems.

4. Recommending additional environmental management measures as appropriate.
5. Attending Project Progress Meetings to report on environmental compliance, if required.
6. Providing a monthly report on environmental compliance to the Developer or his representative.

It must be noted that the ECO is responsible for providing an independent evaluation of compliance with the CEMPr and not for enforcement of the conditions of the CEMPr. The responsibility of enforcement of the conditions of the CEMPr lies with the Developer or his representative, while the Environmental Management Inspectors may also enforce conditions through compliance notices.

3.7 Method Statements / Plans / Programmes

The Contractors must submit Method Statements to the Developer or his representative and ECO outlining proposed construction activities, phasing and procedures and methods to comply with the targets stipulated in this CEMPr.

Method Statements indicate how the procedures will be applied in order to meet the relevant targets and are central to the proper implementation of the CEMPr. It is anticipated that in addition to assessing the systems and performance of the CEMPr, the ECO will review the formulation of, and adherence to "Method Statements".

Method Statements must be submitted before any work on the project is undertaken. The various method statements must be approved by the Developer or his representative (in consultation with the ECO). The Developer or his representative and Contractor must keep copies of these Method Statements and letters of approval (including conditions attached) in a Method Statements file, to be located on site.

The Developer or his representative (and, if required, the ECO) must approve any deviations from the approved Method Statements.

All amendments must be in writing and must be submitted to the Developer or his representative.

3.8 Meetings

It is anticipated that Progress Meetings, attended by the Developer or his representative and other members of the project team will be held on a regular basis. It is recommended that a minimum of one meeting every month be held where the compliance to the CEMPr can be discussed, this can be done during the Monthly Site Progress Meeting. The discussions on the CEMPr must continue for the life of the construction phase.

The Developer or his representative may call for additional meetings in response to particular environmental problems. The ECO will attend progress meetings if requested to do so by the Developer or his representative. At each of the meetings, Contractors will report performance against their defined CEMPr objectives and targets.

Chapter 4: Construction EMPr Requirements

4.1 Environmental Management Requirements

The environmental requirements provided in this section address the impacts relating to the construction of the Ocean View Collector Sewer. The environmental management requirements are worded in broad terms and details of the actions to be undertaken must be presented in the method statement / procedure for each aspect as applicable / where required.

The Environmental Management Requirements are presented as follows:

- **Impact Management Outcome:** The desired management outcome(s) for a particular construction risk / impact.
- **Impacts:** Identified during the Basic Assessment Process.
- **Mitigation Measures:** Measures to reduce significance of impact.
- **Procedure**: Steps and/or actions required to manage (and minimise) the relevant aspects.
- **Time Periods:** Time periods within which actions must be undertaken.
- **Performance Indicator:** The (quantitative) level of performance, sometimes determined by legislation, which must be met.
- **Monitoring**: Method, frequency and mechanism of monitoring required.
- **Responsibility:** Persons responsible for implementation.

The development components consist of the following:

- Construction site – Ocean View Collector Sewer
- Vehicles and equipment
- Site office, Storage and laydown areas
- Waste (general waste, hazardous waste).

4.1.1 Terrestrial Biodiversity (Flora, Fauna and Avifauna)

Impact Management Outcome	To minimise damage to indigenous flora and fauna and the surrounding areas. To re-vegetate the area as necessary to alleviate erosion potential and to improve any aesthetic issues. To ensure minimum disturbance to indigenous flora and fauna occupying the area influenced by construction. To control and prevent alien vegetation growth.
Impacts	Loss of natural vegetation Loss of plant species of conservation concern Spread of alien and invasive plant species Erosion Disturbance to ecological processes
Mitigation Measures (BAR)	No clearing outside of footprint to take place. Surrounding intact Humansdorp Shale Renosterveld is to be conserved and not harmed during the construction process unnecessarily. A suitable weed management strategy to be implemented along the pipeline after completion of construction. Suitable measures must be implemented in areas that are susceptible to erosion. Areas must be rehabilitated, and a suitable cover crop planted. If natural vegetation re-establishment does not occur, a suitable grass must be applied. Possible grasses include *Cynodon dactylon, Eragrostis curvula* & *Digitaria eriantha*.
Procedure	No animals are to be harmed or killed during the course of construction. Workers are NOT allowed to collect any flora or snare any faunal species. No domestic animals are permitted on the site. Any fauna (frogs, snakes, etc.) that are found within the construction area must be moved to the closest point of similar habitat type outside of the areas to be impacted. Some common species (including most amphibians, reptiles, and birds) that potentially occur in the project area are protected under the Nature and Environmental Conservation Ordinance (NECO) (Ordinance 19 of 1974). Where applicable, a permit is required for the capture and relocation of protected species. A permit would be required for activities that disturb protected bird species, particularly during the breeding season. Sites with eggs or chicks are considered protected sites. Permit applications must be submitted to Eastern Cape DEDEAT, and relocations should be to suitable habitats near the project area. All disturbed areas beyond the construction site that are intentionally or accidentally disturbed during the construction phase must be rehabilitated. Limit destruction of habitat during construction phase strictly to the development footprint. No trenches or holes are to be left open for extended periods of time. Low speed limits to be adhered to on site, to avoid collisions with fauna or avifauna. Topsoil cleared from construction areas to be stockpiled separately to spoil. This topsoil is to be reinstated after the construction. Alien and Invasive Plan Management Plan: Alien species must be removed from the site as per the National Environmental Management: Biodiversity Act (No. 10 of 2004) requirements. Weeds and alien species must be cleared by hand before the rehabilitation phase of the areas. Removal of alien plants are to be done according to the Working for Water Guidelines. The Contractor is responsible for the removal of alien species within all areas disturbed during construction activities. Disturbed areas include (but are not limited to) access roads, construction camps, site areas and temporary storage areas. In consultation with relevant authorities, the Engineer may order the removal of alien plants (when necessary). Areas within the confines of the site are to be included.

	All alien plant material (including brushwood and seeds) should be removed from site and disposed of at a registered waste disposal site. Should brushwood be utilised for soil stabilization or mulching, it must be seed free.
Time Periods	Lifespan of construction phase
Performance Indicator	No vegetation to be removed outside of the demarcated areas. No harming or killing of animals.
Monitoring	All animal mortalities must be recorded and reported to the Developer. Alien and invasive plant regrowth to be monitored and area to be kept free of alien invasive plants.
Responsibility	Contractor

4.1.2 Aquatic Biodiversity

Impact Management Outcome	To limit the disturbance to watercourses and aquatic biodiversity.
Impacts	Loss of intact wetland or aquatic faunal habitats that could contain various species of special concern, Critical Biodiversity Areas Disturbance of aquatic features and habitat fragmentation (aquatic), especially areas linked to Ecological Support Areas Increase in sedimentation and erosion due to improper stormwater management. Risks on the aquatic environment due to water quality impacts.
Mitigation Measures (BAR)	The proposed footprint has avoided any aquatic areas, which will then also avoid any listed / protected species. The appointed environmental site team should have these areas demarcated to prevent any additional disturbance outside the proposed works areas. The proposed footprint has been optimised to avoid any High Sensitivity areas. It is assumed that all pipelines will be buried and that this would not have an impact of surface water run-off when backfilled and compacted, which would result in no stormwater management issues. Limit any spills from plant, machines or camps during the construction phase. Any use of chemical, cement or paint must be carefully monitored and the necessary spill kits should be in place. Provide suitable solid / liquid waste management that is serviced regularly.
Procedure	All relevant DWS permits (GA or full WUL) must be obtained from the competent authorities prior to commencement of any activities on site. Use existing roads or upgrade existing tracks rather than constructing entirely new roads wherever possible. Clear demarcation of construction footprint is required and no works to take place outside the demarcated area. All liquid chemicals including fuels and oil, must be stored in with secondary containment (bunds or containers or berms) that can contain a leak or spill. A spill kit to be kept on site for hydrocarbon leaks or spills. Washing and cleaning of equipment must be done in designated areas and no run off is allowed into the Pietersgaat River system. All stockpiles must be protected and located in flat areas where run-off will be minimised and sediment recoverable. Any erosion channels developed during the construction period or during the vegetation establishment period shall be backfilled and compacted and the areas restored to a proper condition.
Time Periods	Lifespan of construction phase
Performance	No contamination of groundwater or surface water

Indicator	No surface water may be affected by silt emanating from the site No erosion on site
Monitoring	All construction equipment, vehicles and liquid chemical containers to be inspected daily.
Responsibility	Contractor

4.1.3 Cultural Historic, Archaeological and Palaeontological

Impact Management Outcome	To limit damage to possible cultural historic, archaeological and palaeontological artefacts and sites, features and objects
Impacts	Clearing of sites, excavations and related activities that may damage sites or features.
Mitigation Measures (BAR)	Should archaeological and historical material be exposed then all work must cease in the immediate area and it must be reported to the Albany Museum in Makhanda (Tel: 046 622 2312) or to the Eastern Cape Provincial Heritage Resources Authority (Tel.: 043 492 1940/1/2), so that a systematic and professional investigation can be undertaken. Sufficient time should be allowed to remove/collect such material. The applicant must finance the costs should additional investigations be required. Procedure for chance palaeontological finds to be followed.
Procedure	Workmen and foremen need to be trained in the procedure to follow in instances of accidental discovery of fossil material. The Contractor must report any possible fossil material to the ECO or Site Agent. All work is to cease immediately in the vicinity of the area where the fossil or fossils have been found. The ECO or Site Agent must inform ECPHRA (i.e. The Eastern Cape Provincial Heritage Resources Authority) of the find immediately and to compile a Preliminary Report. This information must include photographs of the findings and GPS co-ordinates. Upon receipt of this Preliminary Report, ECPHRA will inform the ECO or site agent whether a rescue excavation or rescue collection by a palaeontologist is necessary. Exposed finds must be stabilised where they are unstable and the site capped, e.g., with a plastic sheet or sandbags. This protection should allow for the later excavation of the finds with due scientific care and diligence. ECPHRA can advise on the most appropriate method for stabilisation. If the find cannot be stabilised, the fossil may be collected with extreme care by the ECO or the site agent and put aside and protected until ECPHRA advises on further action. Finds collected in this way must be safely and securely stored in tissue paper and an appropriate box. Care must be taken to remove all the fossil material and any breakage of fossil material must be avoided at all costs. No work may continue in the vicinity of the find until ECPHRA has indicated, in writing, that it is appropriate to proceed.
Time Periods	During clearing of vegetation and excavation activities
Performance Indicator	No cultural historic, archaeological or palaeontological artefacts or sites may be purposefully damaged or destroyed. (It is illegal to disturb fossils or other historic and or cultural sites and objects without the prior consent of the Eastern Cape Provincial Heritage Resources Authority).

Monitoring	During earthmoving and excavation activities, the Contractor's Environmental Officer must monitor for potential cultural historic, archaeological and palaeontological sites daily, or more frequently at his discretion.
Responsibility	Developer, Contractor

4.1.4 Employment Opportunities & Economic Contributions

Management Outcome:	To ensure local employment and economic contributions.
Impacts	Temporary and limited employment opportunities Economic impact for local/regional economy
Mitigation Measures (BAR)	No additional mitigation measures have been identified
Procedure	Use local labour from surrounding communities. Make use of local suppliers.
Time Periods	Lifespan of construction and where relevant decommissioning
Performance Indicator	Employment of local persons. Materials sourced from local suppliers, where available
Monitoring	Monthly monitoring of staff and supplier records.
Responsibility	Contractor

4.1.5 Air Quality Management

Management Outcome	To minimise nuisance and potential health problems, and potential damage to flora, associated with dust and/or sand. To minimise air pollution from construction activities
Impacts	Dust generated from construction activities Poorly maintained construction vehicles and burning materials for warmth during winter by contraction staff.
Mitigation Measures (BAR)	On-going implementation of dust suppression and control measures on any dust generating surface. Potable water is not to be used for dust suppression.
Procedure	When required, water spray vehicles to be used to control dust. No over-watering of the site or road surfaces. All earth works must stop during high wind conditions (i.e. when wind speeds exceed 35km/h). The speed of construction vehicles to be restricted to 25km/h within the construction area or near stockpiles. Trucks transporting any form of soil or fine building materials to be covered with a tarpaulin. The Contractor will be responsible for the continued control of dust arising from his operations. Should a dust control method prove to be ineffective by the ECO, alternative methods will need to be conducted by the Contractor. Any changes in the dust control methods shall be for the cost of the Contractor. Any complaints about dust recorded in the complaints register must be immediately investigated by the Developer or his representative and addressed. Contact details (e.g. telephone number) should be located at the entrance of the site for reporting of excessive dust after hours. The Developer or his representative (advised by the ECO) must implement a more rigorous dust-monitoring programme (instrument measurement) if there are persistent complaints about dust in the area.

	No waste, vegetation or any other material shall be burnt. Vehicles and machinery will be maintained in good running condition.
Time Periods	Lifespan of construction
Performance Indicator	Excessive dust generation as determined visually by the ECO is not permitted. Dust levels are not to exceed 1200mg/m^2/day (30 day average) for rural areas.
Monitoring	Dust must be visually monitored on a daily basis, or more frequently in conditions conducive to dust generation. A formal dust monitoring programme and dust suppression techniques be revised, if persistent complaints are recorded.
Responsibility	Contractor

4.1.6 Noise Management

Management Outcome:	To avoid noise disturbance with particular reference to construction and decommissioning activities on the site
Aspect	Operation of construction equipment, assorted maintenance and vehicle operation, construction staff.
Impacts	Noise impacts from construction activities
Mitigation Measures (BAR)	All construction vehicles and equipment must be in sound working order with the prescribed mufflers and silencers. Construction work to be undertaken as per the Kouga Local Municipality Bylaws.
Procedure	Any complaints pertaining to noise and vibrations as recorded in the complaint register must be immediately investigated by the Developer or his representative and addressed. SABS 0103 - 1983 Code of Practice indicates that an increase of ambient noise levels by 5 dB (A) will induce “sporadic complaint” from the community. A formal noise monitoring programme must be implemented by the Developer or his representative if there are persistent complaints. No loud music will be allowed on site or in the construction camp.
Time Periods	Lifespan of construction
Performance Indicator	No excessive noise or complaints.
Monitoring	The Contractor’s Environmental Officer must subjectively monitor noise and vibration levels on a frequent basis. The Contractor’s Environmental Officer must implement a formal noise-monitoring programme if persistent complaints are recorded.
Responsibility	Contractor

4.1.7 Traffic Management

Management Outcome:	To minimise transport related impacts.
Impacts	Additional traffic volumes & road pavement conditions Traffic safety impact due to additional traffic.
Mitigation Measures (BAR)	Construction vehicles must adhere to the speed limits. Signage is to be displayed regarding construction activities.
Procedure	Temporary construction and traffic accommodation signage shall be displayed at the proposed site in order to create awareness of construction vehicles by other road users and to ensure that construction vehicle speeds are restricted. Access to the site must be managed to ensure that no unauthorised vehicles are permitted onto the construction site and to ensure safe entry to and exit from the site. All vehicles used during construction must be roadworthy, regularly maintained and

	repaired when required. Construction vehicles travelling on all public roads shall adhere to the posted speed limits.
Time Periods	Lifespan of construction
Performance Indicator	No accidents No spillages of any material onto roads.
Monitoring	Drivers of construction vehicles shall be in possession of the necessary licenses in terms of the National Road Traffic Act (Act 93 of 1996); All construction vehicles shall be in possession of the necessary licenses and roadworthy certificates in terms of the National Road Traffic Act (Act 93 of 1996);
Responsibility	Contractor

4.1.8 Waste Management

Management Outcome:	To prevent accumulation of waste materials. To prevent littering Minimise quantities of waste generated Dispose of wastes in the appropriate manner Recycle and reuse waste where possible
Impacts:	Impacts relating to ineffective waste management procedures may lead to the dumping of building rubble, littering and pollution of the surrounding areas as well as unsanitary (toilet) conditions. Construction waste will increase the amount of waste disposed to landfill.
Mitigation Measures (BAR):	Good housekeeping to be undertaken at all times. No illegal dumping or burning of waste allowed. Waste is not to be buried. Environmental awareness training to be undertaken with the construction workers regarding health and environmental impacts from illegal dumping. Waste bins are to be located at the construction areas. Bins are to have secured lids to prevent waste from being blown into the surrounding area and to prevent animals scavenging in the bins. Domestic and general construction waste to be disposed of at a licensed landfill site, unless this waste can be recycled or reused. Proof of disposal must be kept at the site office by the Contractor. Chemical toilet facilities to be provided at construction areas, secured to the ground, and to be cleaned at least weekly. No hazardous waste material to be disposed of as general waste. Hazardous waste to be stored separately in impermeable (i.e. leak proof) containers, and if possible sent for recycling. Recycling measures to be implemented for paper, plastic and metals, if applicable.
Procedure	Toilet facilities must be made available to construction staff. If portable chemical toilets are used, these are to be secured to the ground and cleaned at least weekly. Water should be provided for washing and sanitary bins for women. Waste to be disposed of at a wastewater treatment works. Copies of the servicing slips of the chemical toilets to be kept on site. Waste should be classified as domestic (including litter), hazardous, or recyclable. Waste materials (e.g. paper and glass) must be sorted and sent for recycling, where possible. No littering is permitted on site. All non-hazardous solid waste must be removed on a regular basis and disposed of off-site at suitably permitted waste facilities. This includes any building rubble left after construction. Unless the waste can be reused or recycled. A register of waste disposal (including waste manifests) and sorting records must be available. Excess soil and stone removed during the excavations should be re-used on site where

	required or stockpiled for reuse (if applicable).
Time Periods	Lifespan of construction
Performance Indicator	All waste material must be removed from the site and suitably disposed of; no solid wastes shall be stored on-site for more than one week (i.e. 7 days).
Monitoring	The Contractor's Environmental Officer must inspect on-site waste disposal facilities / temporary storage areas daily, to ensure that they are sufficient and that they are properly maintained. During site inspections the Contractor's Environmental Officer must check for waste material, which is inappropriately (temporarily) disposed of or stored. A record must be kept of waste that is disposed of at the landfill site or sent for recycling. The Contractor's Environmental Officer must monitor the site for litter and other waste material.
Responsibility	Contractor

4.1.9 Health, Safety and Security

Management Outcome:	Reduction of any safety risks for employees or adjacent landowners Fire prevention and fire response measures are to be in place.
Impacts	Health, Safety and Security risks from construction activities
Mitigation Measures (BAR)	Existing services and sewage connections to be identified by the contractor prior to excavation for the pipeline. Firefighting equipment (according to the fire risk) to be available on site at all times. No "hot work" is to be undertaken on days where the Fire Danger Index is "orange" or "red". Hot work is any work that involves burning, welding, cutting, brazing, soldering, grinding, using fire- or spark-producing tools, or other work that produces a source of ignition. The construction area must be demarcated and access controlled for the duration of the construction period. Access to and from the construction site(s) should be closely monitored and controlled. Signs must be erected at strategic locations throughout the construction areas, warning the public and site visitors about the hazards around the construction site and the presence of heavy vehicles. Compliance with the relevant health and safety procedures and regulations during construction.
Procedure	Adequate clean drinking water must be available to construction staff. Security to be provided after hours to protect equipment in the construction camp. Excavations to be demarcated with suitable high visibility material. Signage is to be displayed regarding construction activities. Approved health and safety plan to be available on site. Visitors to report to the Site Office, and appropriate Protective Personal Equipment (PPE) to be worn by visitors. Smoking will not be permitted in those areas where there is a fire hazard. These areas include the fuel storage areas and any area where the vegetation or other material may support the rapid spread of an initial flame. Where possible, these areas (e.g. at the chemical and hazardous substances storage area) are to be demarcated with no-smoking signs. The Contractor must ensure that an emergency preparedness plan is in place in order to fight accidental fires or veld fires, should they occur. The use of branches of trees and shrubs for fire-making must be strictly prohibited. The Contractor must ensure that an emergency preparedness plan is in place in order to fight accidental fires or veld fires, should they occur. The adjacent landowners/ users/ managers should also be informed or otherwise involved. Contractors must take precautions when working with welding or grinding equipment near potential sources of combustion. Such precautions include having a suitable, tested

	and approved fire extinguisher immediately at hand and the use of welding curtains.
Time Periods	Lifespan of construction
Performance Indicator	No fires or accidents.
Monitoring	Daily inspections of facilities and accessibility of firefighting equipment. The Contractor's Environmental Officer must monitor the site regularly (as part of daily inspections) and be alert to potential social problems on and off site.
Responsibility	Contractor

4.1.10 Fuels and Hazardous Material Management

Management Outcome:	To ensure that materials are appropriately stored in order to minimise the potential for pollution and accidents.
Impacts	Soil, surface and ground pollution
Mitigation Measures (BAR)	Limit any spills from plant, machines or camps during the construction phase. Any use of chemical, cement or paint must be carefully monitored and the necessary spill kits should be in place. Provide suitable solid / liquid waste management that is serviced regularly.
Procedure	All liquid chemicals including fuels and oil must be stored in with secondary containment (bunds or containers or berms) that can contain a leak or spill. All construction camps, lay down areas, wash bays, batching areas and any stores should be more than 10m from any demarcated water courses. Fuel, solvents and other hazardous or toxic substances must be securely stored in a restricted, locked facility. Fuel and hazardous materials containers must be properly and boldly labelled. Generators and fuel supply needed for equipment must be placed on drip trays. Drip trays are to be placed underneath fuel bowsers when parked. Drip trays are to be used during refuelling of construction equipment or vehicles on site. Drip trays are to be placed underneath any leaks from construction vehicles. All contaminated material must be disposed of at a registered hazardous waste disposal facility. No cement or concrete to be mixed on the soil surface or on plastic sheeting. Cement mixing is to undertaken in trays. Cement mixers must be placed on large trays to prevent accidental spills onto the soil surface. Where cement or concrete is mixed on the soil, contaminated soils should be removed and disposed of at a registered waste disposal site. Spill kits to be kept on site.
Time Periods	Lifespan of construction
Performance Indicator	Fuels and hazardous liquids must be stored in an impervious, bunded and covered area with a capacity of 110% of the largest single storage tank. No spills or leaks from hydrocarbon liquids or chemicals.
Monitoring	The Contractor's Environmental Officer must ensure that materials are stored in the designated area set aside for that purpose. During daily site inspections the Contractor's Environmental Officer must check storage facilities to ensure that they are in a proper state of repair. A record must be kept of any spills and what follow-up action was taken. In the event of a significant spill or leak of hazardous substances (petrol and diesel) during activities, such incident(s) must be reported to all relevant authorities, including the DWS, in accordance with Section 30 (5) of the National Environmental Management Act (NEMA) (Act 107 of 1998), pertaining to the control of incidents.
Responsibility	Contractor

4.2 Rehabilitation Plan

Impact Management Outcome	To rehabilitate areas not forming part of the operational footprint
Impacts	Impact on aquatic biodiversity and systems Impact on terrestrial biodiversity
Mitigation Measures (BAR)	A suitable weed management strategy to be implemented along the pipeline after completion of construction. Suitable measures must be implemented in areas that are susceptible to erosion. Areas must be rehabilitated, and a suitable cover crop planted. If natural vegetation re-establishment does not occur, a suitable grass must be applied. Possible grasses include *Cynodon dactylon, Eragrostis curvula & Digitaria eriantha.*
Procedure	All structures, materials and equipment as well as construction waste must be removed and where possible, recycled. Construction sites are to be left neat, tidy with no litter or waste items on site. Vegetation that has been removed from large areas (not forming part of permanent works) during construction must be replaced with indigenous vegetation after construction has been completed. All compacted areas not forming part of the operational footprint should be ripped to a depth of 500cm to loosen the soil. Ripping will promote water infiltration and root penetration. Ripping should be carried out when the soil is relatively dry to increase soil break-up. Stored topsoil must be replaced uniformly on disturbed areas. Re-spread soil should be left with a rough surface. Avoid spreading soil when saturated or sticky, as compaction and other damage to the soil structure will occur. An appropriate cover crop may be required, should natural re-establishment of grasses not take place in a timely manner. The site shall then be seeded with suitable grasses and local indigenous seed mix, if required. Any alien invasive plants are to be removed from areas disturbed by construction works.
Time Periods	Six months after the end of construction, or by an alternative date stipulated by Developer or his representative.
Performance Indicator	Site rehabilitation to be completed within six months after the end of construction, or by an alternative date stipulated by Developer or his representative
Monitoring	The Developer's Environmental Officer must monitor site re-vegetation and alien plant regrowth, commencing after construction. Monitor the erosion control measures.
Responsibility	Developer, Contractor

4.3 Environmental Compliance Monitoring and Auditing

4.3.1 Monitoring

The Developer or his representative and Contractor is responsible for monitoring the procedures and targets applicable to each environmental management requirement.

4.3.2 Compliance Auditing

Compliance auditing of the Environmental Authorisation and Environmental Management Programme is to be undertaken on a monthly basis by an independent ECO for the duration of the construction phase.

The environmental compliance audit report is to be compiled according to the requirements in the EIA Regulations, 2014, as amended.

4.4 Response to Public Complaints

The Kouga Local Municipality, together with the Contractor, must respond to queries and complaints from the public regarding construction activities within 14 days.

In responding to such queries and / or complaints all such communications must be documented in a complaints register. All remedial action taken on a complaint must be recorded in the complaints register.

4.5 Environmental Awareness Training

The Contractor shall ensure that all staff receive site environmental awareness training, as well as any refresher courses, pertaining to their role in the operations, including:

- Induction training on project specific environmental awareness relating to the conditions of the EA and CEMPr prior to commencing with any work on the project.
- Staff must understand their specific role in managing daily activities required to prevent environmental and social risks, and how to respond to any incidents should these occur.
- 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), notifications/reporting).
- Management and minimising of waste, including waste separation.
- Water conservation and water quality protection.
- Erosion control measures.
- Maintenance of equipment to prevent the accidental discharge or spill of fuel, oil, lubricants, and other chemicals.
- Responsible handling of chemicals and spills.

In the event that new personnel are brought onto site by the Contractor during the project, these personnel are to undergo environmental awareness training prior to any work being undertaken. The Contractor is to include environmental awareness training in the toolbox talks on a monthly basis.

4.6 Corrective and Preventive Action

The Developer must devise a Corrective Action Procedure for implementing corrective and preventive action for non-compliances that are ongoing. The Corrective Action Procedure is to be implemented by all contractors and subcontractors on site.

The Correct and Preventive Action Procedure should include the following:

- Report non-compliance with procedures or targets identified during monitoring and inspections (on Incident Forms).
- Report other failures creating environmental problems.
- Report imminent non-compliance and potential environmental problems.
- Delegate responsibility for corrective and preventive action.
- Document the resolution of the reported non-compliance or environmental problem.
- Impose disciplinary action where persistent non-compliance occurs.

All contractors and sub-contractors must retain copies of the Corrective Action Procedure and other appropriate documentation and submit copies of all documentation to the Developer or his representative at a frequency to be determined by the Developer or his representative.

Transgressions relate to actions by the Contractor, Sub-contractor or Contractor team member whereby damage or harm is inflicted upon the environment or any feature of the environment and where any of the conditions or specifications of the CEMPr are infringed upon.

In the instance of environmental damage, the damage, where possible, is to be repaired and rehabilitated using appropriate measures, as specified and undertaken by appropriate specialists, for the account of the Contractor or other guilty party.

Where infringement of the specifications or conditions of the CEMPr is registered, appropriate remedial action or measures are to be implemented for the account of the Contractor. Where non-repairable damage is inflicted upon the environment or non-compliance with any of the CEMPr conditions is registered, the Contractor may face a monetary penalty to an amount specified by the Developer. A first offence warning may be implemented.

4.7 Record Keeping

The following documentation is to be kept on site:

- Environmental Authorisation, Water Use Licence and CEMPr.
- Incident and complaints register
- Method statements (where and if applicable)
- Environmental awareness training
- Environmental Compliance Audit reports
- Waste disposal records and manifests

Appendix A: Example of Environmental Incident Log

DATE	INCIDENT LODGED BY (Name and Capacity)	DETAILS OF INCIDENT	PROPOSED REMEDIAL ACTION	DATE INCIDENT TO BE ADDRESSED BY	DATE REMEDIAL ACTION WAS UNDERTAKEN AND INCIDENT CLOSED	SIGNATURE	
						LOGGED IN	CLOSED OUT

Appendix B: Example of Complaint Register and Complaint Form

DATE	COMPLAINT LODGED BY (Name and Capacity)	DETAILS OF COMPLAINT	PROPOSED REMEDIAL ACTION	DATE COMPLAINT TO BE ADDRESSED BY	DATE ACTION WAS UNDERTAKEN AND COMPLAINT CLOSED	SIGNATURE	
						LOGGED IN	CLOSED OUT

Complaint Form

Complaint Record Sheet	**File No** **Reference**	**Date**
Complaint Lodged By:		
Capacity of Complainant		
Complaint Logged by		
Details of Complaint:		
Proposed Remedial Action		
Notes by ECO / Auditor		

ECO	**Date**	**Auditor**	**Date**
Resident Engineer	**Date**		

Appendix C: EAP Curriculum Vitae

CEN
Integrated Environmental Management Unit
Reg No: 1996/032402/23

Lucille Behrens: 082 922 1645 lucille@environmentcen.co.za

CURRICULUM VITAE

LUCILLE BEHRENS (maiden name Van Staden)

Name of Firm	CEN Integrated Environmental Management Unit
Date of birth	20 August 1976
Position in Firm	Senior Environmental Scientist
Specialisation	Environmental Management
Nationality	South African
Years of experience	19
HDI Status	White female, no disabilities
Languages	English, Afrikaans

KEY QUALIFICATIONS

Lucille has 19 years' experience in the Environmental Management field. Lucille has undertaken a number of Environmental Impact Assessments (i.e. Basic Assessments; Scoping and EIA) under the EIA Regulations of 2006, 2010 and 2014. Her roles have included being the Environmental Assessment Practitioner (EAP), Assistant EAP, Project Manager and Environmental Scientist for EIA related projects. Her responsibilities have included undertaking environmental assessments, compilation of regulated EIA's (i.e. scoping reports, EIA reports, Basic assessments and EMPs) and incorporating specialists into the EIA team for any required specialist studies. Lucille has also undertaken and been involved with the regulated public participation process required for EIAs.

Her experience in compiling environmental management plans relate to construction, maintenance operations and wildlife management. Lucille has been involved in environmental compliance monitoring and auditing (environmental control officer) on a number of construction sites and borrow pits. She has also gained experience in GIS mapping.

Lucille has also been involved in waste studies and sustainable development projects, for example green procurement, elimination of illegal dumping strategies and water conservation and demand management plan.

EDUCATION

Qualification	Institution	Year
BSc (Hons) (Environmental Monitoring and Modelling)	UNISA	2008
BSc (Environmental Management)	UNISA	2005
BA (Hons) (Criminology)	University of Pretoria	1998
BA	University of Pretoria	1997

COURSES & CONFERENCES

Course / Conference	Date
Management Training Session – Nelson Mandela Metropolitan University: Business School	2006
The Environment And the Project Cycle	March 2008
Technical and Business Report Writing	March 2009
Institute of Waste Management South Africa – Eastern Cape Mini Conference	August 2009
Project Management, Incl. MS Projects	March 2010
Legal Workshop on the Key Implications of the National Environmental Management: Integrated Coastal Management Act	April 2010
Environmental Awareness and Legal Liability for Management	May 2010
Green Star SA Accredited Professional Course	September 2011
WASTECON	October 2012
Contaminated Land Workshop	February 2013
Water Law in South Africa Workshop	August 2013
Institute of Waste Management of Southern Africa – Eastern Cape Conference: The Green Revolution	September 2013
National Wetlands Indaba	October 2013
IWRM, the NWA, and Water Use Authorisations, focusing on Water Use License Applications – Procedures, Guidelines, IWWMP's and Monitoring, Carin Bosman Sustainable Solutions	September 2014
Water Use Licence Training – Section 21 c and i water use activities	August 2016
ISO 14001:2015 Environmental Management Systems Implementation	August 2016
Renewable Energy Workshop	June 2020
IAIAsa Virtual Symposium	October 2020
Council for Geoscience Conference 2021	March 2021
Environmental Law Update Workshop	April 2021
IAIAsa Climate Impact Assessment Webinar	May 2021
Environmental Law Annual Conference	September 2021
National Wetlands Indaba	October 2021

PROFESSIONAL MEMBERSHIP / REGISTRATION

Institution Name	Membership	Year Joined
International Association of Impact Assessments (South Africa)	Member (No. 2668)	2010
Environmental Assessment Practitioners Association of South Africa (EAPASA)	Registered EAP 2016/38	2019

EMPLOYMENT RECORD

August 2013 – Present: CEN IEM Unit

On 1 August 2013, Lucille joined the CEN Integrated Environmental Management Unit as **Senior Environmental Scientist**. Her responsibilities include:

- Project management,
- Environmental Impact Assessments (Basic Assessment, Scoping and EIA and associated public participation),
- Co-ordinating and assessing specialist studies,
- Environmental Management Plans/Programmes,
- Environmental Compliance Monitoring,
- GIS mapping.

July 2007 – July 2013: BKS (Pty) Ltd / AECOM SA (Pty) Ltd
On 1 October 2012 Lucille was appointed as a **Senior Environmental Scientist** for the Infrastructure and Management Sector of BKS in Port Elizabeth after BKS and its subsidiaries rebranded on 1 November 2012 to become AECOM SA (Pty) Ltd. Her responsibilities included:

- Project management, including financial management on projects,
- Environmental Impact Assessments (basic assessment, scoping and EIA and associated public participation),
- Co-ordinating and assessing specialist studies,
- Environmental Management Plans/Programmes,
- Environmental Compliance Monitoring,
- Waste and Sustainablity Strategies,
- Business development focusing within the Eastern Cape, KwaZulu Natal.
- GIS mapping.

In 2009, Lucille was promoted to **Senior Environmental Scientist** and was responsible for project management, environmental impact assessments (basic assessment, scoping and EIA and associated public participation), environmental management plans, environmental compliance monitoring, waste and sustainablity strategies within the Eastern Cape.

In 2007, Lucille joined BKS (Pty) Ltd as an **Environmental Scientist**. Her responsibilities included undertaking environmental impact assessments (basic assessment, scoping and EIA and associated public participation), compiling environmental management plans and undertaking environmental compliance monitoring.

August 2000 – June 2007: Shamwari Game Reserve (Mantis Collection)
Lucille was the **Wildlife / Environmental Co-Ordinator** for Shamwari Game Reserve (Mantis Collection) from November 2003 – June 2007. During this time, her responsibilities included the following:
Compiling environmental management plans for construction operations and wildlife management for reserves in South Africa, United Arab Emirates and Morocco. Undertaking environmental compliance monitoring of construction sites within game reserves. Monitoring environmental aspects (e.g. water usage) within Mantis game reserves and organising related wildlife permits.

In November 2001, Lucille transferred to the Wildlife Department as the PA to the Wildlife Director.

In 2000, Lucille joined Shamwari Game Reserve and during this time her roles included Personal Assistant to the General Manager, Switchboard Operator and Reservationist.

June 1999 – July 2000: Formax
Computer room supervisor, Data Capturer

1997: University of Pretoria

Practical Tutor, Information Science Department

EXPERIENCE RECORD – SELECTED PROJECTS

ENVIRONMENTAL IMPACT ASSESSMENTS:

- Basic Assessment for the Expansion of BORBET SA Furnaces, Nelson Mandela Bay Municipality – *BORBET SA / LAQS*
- Scoping and Environmental Impact Assessment for the Proposed Seraphim Solar Cell Facility in the Coega SEZ, Nelson Mandela Bay Municipality – *Seraphim Energy*
- Scoping and Environmental Impact Assessment for the Proposed Newlyn Manganese Storage and Conveyor Facility in Coega SEZ, Nelson Mandela Bay Municipality – *Newlyn Group*
- Basic Assessment for the Proposed Beenleegte Hydro Power Facility in Somerset East - *Navitas*
- Basic Assessment for the Proposed Little Fish Hydro Power Facility in Somerset East - *Navitas*
- Basic Assessment for the Proposed Coegakop Wellfield and Water Treatment Works – *NMBM*

- Basic Assessment for the Upgrading of the Emsengeni Access Road, Kirkwood – *LA Consulting Engineers*
- Basic Assessment for the Proposed Stormwater Management Infrastructure in Colchester, Nelson Mandela Bay Municipality - *NMBM*
- Basic Assessment for the Proposed Alexandria Community Health Centre - *Archworxs*
- Scoping & Environmental Impact Assessment for the Kei Road Water Conveyance (pipeline and water treatment works) - *Aurecon*
- Basic Assessment for the St Francis Stormwater Upgrade - *Aurecon*
- Basic Assessment for the Proposed SACE Ranger PV Plant, Uitenhage – *SACE.*
- Basic Assessment of the Proposed Clearing of Vegetation for Fence Construction at SAPS Training Institute, Addo, Sundays River Valley Municipality – *Engineering Advice & Services.*
- Basic Assessment for Construction and Operation of a Filling Station with Rest and Retail Facilities, an Agri-Business Retail / Wholesale Facility adjacent to the Nanaga Farm Stall on the Remainder of Portion 8 Nanaga Hoogte No 229, Sundays River Valley Municipality – *Pantheon Trust*
- Scoping & Environmental Impact Assessment for the Malabar Extension 6 Phase 2 Housing Development, Nelson Mandela Bay Municipality, Eastern Cape – *NMBM (undertaken whilst in employ at AECOM)*
- Scoping & Environmental Impact Assessment for the Residential Development on Farm Grants Valley 396/2, Ndlambe Municipality – *ACME Capital (undertaken whilst in employ at BKS)*

ENVIRONMENTAL MANAGEMENT PROGRAMMES:

- Environmental Management Programme for the Kirkwood Revitalisation Programme within the Sundays River Valley Municipality - *LA Consulting Engineers*
- Environmental Management Programme for the Rural Roads Prioritized Infrastructure Project within the Sundays River Valley Municipality - *LA Consulting Engineers*
- Coastal Management Programme for the Nelson Mandela Bay Municipality

ENVIRONMENTAL COMPLIANCE MONITORING:

- Environmental Control Officer: Graaff Reinet Wellfield – *LA Consulting Engineers*
- Environmental Control Officer: Coegakop Wellfield Phase 1: Drilling of boreholes and installation of bulk water pipelines in Port Elizabeth – *Aurecon*
- Environmental Control Officer: Upgrading of Roads and Stormwater in Valencia, Addo – *LA Consulting Engineers*
- Environmental Control Officer: Upgrading of Roads and Stormwater in Emsengeni, Kirkwood – *LA Consulting Engineers*
- Environmental Control Officer: Construction of the Kuyga Rising Main – *Hatch Goba*
- Environmental Control Officer: Upgrading of Access Roads in Moses Mabida, Kirkwood – *LA Consulting Engineers*
- Environmental Control Officer: Upgrading of Stormwater Infrastructure in Summerstrand – *Hatch Goba*
- Environmental Control Officer: Upgrading of Roads and Stormwater in Nomathamsanqa, Addo – *LA Consulting Engineers*

WATER USE LICENCE APPLICATIONS (WULA):

- WULA for the Proposed Beenleegte Hydro Power Facility in Somerset East - *Navitas*
- WULA for the Proposed Little Fish Hydro Power Facility in Somerset East - *Navitas*
- WULA for the Proposed Coegakop Wellfield and Water Treatment Works – *NMBM*
- WULA for the Upgrading of the Emsengeni Access Road, Kirkwood – *LA Consulting Engineers*
- WULA for the Proposed Malabar Phase 2 Extension 6 Housing Development - *NMBM*
- WULA for Proposed Gqunu Village Bridge Crossing and Road Upgrades - *Department of Land Reform and Rural Development*.

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SUSTAINABILITY / OTHER PROJECTS:

- Environmental Screening for the Port St Johns Community Access Roads – *LA Consulting Engineers*
- Environmental Screening for the Pearston Bulk Water Supply Augmentation – *BVi Consulting Engineers*
- Due Diligence for Zone 10 of the Coega Special Economic Zone – *Coega Development Corporation*
- Environmental Sensitivity Review for the Kirkwood Revitalisation Programme within the Sundays River Valley Municipality - *LA Consulting Engineers*
- Environmental Sensitivity Review for the Rural Roads Prioritized Infrastructure Project within the Sundays River Valley Municipality - *LA Consulting Engineers*
- Environmental Screening Assessment on Portion 62 of Ongegunde Vryheid No 746, St Francis for Mixed Land Use– *Aurecon*

Environmental Assessment Practitioners Association of South Africa

Registration No. 2016/38

Herewith certifies that

LUCILLE BEHRENS

is registered as an

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

SAQA

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Appendix F-2: Operational & Maintenance EMPr

CEN INTEGRATED ENVIRONMENTAL MANAGEMENT UNIT

Environmental and Rural Development Specialist

OPERATIONAL & MAINTENANCE MANAGEMENT ENVIRONMENTAL MANAGEMENT PROGRAMME

OCEAN VIEW COLLECTOR SEWER,
KOUGA LOCAL MUNICIPALITY, EASTERN CAPE

DEDEAT Reference Number:
EC08/C/LN3/M/14-2025

8 May 2025

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REVISIONS TO THE OPERATION ENVIRONMENTAL & MAINTENANCE MANAGEMENT PROGRAMME

Version	Date	Comment
0	08-05-2025	EMMPr included in Draft Basic Assessment Report

Glossary of Terms

Term	Explanation
Ambient (air)	Current surrounding atmospheric condition
Construction	Maintenance activities may also be referred to construction.
dB(A) (decibels A-scale)	A frequency-weighted noise unit used for traffic and industrial noise measurement
Environment	The surroundings in which an organisation operates, including air, water, land, natural resources, flora, fauna, humans, and their interrelation
Environmental Aspect	An element of an organisation's activities, products or services that can interact with the environment
Environmental Impact	Any change to the environment, whether adverse or beneficial, wholly or partially resulting from an organisation's activities, products or services
Environmental Impact Assessment (EIA)	A study of the environmental consequences of a proposed course of action. An environmental evaluation or assessment is a study of the environmental effects of a decision, activity or undertaking. It is most often used within an IEM Planning process as a decision support tool to compare different options
Environmental Management System	The part of the overall management system that includes organisational structure, project activities, responsibilities, practices, procedures, processes and resources for developing, implementing, achieving, reviewing and maintaining the environmental policy
Exotic	Any plant species not falling under the indigenous definition.
Integrated Environmental Management (IEM)	A process that involves the authorities and public, and integrates environmental issues with all aspects of Planning
Invasive	Tending to displace, or increase in cover relative to, surrounding vegetation.
Palaeontology	(study of) life in geological past, fossils

Checklist in terms of Appendix 4 of the EIA Regulations, 2014, as amended

Content Requirement for an Environmental Management Programme (Appendix 4 of the EIA Regulations, 2014, as amended)	Relevant Section in this EMPr
1 (1) An EMPr must comply with section 24N of the Act and include–	
(a) details of– (i) the EAP who prepared the EMPr; and (ii) the expertise of that EAP to prepare an EMPr, including a curriculum vitae	Chapter 1, Appendix C
(b) a detailed description of the aspects of the activity that are covered by the EMPr as identified by the project description	Chapter 2
(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	Chapter 2
(d) a description of the impact management outcomes, including management statements, identifying the impacts and risks that need to be avoided, managed and mitigated as identified through the environmental impact assessment process for all phases of the development including– (i) planning and design; (ii) pre-construction activities; (iii) construction activities; (iv) rehabilitation of the environment after construction and where applicable post closure; and (v) where relevant, operation activities;	Chapters 3 and 4
(f) a description of proposed impact management actions, identifying the manner in which the impact management outcomes contemplated in paragraph (d) will be achieved, and must, where applicable, include actions to — (i) avoid, modify, remedy, control or stop any action, activity or process which causes pollution or environmental degradation; (ii) comply with any prescribed environmental management standards or practices; (iii) comply with any applicable provisions of the Act regarding closure, where applicable; and (iv) comply with any provisions of the Act regarding financial provision for rehabilitation, where applicable;	Chapters 3 and 4
(g) the method of monitoring the implementation of the impact management actions contemplated in paragraph (f);	Chapters 3 and 4
(h) the frequency of monitoring the implementation of the impact management actions contemplated in paragraph (f);	Chapters 3 and 4
(i) an indication of the persons who will be responsible for the implementation of the impact management actions	Chapters 3 and 4
(j) the time periods within which the impact management actions	Chapters 3 and 4

Content Requirement for an Environmental Management Programme (Appendix 4 of the EIA Regulations, 2014, as amended)	**Relevant Section in this EMPr**
contemplated in paragraph (f) must be implemented	
(k) the mechanism for monitoring compliance with the impact management actions contemplated in paragraph (f);	Chapters 3 and 4
(l) a program for reporting on compliance, taking into account the requirements as prescribed by the Regulations;	Chapters 3 and 4
(m) 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; and	Chapter 4
(n) any specific information that may be required by the competent authority	N/A

Chapter 1: Introduction

1.1 Background

CEN IEM Unit has been appointed by VST Consulting Engineers (Pty) Ltd on behalf of the Kouga Local Municipality to undertake the Environmental Impact Assessment (EIA) process as the independent Environmental Assessment Practitioner (EAP) for the proposed Ocean View Collector Sewer.

The applicant for an Environmental Authorisation is Kouga Local Municipality (KLM).

1.2 Purpose of the Operational and Maintenance Management Programme

The purpose of the Operational Environmental & Maintenance Management Programme (OEMMPr) is to provide a framework for the management of environmental impacts associated with the maintenance of the Ocean View Collector Sewer. The OEMMPr is to serve as a management tool for the management of the Kouga Local Municipality and contractors responsible for the maintenance activities.

This OEMMPr is a framework programme and outlines procedures and actions to be carried out during the operational phase. It is aimed at minimising and managing environmental impacts that may arise during the operational phase of the project.

The OEMMPr identifies and clarifies the roles and responsibilities of key role-players in the implementation of the specific requirements of the OEMMPr. The OEMMPr further outlines the monitoring, reporting, auditing and review requirements.

The purpose of this OEMMPr is to describe:

- How adverse environmental impacts will be managed.
- How environmental damage or degradation will be mitigated.
- Monitoring requirements to ensure the above measures are successful.

1.3 Scope of the Operational and Maintenance Management Programme

The OEMMPr is specific to the maintenance of the Ocean View Collector Sewer.

The specific aims of the OEMMPr are to:

- Formulate procedures to rectify impacts created through the maintenance of the Ocean View Collector Sewer; and minimise potential secondary environmental impacts.
- Recommend methods to ensure compliance with the OEMMPr, including record keeping.
- Provide environmental guidelines to ensure environmentally acceptable practices are followed during the operational phase of the project.

The successful implementation of this OEMMPr is dependent on integrating it into the project's management system. Without regular checks on performance and corrections of deviations from the environmental objectives, procedures and targets, the OEMMPr will fall into disuse and become ineffective. The OEMMPr, therefore, includes various elements of an Environmental Management System such as objectives and targets, the allocation of responsibilities, checking of corrective action, regular audits, and management review of the system.

The OEMMPr should be viewed as a dynamic document, which may require periodic updating and / or revision.

1.4 Methodology

A Basic Assessment was undertaken for the proposed Ocean View Collector Sewer under the EIA Regulations, 2014, as amended. This OEMMPr has been drafted during the Basic Assessment phase and includes the mitigation measures recommended in the Basic Assessment Report.

A step-wise approach is used to develop and implement a OEMMPr:

- Potential impacts must be identified, and their significance assessed – this is undertaken in the Basic Assessment Report (BAR).
- Suitable mitigation measures need to be defined – these have been provided for each identified impact in the BAR.
- A system to ensure that the necessary mitigation is being implemented must be established.
- The effectiveness of the recommended management systems and measures must be monitored.
- The representatives of the developer must be in a position to verify the work undertaken and to monitor the environmental management process.

1.5 Details of the Environmental Assessment Practitioner

EAP company:	CEN Integrated Environmental Management Unit
Environmental Assessment Practitioner (EAP)	Lucille Behrens
Professional Registration	Registered EAP with EAPASA, 2016/38
Years of Experience	19

Refer to **Appendix C** for the EAP's *Curriculum Vitae*.

1.6 Structure of Construction and Maintenance Management Programme

Chapter 1 of this OEMMPr serves to introduce the scope of the OEMMPr. The purpose of the OEMMPr is explained. The OEMMPr is designed to manage and mitigate identified environmental impacts.

Chapter 2 identifies and briefly describes the details of the project.

Chapter 3 briefly discusses environmental policy. It presents a suggested organisational structure for the project to ensure that responsibilities are allocated and there is adequate control over the work.

Chapter 4 outlines the environmental management requirements for construction activities, including environmental monitoring requirements to facilitate the implementation, management and regular auditing of the OEMMPr.

Chapter 2: Description of Project

2.1 Overview

The overall proposed Ocean View Collector Sewer project will consist of sewer pipelines ranging from 160mm to 315mm in diameter over a total length of approximately 1500m:

a) The pipeline along Rolihlanhla Street is a new pipeline within the road verge / reserve, with diameters of 160 – 200mm and over a length of approximately 650m.

b) The pipeline then turns and runs along Dolphin Drive for approximately 700m, with diameters ranging from 200 – 315mm. This section of the pipeline will be located adjacent to the existing sewer pipeline, within the road reserve / verge.

c) The 315mm diameter pipeline then turns in a north westerly direction from Dolphin Drive and follows an existing gravel road for approximately 150m and then turns and ties into the existing sewer pumpstation.

The portions of the proposed sewer collector pipeline along Rolihlanhla Street and Dolphin Drive do not trigger EIA listed activities for the bulk transportation of sewage as the pipeline diameter is under the threshold of 360mm and exclusions of being located within road reserves and urban areas; and are not located within watercourse areas.

The relevant portion of the collector sewer for the application of an Environmental Authorisation and subject to the EIA is the proposed 315mm diameter sewer collector pipeline, from Dolphin Drive to the Ocean View sewer pumpstation, over a distance of approximately 150m. This portion of the sewer collector pipeline is located within 32m of a watercourse and on public open space, thereby triggering listed activities in terms of the EIA Regulations, 2014 as amended; and as a result an Environmental Authorisation is required.

The existing sewer network blocks frequently and a collector sewer within the road reserve is proposed to reduce the flow in the midblock sewer reticulation area of Ocean View.

No capacity increase is proposed for the existing Ocean View Sewer Pumpstation.

The sewage will then be pumped via pumpstations to discharge into the Jeffreys Bay Waste Water Treatment Works.

2.2 Location of the Project

The collector sewer from Dolphin Drive to the Ocean View Sewer Pumpstation is located on Portion 125 of Farm Estate Klein Zeekoe River No. 335 of the Ocean View area of Jeffreys Bay, in Ward 14, in the Kouga Local Municipality, Sarah Baartman District Municipality, Eastern Cape.

2.3 Description of the Project

The relevant portion of the proposed collector sewer for the application of an Environmental Authorisation and subject to the EIA is the proposed 315mm diameter sewer collector pipeline, from Dolphin Drive to the Ocean View sewer pumpstation, over a distance of approximately 150m.

The 315mm diameter pipeline will follow an existing gravel road in a north westerly direction, from Dolphin Drive to the Ocean View Sewer Pumpstation. The proposed collector sewer will then turn in a southerly direction into the existing Ocean View sewer pumpstation, and will tie into the existing sewer infrastructure.

The proposed Ocean View Collector Sewer (315mm diameter) will cater for velocities between a minimum of 0.667m/s and a maximum of 3.0m/s for the gravity sewer.

2.4 Site Description

The area surrounding the Ocean View Pump Station is largely transformed. The area has a few small, isolated pockets of near-natural Humansdorp Shale Renosterveld (Endangered Ecosystem) between the Ocean View pump station and Dolphin Drive to the south. These small pockets are generally degraded and ecologically insignificant and also bisected by several access tracks, pathways and other sewer lines. The collector sewer will follow an existing gravel track. The Ocean View Collector Sewer is located within an Ecological Support Area (ESA1) corridor, in terms of the Eastern Cape Biodiversity Conservation Plan (ECBSP, 2019). The site is located within degraded / transformed habitat. No Endangered or Critically Endangered flora species were confirmed to be present nor are known to be present in the affected area. Eight (8) alien invasive and other weed species were noted within the site and surrounding area. Of these, six (6) species were noted as a listed alien invasive species, either as a Category 1b or Category 2. The site is largely considered to have a low sensitivity due to the disturbed and transformed nature. A small section near the Ocean View Pump Station is designated moderate sensitivity as it will be in proximity to some remnant Humansdorp Shale Renosterveld (Pote, 2024).

The proposed Ocean View Collector Sewer is located near localised watercourses which have no direct connection to any mainstem systems or estuaries within the K90G Kabeljous quaternary catchment. The wetland areas are fragmented, contain higher levels of solid waste and grazed frequently; resulting in a reduction in wetland species diversity (plants). The Present Ecological Score (PES) is Class D - Largely modified and Ecological Importance and Sensitivity is Low. There are no Strategic Water Source Areas mapped near the site. The southwestern end of the sewer alignment is located within a Wetland Cluster. The Eastern Cape Biodiversity Conservation Plan (ECBCP, 2019) indicates the site is located within an Aquatic Ecological Support Area (ESA 1). No endemic, conservation worthy species or species of special concern (Listed or Protected) were observed or have been recorded within the proposed route areas. The proposed Ocean View Collector Sewer is located outside riverine / wetland areas and are currently within highly transformed areas (Colloty, 2024).

No archaeological sites/materials were observed during the investigation of the proposed study area. No known graves or buildings / structures older than 60 years along the proposed pipeline route. The proposed development area appears to be of low archaeological sensitivity, and it is therefore unlikely that any significant archaeological remains will be found on the property. The proposed development may therefore proceed as planned (Reichert, 2024).

The study site is underlain by the Ceres Subgroup of the Bokkeveld Group of the Cape Supergroup. The Ceres Subgroup is well known for its invertebrate benthic marine fossils and is marked as very sensitive from a palaeontological point of view. The area is covered with a soil layer and vegetation. The area is underlain by an extremely jointed and fractured rock, with rock cleavage cutting through bedding planes. This decreases the chance of any fossil finds. Although possible, it is unlikely that any significant fossils will be found, damaged, or lost during construction (Wilken, 2024).

Refer to **Figure 1** for the Environmental Sensitivity Map.

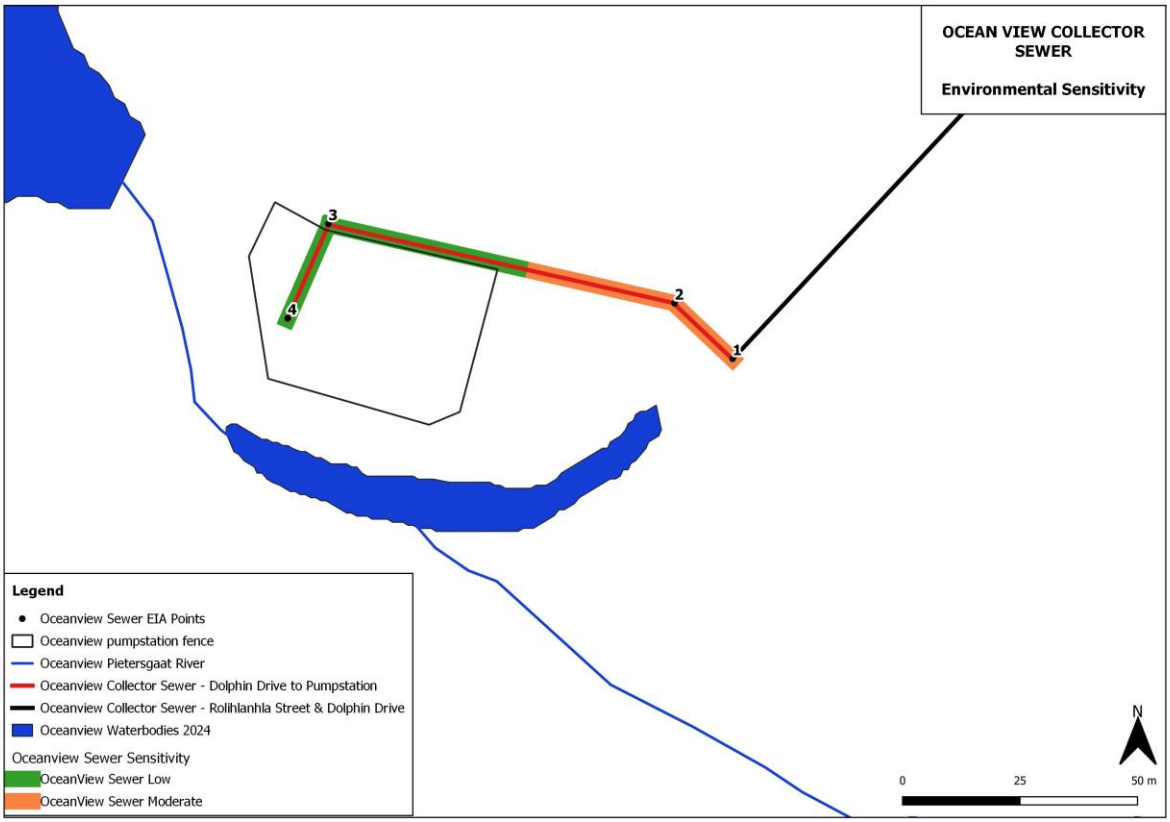

Figure 1: Environmental Sensitivity Map

Chapter 3: Organisational Requirements

3.1 Introduction

The developer and their appointed managers must ensure permanent staff, maintenance staff and contractors are aware of their environmental objectives and policy.

3.2 Environmental Commitment

All persons involved with the maintenance of the Ocean View Collector Sewer must be made aware of the environmental goals and policy for the operation of the infrastructure and encouraged to develop a commitment to compliance with the environmental legislation and to being good neighbours.

3.3 Background to Environmental Policy

An environmental policy is a statement of the environmental values of an organisation. It conveys these environmental values to employees, demonstrates to stakeholders the importance that senior management attaches to environmental protection and management, and provides a guiding framework for conducting the organisation's business in an environmentally compatible manner.

The philosophy behind the OEMMPr is for it to become an effective means of managing environmental performance by:

- Enabling the identification of critical environmental issues:
- Developing action programmes and setting targets;
- Ensuring environmental performance;
- Raising environmental awareness amongst management, staff and the community which it serves; and,
- Providing appropriate training.

The purpose of the OEMMPr is to translate environmental policy into practice by putting in place workable systems, structures and tools to achieve integrated and consistent environmental management of all environmental initiatives.

This OEMMPr suggests certain detailed objectives, which are applicable to the maintenance of the Ocean View Collector Sewer. It is important that Kouga Local Municipality's operational managers review these detailed policies and if in agreement, adopt them as firm policy.

3.4 Environmental Policy

The following is a recommended environmental policy:

We aim to conduct all our activities in an environmentally responsible manner.

We are committed to:

- *Practising and promoting sustainable development during day-to-day execution of duties which have an impact on the environment, whether directly or indirectly.*
- *Establishing and maintaining compliance with all applicable legislation, regulatory requirements and industry standards for protection of the environment as a minimum condition and go beyond those requirements wherever practicable.*
- *Educating, informing and motivating our employees and contractors to ensure our activities and operations are conducted in an environmentally responsible manner through development and implementation of an Environmental Training Program and the provision of advice as required.*

- *Actively communicate with employees, government agencies and the public with regard to environmental management and contribute to the development of laws and regulations which may affect our business.*
- *Prevent pollution, ensure efficient use of resources and minimise waste through promotion and implementation of cleaner operation principles and technology.*
- *Research, support and implement new technology and practices which improve environmental performance where practicable.*
- *Pursue continuous improvement in environmental performance through development and implementation of objectives and targets, reviewing Policy and Procedures and regularly monitoring and auditing our performance.*
- *Conduct periodic reviews of the effectiveness of this Environmental Policy, update this Policy when necessary and re-issue it to employees and the public as appropriate.*

3.5 Organisational Overview

All managers involved should be obliged to familiarise themselves with the adopted Environmental Policy.

Managers should be familiar with the requirements of the OEMMPr and should execute all maintenance activities in an environmentally responsible manner.

Ultimate responsibility and public accountability for the OEMMPr and general environmental management during the operational phase resides with the management of Kouga Local Municipality.

The operational managers are responsible for implementing and managing the OEMMPr. It is recommended that a member of the operational team is nominated as an Environmental Officer, to ensure that the requirements of the OEMMPr are implemented throughout operational phase.

Where procedures in the OEMMPr are persistently transgressed and appropriate corrective action is not implemented, the Developer or his representative may order the suspension of related activities or impose a fine on the transgressor.

3.6 Roles and Responsibilities

This section defines the roles of the key parties involved in the implementation of the OEMMPr and mitigation measures.

3.6.1 Kouga Local Municipality

Kouga Local Municipality has the overall accountability and responsibility for environmental management during the operational phase. Further it is their responsibility to ensure that the conditions of the relevant licenses and the mitigation measures in this OEMMPr are communicated to, implemented and complied with by the operational managers, operational personnel and contractors.

The Kouga Local Municipality will be responsible for liaison with the relevant authorities with respect to the OEMMPr.

Kouga Local Municipality or its representative will be responsible for.

- Reviewing and approving any Method Statements that may be required for maintenance activities.
- Reviewing and approving any environmental monitoring programmes that may be required for the operational phase.
- Advising on actions to be taken in the event of incidents or public complaints.
- Providing the results of environmental reports to the relevant authority as and when required.

- Ensuring any required audits are undertaken on a timely basis and that the results of the audits are communicated to all operational personnel.

3.6.2 Authorities

Where necessary, the authorities will assist the Kouga Local Municipality in understanding and meeting the specified requirements and conditions.

The authorities may perform random inspections to ensure compliance with the conditions. In such case, the Kouga Local Municipality will assist the authorities in every possible way so as to facilitate the inspection. In case of long-term non-compliance, the Kouga Local Municipality will be required to provide an action plan with corrective measures for approval by the authorities.

3.6.3 External Contractors and Sub-Contractors

External contractor and sub-contractors are responsible to the KLM Management for the effective implementation of the OEMMPr within their respective line functions. External contractors may be required to undertake maintenance activities in the event that the KLM are unable to do so.

Specific responsibilities include:

- Compilation of applicable Method Statements, as applicable.
- Appointing a Contractor's Environmental Officer who is responsible for ensuring that the requirements of the OEMMPr are implemented on a day to day basis.
- The implementation of the requirements of the OEMMPr.
- Ensuring that all sub-contractors are familiar with and implement the OEMMPr.
- Implementing corrective and preventive actions.
- Reviewing of the OEMMPr implementation and effectiveness at site meetings with the KLM.
- Maintaining and submitting records of waste disposal activities and corrective actions taken to rectify environmental problems on site.
- Keeping of a complaints and incidents register on site.

3.6.4 Environmental Officer

An Environmental Officer (EO) is to be appointed by the KLM to advise and assist the project team where necessary and to monitor the implementation of the OEMMPr. The EO role is to be fulfilled by a person with previous experience in environmental management and compliance monitoring.

The EO's duties include:

1. Supporting and advising the Developer or his representative, with regards to the review of Method Statements, auditing, monitoring and corrective and preventive action.
2. Undertaking monthly environmental compliance site monitoring for the duration of the construction phase.
3. Recommending environmentally appropriate solutions to environmental problems.
4. Recommending additional environmental management measures as appropriate.
5. Attending Project Progress Meetings to report on environmental compliance, if required.
6. Providing a monthly report on environmental compliance to the Developer or his representative.

3.7 Meetings

It is recommended that a meeting is held annually to discuss and review the OEMMPr. Additional meetings to discuss environmental issues raised during operations can be set up as required.

Chapter 4: Operational / Maintenance EMPr

4.1 Environmental Maintenance Management Requirements

The environmental requirements provided in this section address the impacts relating to the operation / maintenance of the Ocean View Collector Sewer..

The Environmental Management Requirements are presented as follows:

- **Impact Management Outcome:** The desired management outcome(s) for a particular operation / maintenance risk / impact.
- **Impacts:** Identified during the Basic Assessment Process.
- **Mitigation Measures:** Measures to reduce significance of impact.
- **Procedure**: Steps and/or actions required to manage (and minimise) the relevant aspects.
- **Time Periods:** Time periods within which actions must be undertaken.
- **Performance Indicator:** The (quantitative) level of performance, sometimes determined by legislation, which must be met.
- **Monitoring**: Method, frequency and mechanism of monitoring required.
- **Responsibility:** Persons responsible for implementation.

The operation / maintenance components consist of the following:

- Repair works to the sewer infrastructure
- Removal of sand, debris and vegetation
- Maintenance relating to blockages along the collector sewer
- Vehicles and equipment
- Waste (general waste, hazardous waste).

4.1.1 Terrestrial Biodiversity (Flora, Fauna and Avifauna)

Impact Management Outcome	To minimise damage to indigenous flora and fauna and the surrounding areas. To re-vegetate the area as necessary to alleviate erosion potential and to improve any aesthetic issues. To ensure minimum disturbance to indigenous flora and fauna occupying the area influenced by construction. To control and prevent alien vegetation growth.
Impacts	Loss of natural vegetation Loss of plant species of conservation concern Spread of alien and invasive plant species Erosion Disturbance to ecological processes
Mitigation Measures (BAR)	No clearing outside of footprint to take place. Surrounding intact Humansdorp Shale Renosterveld is to be conserved and not harmed during the maintenance process unnecessarily. A suitable weed management strategy to be implemented along the pipeline after completion of construction. Suitable measures must be implemented in areas that are susceptible to erosion. Areas must be rehabilitated, and a suitable cover crop planted. If natural vegetation re-establishment does not occur, a suitable grass must be applied. Possible grasses include *Cynodon dactylon, Eragrostis curvula* & *Digitaria eriantha*.
Procedure	No animals are to be harmed or killed during the course of maintenance activities. Workers are NOT allowed to collect any flora or snare any faunal species. All disturbed areas beyond the construction site that are intentionally or accidentally disturbed during the operation / maintenance phase must be rehabilitated. Limit destruction of habitat strictly to the maintenance footprint. No trenches or holes are to be left open for extended periods of time. Topsoil cleared from maintenance areas to be stockpiled separately to spoil. This topsoil is to be reinstated after maintenance. Alien species must be removed from the site as per the National Environmental Management: Biodiversity Act (No. 10 of 2004) requirements. Weeds and alien species must be cleared by hand. All alien invasive plant material (including brushwood and seeds) is to be removed from site and disposed of at a registered waste disposal site. Should brushwood be utilised for soil stabilization or mulching, it must be seed free.
Time Periods	Lifespan of operational phase
Performance Indicator	No vegetation to be removed outside of the demarcated areas. No alien invasive plant species.
Monitoring	Alien and invasive plant regrowth to be monitored and area to be kept free of alien invasive plants.
Responsibility	KLM

4.1.2 Aquatic Biodiversity

Impact Management Outcome	To limit the disturbance to watercourses and aquatic biodiversity.
Impacts	Loss of intact wetland or aquatic faunal habitats that could contain various species of special concern, Critical Biodiversity Areas Disturbance of aquatic features and habitat fragmentation (aquatic), especially areas linked to Ecological Support Areas Increase in sedimentation and erosion due to improper stormwater management.

	Risks on the aquatic environment due to water quality impacts.
Mitigation Measures (BAR)	The proposed footprint has avoided any aquatic areas, which will then also avoid any listed / protected species. The appointed environmental site team should have these areas demarcated to prevent any additional disturbance outside the proposed works areas. The proposed footprint has been optimised to avoid any High Sensitivity areas. It is assumed that all pipelines will be buried and that this would not have an impact of surface water run-off when backfilled and compacted, which would result in no stormwater management issues. Limit any spills from plant, machines or camps during maintenance activities. Any use of chemical, cement or paint must be carefully monitored and the necessary spill kits should be in place. Provide suitable solid / liquid waste management that is serviced regularly. Any operations of the sewers, must be in line with the DWS Aid Memoire related to the management of these systems. This will need to form part of the WULA submission, but it has been assumed that this project has been proposed to improve the network and reduce potential water quality issues that are currently present.
Procedure	Use existing roads or upgrade existing tracks rather than constructing entirely new roads wherever possible. Clear demarcation of maintenance footprint is required and no works to take place outside the demarcated area. All liquid chemicals including fuels and oil, must be stored in with secondary containment (bunds or containers or berms) that can contain a leak or spill. A spill kit to be kept on site for hydrocarbon leaks or spills. Washing and cleaning of equipment must be done in designated areas and no run off is allowed into the Pietersgaat River system. All stockpiles must be protected and located in flat areas where run-off will be minimised and sediment recoverable. Any erosion channels developed shall be backfilled and compacted and the areas restored to a proper condition.
Time Periods	Lifespan of operational phase
Performance Indicator	No contamination of groundwater or surface water No surface water may be affected by silt emanating from the site No erosion on site
Monitoring	All equipment, vehicles and liquid chemical containers to be inspected daily.
Responsibility	KLM

4.1.3 Air Quality Management

Management Outcome	To minimise nuisance and potential health problems, and potential damage to flora, associated with dust and/or sand. To minimise air pollution from maintenance activities
Impacts	Dust generated from maintenance activities Poorly maintained vehicles
Mitigation Measures (BAR)	On-going implementation of dust suppression and control measures on any dust generating surface whilst undertaking maintenance activities. Potable water is not to be used for dust suppression.
Procedure	When required, water spray vehicles to be used to control dust. No over-watering of the site or road surfaces. All earth works must stop during high wind conditions (i.e. when wind speeds exceed

	35km/h). The speed of construction vehicles to be restricted to 25km/h within the construction area or near stockpiles. Trucks transporting any form of soil or fine building materials to be covered with a tarpaulin. Any complaints about dust recorded in the complaints register must be immediately investigated by the KLM and addressed. Contact details (e.g. telephone number) should be located at the entrance of the site for reporting of excessive dust after hours. The KLM must implement a more rigorous dust-monitoring programme (instrument measurement) if there are persistent complaints about dust in the area. No waste, vegetation or any other material shall be burnt. Vehicles and machinery will be maintained in good running condition.
Time Periods	During maintenance activities
Performance Indicator	Excessive dust generation as determined visually by the EO is not permitted. Dust levels are not to exceed 1200mg/m^2/day (30 day average) for rural areas.
Monitoring	Dust must be visually monitored on a daily basis, or more frequently in conditions conducive to dust generation. A formal dust monitoring programme and dust suppression techniques be revised, if persistent complaints are recorded.
Responsibility	KLM

4.1.4 Noise Management

Management Outcome:	To avoid noise disturbance with particular reference to maintenance activities on the site
Aspect	Operation of construction equipment for maintenance, assorted maintenance and vehicle operation, construction staff.
Impacts	Noise impacts from maintenance activities
Mitigation Measures (BAR)	All construction vehicles and equipment must be in sound working order with the prescribed mufflers and silencers. Construction and maintenance work to be undertaken as per the Kouga Local Municipality Bylaws.
Procedure	Any complaints pertaining to noise and vibrations as recorded in the complaint register must be immediately investigated by the KLM and addressed. SABS 0103 - 1983 Code of Practice indicates that an increase of ambient noise levels by 5 dB (A) will induce “sporadic complaint” from the community. A formal noise monitoring programme must be implemented by the Developer or his representative if there are persistent complaints. No loud music will be allowed on site.
Time Periods	During maintenance activities
Performance Indicator	No excessive noise or complaints.
Monitoring	The Environmental Officer must subjectively monitor noise and vibration levels on a frequent basis. The Environmental Officer must implement a formal noise-monitoring programme if persistent complaints are recorded.
Responsibility	KLM

4.1.5 Health, Safety and Security

Management Outcome:	Reduction of any safety risks for employees or adjacent landowners
Impacts	Health risks reduced from sewage spillages on surrounding environment
Mitigation Measures (BAR)	Sewer rising main to be monitored for any leaks. Leaks or pipe bursts to be fixed immediately.
Procedure	Excavations to be demarcated with suitable high visibility material. Signage is to be displayed regarding construction activities.
Time Periods	Lifespan of operations
Performance Indicator	No leaks into surrounding environment.
Monitoring	Inspections by maintenance staff as per operational requirements.
Responsibility	KLM

4.1.6 Fuels and Hazardous Material Management

Management Outcome:	To ensure that materials are appropriately stored in order to minimise the potential for pollution and accidents.
Impacts	Soil, surface and ground pollution
Mitigation Measures (BAR)	Limit any spills from plant, machines or camps during maintenance activities. Any use of chemical, cement or paint must be carefully monitored and the necessary spill kits should be in place.
Procedure	All liquid chemicals including fuels and oil must be stored in with secondary containment (bunds or containers or berms) that can contain a leak or spill. All construction camps, lay down areas, wash bays, batching areas and any stores should be more than 10m from any demarcated water courses. Fuel, solvents and other hazardous or toxic substances must be securely stored in a restricted, locked facility. Fuel and hazardous materials containers must be properly and boldly labelled. Generators and fuel supply needed for equipment must be placed on drip trays. Drip trays are to be placed underneath fuel bowsers when parked. Drip trays are to be used during refuelling of construction equipment or vehicles on site. Drip trays are to be placed underneath any leaks from construction vehicles. All contaminated material must be disposed of at a registered hazardous waste disposal facility. No cement or concrete to be mixed on the soil surface or on plastic sheeting. Cement mixing is to undertaken in trays. Cement mixers must be placed on large trays to prevent accidental spills onto the soil surface. Where cement or concrete is mixed on the soil, contaminated soils should be removed and disposed of at a registered waste disposal site. Spill kits to be kept on site.
Time Periods	During maintenance activities
Performance Indicator	No spills or leaks from hydrocarbon liquids or chemicals.
Monitoring	A record must be kept of any spills and what follow-up action was taken. In the event of a significant spill or leak of hazardous substances (petrol and diesel) during activities, such incident(s) must be reported to all relevant authorities, including the DWS, in accordance with Section 30 (5) of the National Environmental Management Act (NEMA) (Act 107 of 1998), pertaining to the control of incidents.
Responsibility	KLM

4.2 Environmental Monitoring and Auditing for Maintenance Activities

4.2.1 Monitoring

The KLM and external Contractor (when applicable) is responsible for monitoring the procedures and targets applicable to each environmental management requirement.

Monitoring of maintenance activities include:

Part of the site that is monitored	Frequency of monitoring	Monitoring Procedure	How results are analysed and presented	Comments
Ocean View Collector Sewer and Pumpstation	Prior to the commencement of maintenance activities, during and after completion of maintenance activities.	Photographs of the site are to be taken prior, during and on completion of maintenance activities.	Record the monitoring and compliance results in a report, with recommended corrective actions. Report to include the maintenance activities being undertaken.	None

4.2.2 Auditing

Auditing of the Environmental Authorisation, Water Use Licence and Environmental Management Programme is to be undertaken on an annual basis by an independent environmental control officer.

The environmental compliance audit report is to be compiled according to the requirements in the EIA Regulations, 2014, as amended and Water Use Licence.

The environmental compliance audit report is to be submitted to the DEDEAT and DWS within 1 month of the audit having been undertaken.

4.3 Complaints and Incident Register

The Kouga Local Municipality must respond to queries and complaints from the public regarding maintenance activities within 14 days.

In responding to such queries and / or complaints all such communications must be documented in a complaints register. All remedial action taken on a complaint must be recorded in the complaints register.

An incident register must be kept and contain all incidents that occurred during maintenance activities and measures taken to address such incidents.

4.4 Environmental Awareness Training

The KLM shall ensure that all staff receive site environmental awareness training, as well as any refresher courses, pertaining to their role in the operations and maintenance, including:

- Induction training on project specific environmental awareness relating to the conditions of the EA, WUL and OEMMPr prior to commencing with any maintenance work on the project.
- 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), notifications/reporting).
- Water conservation and water quality protection.

- Erosion control measures.
- Maintenance of equipment to prevent the accidental discharge or spill of fuel, oil, lubricants, and other chemicals.
- Responsible handling of chemicals and spills.

4.5 Record Keeping

The following documentation is to be kept by the KLM:

- Environmental Authorisation, Water Use Licence and OEMMPr.
- Incident and complaints register
- Method statements (where and if applicable)
- Environmental awareness training
- Monitoring and Audit reports

Appendix A: EAP Curriculum Vitae

CEN
Integrated Environmental Management Unit
Reg No: 1996/032402/23

Lucille Behrens: 082 922 1645 lucille@environmentcen.co.za

CURRICULUM VITAE

LUCILLE BEHRENS (maiden name Van Staden)

Name of Firm	CEN Integrated Environmental Management Unit
Date of birth	20 August 1976
Position in Firm	Senior Environmental Scientist
Specialisation	Environmental Management
Nationality	South African
Years of experience	19
HDI Status	White female, no disabilities
Languages	English, Afrikaans

KEY QUALIFICATIONS

Lucille has 19 years' experience in the Environmental Management field. Lucille has undertaken a number of Environmental Impact Assessments (i.e. Basic Assessments; Scoping and EIA) under the EIA Regulations of 2006, 2010 and 2014. Her roles have included being the Environmental Assessment Practitioner (EAP), Assistant EAP, Project Manager and Environmental Scientist for EIA related projects. Her responsibilities have included undertaking environmental assessments, compilation of regulated EIA's (i.e. scoping reports, EIA reports, Basic assessments and EMPs) and incorporating specialists into the EIA team for any required specialist studies. Lucille has also undertaken and been involved with the regulated public participation process required for EIAs.

Her experience in compiling environmental management plans relate to construction, maintenance operations and wildlife management. Lucille has been involved in environmental compliance monitoring and auditing (environmental control officer) on a number of construction sites and borrow pits. She has also gained experience in GIS mapping.

Lucille has also been involved in waste studies and sustainable development projects, for example green procurement, elimination of illegal dumping strategies and water conservation and demand management plan.

EDUCATION

Qualification	Institution	Year
BSc (Hons) (Environmental Monitoring and Modelling)	UNISA	2008
BSc (Environmental Management)	UNISA	2005
BA (Hons) (Criminology)	University of Pretoria	1998
BA	University of Pretoria	1997

COURSES & CONFERENCES

Course / Conference	Date
Management Training Session – Nelson Mandela Metropolitan University: Business School	2006
The Environment And the Project Cycle	March 2008
Technical and Business Report Writing	March 2009
Institute of Waste Management South Africa – Eastern Cape Mini Conference	August 2009
Project Management, Incl. MS Projects	March 2010
Legal Workshop on the Key Implications of the National Environmental Management: Integrated Coastal Management Act	April 2010
Environmental Awareness and Legal Liability for Management	May 2010
Green Star SA Accredited Professional Course	September 2011
WASTECON	October 2012
Contaminated Land Workshop	February 2013
Water Law in South Africa Workshop	August 2013
Institute of Waste Management of Southern Africa – Eastern Cape Conference: The Green Revolution	September 2013
National Wetlands Indaba	October 2013
IWRM, the NWA, and Water Use Authorisations, focusing on Water Use License Applications – Procedures, Guidelines, IWWMP's and Monitoring, Carin Bosman Sustainable Solutions	September 2014
Water Use Licence Training – Section 21 c and i water use activities	August 2016
ISO 14001:2015 Environmental Management Systems Implementation	August 2016
Renewable Energy Workshop	June 2020
IAIAsa Virtual Symposium	October 2020
Council for Geoscience Conference 2021	March 2021
Environmental Law Update Workshop	April 2021
IAIAsa Climate Impact Assessment Webinar	May 2021
Environmental Law Annual Conference	September 2021
National Wetlands Indaba	October 2021

PROFESSIONAL MEMBERSHIP / REGISTRATION

Institution Name	Membership	Year Joined
International Association of Impact Assessments (South Africa)	Member (No. 2668)	2010
Environmental Assessment Practitioners Association of South Africa (EAPASA)	Registered EAP 2016/38	2019

EMPLOYMENT RECORD

August 2013 – Present: CEN IEM Unit

On 1 August 2013, Lucille joined the CEN Integrated Environmental Management Unit as **Senior Environmental Scientist**. Her responsibilities include:

- Project management,
- Environmental Impact Assessments (Basic Assessment, Scoping and EIA and associated public participation),
- Co-ordinating and assessing specialist studies,
- Environmental Management Plans/Programmes,
- Environmental Compliance Monitoring,
- GIS mapping.

July 2007 – July 2013: BKS (Pty) Ltd / AECOM SA (Pty) Ltd
On 1 October 2012 Lucille was appointed as a **Senior Environmental Scientist** for the Infrastructure and Management Sector of BKS in Port Elizabeth after BKS and its subsidiaries rebranded on 1 November 2012 to become AECOM SA (Pty) Ltd. Her responsibilities included:

- Project management, including financial management on projects,
- Environmental Impact Assessments (basic assessment, scoping and EIA and associated public participation),
- Co-ordinating and assessing specialist studies,
- Environmental Management Plans/Programmes,
- Environmental Compliance Monitoring,
- Waste and Sustainablity Strategies,
- Business development focusing within the Eastern Cape, KwaZulu Natal.
- GIS mapping.

In 2009, Lucille was promoted to **Senior Environmental Scientist** and was responsible for project management, environmental impact assessments (basic assessment, scoping and EIA and associated public participation), environmental management plans, environmental compliance monitoring, waste and sustainablity strategies within the Eastern Cape.

In 2007, Lucille joined BKS (Pty) Ltd as an **Environmental Scientist**. Her responsibilities included undertaking environmental impact assessments (basic assessment, scoping and EIA and associated public participation), compiling environmental management plans and undertaking environmental compliance monitoring.

August 2000 – June 2007: Shamwari Game Reserve (Mantis Collection)
Lucille was the **Wildlife / Environmental Co-Ordinator** for Shamwari Game Reserve (Mantis Collection) from November 2003 – June 2007. During this time, her responsibilities included the following:
Compiling environmental management plans for construction operations and wildlife management for reserves in South Africa, United Arab Emirates and Morocco. Undertaking environmental compliance monitoring of construction sites within game reserves. Monitoring environmental aspects (e.g. water usage) within Mantis game reserves and organising related wildlife permits.

In November 2001, Lucille transferred to the Wildlife Department as the PA to the Wildlife Director.

In 2000, Lucille joined Shamwari Game Reserve and during this time her roles included Personal Assistant to the General Manager, Switchboard Operator and Reservationist.

June 1999 – July 2000: Formax
Computer room supervisor, Data Capturer

1997: University of Pretoria

Practical Tutor, Information Science Department

EXPERIENCE RECORD – SELECTED PROJECTS

ENVIRONMENTAL IMPACT ASSESSMENTS:

- Basic Assessment for the Expansion of BORBET SA Furnaces, Nelson Mandela Bay Municipality – *BORBET SA / LAQS*
- Scoping and Environmental Impact Assessment for the Proposed Seraphim Solar Cell Facility in the Coega SEZ, Nelson Mandela Bay Municipality – *Seraphim Energy*
- Scoping and Environmental Impact Assessment for the Proposed Newlyn Manganese Storage and Conveyor Facility in Coega SEZ, Nelson Mandela Bay Municipality – *Newlyn Group*
- Basic Assessment for the Proposed Beenleegte Hydro Power Facility in Somerset East - *Navitas*
- Basic Assessment for the Proposed Little Fish Hydro Power Facility in Somerset East - *Navitas*
- Basic Assessment for the Proposed Coegakop Wellfield and Water Treatment Works – *NMBM*

- Basic Assessment for the Upgrading of the Emsengeni Access Road, Kirkwood – *LA Consulting Engineers*
- Basic Assessment for the Proposed Stormwater Management Infrastructure in Colchester, Nelson Mandela Bay Municipality - *NMBM*
- Basic Assessment for the Proposed Alexandria Community Health Centre - *Archworxs*
- Scoping & Environmental Impact Assessment for the Kei Road Water Conveyance (pipeline and water treatment works) - *Aurecon*
- Basic Assessment for the St Francis Stormwater Upgrade - *Aurecon*
- Basic Assessment for the Proposed SACE Ranger PV Plant, Uitenhage – *SACE.*
- Basic Assessment of the Proposed Clearing of Vegetation for Fence Construction at SAPS Training Institute, Addo, Sundays River Valley Municipality – *Engineering Advice & Services.*
- Basic Assessment for Construction and Operation of a Filling Station with Rest and Retail Facilities, an Agri-Business Retail / Wholesale Facility adjacent to the Nanaga Farm Stall on the Remainder of Portion 8 Nanaga Hoogte No 229, Sundays River Valley Municipality – *Pantheon Trust*
- Scoping & Environmental Impact Assessment for the Malabar Extension 6 Phase 2 Housing Development, Nelson Mandela Bay Municipality, Eastern Cape – *NMBM (undertaken whilst in employ at AECOM)*
- Scoping & Environmental Impact Assessment for the Residential Development on Farm Grants Valley 396/2, Ndlambe Municipality – *ACME Capital (undertaken whilst in employ at BKS)*

ENVIRONMENTAL MANAGEMENT PROGRAMMES:

- Environmental Management Programme for the Kirkwood Revitalisation Programme within the Sundays River Valley Municipality - *LA Consulting Engineers*
- Environmental Management Programme for the Rural Roads Prioritized Infrastructure Project within the Sundays River Valley Municipality - *LA Consulting Engineers*
- Coastal Management Programme for the Nelson Mandela Bay Municipality

ENVIRONMENTAL COMPLIANCE MONITORING:

- Environmental Control Officer: Graaff Reinet Wellfield – *LA Consulting Engineers*
- Environmental Control Officer: Coegakop Wellfield Phase 1: Drilling of boreholes and installation of bulk water pipelines in Port Elizabeth – *Aurecon*
- Environmental Control Officer: Upgrading of Roads and Stormwater in Valencia, Addo – *LA Consulting Engineers*
- Environmental Control Officer: Upgrading of Roads and Stormwater in Emsengeni, Kirkwood – *LA Consulting Engineers*
- Environmental Control Officer: Construction of the Kuyga Rising Main – *Hatch Goba*
- Environmental Control Officer: Upgrading of Access Roads in Moses Mabida, Kirkwood – *LA Consulting Engineers*
- Environmental Control Officer: Upgrading of Stormwater Infrastructure in Summerstrand – *Hatch Goba*
- Environmental Control Officer: Upgrading of Roads and Stormwater in Nomathamsanqa, Addo – *LA Consulting Engineers*

WATER USE LICENCE APPLICATIONS (WULA):

- WULA for the Proposed Beenleegte Hydro Power Facility in Somerset East - *Navitas*
- WULA for the Proposed Little Fish Hydro Power Facility in Somerset East - *Navitas*
- WULA for the Proposed Coegakop Wellfield and Water Treatment Works – *NMBM*
- WULA for the Upgrading of the Emsengeni Access Road, Kirkwood – *LA Consulting Engineers*
- WULA for the Proposed Malabar Phase 2 Extension 6 Housing Development - *NMBM*
- WULA for Proposed Gqunu Village Bridge Crossing and Road Upgrades - *Department of Land Reform and Rural Development*.

CV: Lucille Behrens **5**

SUSTAINABILITY / OTHER PROJECTS:

- Environmental Screening for the Port St Johns Community Access Roads – *LA Consulting Engineers*
- Environmental Screening for the Pearston Bulk Water Supply Augmentation – *BVi Consulting Engineers*
- Due Diligence for Zone 10 of the Coega Special Economic Zone – *Coega Development Corporation*
- Environmental Sensitivity Review for the Kirkwood Revitalisation Programme within the Sundays River Valley Municipality - *LA Consulting Engineers*
- Environmental Sensitivity Review for the Rural Roads Prioritized Infrastructure Project within the Sundays River Valley Municipality - *LA Consulting Engineers*
- Environmental Screening Assessment on Portion 62 of Ongegunde Vryheid No 746, St Francis for Mixed Land Use– *Aurecon*

Environmental Assessment Practitioners Association of South Africa

Registration No. 2016/38

Herewith certifies that

LUCILLE BEHRENS

is registered as an

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*

SAQA

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