SALT ROCK BEACH ESTATES CC

RECONSTRUCTION AND REINFORCEMENT OF SALT ROCK SEA WALL

DRAFT ENVIRONMENTAL MANAGEMENT PROGRAMME [DC29/0023/2017]

15 FEBRUARY 2018

PUBLIC

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1 INTRODUCTION

1.1 TERMS OF REFERENCE

The sea wall located in front of the Salt Rock Hotel, on the Kwa-Zulu Natal (KZN) north coast was significantly damaged following the high sea and storm event experience along the KZN coast in March 2007.

Salt Rock Beach Estates cc (the Applicant) received Environmental Authorisation (EA) for the reconstruction of the sea wall in November 2013 (Ref: DC29/0040/08). An additional application for EA was submitted in November 2017 for the reinforcement of the portions of the existing sea wall not described under the aforementioned EA (Ref: DC29/0023/2017).

In terms of the EIA Regulations an application for EA must include an Environmental Management Programme (EMPr). A condition of the EA for the reconstruction of the sea wall was that the EMPr included in the application must be amended submitted to, and approved by Economic Development Tourism and Environmental Affairs (EDTEA) prior to commencement of the activity (see Section 1.4 for details of the required amendments).

For simplicity, it has been agreed with EDTEA (pers comm. 1 June 2017 via email / Appendix A) that one consolidated Environmental Management Programme (EMPr) covering both the reconstruction of the sea wall and the reinforcement of the portions of the existing sea wall must be submitted for approval.

Therefore, this document comprises a consolidated EMPr for the reconstruction of the sea wall and the reinforcement of the portions of the existing sea wall; superseding and nullifying the previous EMPr for the reconstruction of the sea wall.

1.2 ENVIRONMENTAL ASSESSMENT PRACTITIONER DETAILS

Details of the EAP are described in **Table 1**.

Table 1: Details of Environmental Assessment Practitioner

Business Name of EAP:	WSP Environmental (Pty) Ltd
Contact Person:	Carla Elliott
Qualifications:	MSocSci Environmental Management, University of Natal
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1.3 AIMS AND OBJECTIVES

This EMPr is the primary document for managing potential environmental risks and opportunities during the project. It provides the framework for managing the environmental controls and processes to be implemented by the project proponent and contractors in carrying out their respective responsibilities.

The EMPr serves as a live document and should be revised and updated to reflect any new information that should arise.

The objectives of the EMPr are to:

- Provide effective, site-specific and implementable procedures and mitigation measures to monitor and control environmental impacts of the construction phase, such that the related activities do not adversely impact the environment in the surrounding area.
- Comply with all applicable laws, regulations, standards and guidelines for the protection of the environment.
- Train employees and contractors with regard to environmental obligations.

Ensure that during the life of the project, Salt Rock Beach Estates cc ensures mitigation for negative impacts and enhances positive impacts associated with the reconstruction and reinforcement of the sea wall structure. An important component of this is the monitoring, evaluation, and communication of findings and adherence to the principle of 'continuous improvement'.

1.4 LEGAL REQUIREMENTS

This EMPr has been prepared in compliance with Section 19 of the National Environmental Management Act (NEMA), 2014 Environmental Impact Assessment (EIA) Regulations (amended 2017) and is submitted in conjunction with the Basic Assessment Report (BAR) for the aforementioned proposed project. It contains required information as set out in Appendix 4 of NEMA 2014 EIA Regulations (as amended).

In addition, the purpose of this document responds to a condition outlined in the initial EA (DC29/0040/08). Conditions 3.5 and 3.6 reads:

The Environmental Management Programme (EMPr), dated May 2012, as prepared by Kerry Seppings Management Specialists, fulfils the requirements of regulation 33 of the EIA Regulations 2010. However, the EMPr must be amended to include:

3.5.1 The EMPr must detail all construction, mitigation and management methods for all impacts that are associated with the authorised alternative.

3.5.2. The removal of the cross walls and the wedding venue. [This is no longer applicable in light of the appeal submitted by the Applicant in respect of the initial EA (DC 29/0040/08) and the Ministers appeal decision dated 12 September 2014. The appeal decision confirmed that all the conditions relating to the wedding venue and the cross walls were deleted from the environmental authorisation.]

3.5.3 Revegetation plan for the sandbags / dune during the construction phase.

3.5.4 An operational phase EMPr for the development of a maintenance plan for the sandbags, rehabilitation of the indigenous and coastal vegetation as well as the seawall.

3.5.5. A revised Stormwater management plan.

3.6 The EMPr must be amended and must be submitted to, and approved by the Compliance, Monitoring and Enforcement component of this Department prior to commencement of the activity.

It should be noted that the EMPr does not address the regulatory requirements under the Occupational Health and Safety Act (No. 85 of 1993) (OHSA); as these do not fall within the remit of the EA process. It is the responsibility of Salt Rock Beach Estates to identify and comply with the relevant regulations of the OHSA.

1.5 PROJECT BACKGROUND

The Salt Rock Hotel is located in the suburb of Salt Rock, within the KwaDukuza Municipality, approximately 4km north of the regional centre of Ballito (**Figure 1**). The property is 46690.8m² in size and is zoned General Residential 1. The damaged seawall is located along the seaward boundary of the Salt Rock Hotel at 59 Basil Hulett Drive, Lot 900 Salt Start co-ordinates: 29°30'11.64"S; 31°14'20.19"E; End co-ordinates: 29°30'17.81"S; 31°14'05.04"E).

Figure 1: Locality map indicating the location of Salt Rock Beach Estates Hotel (WSP, 2017)

1.6 CONSTRUCTION METHODOLOGY

The construction methodology for the reconstruction of the sea wall and the reinforcement of the portions of the existing sea wall is described below.

1.6.1 CONSTRUCTION CAMP AND ACCESS

The large flat-grassed area on the northern portion of the site (on the Hotel grounds) will be used as the construction camp for the contractor.

Public access will be controlled by fencing the area of operation. The public will have access to the beach at all times (a gate restricts access to the hotel grounds and has been placed at the beach entrance for security purposes).

Site access will be via Shrimp Lane, north end of site (no public access will be affected). The inland side of the wall has vehicular access from the Shrimp Lane entrance, the southern end of the wall section will need to be accessed from north of the tidal pool, on the seaward side.

1.6.2 EXCAVATION VOLUMES

Excavation of an estimated 11420m^3 of soil and sand materials to expose the rock foundation over the required foundation width including working space will take place for reconstruction of lost wall and reinforcement of remaining wall.

1.6.3 SEAWARD ACTIVITIES

Although no structures are to be erected on the seaward side of the wall, the following activities will take place seaward:

- Stockpiling of excavated material on the beach adjacent to the excavated section being worked on. This would in effect create a berm / bund of a temporary nature to facilitate the construction during working hours. This is not intended to act as a barrier to wave action. The intention is to limit work on any section to time periods that do not conflict with high seas, tides or when the resort / beach is busy in season. The combined volume of stockpiled excavated material will not exceed 50m^2 at any time of the project. Once a certain planned section is completed, the stockpiled sand will be replaced along the wall and the next section will be excavated – to continue for full length of the wall.
- Trench shoring is the process of bracing the walls of a trench to prevent collapse. Shoring will allow for a smaller area of excavation. The maximum collapse height of the entire excavation will be from natural ground level to foundation level, which is approximately 4m. It is noted that shoring involves erection of temporary structures to aid in the construction of a project. Temporary structures will be dismantled and removed when the permanent works become self-supporting or complete.
    - Reinforcement: Shoring of the excavation will be constructed of removable timber sections on the landward side with the existing wall providing support on the seaward side.
    - Reconstruction: Shoring of the excavation will be constructed of removable timber sections on both the seaward and landward sides.

1.6.4 SEAWALL

The intention is to do the works piece-meal during the low tourist periods. The process will be undertaken along 5 - 10 metre sections of the wall at a time, so as to limit disruptions to hotel and beach users, prevent the build-up of large stockpiles of materials on site, and limit exposure to extreme sea events. The methodology below describes both reinforcement and reconstruction works.

- Batter the excavation to achieve a safe working angle – in order to prevent collapse.
- Drill and grout steel dowels into the rock foundation.

- Drill and grout steel connecting dowels into the back face of the existing stone wall.
- Core 50mm diameter drain holes through the existing stone wall, at spacing shown on the design drawings. Grout in an uPVC drain pipe, allowing for extra length to extend through the concrete reinforcing wall.
- The new wall will have uPVC pipe cast into the concrete and hidden behind the sandbags.
- Fix reinforcing steel to the wall foundation.
- Cast the foundation concrete.
- Erect the back and front shutter to the new wall sections; the existing stone wall will form a permanent shutter to the front of the wall to be reinforced
- Cast concrete for the retaining wall.
- Install sand drainage layer and geofabric separation layer to the back of the retaining wall in accordance with the design drawings. Drainage layer and backfill to be brought up in 500mm compacted lifts behind the wall until full height is reached.
- Sandbags will be positioned 4m from toe of wall along full length of reconstructed portion.
- The sandbags will be used in front of the existing wall on the south end to provide an effective tie-in to the sand dune to the south of the property. The tie-in on the north side is the same, but will have the new wall behind it.

1.6.5 CONSTRUCTION MATERIALS AND MACHINERY

Concrete will be imported onto the site in the form of ready-mix at the time of requirement. The only material on site will be the reinforcing steel, shoring materials, geo-fabric /sand bags.

Sand bags will be filled *in-situ*; the fill will be the same sand as on the site but will be sourced within the private property and not from the beach. As the bags are four-ton units this will require the use of heavy construction machinery.

The water for any construction will be sourced from the resort as required. Currently, no need for dewatering pumps has been identified for the project.

1.6.6 REHABILITATION OF CONSTRUCTION ACTIVITIES

Upon completion of the bulk construction activities, the site will be rehabilitated to ensure it is stabilised and all construction machinery and infrastructure will be removed.

1.6.7 OPERATIONAL ACTIVITIES

Key aspects associated with on-going maintenance of sea wall include dune vegetation, stormwater management; and sand infilling of the soft structures. Maintenance of the sea wall is dealt with here as it is applicable to both the already authorised reconstructed portions; and current application for reinforcement of remaining portions, as this will form one contiguous structure.

VEGETATION

The sloped sandbag section of the new portions of the wall allows for planting of vegetation as an authorised activity (GNR 386(3) through the existing EA (DC29/0040/08). The slope of a soft geobag structure would be such that it promotes placement of a layer of sand over the structure and the planting of dune vegetation. Planting of dune vegetation will be required to create and maintain an aesthetic and biological connection with the beach and a means to accumulate windblown sand and reduce erosion effects.

A *Vegetative Rehabilitation Management Plan for Lot 900 Salt Rock* (23 July 2017) has been prepared by Dutton Ecological Landscaping in support of the EMPr (**Appendix B**). The plan includes measures to maintain the vegetative cover once indigenous species have been established on the sandbags. These maintenance and management measures are included **Section 4.5** of this EMPr.

STORMWATER MANAGEMENT

Bosch Projects was contracted by the Salt Rock Beach Estates to prepare a *Storm Water Management Plan* (SWMP) (July 2017), in support of the EMPr (**Appendix C**). This includes post-construction on-site management responsibilities to reduce the risk of failure of the sea wall structure in future due to scour and erosion of soil adjacent to these structures. All runoff will be diverted away from the construction operations and discharged to the beach in a controlled manner to ensure little or no effect on water quality or erosion damage. Key interventions include maintenance of stormwater outlets to ensure blockage of pipes does not occur; and preventing entry of hazardous substance to stormwater drains and drainage line. These maintenance and management measures are included **Section 4.5** of this EMPr.

SAND SUPPLY AND INFILLING OF THE SOFT STRUCTURES

Localised additional scour and consequent beach lowering caused by major storms may require sand supply and / or sand infilling of sand bags forming the soft structure of wall (i.e. where rebuilt as approved by existing EA (DC29/0040/08). It is anticipated that this post storm requirement will be on an infrequent basis as sand eroded from a dune is returned to the shore by onshore wave- and wind-driven sand transport and thus no net loss of sand occurs. Furthermore, the sandbag section of the hybrid coastal protection will tend to accumulate wind-blown sand, which will be "fed" to the profile (via erosion) during storms.

Should the potential denial of sand to the nearshore region become an issue (e.g. possible aggravation of erosion of neighbouring properties or as a result of a storm event), sand will need to be supplied with the appropriate grain size. This should be practical in the medium term (with supply in the order of a thousand cubic metres of sand required for the largest storms only). However, the required supply of sand could increase considerably in the long-term, in the event of sea-level rise evolving as predicted (~1 m of sea-level rise in 100 years). This may require the presence of workers and machinery on the beach.

WSP Coastal and Port Engineering (2010) recommends that a programme of regular beach surveys after severe storms (which have caused obvious beach erosion) be instituted. Although the results of surveys may not provide definitive answers relating to the aggravation of erosion, they will at the least serve as a tool to aid in erosion assessments.

2 IDENTIFICATION OF ISSUES AND CONTROLS

Environmental issues generated by the proposed reconstruction and reinforcement of the sea wall may affect the surrounding physical and biotic environments. The following subsections describe the potential environmental issues and impacts identified and assessed during both applications for EA.

2.1 IMPACT ASSESSMENT SUMMARY TABLE

Table 2 below provides a summary of the potential environmental impacts identified during both the reconstruction (as identified in 2012 EIA Report and EMPr) and reinforcement of remaining portions (current application).

It is highlighted that the proposed reinforcement of the remaining portions will not result in additional negative impacts previously assessed and authorised in 2012 relating to the reconstruction of the sea wall. As per previous studies on the reconstruction of the wall, and more recent confirmation on the reinforcement), the project in totality (i.e. contiguous structure) will not result in any impacts which were not previously identified as low and which can be easily mitigated.

The EMPr outlines the mitigation measures, controls, monitoring and reporting requirements and responsibilities required to achieve the environmental objectives and demonstrate environmental compliance within the construction and operational phase for all impacts identified in **Table 2** (i.e. reconstruction and reinforcement).

Table 2: Impact Assessment Summary Table

Phase	Nature	Impact (Reinforcement of the portions of the existing sea wall) Ref: WSP (2018) Reinforcement of salt Rock Sea Wall: Draft Basic Assessment Report.	Impact (Reconstruction of the sea wall) Ref: KSEMS (2012) Proposed Reconstruction of Sea wall in front of Salt Rock Hotel: Final Environmental Impact Report.
Construction Phase	Negative	**Air Quality** The construction phase may generate dust emissions from excavation activities and stockpiling of materials (particularly during windy conditions). This may result in a nuisance factor to the Hotel and caravan park users. The impact is short-term in nature.	- Emissions generated from construction vehicles.
	Negative	**Noise** The construction phase is likely to generate noise emissions as a result of general activities on site. Sources of noise may include: excavation machinery (e.g. TLB), welding, grinding, movement of vehicles to and from the site, pouring of concrete (concrete trucks and motors), and presence of construction workers on site. Construction activities are likely to take place during normal working hours (e.g. weekdays between 7:00 and 16:00). Noise emissions have the potential to result in nuisance factor to Hotel, caravan park and beach users however this will be temporary in nature.	- Noise generated by construction workers, machinery and construction vehicles disturbing surrounding residents, tourists and hotel patrons.
	Negative	**Soils and Stability** Construction activities, including excavation and stockpiling of materials, have the potential to increase localised soil erosion. This may lead to the displacement of soils and inability for the soil to support ecosystems and fulfil its ecological functions.	- Erosion of stockpiled material (stone, sand and gravel). - Potential onsite erosion of exposed soil banks during excavation and before rehabilitation is completed.
	Negative	**Stormwater** Prolonged use of the large flat-grassed area on the northern portion of the Hotel grounds to be used as construction camp may result in compaction and loss of permeability. The increased runoff could result in localised erosion and sedimentation of stormwater drains and surface water contamination resulting in a deterioration of water quality off site (nearshore environment) where stormwater flows into the sea.	- Deposition of sediment or contaminants into the ocean. This in turn could affect the water quality of surrounding areas.
	Negative	**Soil, Stormwater and Groundwater Contamination** The storage and handling of small quantities of hazardous construction materials such as oil and grease can result in accidental or negligent small-scale spills This has the potential to lead to surface water contamination resulting in a deterioration of water quality off site (nearshore environment) where stormwater flows into the sea. Reduced water quality has the potential to affect sensitive habitats, flora and fauna.	- Risk of contamination to soil during concrete mixing. - Contaminated stormwater run-off entering the ocean. - Deposition of sediment or contaminants into the ocean. This in turn could affect the water quality of surrounding areas. - Pollution of the ocean and surrounding beaches.

			- Construction vehicles may cause damage or contamination of the beach. - Potential contamination of groundwater, the beach and the ocean from hazardous substances such as cement, oil leaks from vehicles, storage of lubricants etc on site. - Lack of toilet facilities resulting in unsanitary conditions. - Improper disposal of toilet waste from chemical toilets resulting in contamination of the surrounding environment.
	Negative	**Solid Waste Generation** The construction period is anticipated to generate general and hazardous waste streams. Typically, this includes plastic and paper packaging, used oil and grease etc. If not managed correctly: a) litter may cause public health issues and threat to the terrestrial and marine fauna; and b) result in a lost opportunity for recycling of waste.	- Pollution of the ocean and surrounding beaches. - Improper storage and disposal of hazardous waste i.e. used oils from vehicles, old cement bags etc. resulting in possible contamination of the surrounding environment. - Littering around the site. - Improper storage and disposal of general waste materials generated during construction resulting in possible contamination of the surrounding environment. - Improper disposal of rubble i.e.: burying or neglecting building rubble resulting in direct mechanical damage to surrounding beaches. - Potential for construction waste to be disposed of at incorrect landfill resulting in contamination at the landfill site.
	Negative	**Aesthetics** Temporary visual disturbance for beach users and hotel guests related to presence of construction activities and machinery	- Interference with appearance and aesthetics of the beach during construction. - Possible disruption of recreational activities associated with the Salt Rock beach.
	Negative	**Road Traffic** Increase in traffic related to movement of contractors and delivery of materials may lead to sporadic local temporary congestion. Public safety risks may also arise	- Increase in traffic disruptions on surrounding access roads i.e. Basil Hulett Drive during construction as a result of construction vehicles.
	Negative	**Public Safety** The presence of machinery and temporary structures has the potential to increase safety risks to beach and hotel users if access and active working area is not managed correctly.	- Temporary restrictions of access to the beach may be required during construction for health and safety reasons.
	Negative	**Cultural Heritage** Excavation for the reinforcement work has the potential for unearthing and damaging items of cultural or historical significance.	- Potential unearthing and damage to items of cultural or historical significance.
	Negative	*Not applicable*	**Resource Utilisation**

			Sourcing of raw materials i.e.: (gravel, stone, sand, cement and water) from unsustainable sources resulting in illegal sand winning and mining operations causing significant environmental damage.
	Negative	*Not applicable*	**Damage to existing services** Disruption to sewerage, and water lines etc.
	Positive	*Not applicable*	**Socio-Economic** Potential temporary employment for skilled local community members during the construction phase.
Operational Phase	Negative	**Noise** No impacts are likely to occur during operation of the sea wall except during maintenance activities. Noise sources may include plant machinery (e.g. TLB) and workers on site. Maintenance is likely to be intermittent and short-term in nature, but may still result in a nuisance factor to hotel, caravan park and beach users.	*Not applicable*
	Negative	**Coastal Geomorphology** The holistic seawall structure could lead to localised scour of the beach profile and denial of natural dune sand supply during large storms. However, as the wall has been in place for approximately 70 years, the reinforcement is unlikely to change the current state of geomorphological processes.	- Localised scour - Limit the potential for establishment of a semi-permanent dune and associated dune vegetation.
	Positive	**Aesthetics** Stabilisation of the wall will provide a long-term improvement for the local aesthetics for beach users and hotel guests.	- Improve the aesthetics of the hotel and beachfront. - A possible increase in tourists visiting the Salt Rock Hotel and the Salt Rock area in general due to the improved appearance of the beach and rock tidal pool area. This may result in an increase in employment opportunities for hotel staff and supporting industries. - Retain sense of place as the wall is an important identifying feature for the area.
	Positive	**Public Safety** The reinforcement of the remaining portions of the wall will provide safety to the hotel and its guests, as well as to beach users by mitigating further collapse. The stabilisation of the wall as a contiguous structure will provide long term improved safety in the event of future extreme weather events.	**Protection of property and security.**
	Negative	*Not applicable*	**Reduction of sand being fed to beaches to the north.**
	Negative	*Not applicable*	**Possible interference with the littoral drift.**
	Negative	*Not applicable*	**May promote the reflection or focusing of wave energy.**
	Negative	*Not applicable*	**Concern regarding knock-on effects on neighbouring properties.**

3 ENVIRONMENTAL MANAGEMENT PROGRAMME

3.1 FUNCTIONS AND RESPONSIBILITIES

Roles, responsibility and authority shall be defined, documented and communicated in order to facilitate effective environmental management through implementation of the EMPr. Management shall provide resources essential to the implementation and control of the EMPr, including: human resources, technology, and financial resources.

Salt Rock Beach Estates cc shall appoint specific management representative(s) who, irrespective of other responsibilities, shall have defined roles, responsibility, and authority for environmental management of the facility.

Table 3 provides an overview of the roles and responsibilities of individuals on site related to construction activities.

Table 3:Roles and Responsibilities

Responsible Person	Responsibilities
Project Manager **(Salt Rock Estates cc)**	– Review and approve the EMPr prior to authorisation by the EDTEA. – Review and authorise updates to the EMPr. – Ensure resource allocation for implementation of the EMPr requirements. – Ensure that environmental requirements are integrated into project plans, work method statements, tender and contract documents. – Ensure necessary support to the Health, Safety and Environment (HSE) representative for implementation of the EMPr. – Undertake environmental system reviews, site inspections, audits and other verification activities to assure that the EMPr implementation is at an optimal level. – Participate in environmental performance verification activities to verify the level of compliance with the EMPr in delivering the legal and environmental obligations. – Assess the efficacy of the EMPr and identify possible areas of improvement or amendment required within the EMPr. – Participate in incident investigations (as required). – Initiate external audits (as required).
Site Manager / HSE Representative **(appointed by Salt Rock Estates cc to oversee contractor team)**	– Ensure implementation of the EMPr. – Ensure that the latest EMPr documents are filed and readily accessible as required. – Ensure communication of EMPr requirements to relevant contractor and sub-contractor personnel. – Facilitate environmental induction of all project staff and either deliver or coordinate delivery of all such training that would be required for the effective implementation of the EMPr. This includes identifying additional project training requirements and implementing the training programme. – Ensure maintenance of site document control requirements. – Maintain training records for all project personnel including contractors. – Maintain environmental incidents and complaints register. – Undertake environmental system reviews, site inspections, audits and other verification activities to assure that the EMPr implementation is at an optimal level. – Report significant incidents internally and externally as required by law and the conditions of EA upon receipt. – Investigate incidents and recommend corrective and preventative actions. – Provide support and advice to the contractor and all sub-contractors in the implementation of environmental management procedures and corrective actions. – Ensure that monitoring programs, which assess the performance of the EMPr, are implemented. – Assess the efficacy of the EMPr and identify possible areas of improvement or amendment required within the EMPr.
Contractors, Staff and Service Providers	– Regular on-site auditing to assess performance against the requirements of this EMPr. – Completion of the appropriate training requirements as specified in the training programme.

	– Implementation and maintenance of environmental management controls as set out in the project's environmental management documentation.
Environmental Control Officer (ECO)	– Undertake compliance audits against the EMPr and conditions of the EA. – Provide support and advice to the project team, contractor and all subcontractors in the implementation of environmental management procedures and corrective actions. – Ensure that monitoring programs, which assess the performance of the EMPr, are implemented. – Assist in the investigation of incidents and non-conformances and confirm in conjunction with the Site Manager that corrective and preventive action is taken and is effective. – Assess the efficacy of the EMPr and identify possible areas of improvement or amendment required within the EMPr. – Facilitate the amendment of the EMPr in conjunction with the Site Manager (as required). – Prepare audit reports (and submit reports to the relevant authority as required).

3.2 TRAINING

Salt Rock Beach Estates cc has the responsibility to ensure that all persons involved in the project are aware of, and are familiar with, the environmental requirements for the project. All project personnel, including contractors and sub-contractors are required to receive training of a type and level of detail that is appropriate for the environmental aspects of their work. As a minimum, all personnel are required to complete the training requirements stipulated in **Table 4** below. Attendance records for all training are to be retained on-site within the Environmental File.

All senior and supervisory staff members shall familiarise themselves with the full contents of the EMPr. They shall know and understand the specifications of the EMPr and be able to assist other staff members in matters relating to the EMPr. Salt Rock Estates cc may seek the support from the independent ECO to provide the necessary training

Table 4: Training Requirements

Training Requirement	Frequency
Site Induction – the purpose of the induction is to ensure that, as a minimum, all on-site personnel understand the EMPr in terms of: – Key issues relating to the project. – Relevant conditions of the EA (upon receipt). – Waste management and minimisation. – Minimising potential impacts to air, noise and ecology. – Surface and groundwater contamination. – Spill control measures. – Emergency Preparedness. – Incident reporting procedures. – Best pollution prevention practices. – Roles and responsibility relating to environmental management.	Construction Phase: prior to commencement of work by staff and / or contractors.
Toolbox Talks – Toolbox talks are intended to deliver specific training in an aspect of work or control including *inter alia*: – Waste handling procedures. – Spill kit training. *The HSE Manager should identify potential areas for which ad hoc training and awareness is required to promote compliance with the EMPr. This can be done on conjunction with the ECO.*	Construction Phase: weekly or as required.
Pre-Start Meeting – Pre-start meetings should be undertaken prior to commencement of a shift or the commencement of a new activity in order to discuss the planned work and operational aspects of the tasks. HSE issues and controls should be discussed and understood.	Construction Phase: as required.

3.3 INSPECTION AND AUDITING

Environmental monitoring of the proposed construction must be undertaken by an independent environmental consultant or suitably qualified ECO at a frequency stipulated within the EA. Monitoring is to be undertaken to ensure compliance with all aspects of the EMPr.

In order to facilitate communication between the ECO, Site Manager and Contractor, it is important that a suitable chain of command is structured that will ensure that the ECO's recommendations have the full backing of the project team before being conveyed to the contractor(s).

A close-out post construction audit must be undertaken to audit the whole project's compliance to the EA and EMPr during the construction phase.

3.4 ENVIRONMENTAL INCIDENT MANAGEMENT AND REPORTING

The following is applicable to incident management and mitigation:

- Any incident should be reported immediately to the HSE representative / Site Manger.
- Environmental incidents that are deemed to be significantly harmful or are likely to harm the environment should be reported to the Project Manager and Site Manager immediately.
- Immediate correspondence should be taken with Salt Rock Beach Estate cc or the HSE representative /Site Manager to determine mitigation and close-out requirements.

Environmental incident reporting and recording should include the following information:

- Time, date and nature of the incident.
- Response and investigation undertaken.
- Actions taken and by whom.

Corrective and preventative action requests should be forwarded to the responsible person so that corrective action can be taken. Open non-conformances should only be closed on verification by the HSE representative / Site Manager that the corrective action has been implemented effectively in order to meet the EMPr requirements.

The cause of all incidents should be investigated to ensure that corrective action is implemented and to ensure that there is no repeat of the incident.

A summary and review of incidents recorded should be included within the Environmental File by the HSE Representative / Site manager and submitted to the ECO for inclusion within audit reports during the construction phase.

3.5 NON-CONFORMANCE AND CORRECTIVE ACTION

Difficulties may be encountered with carrying out mitigation measures that could result in future non-compliance. Salt Rock Beach Estate cc may put in place procedures to motivate staff members to comply with the EMPr, and to deal with acts of non-compliance, or malicious damage to the environment by any staff member, agent, contractor or sub-contractor. Contractors, agents and subcontractors will be required to enter into agreements regarding the work to be completed and copies of the EA and EMPr will be attached to these agreements. Contractors, agents and subcontractors will be liable for any rehabilitation and or damage to the environment should they not comply with the conditions of the EA and EMPr while undertaking the relevant work.

3.6 PUBLIC COMPLAINTS AND ENQUIRIES

Enquiries or complaints should be received by Salt Rock Beach Estate cc from stakeholders and / or the community through the following contact person in response to public notifications (**Section 4.2, Table 5**):

Salt Rock Beach Estate Manager:

Name: Evan Mitchell

Telephone number: 032 5255025

Email: gm@saltrockbeach.co.za

Community or public enquiries or complaints must be brought to the attention of the Project / Site Manager who should ensure corrective action and close-out. As a minimum the following information should be recorded:

— Time, date and nature of enquiry or complaint.
— The means by which the enquiry or complaint was made.
— Personal details of the person / party lodging the enquiry or complaint (subject to privacy considerations).
— Actions taken to investigate and close-out the complaint as well as complainant feedback.

All complaints received will be investigated and a response (even if pending further investigation) will be given to the complainant within 48 hours.

Any actions that cannot be managed immediately should be assigned to the appropriate personnel and will become an outstanding action. The action remains outstanding until it is closed off by the Site Manager and ECO.

3.7 DOCUMENT CONTROL

The HSE Representative (construction and operational phase) is responsible for ensuring the maintenance of, as a minimum, the following documentation on-site:

— An up-to-date copy of the EMPr.
— All monitoring and inspection reports.
— Internal and external audit reports.
— Reports of pollution incidents, environmental non-conformances and follow-up action.
— Reports of stakeholder and community complaints and follow-up action.
— Minutes of management review meetings, and actions required as a result.
— Site inspections.
— Induction and training records.
— Records of monitoring of contractors and sub-contractors.

All HSE documents from the construction phase must be handed to Salt Rock Beach Estate cc after completion of the construction phase of the project.

It is recommended that the above documents be consolidated into the Environmental File for ease of reference.

3.8 EMPR AMENDMENTS OR INSTRUCTIONS

No EMPr amendments (relaxation or revision of any mitigation measure) shall be allowed without approval from the relevant authority (EDTEA).

4 MITIGATION MEASURES

This section of the report forms the core of the EMPr and is broken down into the following sub-sections:

- Project Layout and Access Plan
- Site Establishment
- Management of Construction Activities
- Post-Construction Activities
- Operational and Maintenance Activities
- Site Closure and Decommissioning

Each sub-section in-turn includes the following information necessary to understand and mitigate potential environmental impacts:

- Background - Provides background information on the site specific issues.
- Sources of Potential Impacts - Describes the source of the potential impact.
- Objectives - Describes what the strategy is aiming to achieve.
- Actions - Describes the steps to be taken to implement the strategy.
- Performance Indicators - Specifies the parameters which may be used to assess the level of EMPr implementation.
- Monitoring Programme - Describes the monitoring, reporting and review arrangement for each task, to include frequency, personnel responsible etc.

4.1 PROJECT LAYOUT AND ACCESS PLAN

A preliminary layout map is included in **Figure 2** which shows the construction camp located on an existing cleared area on the northern portion of Salt Rock Estate cc private property; and Shrimp Lane as the access route.

Figure 2 Preliminary proposed location of construction activities (WSP, 2018)

A project layout and access plan to show the intended use of the construction area must be developed prior to the commencement of construction. The plan must clearly indicate and/or describe the location and details of:

- The construction camp site and rest areas to be used during construction;
- Temporary on site waste disposal areas to be used during construction;
- Designated areas for onsite storage of construction materials;
- Designated areas / facility for onsite storage of hazardous materials;
- Designated stockpile areas;
- Location of fire extinguishers;
- Designated toilet facilities;
- Sources for water provision on site;
- Areas designated for power supply during construction;
- Existing roads and tracks to be used as transportation routes, and routes to gain access to construction areas; and,
- The footprint of the construction area.

The layout plan must be provided to the ECO prior to the commencement of construction activities on site. The ECO should be consulted when the contractor is unsure of the placement of any of the items listed above.

4.2 SITE ESTABLISHMENT

4.2.1 BACKGROUND

The aim of the site establishment in terms of this document is to reduce unnecessary damage to the site, potentially affecting sensitive bio-physical features and surrounding land uses.

Sources of Potential Impacts:

- Removal of vegetation;
- Heavy vehicles delivering materials;
- Ablution facilities;
- On-site waste management facilities;
- Water storage and supply; and,
- Storage areas and stockpiles.

Objectives:

- Minimise disturbance of the land;
- Minimise erosion and sediment transport from the site;
- Minimise visual intrusion;
- Maximise the use of the soils on the site for rehabilitation and;
- Prevent the proliferation of alien invasive plant species.

Table 5 provides mitigation measures to be implemented during site establishment.

Table 5: Site Establishment Mitigation Measures

Issue	Management Guideline	Monitor	Frequency
Permits	– A permit for the use of vehicles on the beach must be applied for from the Department of Environmental Affairs (DEA) Oceans and Coasts, Cape Town (021 819 2444) prior to the commencement of construction.	– Project Manager – Site Manager / HSE – ECO – DEA: Oceans and Coasts	Prior to construction
Public Safety & Notifications	– The working area must be demarcated with warning signage and construction activities must be restricted to this area. – Due to the area being access by a large amount of beach users, safety of beach users must be at the forefront and therefore signage and advertisements must be put up two weeks prior to commencement of construction. Proof of this must be made available to EDTEA for record keeping.	– Project Manager – Site Manager / HSE – ECO	Prior to construction
Water Source	– Water used on site must be from a tanker or an approved municipal source.	– Project Manager – Site Manager / HSE – ECO	Prior to construction
Vegetation Clearing	– No clearing of vegetation is allowed for the purposes of the construction camp.	– Site Manager / HSE – ECO	Prior to construction
Construction Camp	– All services should be identified prior to construction so as to ensure they are not damaged.	– Site Manager / HSE	– Prior to construction

	– The construction camp may not be located on the beach. – The construction camp must be planned in consultation with the ECO and EDTEA: Coastal and Biodiversity Management Section (Mr Omar Parak – 033 355 9438). – The size of the construction camp must be minimized and must not encroach on any privately owned land. – The construction camp must be well demarcated with adequate signage and fencing. – The contractor must attend to drainage requirements of the construction camp in consultation with the ECO and with reference to the SWMP (Appendix C) to avoid standing water or sheet erosion. – The drainage system must be regularly checked to ensure an unobstructed water flow. – Bins allowing separation of waste for recycling purposes and correct disposal must be provided within the construction camp. – A hazardous materials storage area must be identified and designated within the construction camp; clearly signed and must have fire extinguishers in close proximity. – The ECO should be consulted when locating the chemical store. – Hazardous storage and refuelling areas are bunded with an impermeable liner. – Specially demarcated areas must be indicated for areas to be utilised by heavy machinery. These areas must be monitored by a designated individual on site, so as to ensure sensitive areas outside of the construction area are not damaged.	– ECO – EDTEA	– Daily
Sourcing Material	– Contractors must prepare a source statement indicating the sources of all materials (including sands, crushed stone, rocks and cement). – Material must be obtained from permitted quarries or can be purchased from commercial sources. – The source statement must be readily available for review by the ECO. – Ensure that all materials are sourced from those sites set out in the source statement and that any changes to sources of materials are updated. – No sand may be removed from the beach. – Make certain transportation of materials is such that no spillage occurs on route to the site.	– Site Manager / HSE – ECO	– Prior to construction – Daily
Access Routes	– No unnecessary access routes should be cleared. – Shrimp Lane has been identified as the construction phase access route for all vehicles and heavy machinery. – The ECO should be consulted prior to the development of any additional access routes.	– Site Manager / HSE – ECO	– Prior to construction – Daily
Emergency Planning	– A method statement must be completed by the Contractor and submitted to the ECO showing procedures for dealing with possible emergencies (e.g. fire / flooding/ bank collapse). – Spill Contingency Plan must be prepared to address possible spillage during the construction phase and submitted to the Department of Water and Sanitation (DWS) for review and comment.	– Site Manager / HSE – ECO	– Prior to construction

Ablutions	— The Salt Rock Hotel cc ablution facilities will be made available for contractor staff during construction.	— Project Manager — Site Manager / HSE — ECO	— Prior to construction

Performance Indicators:

- No areas unnecessarily disturbed / stripped of vegetation.
- No additional access routes.
- Correct placement of waste facilities, hazardous material storage and machinery within construction camp.
- Suitable drainage within construction camp.
- Spill Contingency Plan/ Emergency Response Plan.
- Correct use of toilet facilities.

Monitoring Programme:

- Visual assessment supported by photographic records of the site.

4.3 MANAGEMENT OF CONSTRUCTION ACTIVITIES

This section outlines the required regulation of activities during the **pre-construction and construction** phases in order to avoid and mitigate identified potential impacts.

4.3.1 AIR QUALITY

Sources of Potential Impacts:

- Vehicle and plant emissions.
- Loading and unloading of material on site and transport from site.
- Excavations.
- Wind action on stockpiles and exposed areas of the site.

Objectives:

- Minimise the release of fugitive emissions from the site during construction.
- Minimise disturbance to neighbours caused by dust.

Table 6: Air Quality Mitigation Measures

Issue	Management guideline	Monitor	Frequency
Deterioration of ambient air quality within the construction area and immediate surrounds	— Avoid dust-generating activities (i.e. grading, excavation and moving of soil) during windy periods. — Re-vegetate or hard surface disturbed areas as soon as possible. — Apply dust suppression methods (e.g. dampening) to active areas and stockpiles. — Maintain a Complaints Register within the Environmental File. — Construction vehicles must be regularly maintained to ensure that excessive emissions are controlled. — Vehicles that are not in good working order must be removed from site.	— Site Manager / HSE Representative — ECO	— Site Manager / HSE Representative: On-going — ECO: Weekly

	— The KwaDukuza Local Municipality may require a permit for construction activities on the beach. It is the responsibility of the contractor to contact the Local Municipality and apply for relevant permits and pay the required amount if required.		

Performance Indicators:

- No dust plumes on site and the surrounding vegetation remains dust free.
- Examination of public complaints recorded in Complaints Register.
- KwaDukuza Local Municipality Permit (if applicable).

Monitoring Programme:

- Visual assessment of the site and adjacent vegetation.
- Inspection of Complaints Register.
- Dust monitoring is not required but may be undertaken, at the discretion of the ECO if significant (dust) complaints are received. Ambient dust (particulate matter) concentration limits are prescribed by South African National Standards (SANS) limit for the protection of human health is 75ug/m^3 over a 24 hour averaging period.

4.3.2 NOISE

Sources of Potential Impacts:

- Earth moving and excavation machinery.
- Vehicle movements.
- General construction activity.

Objectives:

- Minimise the noise generated by construction activities.

Table 7: Noise Mitigation Measures

Issue	Management guideline	Monitor	Frequency
Public disturbance due to site activities	— Maintain normal working hours (i.e. no after-hours or weekend works). — Switch off construction equipment and machinery when not in use. — Maintain a Complaints Register within the Environmental File.	— Site Manager / HSE Representative — ECO	— Site Manager / HSE Representative: On-going — ECO: Weekly

Performance Indicators:

- Examination of public complaints recorded in Complaints Register.

Monitoring Programme:

- Inspection of the complaints register and general observations in terms of noise levels during audits.
- Noise monitoring is not required but may be undertaken, at the discretion of the ECO if noise complaints are received. Acceptable noise levels are prescribed by SANS 10103:2008 (The Measurement and Rating of Environmental Noise with Respect to Annoyance and to Speech Communication) for different types of districts (e.g. rural, suburban, urban and industrial). Suburban (with little road traffic) District would be applicable to the proposed project location. Typical noise levels should average 50dBA during the daytime and 40dBA during the evenings and weekends. However, due to the coastal nature of the project location and noise associated with wave action, should noise monitoring be required, the reference framework may be at the discretion of the ECO.

4.3.3 FLORA AND FAUNA

Sources of Potential Impacts:

- Potential disturbance to indigenous vegetation by trampling during walkover surveys and localised removal.
- Potential disturbance of fauna through careless conduct.
- Potential for further alien vegetation encroachment in cleared and disturbed areas; and

Objectives:

- Avoid unnecessary removing vegetation;
- Minimise the destruction/degradation of the indigenous vegetation; and
- Minimise the effects to fauna (specifically the red-data species) due to habitat loss.

Table 8: Flora and Fauna Mitigation Measures

Issue	Management Guideline	Monitor	Frequency
Disturbance to flora and fauna	– No herbicides should be used at any time. – Demarcate active working areas. – Construction activities must be limited to the development footprint. – Ongoing communication with ECO / Revegetation Specialist regarding alien vegetation removal and disposal (if required). – There is to be no capture of marine life / wildlife.	– Site Manager / HSE Representative – ECO / Revegetation Specialist	As required

Performance Indicators:

- Minimal encroachment of alien invasive species within construction camp and active working areas.
- Minimal disturbance to sensitive floral dune species.

Monitoring Programme:

- Level of vegetation disturbance outside the construction camp and active working areas.

4.3.4 SOILS AND STABILITY

Sources of Potential Impacts:

- Excavation and stockpiling of materials.
- Continual use of bare ground (e.g. construction camp).

Objectives:

- Minimise disturbance of the land.
- Minimise displacement of soils and inability for the soil to support ecosystems.

Table 9: Soils and Stability Mitigation Measures

Issue	Management Guideline	Monitor	Frequency
Localised Soil Erosion	– Designated stockpile areas must be kept secured (access controlled). – Erect shade cloth barriers to prevent wind erosion. – Place berms at the toe of denuded banks and stockpiles. – A maximum slope of 1:3 must be maintained for any stockpiles on site. – Stockpiles must not exceed 2m in height.	– Site Manager / HSE Representative – ECO	– Site Manager and HSE Representative: On-going – ECO: Weekly

	— Stockpiles must be covered if exposed to heavy wind or rain. — Materials from stockpiles are to be used as soon as is practically possible.		

Performance Indicators:

— Erosion avoided or minimised, the implementation of standard erosion and sediment control techniques.

Monitoring Programme:

— Inspection of all erosion control measures.
— Inspection of all stockpile slopes created.

4.3.5 STORMWATER AND SEDIMENTATION

Sources of Potential Impacts:

— Soil compaction from on-going site activities (e.g. construction camp).

Objectives:

— Minimise runoff and sedimentation.
— Avoid secondary to nearshore environmental (i.e. water quality deterioration).

Table 10: Stormwater Mitigation Measures

Issue	Management guideline	Monitor	Frequency
Increased surface water runoff form exposed surfaces and sedimentation	— The contractor will be required to manage runoff from bare areas (e.g. construction camp) and will be required to reinstate grass in any bare patches once the construction camp has been de-established or regularly (quarterly) throughout the construction phase should construction exceed one year. — Prevent stormwater from concentrating in streams and scouring slopes, banks, etc. (may require the installation of temporary drainage works). — The tying in of the existing storm water outfalls will be carried out as and when construction activities pass the area of the existing storm water outfall.	— Site Manager / HSE Representative — ECO	— Site Manager / HSE Representative: On-going — ECO: Weekly

Performance Indicators:

— No erosion lines or gullies.
— No damage to properties or infrastructure downstream of any stormwater discharges.

Monitoring Programme:

— Visual assessment supported by photographic records of the site and immediate surrounds.

4.3.6 HAZARDOUS SUBSTANCES AND CONTAMINATION

Sources of Potential Impacts:

— Machinery and vehicle leaks.
— Accidental spillages of hazardous substances (e.g. cement, hydraulic fuel, diesel and oil).
— Potential deterioration of surface water quality and nearshore environment associated with the accidental release of hazardous substances.

— Potential deterioration of groundwater quality as a result of accidental release and seepage of hazardous substances.

Objectives:

— Minimise the effects of potential contaminated stormwater flow.
— Avoid secondary impacts to sensitive ecosystems (e.g. dune and nearshore).

Table 11: Hazardous Substances Mitigation Measures

Issue	Management guideline	Monitor	Frequency
Accidental Spillage and Contamination of soil, groundwater and storm water.	— Ensure that hazardous materials are stored in a bunded area or on a drip tray that can contain 110% volume of the containers contents stored on it. — Ensure that proper signage is installed at the hazardous material storage area. — Prevent stormwater runoff from coming into contact with wastes or contaminants on the site. — All spills must be recorded on the Incidents Register. — If a spill of any description occurs, appropriate corrective action must be taken as per Spill Contingency Plan. — If a significant spill occurs (i.e. contamination entering nearshore environment), authorities (EDTEA, DWS, KwaDukuza Municipality, ILembe Municipality) are to be notified as per Spill Contingency Plan: — All machinery should be re-fuelled and serviced offsite. If on-site re-fuelling is required, re-fuelling must be undertaken in an area with an impermeable layer and containment. — Vehicles must be carefully maintained to ensure that they do not leak (oil, hydraulic fluids, and diesel). — Drip trays are to be placed under all stationary machinery. — Hazardous materials (e.g. hydraulic fluids) must be stored in labelled, closed containers within a designated area. — Access to the chemical stores must be controlled and limited to trained staff only. — Spill kit must be kept on site. — No contaminated runoff or grey water may be discharged from the construction camp. — Grey water must be collected and disposed of either into conservancy tanks or as hazardous waste. — Mixing of cement must take place on an impervious surface (e.g. plastic sheeting). — Cement mixing will is not permitted to occur on the beach. — Material Safety Datasheets (MSDS) for all hazardous material must be maintained in the Environmental File.	— Site Manager / HSE Representative — ECO	— Site Manager / HSE Representative: On-going — ECO: Weekly

Performance Indicators:

— No significant spills.
— No breach in containment structures.
— Number of recorded spills in Environmental Incident Register.

— MSDSs contained in Environmental File.

Monitoring Programme:

— Inspection of hazardous storage and bunding.
— Assessment of containment structures.
— Visual assessment supported by photographic records of the site.
— Examination of Environmental Incident Register.

4.3.7 WASTE MANAGEMENT

Sources of Potential Impacts:

— General and hazardous solid waste generation.
— Poor waste management on site.

Objectives:

— Pollution prevention.
— Implementation of the waste hierarchy principles (i.e. maximise re-use and recycling and reduce volume of waste to landfill).
— Avoid disruption to aesthetics athletics for beach users.
— Avoid public health impacts.
— Maintain and neat and orderly construction site.

Table 12: Waste Mitigation Measures

Issue	Management guideline	Monitor	Frequency
General Waste	— No dumping to occur on the beach or in the ocean. — No littering. Active working areas and construction camp must be cleared of litter daily. — Rubble must not be buried on site or on the beach. — Implement appropriate training and induction procedures to ensure all staff adopt best practice waste minimisation procedures. — Provision of lidded waste disposal containers at the construction camp. These receptacles must be clearly marked as "rubbish" in both English and Zulu/Afrikaans. — The receptacles must be emptied prior to reaching capacity or on a daily/weekly basis. — Separation of waste and recycling of paper, glass etc. must be encouraged throughout the construction period. — The waste must be disposed of at a registered landfill.	— Site Manager / HSE Representative — ECO	— HSE: Daily — ECO: Weekly
Hazardous Waste	— Load and unload any solid hazardous materials in a manner that reduces the potential for spills. — A sump for concrete waste must be created (if required). — A separate drum must be available for storage of contaminated soil. — Hazardous waste are to be stored temporarily (prior to disposal) in lined receptacle. — Hazardous waste disposal must be undertaken by an approved waste contractor and safely disposed of at a registered hazardous waste disposal facility. — Safe disposal certificates for any hazardous waste removed from the site must be kept on file and provided to the ECO for inspection.	— Site Manager / HSE Representative — ECO	

Performance Indicators:

— Appropriately sealed and labelled waste receptacles separating hazardous and general waste (including recycling).

Monitoring Programme:

— Regular visual assessment of:
  — Waste receptacles and areas for capacity
  — Evidence of spillage
  — Potential for recycling
— Tracking of disposal certificates for hazardous waste.
— General housekeeping will be assessed (i.e. litter evident in stormwater channels, dunes and open beach immediately surrounding the active working area and construction camp).

4.3.8 AESTHETICS

Sources of Potential Impacts:

— Poor on-site waste management.
— Excavation works.
— Presence of construction activities and machinery.

Objectives:

— Reduce temporary visual disturbance for beach users and hotel guests.

Table 13: Aesthetic Mitigation Measures

Issue	Management guideline	Monitor	Frequency
Aesthetics	— Maintain a Complaints Register. — The site must maintained in a neat and orderly manner. — If screening is being used, this must be moved and re-erected as the work front progresses. — Beach must be returned to pre-construction appearance as the work front progresses (i.e. any excavation must be evenly distributed to match the existing profile of the beach).	— Site Manager / HSE Representative — ECO	— HSE: Daily — ECO: Weekly

Performance Indicators:

— Number of public complaints received.
— A neat site with screening at the active working areas.

Monitoring Programme:

— Visual assessment supported by photographic records of the site.
— Inspection of the Complaints Register.

4.3.9 ROAD TRAFFIC

Background:

Increase in traffic related to movement of contractors and delivery of materials may lead to sporadic local temporary congestion. Public safety risks may also arise

Sources of Potential Impacts:

— Movement of contractors.
— Delivery of materials.
— Heavy machinery.

Objectives:

— Avoid incidents related to vehicular movement on-site.

Table 16 provides mitigation measures to be implemented to manage the increase in traffic movement.

Table 14: Road Traffic Mitigation Measures

Issue	Management guideline	Monitor	Frequency
Road Traffic	— Utilise flagmen on the road adjacent to the site where necessary.	— Site Manager / HSE Representative — ECO	As required

Performance Indicators:

— No damage to hotel infrastructure,
— No injury to hotel staff and public.
— No motor vehicle accidents reported.

Monitoring Programme:

— Visual assessment supported by photographic records of the site; and
— Inspection of Complaints Register.
— Inspection of the Incident Register.

4.3.10 PUBLIC SAFETY

Sources of Potential Impacts:

— Excavation machinery and temporary structures.
— Poorly managed active working area.

Objectives:

— Ensure that the public and hotel staff are not subject to danger.

Table 15: Public Safety Mitigation Measures

Issue	Management guideline	Monitor	Frequency
Public Safety	— Construction must be done in off-peak seasons to avoid high volumes of beach users access the beach and reduce risk to injury. — No open trenches are to remain unmanned or outside of working hours. — The site must be maintained in a neat and orderly manner. — Placement of signboards informing the public of construction activities must be placed in visible areas. — There must be clear demarcation of active working areas. — The contractor must notify neighbours and hotel guests of potential restrictions to access prior to higher risk construction activities.	— Site Manager — HSE Representative — ECO	— HSE: Daily — ECO: Weekly

Performance Indicators:

— No injury to hotel staff and public.

Monitoring Programme:

— Evidence of demarcation and signage.
— Proof of communication with neighbours.
— Inspection of Complaints Register.
— Inspection of the Incident Register.

4.3.11 CULTURAL HERITAGE RESOURCES

Sources of Potential Impacts:

— Excavation works may uncover items of heritage value.

Objectives:

— Ensure that if any items of heritage value are uncovered (chance find), they are preserved and protected.

Table 16: Cultural Heritage Mitigation Measures

Issue	Management guideline	Monitor	Frequency
Heritage Resources	— Amafa must be contacted if any heritage objects are identified during earthmoving activities and all excavations should cease until further notice: — 195 Langalibalele St, Pietermaritzburg, 3201 Tel: 033 934 6543 — Should the contractor be unsure of any of the above aspects, the ECO should be contacted immediately. — Any potential "chance finds" of heritage objects must be logged in the site Incident Register.	— Site Manager /HSE Representative — ECO	As required

Performance Indicators:

— No damage to any items uncovered of heritage value.

Monitoring Programme:

— Visual assessment supported by photographic records of the site.

— Inspection of the Incident Register.

4.4 POST-CONSTRUCTION ACTIVITIES

The requirements for the control of soil, water, dust and noise pollution and environmental protection stipulated in this EMPr still applies during the **post construction and site rehabilitation** phase of the project.

Table 17 Post Construction Management Measures

Issue	Management guideline	Monitor	Frequency
Infrastructure	— All infrastructure units must be disassembled; and components from the working and storage areas removed, including: — Temporary office and storage structures and containers — Water storage containers — Temporary stormwater control structures — Power supply — Wastewater / grey water facilities must be drained and the waste transferred to an appropriate disposal/treatment site.	— Site Manager /HSE Representative — ECO	Construction close out audit
Pollution Control Structures	— All plastic linings used for pollution/contamination control must be removed and transferred to a registered disposal site. — All temporary concrete structures that have been created must be broken up and the concrete removed to a registered disposal site. — All leftover construction materials from the storage area and construction site must be removed.	— Site Manager /HSE Representative — ECO	Construction close out audit

	— All construction debris, litter and domestic waste from the construction site must be removed and transferred to a registered disposal site. — All waste receptacles from the construction camp and working areas must be removed.		
Revegetation & Rehabilitation of Cleared Areas	— Once construction is completed, areas that are exposed and / or affected by construction activities must be re-vegetated and landscaped as soon as possible with indigenous vegetation to prevent seaward erosion and deposition. — Re-vegetation activities must be planned in advance to ensure that seed and plant stockists are able to supply the required volume when required. — All re-vegetated areas will need to be watered to ensure adequate plant growth and development. The volume and frequency of watering will be left to the discretion of the Rehabilitation Contractor / ECO. All areas within the construction camp or adjacent to the construction area, where soil has been stripped, disturbed and replaced will need to be revegetated, including: — Contractor's construction camp — Access routes — Other areas disturbed during construction. — Appropriate local indigenous species must be used in the rehabilitation of the site. — Any alterations to the topography must be blended into the existing topography to ensure a stable, safe and sustainable topography where disturbances have occurred.	— Site Manager /HSE Representative — ECO	Construction close out audit
Waste	— Remove all leftover construction materials from the storage area and construction site and either sell, auction, donate to the local community or transfer to a Salt Rock Beach Hotel storage area for re-use. — Remove all construction debris, litter and domestic waste from the construction site and transfer to a registered disposal site. — Remove all waste receptacles from the camp and working areas. — Do not burn or bury any waste at the construction site – all waste is to be transferred to a permitted and registered disposal site.	— Site Manager /HSE Representative — ECO	Construction close out audit

Performance Indicators:

— Vacant tidy sites.
— Stable dunes.

Monitoring Programme:

— Visual inspection of construction camp and active working areas.
— Visual inspection of shoreline and beach profile.
— Proof of waste disposal.
— Revegetation and Rehabilitation Plan available in the Environmental File (appended to EMPr).
— Replanting of dunes and disturbed areas with indigenous species.

4.5 OPERATIONAL AND MAINTENANCE ACTIVITIES

The management and maintenance measures outlined in this section are prepared to mitigate potential impacts associated with the **operational phase**.

4.5.1 DUNE REHABILITATION

Sources of Potential Impacts:

— Disturbance to dunes and erosion.

Objectives:

— Minimise dune erosion and retreat.

— Vegetate the new sandbag filled wall to stabilise the slope.

Table 18: Dune Rehabilitation Management and Maintenance Measures

Issue	Management guideline	Monitor	Frequency
Dune erosion	— All excess material and rubble must be removed from the site so not to restrict the rehabilitation process. — On-going rehabilitation of dunes. — Comprehensive follow up treatment on alien invasive removal must be undertaken on a regular basis until the indigenous species are suitably established. — As outlined in the Vegetation Rehabilitation Management Plan (**Appendix B**): — No less than 600m^2 is required to be replanted to ensure restoration of the dune. — Use recommended species for specified zones (ground cover, saline and wind hardy woody vegetation, dune crest contiguous with grass lawn). — Planting must proceed after completion of the engineering requirements and shaping of the dune profiles with suitable soil for the four areas designated for restoration. — Seed is to be sourced from a reputable supplier. — Zonation of the plantings will relate to the dune's vulnerability in terms storm wave surges. — Establish micro irrigation systems on all proposed zones in the early stages of planting. — Irrigation system may make use of Hotel grey water from the laundry however odour and aesthetic issue must be monitored and rectified (i.e. halt issues) if complaints received. — Rehabilitation site must be fenced during replanting (make use of logs and thorny brush (will degrade and enhance soil conditions). — The exposed geo fabric bagged areas which are sloped 1:1.5 will be covered with bio-degradable netting which will be filled with a combination of weed free treated mulch and typical soil sourced from hotel site (not the beach). — Plant plugs of identifiable vegetation, (refer to the list within **Appendix B**) and planted into the mulched soil medium at the recommended densities.	— Salt Rock Beach Estates cc / Project Manager — ECO	— Salt Rock Beach Estates cc / Project Manager: Post construction & as required thereafter. — ECO: Monthly for first 6 months; thereafter bi-annually.

Performance Indicators:

— Vegetation cover on dune and sandbags.

Monitoring Programme:

— Monitoring of the revegetated area will be undertaken by responsible staff to ensure regular watering and care of the revegetated area. Where die back is experienced due to the anticipated wind and salt water damage, the affected areas will be treated in the same method as originally established.

4.5.2 STORMWATER MANAGEMENT

Sources of Potential Impacts: Unmaintained discharge points

Objectives: Accommodate the existing storm water discharge points through the re-instated wall. It is noted that due to the fact that this project only covers the reconstruction of existing sea walls and that no other structures or impermeable surface are to be created, the pre and post construction surface runoff will remain equal and hence no attenuation of surface runoff is required.

Table 19: Stormwater Management and Maintenance Measures

Issue	Management guideline	Monitor	Frequency
Dune erosion	– Proposed discharge points Annexure B of SWMP (**Appendix C**): — i) An open channel concrete cascade over the geobag wall on the southern boundary of the property identified as discharge point 1. — ii) Run-off from the Caravan Park, internal paths and grass areas immediately north of the Tidal Pool (discharge points 2 and 3) will remain as before and will infiltrate into the cohesion-less sands inland of the proposed sea wall. The sea wall is designed to pass any build-up of ground water through drain holes in the wall. — iii) The concrete storm water pipe which carries storm water from the buildings situated centrally on the property (discharge point 4) will not be altered and the new strengthening measures will be built around the existing pipe and outlet. — iv) Run-off from the northern boundary (discharge point 5) will, as it currently does, infiltrate the cohesion-less sands behind the geobag wall, which will also consist of cohesion-less sands and filter materials. – Regular inspection flow from discharge points through the seawall (particularly during heavy rainfall events).	– Salt Rock Beach Estates cc / Project Manager – ECO	– Salt Rock Beach Estates cc / Project Manager: Pre-Construction & Heavy rainfall events – ECO: Construction Close-Out Audit & Quarterly for first 12 months.

Performance Indicators:

— The stability of the wall and consistent profile of the beach profile and shoreline.

Monitoring Programme:

— Visual inspection of the beach profile and shoreline.

4.5.3 COASTAL GEOMORPHOLOGY

Sources of Potential Impacts:

— Seawall structure

Objectives:

— Minimise probability of alteration to beach profile / shoreline and damage to adjacent properties.

Table 20: Coastal Geomorphology Management and Maintenance Measure

Issue	Management Guideline	Monitor	Frequency

Denial of sand supply (and local scour)	Salt Rock Estate cc must determine the need to provide sand for beach replenishment should the potential denial of sand to the nearshore region become an issue (e.g. possible aggravation of neighbouring properties or as a result of an extreme storm event). WSP Coastal (2010) recommends: — Post-storm replenishment of sand (of suitable grain size distribution) which would have been naturally "supplied" from the dune during the storm must be sourced. — Required sand supply could be estimated through the monitoring of nearby profiles and volume of sand denied during storm (i.e. pre- and post- storm surveys). — Alternatively the amount of sand supply required could be estimated by means of a calibrated storm erosion model. — Supply should be practical in the medium term (with supply in the order of ~1000m^3 of sand required for the largest storms only). However, the required supply of sand could increase considerably in the long-term, in the event of sea-level rise evolving as predicted (~1 m of sea-level rise in 100 years). — This may require the presence of workers and machinery on the beach.	— Salt Rock Beach Estates cc / Project Manager — ECO	— Salt Rock Beach Estates cc / Project Manager: — Internal monitoring / beach surveys with photographic evidence for first 12 months. — Replenishment post-extreme storm events. — ECO - Post extreme storm events during replenishment (if required). — Coastal Engineer – As required
Reflection of wave energy onto adjoining properties causing damage.	Engineers (WSP, 2009; Subtech, 2008) recommend: — Short rock revetment / geo-container cross sections must be created at each end with 4 ton enviro rock bags in a sawtooth arrangement which would be placed along the base of the wall. — This should assist the diffraction (lateral spreading of wave energy), refraction and bottom friction.	— Salt Rock Beach Estates cc / Project Manager — ECO	— Salt Rock Beach Estates cc / Project Manager: Pre-Construction — ECO: Construction Close-Out Audit
Localised scour during storm events.	— Incorporation of a "toe" at the base of the wall founded on bed rock to	— Salt Rock Beach Estates cc / Project Manager	— Salt Rock Beach Estates cc / Project Manager: Pre-Construction

	avoid the wall being undermined. — Foundation footing must extend behind (landward) the existing wall. Some haunching (providing strengthening of the joint between the vertical wall and the horizontal footing) will be required to strengthen the base of the wall at foundation level. — Geotech revetment / proper tie between the wall and the adjoining northern property must be established (to act as an energy diffuser).	— ECO	— ECO: Construction Close-Out Audit
Temporary danger to pedestrians related to wave overtopping during storm events).	Hotel should take the responsibility of warning guests by posting a guard and/or fencing off the shoreward region and/or erecting signage, during wave overtopping events.	— Salt Rock Beach Estates cc / Project Manager	— Post-Construction

Performance Indicators:

— The stability of the wall and consistent profile of the beach profile and shoreline.

Monitoring Programme:

— Beach / erosion surveys
— Visual inspection of the beach profile and shoreline during audits.

4.6 SITE CLOSURE AND DECOMMISSIONING

In the unlikely event of any structure(s) decommissioned in future on the site (including the camp site); a written notice must be submitted to EDTEA within 3 months prior to the commencement of decommissioning. EDTEA must be approached to determine the required actions for the rehabilitation and closure of the site.

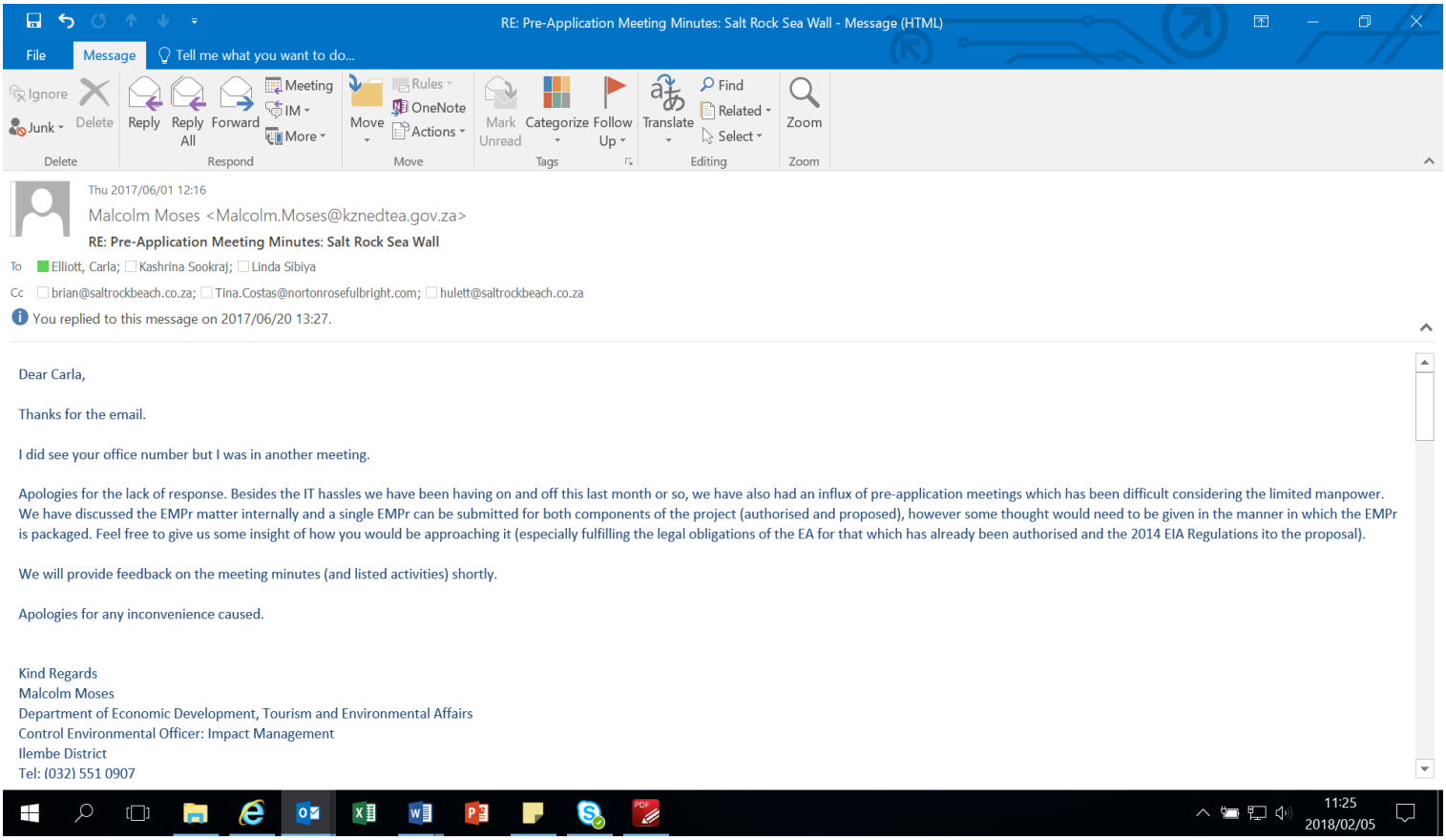
Should the activity ever cease or become redundant, the authorisation holder must contact EDTEA to determine the required actions for rehabilitation and closure of the site.

5 CONCLUSION

In terms of NEMA, everyone (i.e. all persons engaging in any component of this project) is required to take reasonable measures to ensure that they do not pollute the environment. 'Reasonable measures' includes informing and educating employees about the environmental risks associated with their work and training them to operate in an environmentally responsible manner.

Salt Rock Beach Estate cc recognises that, in terms of NEMA, the cost to repair any environmental damage will be borne by the person responsible for the damage. If the above-mentioned environmental guidelines and mitigation measures are adopted, it is anticipated that the negative environmental impacts of all project phases will be mitigated against.

A EDTEA EMAIL COMMUNICATION


RE: Pre-Application Meeting Minutes: Salt Rock Sea Wall - Message (HTML)
File
Message
Tell me what you want to do...
Ignore
Junk
Delete
Reply
Reply All
Forward
Meeting
IM
More
Move
Rules
OneNote
Actions
Mark Unread
Categorize
Follow Up
Translate
Find
Related
Select
Zoom
Delete
Respond
Move
Tags
Editing
Zoom
Thu 2017/06/01 12:16
Malcolm Moses <Malcolm.Moses@kznedtea.gov.za>
RE: Pre-Application Meeting Minutes: Salt Rock Sea Wall
To Elliott, Carla; Kashrina Sookraj; Linda Sibiya
Cc brian@saltrockbeach.co.za; Tina.Costas@nortonrosefulbright.com; hulett@saltrockbeach.co.za
You replied to this message on 2017/06/20 13:27.
Dear Carla,
Thanks for the email.
I did see your office number but I was in another meeting.
Apologies for the lack of response. Besides the IT hassles we have been having on and off this last month or so, we have also had an influx of pre-application meetings which has been difficult considering the limited manpower. We have discussed the EMPr matter internally and a single EMPr can be submitted for both components of the project (authorised and proposed), however some thought would need to be given in the manner in which the EMPr is packaged. Feel free to give us some insight of how you would be approaching it (especially fulfilling the legal obligations of the EA for that which has already been authorised and the 2014 EIA Regulations ito the proposal).
We will provide feedback on the meeting minutes (and listed activities) shortly.
Apologies for any inconvenience caused.
Kind Regards
Malcolm Moses
Department of Economic Development, Tourism and Environmental Affairs
Control Environmental Officer: Impact Management
Ilembe District
Tel: (032) 551 0907
11:25
2018/02/05

B VEGETATIVE REHABILITATION MANAGEMENT PLAN (JULY 2017)

C STORMWATER MANAGEMENT PLAN (JULY 2017)