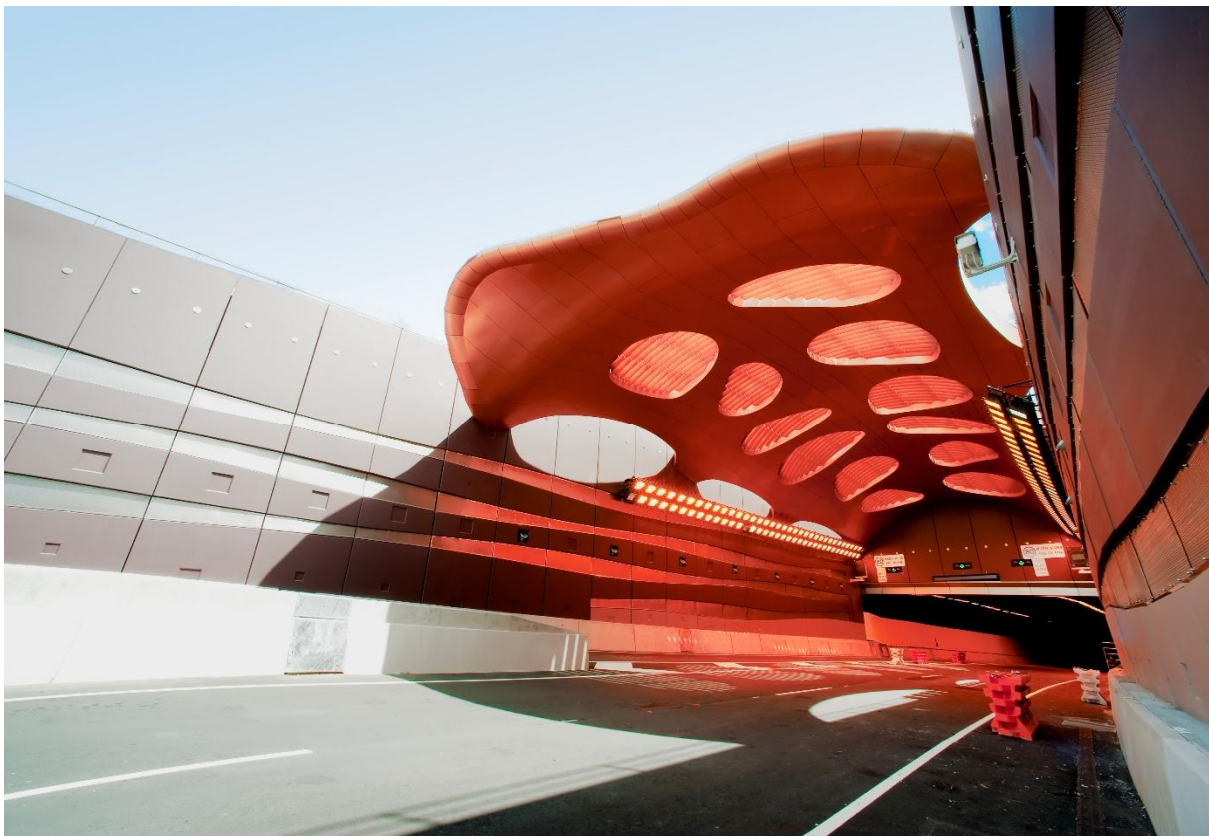


RICHARDS BAY COAL TERMINAL (PTY) LTD

RICHARDS BAY COAL TERMINAL PROPOSED REPEATER MAST DRAFT ENVIRONMENTAL MANAGEMENT PROGRAMME

07 DECEMBER 2017

PUBLIC





RICHARDS BAY COAL TERMINAL PROPOSED REPEATER MAST

DRAFT ENVIRONMENTAL MANAGEMENT PROGRAMME

RICHARDS BAY COAL TERMINAL (PTY) LTD

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1 INTRODUCTION

1.1 TERMS OF REFERENCE

This Draft Environmental Management Programme (EMPr) has been prepared in support of Richards Bay Coal Terminal (Pty) Ltd (RBCT) Environmental Authorisation (EA) application for the proposed erection of mast for a radio frequency repeater at the Richards Bay Harbour, KwaZulu-Natal.

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 will be submitted in conjunction with the Basic Assessment Report (BAR) for the aforementioned proposed project.

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:	Nigel Seed
Qualifications:	BSocSci Environmental Management, University of Natal
Years of Experience:	15
Physical Address:	WSP House, 1 on Langford, Langford Rd, Westville
Telephone:	(031) 240 8861
Email:	Nigel.Seed@wsp.com

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, RBCT ensures mitigation for negative impacts associated with the construction and installation of gabion river training structures. An important component of this is the monitoring, evaluation, and communication of findings and adherence to the principle of 'continuous improvement'.

1.4 PROJECT DESCRIPTION

Richards Bay Coal Terminal (Pty) Ltd (RBCT) is one of the leading coal export terminals in the world. It was opened in 1976 with an original capacity of 12 million tons per annum, it has grown into an advanced 24-hour operation with a design capacity of 91 million tons per annum.

RBCT is positioned at the Richards Bay deep sea ports. It is able to handle large ships and subsequent large volumes. As such, it has gained a reputation for operating efficiently and reliably. RBCT shares a strong cooperative relationship with South Africa's national utility, RBCT, which provides the railway services linking the coal mines to the port.

In order to provide stringent collision prevention support for the rail locomotives that move the coal, RBCT has identified a need to improve the radio-based navigation system through the installation of an additional radio repeater. A radio repeater is a combination of a radio receiver and a radio transmitter that receives a signal and retransmits it, so that two-way radio signals can cover longer distances. The repeater will be sited on a mast in order for it to have enough elevation to have line of sight with the RBCT central tower and the locomotives.

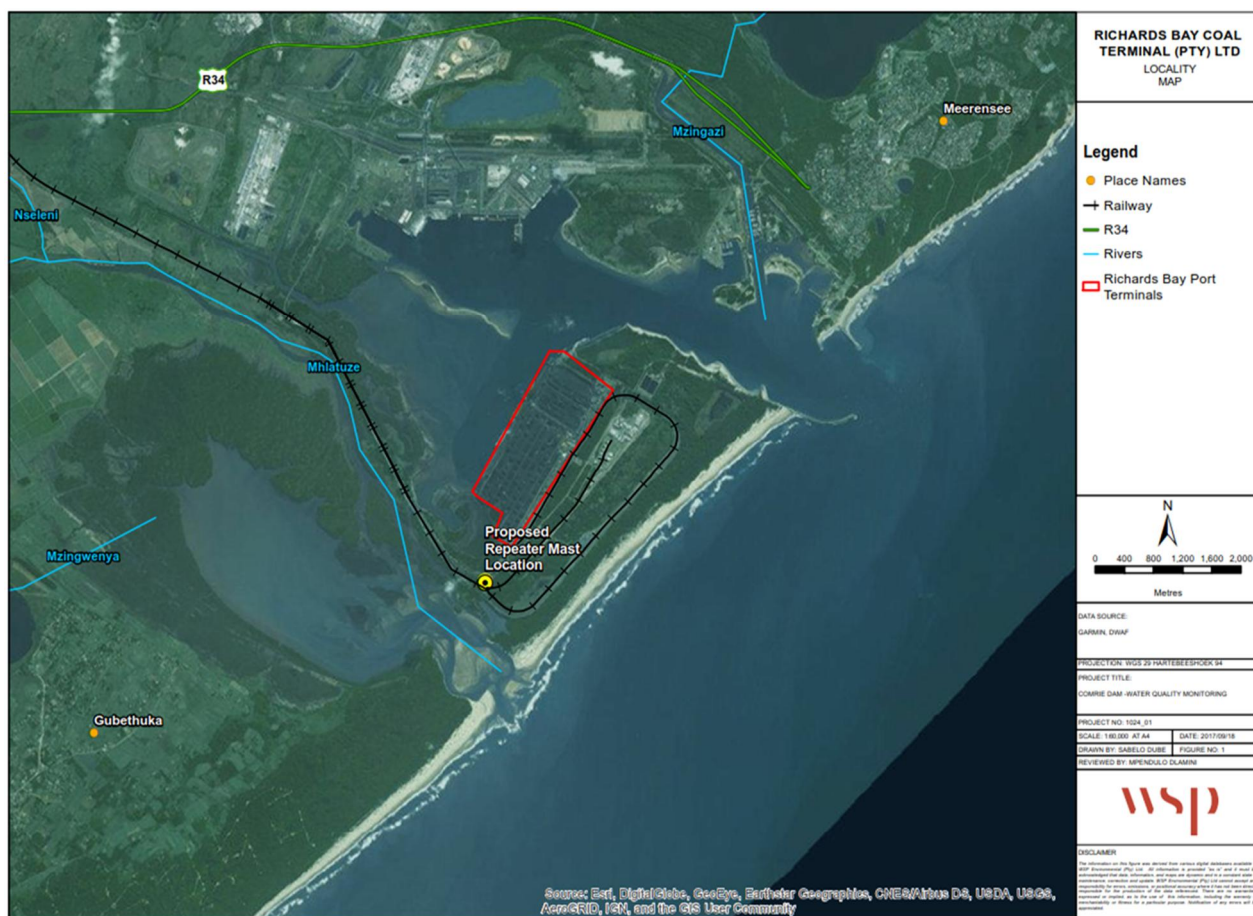


Figure 1: Locality map indicating the location of the RBCT site (WSP, 2017)

2 LEGAL REQUIREMENTS

The EMPr forms part of the required documentation in support of the Basic Assessment (BA) process submitted to the KwaZulu-Natal Department of Economic Development, Tourism and Environmental Affairs (EDTEA). The EMPr has been prepared in compliance with GN. R982 of the 2014 EIA Regulations (amended 2017). It intends to meet the requirements of the environmental law of South Africa and the principle recommendations contained within the BAR. RBCT is, like all other legal persons, bound to operate within the legal framework of the country and province.

In South Africa a multitude of legislation has developed over time, governing environmental management, promoting environmental objectives, regulating environmental exploitation or containing incidental environmentally specific norms - all of which impose legal obligations on RBCT. These have been addressed within the BA process.

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 RBCT to identify and comply with the relevant regulations of the OHSA.

3 IDENTIFICATION OF ISSUES AND CONTROLS

Environmental issues generated by the proposed construction and erection of a repeater mast structures may affect the surrounding physical and biotic environments. The following subsections describe the potential environmental issues and impacts identified in the BA Report:

3.1 IMPACT ASSESSMENT SUMMARY TABLE

Table 2 below provides a summary of the potential environmental impacts of the proposed project during the construction and operational phases.

Table 2: Impact Assessment Summary Table

Phase	Nature	Impact	Pre-Mitigation	Post-Mitigation
Construction Phase	Negative	The use of vehicles and equipment in the work area has the potential to generate dust emissions. During excavation of the repeater mast's foundation, dust may also be emitted but it will not be enough to cause a public health concern. With the exception of very windy conditions these emissions are likely to be confined to the immediate area.	Medium	Low
	Negative	<p>FAUNA</p> <p>The presence of construction vehicles, personnel and construction activities may disturb fauna present in the area. Due to the presence of a bird hive close to the proposed site, an avifauna specialist has compiled a professional opinion on the impact of the proposed repeater mast on the avifauna. According to the specialist report the project may provide a risk for avian collision as it will be approximately 10m higher than surrounding structures. However, the specialist further stated that the dominant species is one with very good eyesight and fast-flying capabilities making the likelihood of collision low. A collision risk was identified for the Trumpeter Hornbill, but it is considered to be low because the observed flying pattern is mainly away from the proposed site towards Lake Mzingazi.</p> <p>FLORA</p>	Medium	Low

		Approximately 70 square metres of vegetation will be cleared to allow for construction activities to take place. This will lead to the removal of plant species thus reducing their presence in the area.		
	Negative	<p>The presence of construction vehicles, personnel and activities may disturb fauna present in the area. Excessive noise from construction equipment and machinery may also cause a disturbance to the surrounding users. However, construction activities will not be continuous in nature, with only some equipment active at a given time.</p> <p>On an indicative basis, the following noise sources have been identified during the construction phase: earth moving equipment; Tractor-Loader-Backhoe (TLB), front end loaders, etc.); material handling equipment (concrete mixers, cranes, etc.); power units (generators, compressors, etc.).</p> <p>The noise emissions from the proposed project are not anticipated to be of public nuisance as the proposed site is already in heavily industrialised area which also contributes to the noise profile of the area. At site level, ambient noise levels are affected by the movement of long haul trucks, trains, loading vessels, tippers as well as other equipment from surrounding industries. The abovementioned noise sources are not particularly audible and that the site noise levels could qualitatively be described as being fairly low (noise dominated by the wind blowing through the trees, birdcalls etc.).</p>	Medium	Low
	Negative	<p>Small quantities of hazardous chemicals (typically not exceeding 500L) may be stored and handled during the construction phase; these include fuel for equipment (diesel /petrol), lubrication oils and greases as well as solvent based detergents and degreasers. These may cause potential soil contamination.</p> <p>During the construction phase, the improper storage and handling of hazardous substances (such as fuel and oil) can result in accidental or negligent small scale spills. This has the potential to lead to localised soil and groundwater contamination.</p>	Medium	Low
	Negative	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.	Medium	Low
	Negative	Stormwater generated has the potential to be contaminated with hydrocarbons emanating from construction machinery which may lead to soil and groundwater contamination.	Medium	Low

	Negative	The construction period is anticipated to generate general and hazardous waste streams. It includes lunch wrappings, equipment wrappings, paint can, oils and greases. The generate waste may cause public litter and may cause pose a threat to the fauna of the area.	Medium	Low
	Negative	With reference to Section 5.4.2, there is no empirical data demonstrating adverse health effects from exposure to typical EMF levels from power transmissions lines and equipment. However, while the evidence of adverse health risks is weak, it is still sufficient to warrant limited concern.	Low	Low
	Negative	Increased vehicular traffic is likely to be associated only with the delivery of equipment and supplies, and removal of waste for off-site disposal. This may disruption the regular traffic flow of within the Richard Bay Harbour premises and on public roads leading to the Richards Bay Harbour.	Medium	Low
	Positive	Creation of employment opportunities to the contractors. This will indirectly contribute to employment generation and sustainability.	Medium	Medium
	Positive	The project will contribute to the overall sustainability and efficiency of RBCT. This will have kickbacks to the number of rail locomotives that that can come into the premises and deliver coal. Work opportunity will also be created for contractors who will service and maintain the repeater device and mast structure	Medium	Medium
Operational Phase	Negative	The creation of the hardstanding foundation area for the proposed repeater mast will increase the volume of stormwater runoff generated at the site. This may lead to localised soil erosion.	Medium	Low
	Negative	The repeater mast will be erected in an area where there is vegetation. It will be located within an existing industrialised area which already includes structures with a similar height. The ground foundation area that will be utilised by the structure is 6m x 6m. Aesthetics of the area will be changed.	Medium	Low
	-	Air Quality	No impacts anticipated	
	-	Noise	No impacts anticipated	
	-	Flora and Fauna	No impacts anticipated	
	-	Soil	No impacts anticipated	
	-	Traffic	No impacts anticipated	
	-	Waste	No impacts anticipated	
	-	Visual	No impacts anticipated	
-	- Socio-economic	No impacts anticipated		
Decommissioning	RBCT are not anticipating decommissioning in the near future.			

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 phase of the proposed project.

4 ENVIRONMENTAL MANAGEMENT PROGRAMME

4.1 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.

RBCT 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 - Reshal Mohan	<ul style="list-style-type: none"> — 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 - Sihle Shezi	<ul style="list-style-type: none"> — 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.

	<ul style="list-style-type: none"> – 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	<ul style="list-style-type: none"> – 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.

4.2 TRAINING

RBCT 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.

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.

Table 4: Training Requirements

Training Requirement	Frequency
<p><u>Site Induction</u> – the purpose of the induction is to ensure that, as a minimum, all on-site personnel understand the EMPr in terms of:</p> <ul style="list-style-type: none"> – 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.
<p><u>Toolbox Talks</u> – Toolbox talks are intended to deliver specific training in an aspect of work or control including <i>inter alia</i>:</p> <ul style="list-style-type: none"> – Waste handling procedures. – Spill kit training. <p><i>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 EO.</i></p>	Construction Phase: weekly or as required.
<p><u>Pre-Start Meeting</u> – 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.</p>	Construction Phase: as required.

Note: Attendance records for the above are required to be retained on-site.

4.3 CONSTRUCTION MONITORING

Environmental monitoring of the proposed construction must be undertaken internally by RBCT's Environmental Officer (EO), due to the low impact nature of the project, 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 EO, Site Manager and Contractor, it is important that a suitable chain of command is structured that will ensure that the EO'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 by an external independent Environmental Control Officer (ECO) to audit the whole project's compliance to the EA and EMPr during the construction phase.

4.4 ENVIRONMENTAL INCIDENT MANAGEMENT AND REPORTING

The following is applicable to incident management and mitigation:

- Any incident should be reported immediately to the HSE representative (or otherwise designated person) and RBCT staff.
- Environmental incidents that are deemed to 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 RBCT or the HSE/Environmental Officer to determine mitigation and close-out requirements.
- All significant incidents are to be reported immediately to the relevant authority within 24 hours.

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 that the corrective action has been implemented effectively in order to meet the EMPr requirements.

The cause of all incidents should be investigated to determine root cause and 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 weekly inspection reports by the HSE representative and submitted to the EO for inclusion within EO's audit reports during the construction phase.

4.5 NON-CONFORMANCE AND CORRECTIVE ACTION

Difficulties may be encountered with carrying out mitigation measures that could result in future non-compliance. RBCT 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. Should rehabilitation be required as a consequence of the contractor's non-compliance with the EMPr, it is strongly recommended that fines / penalties be set according to the cost required to rehabilitate an area. Penalties for non-compliance need to be discussed with RBCT staff at the earliest stage.

4.6 PUBLIC COMPLAINTS AND ENQUIRIES

Enquiries or complaints should be received by RBCT from stakeholders and / or the community through the following contact person:

RBCT Environmental Specialist:

Name: Sihle Shezi

Telephone number: 035 904 4102

Email: sshezi@rbct.co.za

Community or public enquiries or complaints must be brought to the attention of the Site / Project 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 EO/ECO.

4.7 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 RBCT after completion of the construction phase of the project.

4.8 EMPr AMENDMENTS OR INSTRUCTIONS

- No EMPr amendments (relaxation or revision of any mitigation measure) shall be allowed without approval from the relevant authority (EDTEA). Motivations for amendments to the EMPr may be discussed with WSP.
- WSP may propose EMPr amendments on behalf of the proponent or issue EMPr instructions (corrective actions, remediation and rehabilitation). The approved amendments or instructions are to be implemented within the specified time frame.

5 MITIGATION MEASURES

This section of the report forms the core of the EMPr and outlines specific issues related to the construction and installation of the proposed tanks. RBCT shall adhere to these measures at all times. Potential environmental impacts, impact sources and objectives are described, and environmental management measures to be implemented during construction are specified below:

- 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.

5.1 PROJECT LAYOUT AND ACCESS PLAN

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:

- Servitudes;
- Areas and routes to be reworked, including the size (dimensions) of the stripped areas;
- 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 for onsite storage of hazardous materials;
- Designated stockpile areas;
- Location of fire extinguishers;
- Designated areas for portable latrines outside of the 1:100 year flood plain;
- 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 EO prior to the commencement of construction activities on site. The EO should be consulted when the contractor is unsure of the placement of any of the items listed above.

5.2 SITE ESTABLISHMENT

5.2.1 BACKGROUND

The aim of the site establishment in terms of this document is to reduce unnecessary damage to the site, potentially affecting biodiversity 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
<i>Water Source</i>	<ul style="list-style-type: none"> – Water may not be abstracted from any river, estuary and/or stream. The only water source that may be used for construction activities, including concrete mixing, cleaning of equipment, etc. must be obtained from a raw water filling point which must be supplied by RBCT. 	<ul style="list-style-type: none"> – Project Manager – Site Manager – HSE Representative – EO 	Prior to construction
<i>Vegetation Clearing</i>	<ul style="list-style-type: none"> – Large (mature) indigenous trees must be identified by the EO prior to the commencement of clearing activities. – If endangered indigenous trees need to be removed, they must be identified, tagged, carefully removed (i.e. with full root system in tact) and an alternative site identified for relocation. – If any large trees (indigenous or non-indigenous) need to be removed, the Department of Forestry and Fisheries (DAFF) must be contacted prior to removal. (Note on Draft Report: DAFF will be issued with the Draft BA Report and EMPr for comment). – The removal of any indigenous, endangered or protected trees may need to be authorised by the Department of Agriculture, Forestry and Fisheries (DAFF). The EO and DAFF must be consulted in this regard. (Note on Draft Report: DAFF will be issued with the Draft BA Report and EMPr for comment). – Clearing activities within riparian areas must be done manually (if practicable), to reduce potential negative impacts on the riverine habitat. – Areas outside of the development footprint (i.e. no more than 5m width on either side of the proposed gabion structure) must be clearly demarcated where feasible. – Removal of all alien vegetation must be undertaken on site in consultation with the EO. – The workforce must be informed that the areas adjacent to the riparian (estuary) areas are out of bounds (no go areas). These areas require buffers as close as possible to the construction site, to prevent this area being disturbed by construction activities. The EO will provide input into the establishment of these buffer zones. – Only clear vegetation that is absolutely necessary immediately before site establishment commences. This minimises the project footprint by disturbing the smallest possible area for the least amount of time. – Manage cleared areas and residual material from clearing in order to minimise degradation of the site. 	<ul style="list-style-type: none"> – Project Manager – Site Manager – HSE Representative – EO 	Prior to construction
<i>Construction Camp</i>	<ul style="list-style-type: none"> – If a construction camp site is required, a plan must be provided with a description of the site and shall show, on an appropriately-scaled map, the intended use of the site. No 	<ul style="list-style-type: none"> – Site Manager 	Daily

	<p>clearing of vegetation is allowed for the purposes of the construction camp.</p> <ul style="list-style-type: none"> – 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. 	<ul style="list-style-type: none"> – HSE Representative 	
<i>Access Routes</i>	<ul style="list-style-type: none"> – No unnecessary access routes should be cleared. The EO should be consulted prior to the development of any additional access routes. 	<ul style="list-style-type: none"> – Site Manager – HSE Representative 	Weekly
<i>Material Stockpiles</i>	<ul style="list-style-type: none"> – Any embankments/stockpiles created must be immediately stabilised using berms and shade cloth, or if to be left for a period longer than eight weeks, by seeding with a grass/legume mix. – Soil storage areas must be located further than 50 meters from any water body or water source (Section 1 (24 and 29) of National Water Act (Act 36 of 1998)); 	<ul style="list-style-type: none"> – Site Manager – HSE Representative 	Weekly
<i>Ablutions</i>	<ul style="list-style-type: none"> – Toilets must be no closer than 50m from any watercourses/river stream. The EO should be consulted on the location of toilet facilities throughout the construction phase of the project. 	<ul style="list-style-type: none"> – Site Manager – HSE Representative 	As required

Performance Indicators:

- Minimal erosion evident;
- No areas unnecessarily disturbed;
- No obstruction to the water resource;
- Amount of litter around the site camp; and
- Correct placement of soil storage, waste and toilet facilities.

Monitoring Programme:

- Visual assessment supported by photographic records of the site.

5.3 MANAGEMENT OF CONSTRUCTION ACTIVITIES AND WORKFORCE

Most environmental impacts of developments occur in the construction phase of the project. As a result, the regulation of construction activities and the general conduct of the workforce is an essential component of this EMPs and must be carried out in conjunction with the EO.

5.3.1 AIR QUALITY

Background:

There is potential for construction activities to deteriorate local air quality. The anticipated impact on air quality during this phase will be the generation of airborne dust and vehicular emissions.

Sources of Potential Impacts:

- Vehicle emissions;
- Land clearing and removal of topsoil;
- Loading and unloading of material on site and transport from site;
- Excavations; and
- Wind action on stockpiles and exposed areas of the site.

Objectives:

- Minimise the release of fugitive emissions from the site during construction; and
- Minimise disturbance to neighbours.

Table 6 overleaf provides mitigation measures to be implemented to prevent air quality impacts.

Table 6: Mitigation measures to be implemented to prevent air quality impacts

Issue	Management guideline	monitor	frequency
<i>Air Quality</i>	<ul style="list-style-type: none"> – Seed any required topsoil stockpiles and exposed areas of the site within 8 weeks of completing construction of a specific site or part thereof. – Spray water on unsealed surfaces in high winds to reduce dust. A dedicated source of water for dust suppression purposes must be determined during site establishment and be approved by the EO. – The starting of open fires for cooking, burning of refuse, or other purposes, is forbidden. 	<ul style="list-style-type: none"> – Site Manager – HSE Representative – EO 	Site Manager and HSE Representative: On-going EO: Monthly

Performance Indicators:

- No dust plumes on site and the surrounding vegetation remains dust free; and
- No complaints in the Environmental Incident Register.

Monitoring Programme:

- Visual assessment of the site and adjacent vegetation; and,
- Dust monitoring is not required but may be undertaken, at the discretion of the EO if noise complaints are received. Ambient dust (particulate matter) concentration limits are prescribed by SANS limit for the protection of human health is 75ug/m³ over a 24 hour averaging period.

5.3.2 NOISE

Background:

The highest non-peak sound levels likely to be emitted during construction activities will be approximately 90dBA. This will result in noise levels ranging from 80 - 90dBA (with no interference from vegetation, topography or weather – i.e. this is the worst case) at the site boundary. Disturbance to the residents in the vicinity of the construction areas will have to be taken into account during the construction phase. Unwarranted noise levels due to excavations and vegetation clearing should be maintained within the satisfactory standards.

Sources of Potential Impacts:

- Earth moving machinery;
- Power tools and compressors;
- Vehicle movements; and,
- General construction activity.

Objectives:

- Minimise the noise generated by construction activities.

Table 7 provides mitigation measures to be implemented to prevent noise impacts to the surrounding receptors.

Table 7: Mitigation measures to be implemented to prevent noise impacts

Issue	Management guideline	monitor	frequency
Noise	<ul style="list-style-type: none">– As far as possible, construction activities must be limited to weekdays (Monday - Friday) during working hours (8am to 5pm).– Construction vehicles are to be well maintained, within service dates, and fitted with silencers (if practicable) prior to the construction phase.– Conduct vehicle and equipment inspections prior to use.– Investigate all instances of excessive noise and assess possibilities for mitigation.– Notify surrounding residents one day ahead of time should any 'out of hours' noise be possible i.e. after 5:00pm during the week, and after 12pm on Saturdays and any time on Sundays.	<ul style="list-style-type: none">– Site Manager– HSE Representative– EO	Site Manager and HSE Representative: On-going EO: Monthly

Performance Indicators:

- The number of complaints received from the public regarding noise.

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 EO if noise complaints are received. The South African National Standards (SANS) have published environmental noise limits for different zones (e.g. rural and industrial). These limits have been incorporated into By-Laws by some municipalities. Typical noise levels in urban districts with some workshops and businesses average 60dBA during the daytime and 55dBA during the evenings and weekends.

5.3.3 MANAGEMENT OF THE REMOVAL OF VEGETATION AND PROTECTION OF FAUNA:

Background:

Vegetation will have to be cleared to lay the foundations and erect the mast. Any sensitive habitats encountered must be managed with particular care.

Sources of Potential Impacts:

- Potential disturbance to indigenous vegetation by trampling during walkover surveys and localised removal;
- Potential disturbance of fauna through careless clearing and disposal of vegetation;
- Removal of floral species without prior consent from the EO;
- Potential for further alien vegetation encroachment in cleared and disturbed areas; and
- The use of herbicides in site clearing.

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 provides mitigation measures to be implemented to prevent impacts to flora and fauna.

Table 8: Mitigation measures to be implemented to prevent flora and fauna impacts

Issue	Management guideline	monitor	frequency
<i>Removal of Vegetation and Protection of Fauna</i>	<ul style="list-style-type: none">– Mechanical methods should be avoided and no herbicides should be used at any time.– The removal of alien vegetation from the construction site should go hand in hand with rehabilitation. The active removal of alien vegetation will stimulate the growth of desirable plants and create spaces for the replanting of useful indigenous plants removed from the construction site.– Keep additional vehicular and worker access routes to a minimum.– No removal of vegetation outside of site area is allowed.– Ongoing communication with EO regarding alien vegetation removal and disposal.	<ul style="list-style-type: none">– Site Manager– HSE Representative– EO	As required

Performance Indicators:

- Minimal encroachment of alien exotic species on disturbed and cleared areas; and
- Minimal disturbance to sensitive floral species.

Monitoring Programme:

- The EO will provide the most appropriate, species-specific methods for eradicating problem plants; and
- Disturbance of vegetation outside the construction area.

5.3.4 SOIL EROSION AND SEDIMENT CONTROL

Background:

There is the potential for soil erosion during site clearing activities, excavation and construction of the mast. It is necessary to ensure that any embankments are promptly stabilised.

Sources of Potential Impacts:

- Sediment transport through stormwater run-off.

Objectives:

- Minimise disturbance of the land;
- Minimise erosion and sediment transport from the site; and
- Minimise contamination of any surrounding surface water features.

Table 9 provides mitigation measures to be implemented to prevent soil erosion and control sediment.

Table 9: Mitigation measures to be implemented to prevent soil erosion and control sediment

Issue	Management guideline	monitor	frequency
<i>Soil Erosion and Sediment Control</i>	<ul style="list-style-type: none"> – Where excavations occur, backfill and rehabilitation where possible must occur promptly. – Use a level area for storage of construction materials. – Where temporary stockpiling of soil is necessary, standing time must be kept to a minimum – i.e. temporary storage (not more than 8 weeks). – Install temporary erosion and sediment control e.g. sand bags and berms, along the down-gradient points prior to commencing with earthworks. – Clear vegetation immediately before earthworks commence (i.e. do not leave soils exposed for long periods). – Minimise the size of the project footprint as far as possible. – Ensure that any embankments created by the earthworks are stable and immediately planted to ensure their long term stability. – Avoid contamination of the soil by cement, hydraulic fluid, oil, diesel, and any other potential contaminants. – Stockpiles must be positioned away from watercourses, steep slopes or stormwater drains; to prevent soil from eroding directly into any watercourses. 	<ul style="list-style-type: none"> – Site Manager – HSE Representative – EO 	Site Manager and HSE Representative: On-going EO: Monthly

Performance Indicators:

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

Monitoring Programme:

- Inspection of all erosion and sediment control devices on a monthly basis, particularly after heavy rains; and,
- Inspection of all slopes created.

5.3.5 WASTE MANAGEMENT

Background:

Waste should be avoided, recycled or at least disposed of in an acceptable manner. Waste generated from construction activities on site may include, but is not limited to:

- Concrete/cement;
- Scrap metal;
- General construction and office refuse;
- Waste construction materials;
- Residual vegetative material from clearing activities; and,
- Oil and diesel contaminated materials disposed of as hazardous waste.

Sources of Potential Impacts:

- Litter and waste from construction; and,
- Waste distributed by the wind, water or by scavengers.

Objectives:

- Prevent the contamination of soils and water as well as pollution in general;
- Minimise the generation of wastes;
- Maximise re-use and recycling of waste material; and,
- Contain, control and dispose of waste in accordance with the required waste management practices.

Table 10 provides mitigation measures to be implemented for waste management.

Table 10: Mitigation measures to be implemented for waste management

Issue	Management guideline	monitor	frequency
<i>General</i>	<ul style="list-style-type: none"> – No waste must be burnt. – The working and storage areas must be cleared of litter on daily basis. – Store metal, oil, paper, batteries and any other major recyclable wastes in a demarcated and labelled, bunded area or in dip-trays away from watercourses prior to re-use or collection for recycling. – Litter bins must be marked for separate types of waste e.g. glass, paper, plastic, etc. – Rubble must be stored in a demarcated area within the site camp or at an approved alternate site, before being reused or disposed of at a registered landfill. – Waste from ablution facilities must be regularly removed and care must be taken to ensure that there is no spillage, resulting in possible soil or water contamination. 	<ul style="list-style-type: none"> – Site Manager – HSE Representative – EO 	<p>Site Manager and HSE Representative: On-going</p> <p>EO: Monthly</p>
<i>General Waste</i>	<ul style="list-style-type: none"> – Implement appropriate training and induction procedures to ensure all RBCT staff adopt best practice waste minimisation procedures. – Minimise littering. Provision of suitable waste disposal containers at the construction camp (or construction area). 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. The waste must be disposed of at a registered landfill. – No water containing waste must be allowed to be discharged into the natural environment. Measures to contain such water containing must be implemented immediately, and safely disposed of. 	<ul style="list-style-type: none"> – Site Manager – HSE Representative – EO 	
<i>Hazardous Waste</i>	<ul style="list-style-type: none"> – Load and unload any solid hazardous materials in a manner that reduces the potential for spills. – Any mixing of concrete, if applicable, must take place on an impermeable surface and a sump for concrete waste must be created (if required). – 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 EO for inspection. 	<ul style="list-style-type: none"> – Site Manager – HSE Representative – EO 	

Performance Indicators:

- No breaches associated with transport, collection, storage and disposal/re-use of solid wastes.

Monitoring Programme:

- Regular visual assessment of all storage containers and areas for capacity, potential for recycling and evidence of spillage etc.
- Tracking of weighbridge slips
- General housekeeping will be examined to ensure stormwater runoff does not contain refuse or contaminants.

5.3.6 CHEMICAL STORAGE AND SPILL MANAGEMENT

Background:

Hazardous substances (fuel, oil, grease, etc.) may be stored on the site for use during the construction phase. Contamination of the environment by cement, hydraulic fluid, oil, diesel etc. must be avoided. These substances should be kept within either of the following:

- A concrete base bund surrounded by a low brick wall; or,
- A shallow excavation lined with two layers of thick plastic sheeting, weighted down with rocks in the base and sandbags on the edge.

Sources of Potential Impacts:

- Some of the materials used for construction could be hazardous, and if spilled will result in soil and potentially water contamination.
- Construction machinery leaking oil and diesel.

Objectives:

- Prevent the uncontrolled release of chemicals to the environment; and,
- Minimise the potential for contamination of land or water.

Table 11 provides mitigation measures to be implemented to prevent chemical spills and contamination.

Table 11: Mitigation measures to be implemented to prevent chemical spills and contamination

Issue	Management guideline	monitor	frequency
<i>Chemical Storage and Spill Management</i>	<ul style="list-style-type: none"> – RBCT will ensure that all employees and contractors who are responsible for handling chemicals or hazardous substances undergo relevant training. The same applies to the section of the workforce who will be responsible for the maintenance of equipment, to prevent the accidental discharge or spill of fuel, oil, lubricants and other chemicals. – Chemicals must be stored in labelled, closed containers within designated areas, upon an impermeable surface and away from drains or watercourses. – Chemicals must not be stored within 100 meters of any water body, drainage line or wetland. The EO should be consulted when locating the chemical stores. – Provide for spillage control by bunding or collecting spills to a sump for disposal or controlling by absorbent material on standby (e.g. Drizit). – Access to the chemical stores must be controlled and limited to trained staff only. Keep chemical stores locked at all times. – Do not bury material from bunded areas. – Mixing of cement, if required, must take place on an impervious surface (e.g. plastic sheeting). – Store waste oil and grease away from drains or watercourses on an impermeable surface and ensure disposal at a suitable facility. – Portable ablution facilities must not be located within 100m of drains or watercourses. – Waste from ablution facilities will be regularly removed and care must be taken to ensure that there is no spillage, resulting in possible environmental contamination. – If an incident occurs, ensure that the appropriate corrective actions are undertaken. – All spills must be recorded on the incidents register. 	<ul style="list-style-type: none"> – Site Manager – HSE Representative – EO 	As required

Performance Indicators:

- No significant chemical spills; and,
- No release of chemicals into the environment.

Monitoring Programme:

- Chemical storage areas will be visually inspected;
- Adequacy of containment will be assessed; and,
- Records of spills will be examined in the environmental incident register/report.

5.3.7 STORMWATER MANAGEMENT

Background:

The National Water Act (36 of 1999) provides for the control of water pollution. Stormwater management focuses on the avoidance of contamination of natural water bodies together with the prevention of erosion and downstream flood events. The majority of stormwater emanating from the site will flow naturally to the sites low-points.

Sources of Potential Impacts:

- Potential deterioration of surface water quality in the event of runoff into a riverine/estuarine environment associated with the accidental release of small volumes of chemicals (e.g. diesel and oil) whilst developing the site camp and during construction; and
- Potential for the deterioration of groundwater quality as a result of the spillage and seepage of chemicals (e.g. diesel and oil) onto soil.

Objectives:

- Minimise the effects of stormwater flow on the downstream catchment;
- Manage any potentially contaminated stormwater (suspended solids) from the site during construction; and,
- Ensure that the long term discharge of stormwater will not lead to erosion or downstream flooding.

Table 12 provides mitigation measures to be implemented to manage stormwater.

Table 12: Mitigation measures to be implemented to manage stormwater

Issue	Management guideline	monitor	frequency
<i>Spillage and Contamination</i>	<ul style="list-style-type: none"> – Prevent stormwater runoff from coming into contact with wastes or contaminants on the site. – Divert clean water around the construction site using defined drainage corridors protected against erosion. – If a spill of any description occurs, appropriate corrective action must be taken. – All potential contaminants (oil, diesel, etc.) must be stored in bunded areas which have the capacity of more than 110% of the substances being contained therein. – 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 or fuel sumps must be placed under machinery that is being refuelled; or that are parked overnight. – Adequate ablutions (such as chemical toilets) must be located in an area 100m or more away from stormwater drainage systems. – Any significant pollution spills must be reported to DWS. 	<ul style="list-style-type: none"> – Site Manager – HSE Representative – EO 	Site Manager and HSE Representative: On-going EO: Monthly

<i>Ponding and Erosion</i>	<ul style="list-style-type: none"> – Increase water infiltration on the site by the use of grass blocks or other infiltration enhancing mechanisms wherever possible. 	<ul style="list-style-type: none"> – Site Manager – HSE Representative – EO 	
<i>Natural Water Resources</i>	<ul style="list-style-type: none"> – Stormwater drainage must not damage properties or infrastructure downstream of any stormwater discharge. 	<ul style="list-style-type: none"> – Site Manager – HSE Representative – EO 	

Performance Indicators:

- No significant spills;
- No erosion lines or gullies; and
- No damage to properties or infrastructure downstream of any stormwater discharges.

Monitoring Programme:

- Visual assessment supported by photographic records of the site.

5.3.8 HERITAGE RESOURCES

Background:

All heritage resources are protected by the National Heritage Resources Act, 1999 (Act No. 25 of 1999), and may not be altered or destroyed, or removed from its place of storage without a permit. The Amafa akwaZulu-Natal Heritage Resources Authority (Amafa) is responsible for the management of Grade II heritage resources (i.e. heritage resources that are of provincial significance, as stipulated in section 8(1) of the National Heritage Resources Act).

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 13 provides mitigation measures to be implemented if heritage resources are uncovered.

Table 13: Mitigation measures to be implemented if heritage resources are uncovered

Issue	Management guideline	monitor	frequency
<i>Heritage Resources</i>	<ul style="list-style-type: none"> – It is imperative that the following conditions are followed in terms of potential cultural and heritage resources on site: – Amafa must be contacted if any heritage objects are identified during earthmoving activities and all excavations should cease until further notice. – Amafa must be contacted if any graves are encountered that have not already been identified during construction and the following procedure is to be followed: <ul style="list-style-type: none"> – Stop construction; – Report finding to local police station; and, – Report to Amafa to investigate. – Should the contractor be unsure of any of the above aspects, the EO should be contacted immediately. – Contact details for Amafa are as follows: 195 Langalibalele St, Pietermaritzburg, 3201 Contact: 033 934 6543 – Any potential "chance finds" of heritage objects must be logged in the site incident register. 	<ul style="list-style-type: none"> – Site Manager – HSE Representative – EO 	As required

Performance Indicators:

- No damage to any items uncovered of heritage value; and,
- No damage to any gravesites uncovered.

Monitoring Programme:

- Visual assessment supported by photographic records of the site; and
- Inspection of the incident register.

5.4 POST-CONSTRUCTION ACTIVITIES

Site rehabilitation is an essential component of this EMP and must be carried out in conjunction with the EO and ECO. The guidelines below are to be used as the basic structure for the site rehabilitation; the specific details must be decided by RBCT and the Contractor in conjunction with the EO and ECO.

The requirements for the control of soil, water, dust and noise pollution stipulated in this EMPs still applies during the site rehabilitation phase of the project. Similarly, the requirements for alien vegetation removal, vegetation and fauna protection also apply.

5.4.1 INFRASTRUCTURE

All infrastructure units must be disassembled; and components from the working and storage areas removed. This includes temporary office and storage structures and containers, water storage containers, temporary stormwater control structures and power supply, etc. All portable chemical toilets must be drained, with care to prevent any spillages. The contents must be transferred to an appropriate disposal site. All wastewater and sewage associated with the temporary ablution facilities must be drained and the waste transferred to an appropriate disposal/treatment site.

5.4.2 POLLUTION CONTROL STRUCTURES

Responsibility for the identification of any sources of pollution from the construction activities on site rests on RBCT. All areas of contaminated substrate must be removed; the contaminated substrate must be transferred to a registered disposal site. 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. 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 site camp and working areas must be removed.

5.4.3 RE-VEGETATION / REHABILITATION OF CLEARED AREAS

Any areas that are disturbed by the construction need to be rehabilitated as soon as possible after the completion of construction; this includes the contouring of the site to ensure free flow of run-off and to prevent ponding of water. It is important that the re-vegetation activities 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/RBCT's EO and the ECO. All areas within the site camp or along / adjacent to the construction area, where soil has been stripped, disturbed and replaced will need to be revegetated. This may include:

- The contractor's site camp;
- Additional infrastructure;
- Access routes; and
- Other area disturbed during the construction phase.

In addition:

- Appropriate local indigenous species must be used in the rehabilitation of the site.

- It is recommended that a comprehensive follow up treatment (the removal of any encroaching alien species) be undertaken on a regular basis until the indigenous species are suitably established.
 - Any alterations to the topography must be blended into the existing topography to ensure a stable, safe and sustainable topography where disturbances have occurred during the construction phase. Areas disturbed during construction operations and not utilised during the operational phase must be re-vegetated and rehabilitated to natural conditions to prevent erosion and further degradation to the environment as far as possible.
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5.4.4 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 RBCT 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 and either donate to the local community, auction, or transfer to a RBCT storage area for re-use; and,
- Do not burn or bury any waste at the construction site – all waste is to be transferred to a permitted and registered disposal site.

6 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.

RBCT also 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 construction will be mitigated against. RBCT's EO will need to monitor the site throughout construction to ensure that the required environmental controls are in place and working effectively, and an external independent ECO must be appointed to undertake a project close-out post construction audit to assess the entire project's compliance to the EA and EMPr .

