	<p align="center"><b>PROJECT SPECIFIC ENVIRONMENTAL SPECIFICATION</b></p>	<p>Form No: SAM EAC F 00017</p> <p>Revision No: 02</p> <p>Effective date: June 2021</p>
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## PROJECT SPECIFIC ENVIRONMENTAL SPECIFICATION

**FOR**

**ENGINEERING, PROCUREMENT AND CONSTRUCT INCLUDING OPERATION AND  
MAINTENANCE OF THE PHOTOVOLTAIC SOLUTIONS AT VARIOUS RAND WATER  
SITES UNDER WORKS PACKAGE 1 & 2**

**DATE OF COMPILATION : 28 September 2021 REVISION NUMBER : 1**

**PROJECT NUMBER: BID NUMBER RW 10396874/21**

**ENVIRONMENT AUTHORIZATION REQUIRED?**

**(MAYBE A HERITAGE PERMIT FOR BUILDINGS OLDER THAN 60 YEARS)  
: N/A**

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Technical Person (Optional Requirement)		
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**NB: As per the recommendation made by Bid Specification Committee contact information must be provided to Contractor and ECO after tender award.**

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•	As this work is understood to be mostly on the buildings roof tops the generic specification crossed out in the table above will therefor not apply unless a site camp is establishe on site	

## 1. PROJECT DELIVERABLES

Tender for the assessment, design, supply, delivery, installation, testing, commissioning and put into operation of the photovoltaic solutions at various rand water sites under works package 3

The work is understood to take place on the building's roof tops with minimal impact on the environment.

### SCOPE OF WORK

#### 1.1 Electrical Scope

The proposed electrical scope of work shall comply with all applicable Rand Water and SANS standard specifications to assess, design, refurbish, manufacture, test, supply, deliver, offload, install, commission and putting into service the following PV Turn Key solution at various sites indicated on this Work Package as a minimum:

- 2.1.1. The selected system shall be a grid-tied system with no requirement for battery storage.
- 2.1.2. Assess, Design, Procure, Construct/ install and Commission Various Rooftop Photovoltaic Systems and all associated infrastructure and balance of systems with a minimum installed DC capacity that will feed at a minimum the baseload of each building. The methodology that was followed to determine the baseload, must be indicated.
- 2.1.3. The output from the PV system must connect into the existing three phase, low voltage distribution systems at each building taking into account the existing switching configurations and control switchgear.
- 2.1.4. The electricity produced by the PV system will be used to supply electricity demand at each building, and thus offset the electricity received from the relevant supply authority.
- 2.1.5. The electricity produced by the PV system will not be exported to the relevant supply authority's grid/network.
- 2.1.6. Earthing and lightning protection shall be included as part of the solution and protection scheme for the roof top PV panels and the rest of the PV solution.
- 2.1.7. Key Factors to be considered in the Photovoltaic (PV) System design are as follows:
  - i. Efficient design and operation of the PV system including the amount of energy produced (kWh/year) at a best price considering the amount of space available. Ease of

maintenance and monitoring including minimal interference on the maintenance of any equipment on site such as HVAC equipment located on the roof. Most favourable savings to investment ratio taking into consideration the levelised cost of energy and the payback period.

- ii. Favourable overall system warranty.
- iii. Minimal interference on structural and roof integrity.
- iv. The design, technology and equipment used must comply with the structural and fire safety requirements, relevant IEC and SANS standards, and other applicable building and electrical standards.
- v. The integration of the PV system onto Rand Water's reticulation system should not interfere nor compromise Rand Water's buildings, reticulation, electrical system (including all protection measures that are in place), and the back-up power source in any form.
- vi. All equipment and cabling shall be positioned in such a way that it is guarded against exposure to direct sunlight and rain. Cable trays and wire ways shall only be filled to a 75% capacity. As far as reasonably practical, all equipment shall be installed in well-ventilated areas that would not require additional HVAC requirements.

2.1.8. The scope of work shall include the following under various project phases:

- i. Assessment of the existing electrical installation and back-up generators.
- ii. Refurbish work identified during assessment phases.
- iii. The contractor will be responsible for planning, specifying and executing any additional (not specified) site investigations required to ensure that their work and performance to the contract is not compromised.
- iv. All tasks to design deliver and install a rooftop photovoltaic system that promotes efficient operation, low maintenance and low operating losses.
- v. Preparation of all drawings, details and design, as built-record drawings according to the requirements and performance specification.
- vi. The work will include, but is not limited to securing and supplying: labour, services, materials and equipment to produce fully operational rooftop photovoltaic systems.

- vii. The contractor will be responsible for delivery to site, offloading, off-site testing, onsite

testing and performance testing.

- viii. Prepare applications and secure approvals for shutdowns and interconnection with the operation and maintenance departments where necessary.
- ix. Provide training and an operation manual to the building facility representatives. Provide Rand Water with manufacturer warranties covering the PV modules, the mounting system, the inverters, and the balance of system components. Provide operation, maintenance and equipment manuals for the PV system.

## 1.2 Architectural Scope

The proposed architectural scope of work shall include, but not be limited to the following:

- 2.2.1 The Architectural work shall comply with all applicable Rand Water and SANS standard specifications, to assess, design, refurbish, construct, test, supply, and put into service the following PV Turn Key solution at the identified buildings at various sites as indicated on Works Package 3 as a minimum
- 2.2.2 All buildings shall be assessed as to whether they are classified as a National heritage structures. If so the appropriate submissions to provide solar panels will be submitted by the successful tenderer to the National Heritage council for consideration. – No installation shall proceed unless such permission is granted. (Alternate adjacent structures i.e. carports can be considered)
- 2.2.3 The Operating access solutions, as well as procedure for the maintenance of the solar panels shall be provided for approval by the successful tenderer.
- 2.2.4 Any alterations, additions, extensions or clip on structures, required for the PV Plant shall match the existing building materials of that structure. Architectural drawings shall be provided to the RW architect for approval, prior to ordering and construction.
- 2.2.5 All drawings, details and design, as built-record drawings, according to the requirements and performance specification shall be provided for approval prior to any construction work commencing.

The proposed civil scope of work shall include, but not be limited to the following:

- 2.3.1. Structural integrity assessment for the rooftop PV system and the buildings internal structural elements for installation of equipment.
  - 2.3.1.1. The contractor must appoint an independent consultant to execute the Condition and Structural Assessments of the identified buildings.
  - 2.3.1.2. Should the building not deemed viable for PV installation subsequent to the Structural Integrity Assessment, the building will be excluded from the contractors Scope of Works and the contractor will only be paid up to and including the works at that point.
  - 2.3.1.3. Should permission not be granted to install PV on heritage buildings, the PV installation for the applicable building will be excluded from the contractors Scope of Works and the contractor will only be paid up to and including the works at that point.
- 2.3.2. Refurbishment work identified during the structural integrity assessment.
- 2.3.3. Rooftop PV system connection to the building including any modifications necessary for such connection.
- 2.3.4. Provision of all labour, supervision, materials, equipment for the design and refurbishment identified during the structural integrity assessment.
- 2.3.5. Preparation of all drawings, details and design, as built-record drawings according to the requirements and specifications.
- 2.3.6. Provision for access to the rooftop PV system for maintenance purposes.
- 2.3.7. Detailed condition and structural assessments

The purpose of these structural assessments is to assess the condition and structural adequacy of each structure to handle additional loads to be imposed by proposed solar installation and related equipment. The inspection and condition assessments shall include the following, but not limited to:

- 2.3.7.1. Pre-inspection
  - a) Perusal and assessment of available information pertaining to each structure
  - b) Verification of existing general arrangement drawings and reconstruct structural drawings where they are not available, with the aid of the 3D laser scanning (including

reinforcement drawings where applicable).

- c) Appraisal of the geological conditions.
- d) Production of assessment drawings.
- e) Identifying critical areas for inspection.

2.3.7.2. Systematic visual inspection and condition assessment of each structure to identify:

- a) Signs of deterioration;
- b) Signs of structural damage, distress or deformation;
- c) Evidence of instability, movement, settlement, etc.
- d) Alterations that can adversely affect a structure.

2.3.7.3. Professional assessment

- a) Assess possible causes, extent and implication of problems identified during visual inspection and condition assessment.
- b) Assess whether identified problems are defects of structural or non-structural significance.
- c) Identify apparent deviation from intended use which can result in overloading.
- d) Structural analysis
  - i. Develop structural model for each structure to determine the current structural capacity of each structure.
  - ii. Assess effects of additional loading (proposed solar installation and related equipment) on each structure
- e) Durability performance analysis including material integrity analysis, in accordance with applicable standards. These include but not limited to (where applicable):
  - i. Cover Surveys
  - ii. Assessment of surface hardness (Schmitt hammer test)
  - iii. Assessment of voids and delamination (Sounding survey, Ultrasonic pulse velocity



testing)

- iv. Material sampling, assessment and testing.
- v. Tests of material strength (compressive and tensile strength)
- vi. Durability index tests (water sorptivity, oxygen permeability and chloride conductivity tests)
- vii. Tests of material chemicals (carbonation depth and chloride content tests)
- viii. Steel corrosion assessment (Half-cell potential and corrosion rate measurement)
- ix. Steel thickness measurements
- x. Timber probing.
- xi. Other special tests that are deemed necessary by the structural engineer.

*Individual tests shall be appropriately motivated and accepted by Rand Water prior to being implemented. The following must be adhered to:*

- xii. Areas or positions where each test is required shall be marked out on drawings with reference to photographs and agreed to with Rand Water.
  - xiii. Frequency of testing must be such that there is at least one test per discrete concrete element, in accordance with relevant standards.
  - xiv. Material samples shall be extracted in accordance with relevant standards
  - xv. Material samples shall be tested at a South African National Accreditation System approved testing laboratory in accordance to relevant standards.
  - xvi. Areas where samples are extracted shall be repaired in accordance with the method statement as accepted by Rand Water.
- f) Geotechnical investigations where applicable

The assessments shall be performed using a standardized, documentable inspection process with condition grading that provides accurate, consistent and repeatable results. This process shall be developed by the Structural Engineer and accepted by Rand Water. Defects identified should be numbered and scaled (width, length, etc.). Location of each identified defects should be marked on the assessment drawings and accompanied with an image.

#### 2.3.8. Condition assessment report

- a) Introduction
- b) Description of each structure
- c) Description of structural system
- d) Geology of the site and founding conditions
- e) Assessment approach methodology
- f) Visual inspection and condition assessment findings
- g) Recommended field investigations (including type, location, need, etc.)
- h) Aggressively of material exposure environment
- i) Detailed analysis of field investigation findings
- j) Overall assessment findings
  - i. ReDefects of structural significance
  - ii. Defects requiring remedial action and/or monitoring
  - iii. Defects requiring immediate action, etc.
  - iv. Structural analysis findings
  - v. Life expectancy analysis (determination of residual life)
  - vi. Proposals and Recommendations
  - vii. Proposal for remedial action.
  - viii. Proposal for additions, alterations or structural strengthening required to accommodate additional imposed loads due to proposed equipment, including design drawings and calculations.
  - ix. Structural health monitoring where necessary
  - x. Cost of estimates for proposals
- k) Conclusions on the structural condition shall include loading conditions; overall condition, structural integrity, remaining useful life, recommended additions, alterations or structural strengthening.

- l) Annexures
- i. As-built drawings
- ii. Assessment drawings indicating problematic areas
- iii. Calculation files
- iv. Proposed solution (drawings and calculation)
- v. Specification for proposed solution
- vi. Bills of quantity of proposed solution

#### 2.3.8.1. Drawings

All drawings shall comply with Rand Water Design Office requirements and shall be subject to the approval of the Civil Asset Manager. Rand Water will not be responsible for any delays, loss or inconvenience to the Contractor(s) through failure to comply with this requirement.

Final drawings shall be on unfolded, untearable transparent film, with a polyester base, having a matt finish on both sides and a thickness of 0.075 mm. These Drawings shall bear Rand Water's contract number. In addition, where drawings have been completed using CAD programme, compact disc copies of each drawing shall be provided either on AUTOCAD or DXF format.

Drawings shall be size A0 in accordance with:

- i. SANS 10111-2011 (Engineering drawings).
- ii. SANS 10144 (Details of steel reinforcement for concrete)
- iii. SANS 282 (Bending dimensions and scheduling of steel reinforcement for concrete)

#### 2.3.9. Final Proposal

All work to be executed within confines of condition of existing structure. Final proposals shall take into consideration current condition of each structure.

### 1.4 Automation Scope of Work

The Automation Scope of work for the design, manufacturing, supply, delivery, installation, testing, commissioning, maintaining of the solar photovoltaic system shall include, but not limited to the following at all buildings listed at section 1.1:

- 2.4.1 Ethernet (Copper or Fibre) network system for all networking equipment's (i.e. inverters, power meters, protection relays etc.) in each building and link the solar photovoltaic system to the station network.
- 2.4.2 All Profibus (Copper or Fibre) compatible instrumentations (i.e. temperature sensors, lux meter, humidity sensors etc.) if required.
- 2.4.3 Profibus (Copper or Fibre) network system for all instrumentations.
- 2.4.4 All cable channels and cable support systems.
- 2.4.5 Latest generation PLC system (hardware and software) in each site.
- 2.4.6 Latest generation HMI system (hardware and software) in each site.
- 2.4.7 Interfacing to the existing nearest SCADA system to display the statuses of the photovoltaic system for monitoring purposes.
- 2.4.8 Automation panels and Junction Boxes to accommodate automation equipment's in each building.
- 2.4.9 Interface to the Reporting application for the Solar Plant in each site.
- 2.4.10 All automation designs and quality documents including, but not limited to complete design drawings, calculations, design reports, FDS, method statements, installation and commissioning procedures, operating and maintenance manuals and updating of all supplied drawings to an As built status for each building.

## 1.5 Mechanical Scope of Work

The mechanical scope of works shall comprise of the full building assessment, design, supply, installation, testing and putting into service of a Heating, Ventilation and Air Conditioning (HVAC) system, Domestic water supply points and Fire protection & detection systems.

The Contractor shall provide a turnkey solution /s that includes all labour, supervision,

installation and consumable materials, equipment, tools, services and every permanent or temporary item necessary for the manufacture, supply, delivery, unloading, installation and putting into service of the specified deliverables.

All equipment and installations shall comply with the requirements of the Occupational Health and Safety Act 85 of 1993 and any amendments thereof.

The work to be performed shall include but not limited to the following:

#### 2.5.1. HVAC System:

- a) The Contractor shall conduct an assessment and determine where required, the requirements of the HVAC system.
- b) Design, supply and deliver of HVAC system complete with fittings.
- c) Install, test, commission and put into operation of the HVAC system.
- d) Design and construct concrete base, supports, structural frame, hangers in support of the HVAC equipment.
- e) The HVAC system selected shall be efficient, reliable and require a minimum of maintenance.
- f) The ventilation fans to be connected to day time clock and the system shall be able to switch off in case of fire or smoke being detected.
- g) The HVAC system to be monitored on SCADA system.
- h) Be safe, meet all legislative requirements and follow appropriate national and international design standards/codes.
- i) HVAC equipment to be installed in such a way that it is easily accessible and maintainable.
- j) And where required, the structural integrity of the building shall be assessed and verified if it is capable of withstanding additional loading of HVAC equipment.
- k) Supply equipment manuals and brochures for inclusion into Rand Water's existing operating and maintenance manuals.
- l) Rectification of all defects of equipment and installation during the Defects Liability Period.
- m) Updating of all supplied and generated drawings to As-built status.

- n) Training of operations and maintenance personnel.
- o) Supply of operating and maintenance manual.
- p) Supply of special tools required to undertake the works.

#### 2.5.2. Fire Protection, Detection and Fire Signage's:

The buildings shall be equipped with a fire protection system that is capable of detection, activation of a protection system, interventions and extinguishing.

The Fire Engineer shall conduct a full building assessment, design and specify the required fire protection system/s, detection & fire signage's required to be installed in the buildings.

The Fire Engineer shall prepare as minimum:

- a) Fire Safety objectives and statutory requirements.
- b) Assessment and risk analysis of the buildings.
- c) Fire design and approval, fire design scope, design philosophy, specifications, design calculations, analysis of worse case fire scenario, design drawings and fire protection equipment etc.
- d) Be safe, meet all legislative requirements and follow appropriate national and international design standards/codes.
- e) Design, supply and deliver of fire protection & detection system complete with fittings.
- f) Install, test, commission and put into operation of the fire protection & detection system.
- g) Design of supports and hangers for the fire system.
- h) To advice on the most cost efficient fire protection system.
- i) Issue design manuals etc.
- j) Supply equipment manuals and brochures for inclusion into Rand Water's existing operating and maintenance manuals.
- k) The fire protection & detection systems equipment to be installed in such a way that it is easily accessible and maintainable.
- l) Rectification of all defects of equipment and installation during the Defects Liability Period.

- m) Updating of all supplied and generated drawings to As-built status.
- n) Training of operations and maintenance personnel.
- o) Supply of operating and maintenance manual.
- p) Supply of special tools required to undertake the works.

#### 2.5.3. Domestic water Supply Points:

- a) The Contractor shall conduct an assessment and determine the point/s of water supply in areas where PV modules are to be installed, to be used for future maintenance of PV systems.
- b) Design, supply and deliver of water supply system complete with fittings, valves, meters etc.
- c) Install, test, commission and put into operation of the water supply system.
- d) Design and construct concrete base and supports for the water supply system.
- e) Be safe, meet all legislative requirements and follow appropriate national and international design standards/codes.
- f) The water supply equipment to be installed in such a way that it is easily accessible and maintainable.
- g) Supply equipment manuals and brochures for inclusion into Rand Water's existing operating and maintenance manuals.
- h) Rectification of all defects of equipment and installation during the Defects Liability Period.
- i) Updating of all supplied and generated drawings to As-built status.
- j) Training of operations and maintenance personnel.
- k) Supply of operating and maintenance manual.
- l) Supply of special tools required to undertake the works.

### **SITE DETAILS:**

#### **SITE LOCATION**

Various Rand Water sites

## **SITE BOUNDARIES**

The Contractor shall confine his activities to the area in the vicinity of designated sites. The actual boundaries of the site will be pointed out by the Engineer. The Contractor shall not extend his activities outside the boundaries unless the Engineer has specifically authorized the extension in writing.

## **SITE ACCESS**

A Site Access Certificate will be required before the Contractor is granted access to site. Please see Additional Particular Conditions of Contract for details of this certificate and where to obtain it.

## **POSSESSION OF SITE**

A Site Access Certificate will be required before the Contractor is granted access to site. Please see Additional Particular Conditions of Contract for details of this certificate and where to obtain it.

## **ACCOMMODATION ON SITE**

No housing is available. The Contractor's employees will not be allowed to be accommodated on the site.

## **ACCESS ROADS**

The Contractor shall be liable for all unnecessary and unreasonable damage caused by his equipment and/or transport to the access roads and fences. The cost of repair and reinstatement of unnecessary and unreasonable damage to these roads and fences will be deducted from moneys due to the Contractor.

## **SERVICES ON SITE**

A sufficient supply of water is available at a convenient point at the sites from which the Contractor shall be responsible for the distribution of water. The contractor shall supply and install the water meter.

The CONTRACTOR shall, at its own costs, supply electricity, for construction purpose.

There is no compressed air available on the site.



## **SITE SECURITY**

The sites are subject to strict security control and the Contractor and his work staff shall comply fully with any requirements imposed by the Employer's security personnel. Permits, issued by the Manager of the site, are required for admission to the sites and, before starting work on the sites, the Contractor shall make arrangements with the Engineer for the issue of the necessary permits for himself and his employees. For purposes of identification, all personnel will be required to carry their identity documents and shall show these, on request, either at entry to the Designated Pumping Station or within the Pumping Station site. The Contractor and his employees will be confined to the site, and the access roads listed above and action will be taken against anyone outside the prescribed areas.

## **CLEANING UP OF WORKS AND SITE**

The Contractor shall maintain the whole of the site in a clean and orderly condition, to the satisfaction of the Engineer. On completion of the work the Contractor shall tidy up the site to the satisfaction of the Engineer; all temporary buildings shall be dismantled and removed; all surplus material, debris etc. shall be carted away and the whole site shall be left in a neat and orderly condition. Items worthy of retention as identified by the Engineer shall be labelled; transported and delivered to the Employer's physical address.

## **ATMOSPHERIC AND ENVIRONMENTAL CRITERIA**

Typical site conditions are as follows:

<b>Environment:</b>	<b>Indoors:</b>
Altitude (m):	1340
Approx. max. temperature on record (°C):	38
Approx. lowest temperature on record (°C):	-9

## **INDUCTION**

The Contractor shall be responsible for acquainting him or herself with and attending any safety induction courses presented at the applicable sites.

The Contractor shall supply the following documentation to the Engineer, which will be sent to the relevant personnel prior to induction:

- a) ID copies of all the personnel that will be working on site.
- b) Valid Letter of Good standing (COLD certificate) from the Workman Compensation.
- c) All the signed appointment letters as per construction regulation. E.g. Building work, Supervisor, Scaffolding Inspector, Safety Officer /Representative, etc.
- d) Signature of the Engineer or the Employer's Representative in charge of the contract.
- e) Initials on each page by the Contractor in charge of the Contract.
- f) Tool list.
- g) Candidates to be present for the Induction.
- h) Health and Safety plan.
- i) Risk Assessment plan.

## **2. PURPOSE OF AN ENVIRONMENTAL SPECIFICATION**

The purpose of this document, is to provide a Rand Water Environmental specification for Rand Water's construction activities to enable the "duty to care principle", of Section 28 of the National Environmental Management Act, to ensure that the potential environmental impacts of a proposed development are minimized throughout the life cycle of the construction.

The document identifies communally occurring environmental impacts and proposed mitigations. The mitigations are expressed as outcomes/objectives which must be achieved. The proposed mitigations in turn may achieve the objective in alternate ways. Alternative mitigations/actions must be identified in method statement which are required to meet the outcome and upfront and recorded in the onsite environmental file under sections 9 grouped under the following main headings.

- i. Administrative matters,
- ii. Social integration of project to the public,
- iii. Establishment of a construction campsite and working area,
- iv. Pollution prevention,
- v. Preservation of the environment.
- vi. Final finishing off standards to leave the site in such a state that will allow for easy site rehabilitation.

## **3. SCOPE OF AN ENVIRONMENTAL SPECIFICATION**

The Environmental specification forms the framework for environmental monitoring to all Rand Water projects, and is to be used by managers, contractors, sub-contractors and monitoring agents, such as the Environmental Control officer (ECO), contractor Environmental Officer CER, external auditors and environmental authorities.

The aim of the document, is to provide coherence and structure for further management of environmental matters. The result of a coherent and consistent approach will facilitate trend analysis of monitoring activities which could not be possible if the basic framework across all projects were different in each project.

This specification reflects minimum outcomes /objectives to assist in managing environmental impacts.

The Contractor must take into account all information in this specification and ensure that their tenders include adequate resource and competence to deal with the matters detailed herein so that all relevant contents are dealt with in a way which is in compliance with legislation.

This specification forms an integral part of the contract, and contractors shall make it an integral part of their Contracts with sub-contractors and suppliers.

#### 4. APPLICABILITY

The use of this RW Environmental specification does not exempt the relevant activity or project from having the correct legal licenses and Authorisations. the application of the document may serve various uses for different parties

- The **Environmental Assessment practitioner** who will obtain environmental authorisations for RW, will use it as a framework, of the subsequent Environmental program (EMPr) and the EMPr will include additional requirement as identified by various specialist (Gap analysis).
- **Managers** Use a generic RW Environmental specification will assist with managing and setting standards for construction sites. The common set of standards across all construction projects, tend analysis can be more appropriately monitored, which intern enables better planning and monitoring of existing work and setting of new targets
- **The contractor** and project team will use this document to support understanding and expectations that will feed into the bill of quantities for the project.
- **The environmental control officer (ECO)**, will monitor environmental compliance, and will use this document to construct and structure a monitoring checklist. Additional requirements as per the EMPr will be included into the monitoring checklist at the end of the monitoring checklist.
  - The RW Environmental specification will assist with providing consistency in managing and monitoring environmental impacts across all projects.
  - The ECO may mark various items as non-applicable during the construction due to the phase of construction not requiring that specific mitigation.

- The RW Environmental specification is a dynamic document and the ECO may amend and or update clauses to benefit the environment, provide adequate reasonable reasons can be provided, after consultation with their line manager/ senior. The objectives of each item are important. Each objective has a list of actions that are relevant to achieving the objective; however, there may be alternative actions that may be applicable to achieve the objective.

## 5. REFERENCES

Specific tender documents pertaining to the project.

Constitution of the Republic of South Africa Act (Act No. 108 of 1996)

National Environmental Management Act (Act No. 107 of 1998)

Environmental Impact Assessment Regulations, 2014, promulgated in terms of Section 24(5) of NEMA

National Environmental Management Act No. 107 of 1998 regulations as amended 2010 (NEMA)

National Environmental Management Act No. 107 of 1998 (NEMA) Public participation

National Environmental Management: Biodiversity Act, (Act No. 10 of 2004)

National Environmental Management Waste Act, (Act No. 59 of 2008)

National Heritage Resources Act (Act No. 25 of 1999)

## 6. TERMS, DEFINITIONS AND ABBREVIATIONS

### Abbreviations / Acronyms

**BA-** Basic assessment as per EIA

**CARA-**Conservation Agricultural Resource Act

**DEA** Department of Environment Affairs

**DWAS-** Department of water affairs and sanitation

**GDARD-** Gauteng Department of Agriculture and Rural Development

**CER-** Contractor's Environmental Representative

**ECO-** Environmental control officer

**EA-** Environmental Authorisation  
**EIA** Environmental Impact Assessment  
**EMPr** Environmental Management Program  
**GIS** – Geographic Information Section  
**EAC** Environmental Assessment and compliance.  
**I&AP** Interested and Affected Parties  
**NEMA** National Environmental Management Act  
**RoD** Record of decision as per ECA but the term is commonly substituted for **EA**  
**RoR** Record of recommendation from DWA on a WUL  
**RW** Rand Water  
**SABS** South African Bureau of Standards  
**WUL** Water use license  
**SAHRA** South African National Heritage Act  
**Terms**

**Affected environment** - Those parts of the socio -economic and biophysical environment impacted on by the development

**Alternatives** - A possible course of action, in place of other, that would meet the same purpose and need.

**Auditing** - A systematic, documented, periodic and objective evaluation of how well the environmental management plan is being implemented and is performing with the aim of helping to safeguard the environment by: facilitating management control which would include meeting regulatory requirements. Results of the audit help the organisation to improve its environmental policies and management systems.

**Biodiversity** - The variety of life in an area, including the number of different species, the genetic wealth within each species, and the natural areas where they are found.

**Communication Procedures on site** - Copies of all documentation described in the Environmental specification must be maintained on site and made available to the Site Manager, ECO, stakeholders or the authorities for inspection as requested. The minutes of the

monthly progress meetings must reflect all environmental queries, agreed actions and dates of eventual compliance. These minutes will form part of the official record.

**Complaints register** - The Contractor shall assist the Engineer with responding to queries and complaints from the public regarding the construction activities by: documenting the details of such communications and submitting the information to the Engineer for inclusion in the complaints register; bring any such matters to the attention of the Engineer immediately when they arise as well as taking any remedial action as per the Engineers instruction.

**Contractor Environmental Representative** - The CER will be responsible, on behalf of the contractor, to ensure that the Environmental specification is implemented on site on a daily basis. The CER will liaise with the ECO in all matters relating to the implementation of the Environmental specification. The CER need not be qualified in the environmental field.

**Contractor** - The Contractor will be responsible for the overall implementation of the Environmental specification. The Contractor will nominate a representative on site as his environmental representative, known as the Contractor's Environmental Representative (CER). The Contractor and/or Rand Water Site Manager must issue site instructions to rectify any environmental noncompliance, based on the CER's and/or ECO's findings.

**Cumulative Impact** - An action that in itself is not significant but is significant when added to the impact of other similar actions.

**Development** - The act of altering or modifying resources in order to produce potential benefits

**ECO Diary Entries** - The purpose of these entries will be to record the comments of the ECO as they relate to activities on the site including; infringements, possible changes to the Environmental specification or work stop orders, on a daily basis.

**Environmental awareness training** - Prior to construction all contractor teams involved in work on the project are to be briefed on their obligations towards environmental controls and methodologies in terms of this Environmental specification. It is recommended that the briefing take the form of an on-site talk and demonstration by the ECO. The education/awareness programme should be aimed at all levels of management and construction workers within the contractor team. A register should be taken as proof of attendance.

**External Auditor** - Rand Water must appoint an external auditor to conduct annual audits or as per the authorizations / license / permit requirements to ensure compliance of the Environmental specification on site. These audit reports will be maintained on site with the ECO diary and should be submitted to the Competent Authorities Environmental Compliance Section.

**Environment** - Means the surroundings within which humans exist and that are made up of

- Micro - organisms, plant and animal life;
- The land, water, and atmosphere of the earth;
- The physical, chemical, aesthetic and cultural properties and conditions of the foregoing that influence human health and well - being.

**Environmental Impact Assessment (EIA)** - refers to the process of identifying, predicting and assessing the potential positive and negative social, economic and biophysical impacts of a proposed development. The EIA includes an evaluation of alternatives; recommendations for appropriate management actions for minimising or avoiding negative impacts and for enhancing positive impacts; as well as proposed monitoring measures

**Environmental Management Plan (EMP)** - A system which provides a structured process for continual improvement and which enables an organization to achieve and systematically control the level of environmental performance that it sets itself. In general, this is based on a dynamic cyclical process of "plan, implement, check and review ". The EMP aims at

- Minimizing impacts by limiting aspects of an action.
- Minimizing impacts by optimizing processes, structural elements and other design features.
- Avoiding impacts by not performing certain actions.
- Compensating for impacts by providing substitute resources or environments
- Any part or combination of the above and the inter - relationships among and between them; and

**Environmental Resources** - Goods, services or environmental conditions that have the potential to enhance social well - being".

**Impacts** - A description of the potential effect or consequence of an aspect of the development on a specified component of the biophysical, social or economic environment within a defined time and space. The outcome of an action, whether considered desirable or undesirable".

**Fence** - A physical barrier in the form of posts and barbed wire and/or "Silex" or any other concrete construction, ("palisade" - type fencing included), constructed with the purpose of keeping humans and animals within or out of defined boundaries.



**Interested and Affected Parties (I&APs)** - Individuals and groups concerned with or affected by an its consequences. These include the authorities, local communities, investors, workforce, customers and consumers, environmental interested groups, and the general public.

**Method Statements** - A method statement describes the scope of the intended work in a step – by – step description in order for the ECO to understand the Contractor's intentions. It enables the ECO to assist in devising mitigation measures to be implemented, which would minimise environmental impacts during these tasks as well as act as a measure against which the contractor's performance could be measured. For each instance wherein it is requested that the Contractor submit a method statement to the satisfaction of the ECO, the format should clearly indicate the following: -

- What – a concise, description of the task / work to be undertaken;
- How – a detailed description of the process of work, methods, materials and mitigation strategies;
- Where – a description / sketch map of the locality of work (if applicable); and
- When – the sequencing of actions with due commencement dates and completion date estimates.

A method statement forms the baseline information on which work in sensitive areas occurs and thus is considered a “live” document in that modifications can be negotiated between the Contractor and the ECO if or as required. The Contractor must submit the method statement 14 days before any particular activities are due to start. The method statements must be included in the rehabilitation of the footprint area.

Work may not commence until the method statement has been accepted by the ECO and clearly communicated to the Contractor's employees.

All method statements will form part of the Environmental specification documentation and are subject to all terms and conditions contained within the E Environmental specification main document.

**Mitigation** - Measures designed to avoid, reduce or remedy adverse impacts

**Monthly Audit Reports** - Monthly reports will be compiled by the Environmental Control Officer (ECO) for study by the external environmental auditor, and could to be presented at the Site Meetings. Monthly reports will describe, in detail, the cause, nature and effects of any environmental non-conformance by the Contractor, and will serve as evidence in the event of penalties being evoked.

The Monthly report should also reflect when the remedial measures have been implemented timeously and to the satisfaction of the ECO.

**Plan** - A purposeful, forward - looking strategy or design often with coordinated priorities, options and measures that elaborates and implement policy

**Policy** - A general course of action or proposed overall direction that is being pursued and which guides ongoing decision - making.

**Pollution** - Any change in the environment caused by substances, radioactive or other waves, or noise, odours, dust or heat, emitted from any activity where there is an adverse effect on human health or well-being or on the composition, resilience and productivity of natural or managed ecosystems, or on materials useful to people, or will have such an effect in the future. Furthermore, pollution can also be regarded as an undesirable state of the natural environment being contaminated with harmful substances as a consequence of human activities.

**Pre- cautionary Principle** – “This involves applying a risk -averse and cautious approach that recognises the limits of current knowledge about the environmental consequences of decision making or action.”

**Programme** - "A coherent, organised agenda or schedule of commitments, proposal instruments and activities that elaborate and implement policy ".

- Provide ongoing monitoring and management of environmental impacts of a development and documenting of any digressions /good performances.
- Rectifying impacts through rehabilitation, restoration, etc. of the affected environment.
- The Environmental specification is a binding document that all parties involved in the project must be aware of.

**Record Keeping** - A photographic record must be taken of the site prior to, during and immediately after construction activities and rehabilitation as visual reference. These photographs should be stored with related documents and other records related to this Environmental specification.

**Rehabilitation** - is defined as the return of a disturbed area to a state which approximates the state, as far as possible, which it was before disruption. Rehabilitation should aim to accelerate the natural succession processes so that the plant community develops in the desired way.

**Reinstatement** - is defined as the initial soil works that replaces soil levels back to the original state as far as possible. It may include an initial light temporary grassing.

**Specialist** - A person that is generally recognised within the scientific community as having the capability of undertaking, in conformance with generally recognised scientific principles, specialist studies or preparing specialist reports, including due diligence studies and socio-economic studies.

**Species** - A group of organisms that resemble each other to a greater degree than members of other groups and that form a reproductively isolated group that will not produce viable offspring if bred with members of another group.

**Site Meetings** - Regular site meetings will be held between the Contractor, Site Manager, ECO and Rand Water. The purposes of the meetings shall be: -

- To establish the suitability of the Contractor's methods and machinery in an effort to lower the environmental, social and health risk involved;
- To discuss non-conformance to environmental legislation / policies of the Environmental specification;
- To assess the general state of the environment on site and discuss any environmental problems which may have arisen;
- To act as a forum for input into the construction works by the ECO and external environmental auditor;
- To accommodate all stakeholders in the decision – making process regarding social and environmental issues.

**Site Instruction Entries** - The Site Instruction Book entries will use for the recording of general site instructions as they relate to the works on site and the measures of the Environmental specification. It will also be used for the issuing of stop orders by the ECO for the purpose of immediately halting any particular activities of the Contractor or his employees in lieu of the environmental risk that they may pose.

**Slope** - Means the inclination of a surface expressed as one unit of rise or fall for so many horizontal units;

**Solid waste** - Means all solid waste, including construction debris, hazardous waste, excess cement/ concrete, wrapping materials, timber, cans, drums, wire, nails, food and domestic waste (e.g. plastic packets and wrappers);

**Spoil-Means** - excavated material which is unsuitable for use as material in the construction works or is material which is surplus to the requirements of the construction works;

**Topsoil** - Means a varying depth (up to 300 mm) of the soil profile irrespective of the fertility, appearance, structure, agricultural potential, fertility and composition of the soil;

**Waste** - Any substance, whether or not that substance can be reduced, re-used recycled and recovered –

- a) that is surplus, unwanted, rejected, discarded, abandoned or disposed of;
- b) which the generator has no further use of for the purposes of production;
- c) that must be treated or disposed of;
- d) that is identified as a waste by the Minister by notice in the Gazette and includes waste generated by the mining, medical, and other sector, but-
  - i) a by-product is not considered waste;
  - ii) any portion of waste, once re-used, recycled and recovered, ceases to be waste.

**Water course** – A water course as defined in the National Water Act:

- a) A river or spring
- b) A natural channel in which water flows regularly or intermittently
- c) A wetland, lake or dam in which or from which, water flows; and Any collection of water which the minister may, by notice in the Gazette, declare to be a water course, and a reference to a watercourse includes, where relevant, its bed and banks

**Wetlands** – means land which is transitional between terrestrial and aquatic systems where the water table is usually at or near the surface, or the land is periodically covered with shallow water, and which land in normal circumstances supports or would support vegetation typically adapted to life in a saturated soil. Waterlogged habitat containing characteristic vegetation species and soil types e.g. vlei's

## **7. RESPONSIBILITY AND AUTHORITY**

The effective implementation of this generic Environmental specification is dependent on established and clear roles, responsibilities and reporting lines within an institutional framework. This section of the Environmental specification gives guidance to the various environmental roles and reporting lines, however, project specific requirements will ultimately determine the need for the appointment of specific person(s) to undertake specific roles and or responsibilities. As such, it must be noted that in the event that no specific person, for example, an environmental control officer (ECO) is appointed, the project manager remains responsible for ensuring that the duties indicated in this document for action are undertaken.

### **Program Manager/The Engineer/Agent's Representative**

The overall Program Manager is the overall accountable person for the overall management of the project both on and off-site.

### **Resident engineer**

The Resident engineer is accountable for ensuring compliance with the Environmental specification and any conditions of approval from the competent authority (CA). Where required, an environmental control officer (ECO) must be contracted by the Project Developer to objectively monitor the implementation of the Environmental specification according to relevant environmental legislation, and the conditions of the environmental authorisation (EA). The Project Developer is further responsible for providing and giving mandate to enable the ECO to perform responsibilities, and he must ensure that the ECO is integrated as part of the project team while remaining independent.

### **Responsibilities**

- Be fully conversant with the conditions of the EA;
- Ensure that all stipulations within the Environmental specification are communicated and adhered to by the Developer and its Contractor(s); - Issuing of site instructions to the Contractor for corrective actions required;
- Monitor the implementation of the Environmental specification throughout the project by means of site inspections and meetings. Overall management of the project and Environmental specification implementation; and
- Ensure that periodic environmental performance audits are undertaken on the project implementation. Issuing of site instructions to the Contractor for corrective actions required;
- Will issue all non-compliances to contractors; and - Ratify the Monthly Environmental Report.

### **EAC MANAGER (MEAC) and EAC coordinator**

The responsibility of the MEAC Manager and **EAC coordinator** is to provide assurance, as well as advice, assist and support the Project Manager in the management of the environmental issues on the project.

## **Environmental Control Officer (ECO)**

The ECO should have appropriate training and experience in the implementation of environmental management specifications. The primary role of the ECO is to act as an independent quality controller and monitoring agent regarding all environmental concerns and associated environmental impacts. In this respect, the ECO's responsibility is to conduct periodic site inspections, attend regular site meetings, pre-empt problems and suggest mitigation measures and be available to advise on incidental issues that arise. The ECO is also required to conduct compliance audits as required by EAs WULAs and HIAs and also to verify the monitoring reports submitted by the CER.

The ECO provides feedback to the Resident Engineer and Project Manager regarding all environmental matters. The Contractor, **Contractor Environmental Representative (CER)** is answerable to the Environmental Control Officer for non-compliance with the Performance Specifications as set out in the EA with EMP or Environmental specification, who in turn reports back to the Contractor and potential and Registered Interested & Affected Parties' (RI&AP's), as required. Issues of non-compliance raised by the ECO must be taken up by the Project Manager, and resolved with the Contractor as per the conditions of his contract.

The responsibilities of the ECO are further listed below

- Be aware of the findings and conclusions of all EA related to the development;
- Be familiar with the recommendations and mitigation measures of this Environmental specification;
- Be conversant with relevant environmental legislation, policies and procedures, and ensure compliance with them;
- Undertake regular and comprehensive site inspections / audits of the construction site according to the generic Environmental specification and applicable licenses in order to monitor compliance as required; - Educate the construction team about the management measures contained in the Environmental specification and environmental licenses;
- Compilation and administration of an environmental monitoring plan to ensure that the environmental management measures are implemented and are effective;
- Monitoring the performance of the Contractors and ensuring compliance with the Environmental specification and associated Method Statements;

- In consultation with the Developer Site Supervisor order the removal of person(s) and/or equipment which are in contravention of the specifications of the Environmental specification and/or environmental licenses;
- Liaison between the DPM, Contractors, authorities and other lead stakeholders on all environmental concerns;
- Compile a regular environmental audit report highlighting any non-compliance issues as well as satisfactory or exceptional compliance with the Environmental specification;
- Validating the regular site inspection reports, which are to be prepared by the contractor Environmental Officer (CER);
- Checking the CER's record of environmental incidents (spills, impacts, legal transgressions etc.) as well as corrective and preventive actions taken;
- Checking the CER's public complaints register in which all complaints are recorded, as well as action taken; This gazette is also available free online at [www.gpwonline.co.za](http://www.gpwonline.co.za) 38 No. 42323 GOVERNMENT GAZETTE, 22 MARCH 2019
- Assisting in the resolution of conflicts;
- Facilitate training for all personnel on the site – this may range from carrying out the training, to reviewing the training programme of the Contractor;
- In case of non-compliances, the ECO must first communicate this to the Senior Site Supervisor, who has the power to ensure this matter is addressed. Should no action or insufficient action be taken, the ECO may report this matter to the authorities as non-compliance; - Maintenance, update and review of the Environmental specification;
- Communication of all modifications to the Environmental specification to the relevant stakeholders.

### **Contractor Environmental Officer (CER)**

The CER reports to the RW ECO. The contractor on site may not interfere with the duties and responsibilities of the CER. The contractor may also not negatively influence the CER in any way that does not positively impact on the environmental monitoring of the site.

As a minimum the CER shall meet the following qualification criteria:

- Qualification must include an environmental related diploma, that has environmental legislative aspects included.

- Have one to two years' experience with onsite environmental monitoring of construction activities.
- The presence of a CER is a full time position and must be available for all activities during all parts of the project life cycle. However, during the liability and rehabilitation period or when the project is on hold, the CER may be relieved of his duties, pending the environmental risks associated during this period. Where the risks are minimal, the ECO may take over the subsequent phases of the project environmental monitoring.

The CER is appointed at a level such that she/he can interact effectively with other site Contractors, labourers, the Environmental Control Officer and the public.

#### Responsibilities of the CER

- Be on site throughout the duration of the project and be dedicated to the project;
- Ensure all their staff are aware of the environmental requirements, conditions and constraints with respect to all of their activities on site;
- Implementing the environmental conditions, guidelines and requirements as stipulated within the EA, Environmental specification and Method Statements;
- Attend the Environmental Site Meetings;
- Facilitates corrective actions where non-compliances are reported within the stipulated timeframes;
- Report back formally on the completion of corrective actions;
- Assist the ECO in maintaining all the site documentation;
- Prepare the site inspection weekly and monthly reports and corrective action weekly and monthly reports for submission to the ECO;
- Assist the ECO with the preparing of the weekly and monthly report; and
- Where more than one Contractor is undertaking work on site, one cEC will oversee all contractors.

#### **Contractor**

The contractor is responsible for implementation and enforce compliance with the requirements of the ENVIRONMENTAL SPECIFICATION and conditions of the EA's, contract and relevant environmental legislation. The Contractor takes full responsibility for his subcontractors. He must



ensure that all sub-contractors have a copy of and are fully aware of the content and requirements of this ENVIRONMENTAL SPECIFICATION, EMP and the EA. The contractor is required, where specified, to provide method statements, setting out in detail how the management actions contained in the ENVIRONMENTAL SPECIFICATION, EMP and the EA will be implemented.

The contractors are required, where specified, to provide Method Statements setting out in detail how the impact management actions contained in the Environmental specification, EMP and the EA will be implemented during the development or expansion of substation infrastructure for the transmission and distribution of electricity activities

#### Responsibilities of the contractor

- project delivery and quality control for the development services as per appointment;
- employ a suitably qualified person to monitor and report to the Project Developer's appointed person on the daily activities on-site during the construction period;
- ensure that safe, environmentally acceptable working methods and practices are implemented and that equipment is properly operated and maintained, to facilitate proper access and enable any operation to be carried out safely;
- attend on site meeting(s) prior to the commencement of activities to confirm the procedure and designated activity zones;
- ensure that contractors' staff repair, at their own cost, any environmental damage as a result of a contravention of the specifications contained in Environmental specification, to the satisfaction of the ECO.
- The Contractor is deemed not to have complied with the Performance Specifications if:
- There is evidence of environmental negligence and / or mismanagement resulting in negative impacts on the environment.
- The contractor will be informed via monitoring and auditing reports as well as by means of direct instruction as to what corrective actions are required in terms of environmental compliance:
- Disregard for instruction, and failure to respond adequately to complaints from the public will be construed as non-compliance.

- Non-compliance may lead to the contractor forfeiting his environmental retention or being penalized. (see penalties for more detail in more serious cases, the project manager may give notice, and then halt construction works until such a time that the contractor has upgraded his site to comply with the performance specifications. Resultant delays may not be claimed, and will be for the contractor's own cost.
- In prolonged cases of persistent non-compliance, the contractor may be evicted from site. Only the project manager may issue such instruction, retaining any costs required to remedy situations perpetuated by environmental negligence, mismanagement and / or non-compliance.

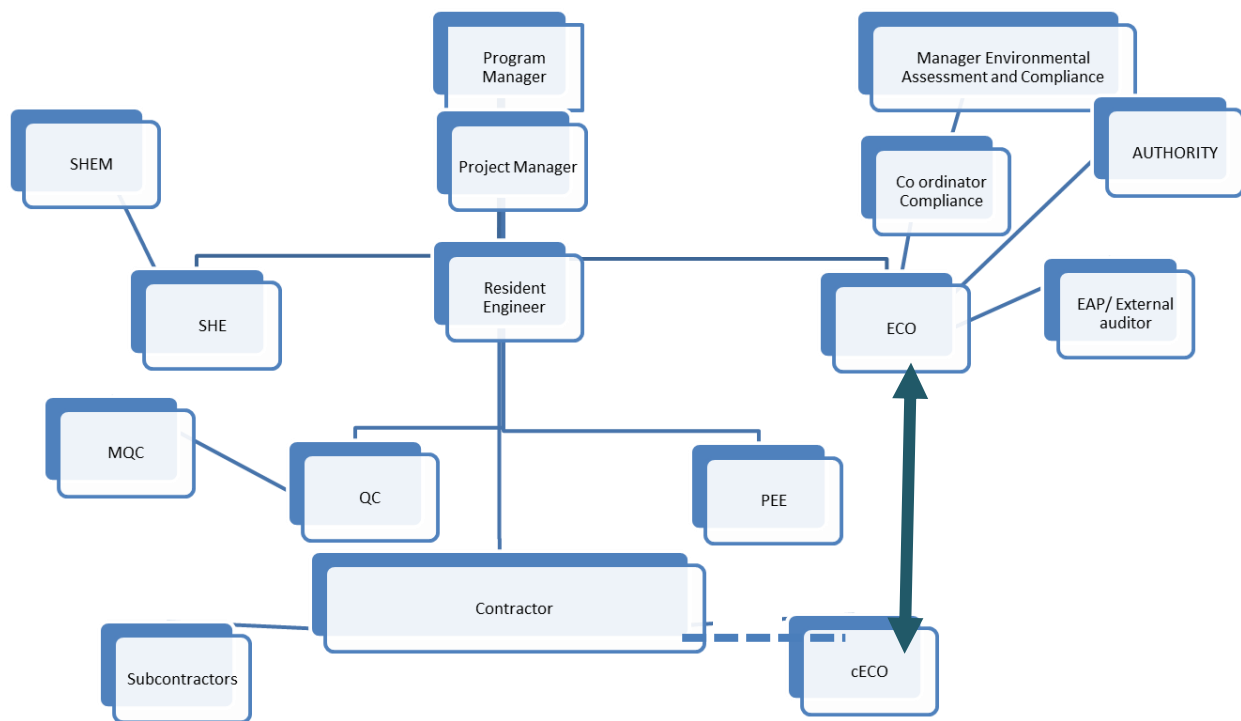
### **Employees on the Project**

The contractor is responsible for adequately informing his employees and sub-contractors of all relevant information relating to the environmental management of the site. Employees are responsible for the environmental management of the site. They must be made aware of their responsibilities during induction and awareness sessions. some of which are: Familiarizing themselves with their workplaces with respect to environmental related issues.

### **Project Liaison Officer**

Depending on the size and complexity, and sensitivity of the project, the appointment of a liaison officer may be required for the duration of the contracted work.

The organogram describes the relationship of the ECO on the construction site with construction team



**Figure 1 an example of an organogram of construction people on a project**

## **8. OUTCOMES/ACTION / PROCEDURE / METHOD**

The control of generally occurring impacts:

During the construction of the reservoir, associated pipelines and structures the impacts are regulated by legislation. There are anticipated to be many impacts that will occur directly or indirectly as a result of this work. All anticipated and known impacts are dealt with in this document and suggested mechanisms to mitigate the negative impacts are addressed.

The list of the identified general accruing activities that follow are discussed in relative detail and aim to address objectives with suggestion on how to achieve the objective. Opportunity to achieve the outcome can be site specific and be resolved in other ways with the approval of the ECO.

A legislative frame work is provided below.

Several laws and regulations apply to the protection of the environment and contain environmental principles and standards that need to be applied and permits and licences that need to be obtained. This Environmental specification will be subject to regulatory control under a range of National, Provincial and Local regulations. Such legislation largely embraces pollution prevention, resource use and conservation, and socio cultural (heritage) protection. This chapter reviews legislation pertaining to the proposed development.

According to Section 2 (1, 2 & 3) of the National Environmental Management Act No. 107 of 1998 (NEMA), all organs of state have to apply certain principles set out in NEMA when taking decisions that may significantly affect the environment. The key principles of this Act include that all —actionsll that they approve must be economically, socially and environmentally sustainable. It further states that —people and their needsll must be at the forefront of —its concernll and their interests must be served equitably. The intent of this Environmental specification is to ensure that the Applicant conducts all its activities related to the operation and maintenance of this parking in accordance with the provisions of the NEMA, and has taken into account the provisions of the Constitution and the principles of Integrated Environmental Management. Key environmental legislation that has been considered in preparation of this G-Environmental specification are outlined in the table below:

**TABLE 1 List of relevant legislation that must be considered in implementing an Environmental specification**

<b>Title of legislation, policy or guideline</b>	<b>Applicability to the project</b>	<b>Administering authority</b>	<b>Date</b>
Constitution of the Republic of South Africa Act (Act No. 108 of 1996)	Comply with the current constitution. Protection of human rights and environment of the study area.	National and Provincial	18 December 1996
National Environmental Management Act (Act No. 107 of 1998)	Comply with requirements for environmental authorisation for this development. Protection of the environment of the study area and surroundings.	National and Provincial	27 November 1998
Environmental Impact Assessment Regulations, 2014, promulgated in terms of Section 24(5) of NEMA.	Listed activities applied for environmental authorisation for this development.	National and Provincial	04 December 2014 (as amended)
National Water Act (Act No. 36 of 1998)	Comply with requirements for a Water Use License for this development. Protection of Water resources and the environment.	National and Provincial	26 August 1998
National Environmental Management: Biodiversity Act, (Act No. 10 of 2004)	Ensuring biodiversity is protected such as the critically endangered Juliana's golden mole.	National and Provincial	07 June 2004
National Environmental Management: Protected Areas Act, (Act No. 31 of 2004)	Ensure the adequate management of Protected Areas in the study area.	National and Provincial	11 February 2005
National Environmental Management: Air Quality Act (Act No. 39 of 2004)	Air quality management and prevention of air pollution.	National and Provincial	24 February 2005
Conservation of Agricultural Resources Act (Act No. 43 of 1983)	Ensuring protection of agricultural resources, if any.	National and Provincial	21 April 1983
National Forests Act (Act No. 84 of 1998)	Ensuring that no protected trees in terms of the act are removed, disturbed, destroyed without requisite permit.	National and Provincial	30 October 1998
National Environmental Management Waste Act, (Act No. 59 of 2008)	Ensuring that waste products are managed successfully.	National and Provincial	10 March 2009
National Heritage Resources Act (Act No. 25 of 1999)	Ensuring protection of heritage resources in the study area.	National and Provincial	28 April 1999
Occupational Health & Safety Act (Act No. 85 of 1993)	Ensuring that health and safety is practiced during construction of the proposed development.	National and Provincial	23 June 1993

<b>Title of legislation, policy or guideline</b>	<b>Applicability to the project</b>	<b>Administering authority</b>	<b>Date</b>
Explosives Act (Act No. No. 15 of 2003)	Authorisation may be required for blasting activities during construction.	National and Provincial	January 2004
Promotion of Access to Information Act 2 of 2000 (PAIA)	Gives effect to the constitutional right of access to any information held by the State and any information that is held by another person and that is required for the exercise or protection of any rights.	National and Provincial	March 2001
SANS 10103:2008	This standard covers method and gives guidelines to assess working and living environments with respect to acoustic comfort, excellence, and with respect to possible annoyance by noise (i.e. whether complaints can be expected).	National and Provincial	January 2008
SANS 10328:2008	Specifies the methods to assess the noise impacts on the environment due to a proposed activity that might impact on the environment. The standard also stipulates the minimum requirements to be investigated for an EIA.	National and Provincial	2008
Gauteng Conservation Plan	Ensuring protection of areas designated as Conservation Priority Areas, Critical Biodiversity Areas and Ecological Support Areas.	Provincial	December 2010
Gauteng Ridges Policy	Conservation of ridges and the area immediately surrounding the ridges, which provide habitat for a wide variety of fauna and flora, some of which are Red List, rare or endemic species or, in the case of certain of the plant species, are found nowhere else in South Africa or the world. The proposed development occurs on a Class 2 Ridge.	Provincial	23 June 2006
Gauteng Guidelines for Biodiversity Studies	Ensuring the requirements for Specialist Studies are met for this development.	Provincial	March 2014
SANBI Grassland Ecosystem Guidelines	These Ecosystem Guidelines are part of a larger focus of work in grassland ecosystems, coordinated under the SANBI Grasslands Programme	National and Provincial	2013
National Veld and Forest Fire Act (Act No. 101 of 1998)	Prevention of veld fires during construction.	National and Provincial	April 1999
Gauteng Environmental Management Framework	Identify areas where certain types of development would be compatible, conditionally compatible, and undesirable.	Provincial	November 2014

Title of legislation, policy or guideline	Applicability to the project	Administering authority	Date
Fencing Act (Act No. 31 of 1963)	To consolidate the laws relating to fences and the fencing of farms and other holdings and matters incidental thereto.	National and Provincial	27 April 1963
National Road Traffic Act (No 93 of 1996)	Rand Water and the contractor will obey traffic laws by driving at minimal speed approved by local authorities.	National and Provincial	1996
National Water Resource Strategy version 2	<p>The National Water Resource Strategy 2 sets out how to achieve the following core objectives:</p> <p>water supports development and the elimination of poverty and inequality;</p> <p>water contributes to the economy and job creation; and</p> <p>water is protected, used, developed, conserved, managed and controlled sustainably and equitably.</p>	National/Provincial	June 2013
All relevant Provincial regulations and Municipal bylaws	Rand Water and the Contractor will obey and abide by provincial and municipal bylaws which are related to the proposed project.	Provincial and Local	-
Hazardous Substances Act (Act No. 15 of 1973).	<p>This Act regulates the control of substances that may cause injury, or ill health, or death due to their toxic, corrosive, irritant, strongly sensitizing, or inflammable nature or the generation of pressure thereby in certain instances and for the control of certain electronic products. To provide for the rating of such substances or products in relation to the degree of danger; to provide for the prohibition and control of the importation, manufacture, sale, use, operation, modification, disposal or dumping of such substances and products.</p> <p>Group I and II: Any substance or mixture of a substance that might by reason of its toxic, corrosive etc., nature or because it generates pressure through decomposition, heat or other means, cause extreme risk of injury etc., can be declared to be Group I or Group II hazardous substance;</p> <p>Group IV: any electronic product;</p>	Department of Health	1973

Title of legislation, policy or guideline	Applicability to the project	Administering authority	Date
	Group V: any radioactive material. The use, conveyance, or storage of any hazardous substance (such as distillate fuel) is prohibited without an appropriate license being in force.		
Nature Conservation Ordinance (Act 19 of 1974)	<p>Article 63 prohibits the picking of certain flora (including cutting, chopping, taking, gathering, uprooting, damaging or destroying). Schedule 3 lists endangered flora and Schedule 4 lists protected flora.</p> <p>Article 26 to 47 regulates the use of wild animals.</p>	National Department of Environmental Affairs	1974
Conservation of Agricultural Resources Act (Act No 43 of 1983).	<p>Regulation 15 of GNR1048 provides for the declaration of weeds and invader plants, and these are set out in Table 3 of GNR1048. Declared Weeds and Invaders in South Africa are categorized according to one of the following categories:</p> <ul style="list-style-type: none"> <li>• Category 1 plants: are prohibited and must be controlled.</li> <li>• Category 2 plants: (commercially used plants) may be grown in demarcated areas providing that there is a permit and that steps are taken to prevent their spread.</li> <li>• Category 3 plants: (ornamentally used plants) may no longer be planted; existing plants may remain, as long as all reasonable steps are taken to prevent the spreading thereof, except within the flood line of watercourses and wetlands.</li> </ul>	National Department of Environmental Affairs	1983
The Gauteng Conservation Plan (Version 3.3) (GDARD, 2011)	The plan has classified areas within the province on the basis of its contribution to reach the conservation targets within the province. Critical Biodiversity Areas (CBAs) contain irreplaceable, important and protected areas (terms used in C-Plan 2) and are areas needed to reach the conservation targets of the Province. In addition, 'Ecological Support Areas' (ESAs), mainly around riparian areas and other movement corridors were also classified to ensure sustainability in the long term. Landscape features associated with ESAs is essential for the maintenance and generation of biodiversity in sensitive areas and requires sensitive management where incorporated into C-Plan 3	National Department of Environmental Affairs	2011
Promotion of Access to Information Act, 2000 (Act No 2 of 2000):	Legislation that allows the public access to information about activities that influence their well-being and to make contributions to decision making.	National Department of Environmental Affairs (DEA) – lead authority.	2000



Title of legislation, policy or guideline	Applicability to the project	Administering authority	Date
		Provincial Environmental Department (GDARD) - commenting authority.	

## **9.1 Administrative matters:**

### **Outcome/Objectives:**

To ensure that all administrative responsibilities are clearly understood and undertaken to enable compliance to the environmental specification.

To provide proof of all compliances actions required

### **Actions:**

The following action are recommended to ensure administrative compliance:

#### **9.1.1 Understanding of compliance**

- All people on site will undergo site environmental induction.
- Environmental monitoring, (weekly and monthly reports) are undertaken to highlight progress in terms of compliance.
- Progress meetings will have environmental matters on the agenda

#### **9.1.2 Auditing requirements**

- All documents relating to auditing must be available in the environmental file.
- Progress in terms of closing findings must be tracked.
- Timeframes for closing finding must be adhered to and failure to comply to timeframes may result in Penalties
- Proof of compliance must be easily available.
- Auditing will follow the ECO protocol

#### **9.1.3 A site environmental file**

- a. The contractor is required to prepare an Environmental Management file that will to be available on site at all times. The file with the required information to be review and approval prior to commencement of works by the RW. The contractor will be required to comply to all contents of the method statements once approved by the ECO.

**The file contents of the file will contain the following items.**

1. Risk assessment to identify potential emergencies and emergency preparedness (This must also contain emergency preparedness with telephone numbers to react to emergencies)
2. Permits and licenses where applicable
3. Environmental specification
4. Environmental audit reports
5. Complaints register
6. Agreements with landowners or other stake holders.
7. Noncompliance notifications and penalties
- 8.. Reporting of environmental incidence
9. Waste disposal documentation
10. Safety data sheet for all chemicals
11. Method statements
12. Appointment details of the ECO and or CER

The environmental representative will provide a letter and report after the file has been assessed, with amendments to be made if needed prior to approval.

<b>PROCESS</b>	<b>ENVIRONMENTAL SPECIFICATION PART OF TENDER DOCUMENTS</b>	<b><u>IF NO SPECIFICATION IS INCLUDED AS PART OF TENDER DOCUMENTS</u></b>
1. Time allowed for preparation of Environmental plan/file by the Contractor	1 week	2 weeks
2. Submission of environmental file	On the 8 <sup>th</sup> day	On the 15 <sup>th</sup> day
3. *Environmental Control Officer to review the environmental file	3day – Notify PM & Contractor immediately of outstanding issues	1 day– Notify PM & Contractor immediately of outstanding issues

4. **Time allowed for submitting outstanding documents to Client i.e. to EAC or PM	2 day	1 day
5. ***Final Submission and Approval	1 day	1 day

#### 9.1.4 The required method statements

##### Outcome/objective

The method statements are intended to confirm and approve upfront the contractors approach to achieving all the environmental outcomes.

##### Actions

The contractor is required to provide method statements which will be kept in the environmental file.

The following method statement are required to show procedures for dealing with possible emergencies that can occur, such as

- **Administrative matters:**

Method Statement for control of environmental awareness, training and induction of employees

Method statements are required in terms of the following emergencies

- i. Removal bees and snakes and other fauna that require specialist to be call to site.
- ii. Obtain the services of a heritage specialist in the event that artifacts, or bones are discovered on site.

- **Social integration of project to the public**

Method Statement for control of noise

Method Statement for the interruption of services

Method Statement for managing the visual intrusion impacts on site

- **Establishment of a construction campsite and working area**

Method Statement for control of ablutions/toilets

Method statement for control of fire risk and burning

Method statement for control of demarcated areas

Method statement for control of fencing:

Method Statement for decommissioning of all construction campsites and working area

Method Statement for stripping topsoil

- **Pollution prevention**

Method statement for control of general waste

Method statement for control of waste water

Method statement for control of storage of fuel and other hazardous materials

Method statement for controlling of all pollution to water sources

Method Statement for dust control, including water source to be used;

Method Statement for the storage and handling of hazardous substances;

Method Statement for management of concrete works, including associated washing facilities for equipment and concrete truck drums and shoots;

A method statement is required for the each following actions

- i. Accidental drips, leaks and spillage of carbon fuels and oils, which are,
- ii. negligible (0-10l),
- iii. minor (10,1l to 100l)
- iv. major (100l and above.
- v. Oil spillages in sensitive areas such water courses

- **Preservation of the environment**

Method Statement for protecting the fauna and flora on and around the construction site.

A method statement is required for the fire prevention and management on site and at each working front to adequately cope will all fire events. No fire will damage property on site or on neighboring areas is acceptable

Method Statement for managing storm water during the construction phase;

Method Statement for drainage line diversions;

Method Statement for controlling alien invasive species and noxious weeds;

Method Statement for the decommissioning of the construction works area; and

Method Statement for rehabilitation of construction footprint.

Method Statement for protecting top soil from degradation and loss such as from storm water and other mismanagements.

Method Statement for the protection of archeological artifacts

Method Statement for the scenic quality of the site

#### **9.1.5 Reporting of environmental incidence**

- All environmental incidents such as pollution (air, water, land, noise, etc.), bird kills, animals killed, plants destroyed, public complaints etc. must be reported to Rand Water Project Manager and SAM environmental officer .
- Where applicable, RW Project Manager or SAM Environmental Officer will inform the Environmental Control Officer/Advisor within 24 hours of its occurrence for further further assistance on the investigation and reporting to Government Authorities.
- All environmental incidents occurring on site must be recorded, detailing how each incident was dealt with. Proof thereof must be kept in an incident register.
- The Contractor will be held liable for any infringement of statutory requirements of the National Environmental Management Act of 1998 or any other relevant legislation.

#### **9.1.6 Signing off of work by the ECO**

- No project should be signed off before Site Risk Control/SAM SHEQ/ECO has given assurance that no environmental liabilities exist. The Responsible Person, Project Manager, SAM/Site Risk or Environmental Advisor shall carry out a physical inspection before acceptance of work done.
- No invoice to be processed before work is accepted.
- The Contractor shall be conversant and in the course of carrying out the Works the Contractor shall comply with the provisions of all Acts, regulations, ordinances, by-laws, Standards, Codes, Rules and requirements of public, municipal and other authorities.
- The Project Team may at any time without notice to the Contractor examine and investigate the Contractors' compliance with all Applicable Legislation and the environmental management conditions.
- At all times during the execution of the Works, the Contractor shall preserve and protect the natural environment in the general area of the site and the external areas that may be affected by his operations.

- In the event of any perceived conflict between the “environmental laws” and the Contract documents, the Contractor shall, prior to commencing the Work, refer such conflict to the Project Management Team for clarification.

#### **9.1.7 Penalties as per Rand Water standards**

- The penalty system as indicated in the contractor’s contract will be used to penalise contractor for non-conformances to the Environmental specification or any other environmental damage caused by the contractor.
- The responsibility of the project manager is to implement the penalty.
- The ECO must recommend penalties when required for the projects managers’ attention according to the table below.
- Penalties shall be enforced on the principal contractor for SHE related non-conformances identified for both the Principal Contractor and/or his/her sub-contractor(s) and/or supplier(s) pertaining to Rand Waters SHE requirements.
- Penalties applied will be according to the following tables and where issued, the amount indicated on the non-conformance will be deducted from the certificate of the PC. Failure or refusal on the part of the PC or their Contractors to take the necessary steps to ensure the safety of workers and the general public in accordance with these specifications or as required by statutory authorities or ordered by the engineer, shall be sufficient cause to apply penalties.
- To note is that environmental penalties will be deducted in the same manner as all SHE fines.
- In cases where a penalty has been issued and the contractor provides reasonable evidence to support the non-issue of the penalty, the client / CCHSR may withdraw the penalty.

- In terms of the Conventional Penalties Act (1962) a creditor is not entitled to recover both the penalty and damages,
- Accordingly, where a Contractor causes damage, Rand Water can either enforce a penalty or make the Contractor make good the damage, but not both.
- The Contractor is deemed NOT to have complied with this specification if: -
  - Within the boundaries of the site, site extensions and access roads there is evidence of contravention of the requirements of the EMP;
  - Environmental damage ensues due to negligence;
  - The Contractor fails to comply with corrective or other instructions issued within a specific time;
  - The contractor fails to comply with a site instruction given from the Engineer based on the ECO report;
  - The Contractor fails to respond adequately to complaints from the public;
  - Legal action is instituted against the developer in terms of Environmental laws.
- Payment of any fines in terms of the contract will not absolve the offender from being liable to prosecution in terms of any law or absolve the contractor from correcting the unsatisfactory non-conformance.
- The items in the list below provide a guideline for typical non-conformance's that are recommended for penalties, but this list may be extended according to the situation at hand.



## PENALTY TABLE

Recommended amount to be deducted from Contractor: (Circle amount)

SHEQ-Contractor Management	Value Of Contract (Excl. VAT.) in millions R				
ITEMS ATTRACTING PENALTIES	<1	≥1<5	≥5<20	≥20<50	≥50
a) SHE non-conformances, corrective and preventative actions not resolved within the agreed target dates exceeding 5 days (Rands)	1,000	5,000	10,000	10,000	10,000
b) Non-reporting of SHE incidents and statistics within the required timeframe within 24 hours ( Rands)	1,000	5,000	10,000	10,000	10,000
c) Repeat SHE non-conformances (Rands)	2,000	10,000	20,000	20,000	20,000
d) Overtime Work without the required approvals (Rands)	2,000	10,000	20,000	20,000	20,000
e) Other	2,000	10,000	20,000	20,000	20,000

Amount recommended to be deducted from contractor for spot fine/s (Rands):

Over and above the details relating to the penalties noted in the RW SHE Management System, and Tender document, spot fines will be issued as follows, according to 'minor', 'medium' or 'severe' non-conformances. **Spot fines do not absolve the issuing of penalties if not resolved**

MINOR:			MEDIUM			SEVERE		
Value of Contract (Excl VAT.) in millions R			Value of Contract (Excl VAT.) in millions R			Value of Contract (Excl VAT.) in millions R		
<1	≥1<5	≥5<20	<1	≥1<5	≥5<20	<1	≥1<5	≥5<20
Penalty: R5/count			Penalty: R/count and a non-conformance			Penalty: R/count, a non-conformance and/or activity stoppage		
R 10	R 25	R 50	R 25	R 250	R 500	R 250	R 2500	R 5000

### **Examples of Medium incidence**

- Eating meals outside of designated areas:
- Individual not making use of site ablution facilities:
- Spot fine for littering by an individual

### **Examples of Medium incidence**

- Vehicles, plant equipment or material outside of the demarcated site:
- Poor house keeping

### **Examples of server incidence**

- Gross poor house keeping
- Weeds that have gone to seed
- Contractors working without environmental approval of actions outside of the approved method statements and approved authorisation.
- Contractors working without inductions
- Access into a designated 'no-go area: excluding specific costs that may be required to rehabilitate this which will be charged to the contractor;
- Un authorized contract staff/ workers/ or other project people, found outside of the authorized areas of the working strip /footprint:
- Persistent un-repaired machinery leaks on site and not in designated areas
- Lighting of fires outside of designated areas:
- fires that are caused by the contractor and result in damaging the environment will be assed according to the monetary damage and the environmental damage and issued at the discretion of the project manager;

- Persons, vehicles, items or plant causing a public nuisance;
  - Erosion: Cost to rehabilitate plus 20% per incident;
  - Oil spills
  - Unauthorized damage to vegetation: Cost to replace plus 20% per incident;
  - Unauthorized damage to the environment: Cost to rehabilitate plus 20% per incident;
  - Unauthorized damage to cultural historical sites or other sensitive sites: to a maximum of R100 000 per incident;( however all cost for restoration and relative specialist such heritage specialist or wet land specialist must also be covered)
  - Unauthorized damage or deformation of small trees; This excludes costs for protect species that were demarcated
  - Mismanagement/ loss of topsoil excluding cost for replacement of topsoil
- Absence of the reference to a possible spot fine or penalty for non-conformance does not mean one cannot be issued.
  - All aspects will link to legal non-compliance or risks identified in the Environmental Specification or work being done at the time. The 2 forms of penalties will be used together, with immediate penalties issued as they apply.
  - In addition, a time-related penalty of R500,00 per hour over and above the fixed penalty may be deducted for non-compliance to rectify any non-conformance within the allowable time after a site instruction to this effect has been given by the Designer. The site instruction shall state the agreed time, which shall be the time in hours for reinstatement of the defects. Should the Contractor fail to adhere to this instruction, the time-related penalty shall be applied from the time the instruction was given.
  - Failure to comply with any/all of the environmental specification / EMP, approved method statements and applicable authorisations, shall be assigned punitive measures in the form of

penalties and/or spot fines. The details of the penalty issued shall be recorded on form SAM EAC 00018 F Notice to Penalise Contractor due to Environmental Non-Conformances by the relevant EAC representative, signed off by the Project Manager, EAC Manager, Construction Services Manager and Programme Manager, and finally approved by MANCO.

#### **9.1.8 Compliance with environmental protection specifications**

##### **Objectives:**

Contractors, employees and subcontractors to all comply with environmental protection specifications as laid out in this document.

Work stoppage for non-compliances actions

##### **Actions:**

- a. Any employees of the Contractor or his sub-contractors found to be in breach of any of the Environmental Protection specifications may be ordered to leave the site forthwith, stop work or be instructed to provide corrective actions.
- b. Supervisory staff of the contractor, Rand Water, or sub-contractors shall not direct any person to undertake any activities, which would place such person/organization in contravention to any law, regulation or the Environmental specification itself.
- c. The main contractor is liable for all subcontractors on site for environmental compliances
- d. Depending on the type of contravention or action it may also be necessary for the work to be called to a halt until such time as the contravention or action is corrected and investigated.
- e. Penalties may be awarded for non-compliance. These penalties will be administrated by the site project manager. A record of penalties may be kept for the adjudication of environmental performance on later tenders.
- f. No compensation will be awarded for lack of production due to work stop ages or delays in line with poor environmental performances
- g. The Client/Agent's representative reserves the right to stop work and issue a work stoppage non-conformance report whenever safety, health or environmental violations are observed for both Principal Contractors and/or their sub-contractors. Expenses incurred as a result of such work stoppage and standing time shall be for the Principal Contractors account. Any non-

conformances/findings/observations found in these audits/inspections on sub-contractors shall be raised and discussed with the relevant Principal Contractor (with whom the sub-contractor is contracted with).

The conditions that lead to work stoppages are based on:

- Management of change – this is when there are changes to the work environment (e.g.: climatic changes) and/construction work (e.g.: modifications to the design), in any phase of the construction project, and/or amendments with regards to Rand Water rules and regulations and/or legislative amendments;
- Unsafe acts/behaviors that pose a hazard to the wellbeing of the environment or contravene a legal requirement of environmental legislation. Alternatively, where artefacts of heritage origins are discovered.

The process to be followed to ensure the worksite is rendered safe:

- The relevant activity must be stopped;
- The Rand Water site/project manager and/or Principal Contractor and his subcontractors shall immediately remove the workforce from the work area and correct the health and safety or environmental deficiencies by allowing only the people in the area that are competent to make the area safe.
- Principal Contractor and his subcontractors shall ensure that no other work is being performed during this time. Should the estimated time from the outset to make the area safe where life threatening/imminent danger situations exist, then the area will be barricaded and a sign placed with the wording “Unsafe Area/ No go area – Authorized Access Only”.
- The Rand Water Site/Project Manager shall review the affected parts/sections of the Environmental specification and method statements with the purpose of providing sufficient SHE information to the principal contractor when necessary.
- The principal contractor shall then revise the relevant sections in the Environmental specification and method statements to accommodate the changes.
- The Rand Water Site/project manager must ensure that the revised provisions in the Environmental specification and method statements plan are adequate and must approve it before the work activity is commenced.

- Before the workforce is allowed back in the area, Principal Contractor and his subcontractors shall ensure:
- Investigation of the work stoppage and the area is to re-inspected by Contractor Safety Officer and supervisor and corrective actions taken documented on the work stoppage form;
- Sign off of the “Work Stoppage report” issued by the Rand Water Site/Representative/RW ECO to declare the area/activity/person/plant/or equipment safe for work.
- Refer to requirements of relevant legislation.
- The site must be clean on completion of all works

### **9.1.9 Emergency preparedness funding**

#### **Objectives:**

To provide funding for and actions relating to emergencies.

#### **Actions**

Conduct a risk assessment of possible emergencies that would require external services and reactions

- Fire call outs
- Rescue of bees snakes and other fauna
- Spillages of hydrocarbons on large scale requiring external services.
- Sewerage spillages requiring external services to clean up
- Services of specialist such as archeologist or paleontologist
- The contractor must make funds available for emergency preparedness. This may include the following services.

### **9.1.10 Checklist of minimum environmental provisions on site**

#### **Objective:**

The checklist is aimed at a high level guideline for budget provision of provisions to be able to implement the Environmental specification. It must be read in-conjunction with the whole RW Environmental specification document and does not exempt any other clause that has been stipulated for compliance

within this RW Environmental specification document. In the event of apparent contradiction, the condition within the RW Environmental specification document, will apply above the checklist.

## Actions

The payment items for Environmental issues are contained in the Commercial Part of the Tender Document i.e. Bill of Quantities. These may include the following layout and items

Item	Description
<b>NO1.</b>	<p><b>Administration and documentation</b></p> <p>The rate for this item must cover all expenses incurred in the preparing and maintenance of an environmental file which includes but will not be limited to permits and licenses, EMPr Environmental specification., Environmental audit reports, Complaints register, Agreements with landowners, Noncompliance notifications, Waste disposal documentation, Safety data sheets for all chemicals</p> <ol style="list-style-type: none"> <li>1 Permits and licenses</li> <li>2 Environmental specification</li> <li>3 Environmental audit reports (acceptance of work)</li> <li>4 Complaints register</li> <li>5 Agreements with landowners or other stake holders.</li> <li>6 Noncompliance notifications</li> <li>7 Waste disposal documentation</li> <li>8. Reporting of environmental incidence</li> <li>9.Safety data sheet for all chemicals</li> <li>10.Method statements</li> <li>11. Emergency preparedness</li> <li>12. Appointment details of the CER</li> </ol>
	<p><b>Appointment of a qualified on site environmental officer</b> with a minimum of one year's appropriate experience</p>
<b>No2</b>	<p><b>Emergency preparedness funding</b></p> <ol style="list-style-type: none"> <li>a) Provision for bee, snake and other fauna removal</li> <li>b) Provision for hydrocarbon spillages that require intervention from professional clean up provider</li> <li>c)Provision to clean up sewage spillages</li> <li>d) Equipment for fire fighting</li> </ol>

	e) Call out of fire department
No 3	<b>Environmental awareness and training</b> The rate for this item shall include costs for environmental awareness and training
No 4	<b>Social integration of the project to the public</b> The rate for this item shall include costs for establishment of construction campsite and working areas
No 5	<b>Establishment of site camp and works area.</b>
	<b>Signage</b> The rate for this item must cover all expenses incurred in preparing signage at the entrance of the site offices indicating the following information <ul style="list-style-type: none"> <li>• The contractor's contact numbers</li> <li>• Authorisations details</li> <li>• ECO details</li> <li>• Emergency numbers and provision for: – snake removal, bee removal, fire, large hydrocarbon spillages, sewerage spillages</li> </ul> Signage measuring 30mmx30mm must also be made available for no go areas.
	<b>Barricading and demarcation</b> <ul style="list-style-type: none"> <li>a. Screening for unsightly works</li> <li>b. Clear demarcating of the working foot print</li> <li>c. Barricading of sensitive no go areas</li> </ul>
No 6	<b>Pollution prevention and preservation of environmental resources</b> The rate for this item shall include costs for pollution prevention and preservation of environmental resources
	Cleaning the site of litter and rubble
	Waste removal
	The rate for this item shall include costs for Identification and reduction or elimination of activities, areas, or processes which create excessive waste products or pollutants. <ul style="list-style-type: none"> <li>a) Spillage kits to clean up spillages</li> <li>b) Waste bins and receptacles that comply with the waste clauses of the Environmental specification.</li> <li>c) Appropriate skips for waste separation</li> <li>d) Barricading the demarcation of edge of the working area if no entry is required</li> <li>e) Hard impervious surfaces for storage of chemicals</li> <li>f) Bunding facility for hazardous products</li> <li>g) Labelled containers for decanting of liquids</li> <li>h) Providing silt control measures when required</li> <li>i) Provide water source for dust suppression on site</li> </ul>
No 7	<b>Retention provision for final clean up</b> inspection of the site <ul style="list-style-type: none"> <li>a) ECO to inspect the site that all rubble and litter are cleaned up</li> <li>b) All soil levels are reinstated adequately for rehabilitation</li> </ul>



### **9.1.11 Environmental awareness, training and induction of employees**

#### **Objectives:**

Improved environmental management of the site and surrounds through training and communication

Inductions provide for awareness of staff on site. The actions enable consistence and documentation of the process

#### **Actions:**

- a) Employees must acquire a basic understanding of the key environmental features of the work site and environment.
- b) Employees are to be made aware of any other environmental matters, such as pollution, protection of fauna and flora, ablution facilities, hazardous waste, and any other matter raised in the Environmental specification.
- c) Proof of induction of all staff and sub-contractors will be required to be kept on file.
- d) An attendance register must be taken.
- e) Water wise information to be passed on to staff to encourage water saving and preventing water pollution also waste disposal.
- f) Training of site personnel in environmental matters is to be on-going, and where formal training is deemed required, it is to be provided, where possible, by accredited training service providers.
- g) Labourers from the local community shall not be allowed to perform work unless if they have been informed of the work and if received formal or informal training on the work pertaining environmental specification.
- h) Visitors to the site shall be required to undergo and comply with the Principal Contractor construction site SHE induction requirement(s) and other access/screening protocols prior to being allowed access to site.
- i) All visitors accessing the site for duration of less than 8 hours will undergo a short induction for which they are expected to sign for and be issued with a Temporary Visitors card. All visitors accessing the site for more than one day will undergo a full SHEQ induction. The parents of children (minors) visiting the site will need to sign a consent form issued by the contractor, prior to them being granted access to the site.

- j) Visitors are to be made of aware of any legal environmental authorisations that exist on site and any relevant aspects that relate to the nature of the visit.

## **9.2 SOCIAL INTEGRATION OF PROJECT TO THE PUBLIC:**

### **Objectives:**

The contractor will ensure that all possible concerns from Interested and Affected Parties (IAP's) are preempted and managed by.

Ensuring adequate responsiveness to the public.

Provide control over information leaving the site

Safety is provided for community from construction site

Avoiding secondary and tertiary impacts occurring along these installations due to the primary impact of construction activities.

To reduce conflict between property owners and construction personal

### **Actions:**

- a. The contractor must ensure that communication with the public is proactive to avoid complaints due to miss information, or lack of information. This includes notification of work starting on site to the private land owners.
- b. A complaints register must be available for complaints to be entered.
- c. All communication must be in line with media relations policy of Rand Water.
- d. No media interviews are allowed without clearance.
- e. The Contractor shall assist the Engineer with responding to queries and complaints from the public regarding the construction activities by: documenting the details of such communications and submitting the information to the Engineer for inclusion in the complaints register; bringing any such matters to the attention of the Engineer immediately they arise; taking any remedial action as per the Engineer's instruction.
- f. The Contractor shall make selected staff available for any formal consultation with affected parties for the purpose of explaining the construction process and answering questions of interest to such parties.

- g. Particular aspects of concern (complaints queries, request etc.) to landowners and local residents should be addressed during construction and documented accordingly.
- h. The PM is responsible for the safety of all staff, and visitors and bystanders on the construction site throughout all the phases of the project where he remains the PM.
- i. Contractor to ensure for security person to be on site, at the site camp after working hours and on weekends/ public holidays.
- j. Any crimes to be reported to the local South African Police Service (SAPS). These incidents are either reported by the PM or through the knowledge of the PM.
- k. All employees to be clearly identifiable.
- l. Proper supervision of employees at all times.
- m. Construction activities must remain within construction/ demarcated/ assigned maintenance areas footprint.
- n. No unauthorized people to be allowed on site.
- o. The Contractor shall not use the land forming the site, or connected with the Works, for any purpose whatsoever other than for the proper carrying out of the Works under the Contract.
- p. The contractor must demarcate the working area, and enforce his staff to remain within that working area, to avoid the footprint expanding outside of the agreed designated working area.
- q. No storage or laydown areas to be created outside of agreed sites.
- r. All agreements that occur during and prior to construction made with the landowners shall be approved by the project manager, recorded and strictly adhered to. Work force management:
- s. No members of the construction teams should be allowed to loiter on private property away from the maintenance site.

### **9.3 Establishment of a construction campsite and working area:**

#### **Objectives:**

To minimize the impacts to the receiving environment.

Avoid triggering additional environmental authorisations.

Limit the foot print of the construction activity

#### **Actions:**

- a. Site establishment is to be done only in an area identified as not being environmentally sensitive and approved by the ECO, prior to establishment.

- b. Prior to establishment of the site camp(s), the Contractor shall produce a plan showing the positions of all buildings, lay down yards, batch plants, vehicle wash areas, vehicle repair area, batching areas and infrastructure for approval by the Resident Engineer or PM.
- c. Camps are not to be placed within the 1:100-year flood line area or within the environmentally sensitive areas/buffers.
- d. No accommodation for workforce on site except a security presence.

### **9.3.1 Ablutions/Toilets Ablutions/Toilet**

#### **Objectives:**

In the event that additional ablutions are required.

#### **Actions:**

- a. The Contractor shall provide sanitation facilities in the form of chemical toilets, at all camps, offices, workshops and construction sites for staff and visitors. No other form of sanitation will be permitted unless a connection with a local sewer main is possible. The provision of this facility will comply with current legislation. A minimum of one toilet per 11 people or within 100 meters of the work site in order to prevent any breach of sanitary bylaws or offence to public decency.
- b. All staff are to use the toilets at all times rather than informal defecation in the environment.
- c. Toilets are to meet the minimum requirements of the OHS ACT.
- d. All sanitary fees that may be payable to any local authority shall be paid by the Contractor.
- e. Ablutions are to be cleaned/emptied before they are full and contaminate the environment.
- f. Toiles are not to be located within sensitive areas such as drainage lines and 1:100 year flood lines
- g. Any sewerage spillages must be regarded as hazardous and cleaned up immediately using appropriate PPE.
- h. A sewage leak due to accidental damage to a sewerage service must contain the spillage. The spillage may not leave the site. The relevant authority must be notified,

### 9.3.2 Fire risk and burning

#### **Objectives:**

To control and assist with fire prevention as well as damage to the environment.

All necessary precautions against veldt fires and also to protect material on site shall be taken.

#### **Actions:**

- a. The contractor shall have fire-fighting equipment easily available on site especial during the winter period.
- b. Packaging and other waste material may not be burned on site under any circumstances
- c. As outlined in the National Veldt and Forest Act 101 of 1998 (periods when the veldt is dry) a firebreak is to be in place by end May each year. If the firebreak is to be built the requirements as laid out in the Act must be followed. If the firebreak is to be scraped, the same requirements of a new access road are to be followed.
- d. Burning of vegetation including tree trunks and stumps cut during site clearing and establishment shall not be permitted. Woody material should be chipped and reused as mulch back on the site. No organic matter other than alien invasive material should leave the site. This will enable the environment to be rehabilitated easier.
- e. The Contractor shall supply firefighting equipment in proportion to the fire risk presented by the type of construction and other on-site activities and materials used on site. This equipment shall be kept in good operating order. This particularly applies to welding activities.
- f. Smoking is only allowed in designated safe smoking areas.
- g. No fires for warming or cooking are allowed outside of secured areas in the construction camp.
- h. Cooking fires in secure areas to be low in smoke pollution and restricted to the purpose for which they were lit. Bomb fires are strictly not allowed.
- i. No open fires are allowed on site. The contractor must ensure that operations are in compliance with statutory requirements at all times. The emergency plan is to ensure fire management is included. Workers are to be trained in fire fighting, and appropriate equipment is available for the work being done at the various stages of the project. The designation and organization of site personnel to carry out fire safety duties, including fire watch service if applicable.
- j. High risk products and processes such as using gas, and activities such as cutting, grinding, or any possibility of explosions or fire are to utilise a system of hot work permits and appropriate controls.

- k. The Contractor shall ensure that staff are educated in fire prevention and will be held responsible to avoid the risk of fire.
- l. No area is to be denuded of vegetation to create firebreaks, to prevent or make fires
- m. The contractor must ensure that operations are in compliance with relative fire Act legislations

### **9.3.2 Demarcated Areas**

#### **9.3.2.1 Fencing**

##### **Objectives:**

To ensure and assist with controlled fencing in the working environment.

##### **Actions:**

- a. Under no circumstances will fences be cut or disturbed without an agreement with the landowner/lessee. Fencing erected during construction, be it temporary or permanent, must be inspected and maintained to the standard intended for the fencing.
- b. Fencing must not cause a safety hazard where low visibility may be of concern. Fencing must be made clearly visible by means of reflective tags or signage for animals and traffic
- c. Fencing shall be erected around sensitive natural vegetation or cultural elements to protect them from damage.
- d. Fenced areas are to be considered “**No-Go**” areas. This means no pedestrian or vehicular access shall be allowed to fenced areas.
- e. Any fences damaged by the Contractor shall be repaired as soon as possible at his/her cost, and shall be of the standard of the original fence.
- f. Fencing must demarcate the intended construction foot print. All other areas are no go areas.

#### **9.3.2.2 Demarcation of sensitive areas**

##### **Objective**

Protection of special features on site during construction.

##### **Action**

- a. Heritage sites, sensitive vegetation, and wet lands are examples of sensitive features that may need to be retained and protected during construction.
- b. Sensitive features must be clearly marked on site.
- c. Fencing and barricading around sensitive features must be monitored and maintained at all times.
- d. Awareness of sensitive features on site must be done by the ECO
- e. All sensitive features are to be considered No- Go areas.

### 9.3.2.3 The approved working strip

#### Objective

To contain the footprint of construction to a controlled area, so as to prevent it from spreading and increasing.

#### Actions

- a. The working area is determined by various aspects, such as the available land, the sensitivity of the area, the existing servitude and additional negotiated working strip.
- b. The working area is clearly understood and marked
- c. At all-times, the containment of the foot print must be considered and reduced to only within the allocated working area.
- d. All access routes must be clear but limited to only essential requirements.
- e. No ingressions outside of the demarcated working strip are allowed

## 9.4 Pollution prevention and preservation of environmental resources:

*Definition: "Refuse" refers to all construction waste (such as rubble, cement bags, waste cement, timber, can, other containers, wire and nails), household and office waste.*

- A wasteplan is to be compiled before commencing of work.

### 9.4.1 General waste

#### Objective

To avoid pollution to the environment

To ensure that once construction activities are completed and all site rubble is removed, that the site is rehabilitated to blend in (as near as possible) with surrounding landscape.

#### Actions



- a. The entire site will be cleared of general litter /construction material, metal, tins, glass bottles, and food packaging or any other type of empty container or waste material or waste equipment used by the construction team on a daily basis.
- b. The contractor shall on a weekly basis dispose of all refuse at an approved refuse disposal site. Proof of disposal must be kept on record.
- c. Clearly marked litterbins must be provided on site for the separation of waste streams.
- d. The ECO should monitor the presence of litter on the work sites as well as at any offsite sites.
- e. All staff shall be sensitised to the use of litter bins for litter.
- f. Waste material that may harm man or animals should be removed immediately.
- g. No refuse or litter is allowed to be burnt on site.
- h. The recycling of all waste is to be encouraged of both the contractor and staff.
- i. The disposal of waste to have a paper trail proving that it was disposed of at a legal permitted waste site.
- j. No waste, whether it be biodegradable or not, is to be left on site once work has ended.

#### **9.4.2 Waste Water**

##### **Objective**

To avoid pollution to the environment

##### **Actions**

- a. All runoff from fuel depots, workshops, truck washing areas and wash water from concreting vehicles and other equipment shall be collected and directed through oil traps to settlement ponds.
- b. The settlement ponds shall be suitably lined at the Contractor's expense if required in the opinion of the Environmental Officer.
- c. Wastewater may not be disposed of directly into drainage lines, streams or rivers.
- d. The Contractor shall provide suitable retention and filtration structures (which shall be properly maintained) for the collection of wastewater

### 9.4.3 Hazardous waste

*Definition: Hazardous wastes are those which are proven to be toxic, corrosive, explosive, flammable, carcinogenic, radioactive, poisonous or classified as such in legal terms*

#### **Objective:**

The effective and safe management and handling of hazardous materials on site.

The prevention of any hazardous substance entering the wetland area.

#### **Actions**

- a. A register of all hazardous waste must be kept by the contractor and form part of end of project documents.
- b. All potentially hazardous waste generated at the site shall be removed and disposed by an approved permitted contractor in terms of legislative requirements.
- c. Potentially hazardous raw and waste materials shall be handled and stored on-site in accordance with the manufacturer's specification and relevant legal requirements. The following waste products are examples of products that shall be disposed at a hazardous permitted landfill site: cement; diesel, petroleum, oil and lubricants; explosives; drilling fluids; pesticides; concrete additives; and water purification and chemicals.
- d. These materials must be stored in a bunded area with adequate containment for potential spills and leaks.

### 9.4.4 Storage of fuel and other hazardous materials

#### **Objectives:**

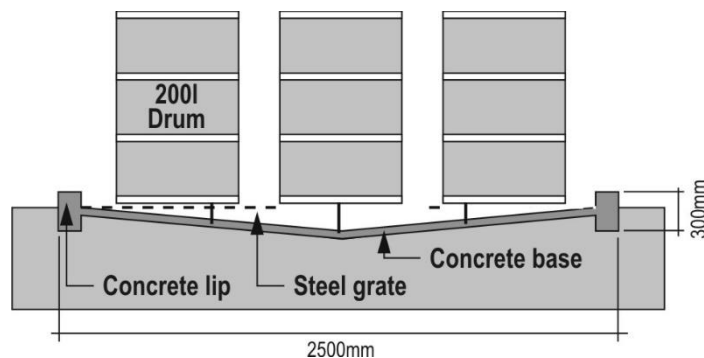
The safe storage and handling of hazardous material to safe guard the environment and people on the construction site.

To provide for the correct handling storage and mitigation in the event of spillages.

#### **Actions:**

- a. Safety Data Sheets (SDSs) must always be readily available on site for all chemicals and hazardous substances to be used on site.
- b. An incompatibility study of chemicals that cause fires when stored too close to each other must be included in the safety data sheets.
- c. All the hazardous substance on site shall be handled/ utilised by the competent employees/ personnel.
- d. Cement mixing will occur in a designated area on an impervious layer (e.g. plastic or cement mixing pit). The runoff water will be contained for re-use in cement mixing or disposed of to the waste water system.
- e. Unused cement bags will be stored in an area not exposed to the weather and packed neatly to prevent hardening or leakage.
- f. Storage areas containing hazardous substances / materials must be clearly indicated.
- g. Any storage tanks containing hazardous materials must be placed in a ventilated bund wall area. The bund walls must be high enough to contain 110% of the total volume of the stored hazardous material.
- h. Hazardous substances must be stored and handled in accordance with the appropriate legislation and standards, which may include the Hazardous Substances Act, the Occupational Health and Safety Act, relevant associated Regulations, and applicable SABS and international standards.
- i. The Contractor will notify the site engineer and the ECO immediately of any pollution incidents.
- j. The Contractor to have an emergency spill kits available on site should there be a spillage of a hazardous substance.
- k. In the event of a hydrocarbon spill, the source of the spillage shall be isolated and the spillage contained.
- l. The area shall be cordoned off and secured. The Contractor shall ensure that there is always a supply of absorbent material readily available to absorb/breakdown the hydrocarbon spillage.
- m. Hydrocarbon contaminated material/soil shall be collected and disposed of at a registered hazardous disposal facility.
- n. Construction vehicles must have designated spillage kits so that oil spillages can be pick up immediately once noted.
- o. Staff is to receive awareness training on picking up oil spillages.
- p. Drip trays must be placed under all vehicles when immobile for longer than 24 hours. Vehicles suspected of leaking must be monitored. Dripping oil must be stopped immediately once detected.
- q. Drip trays must be of a sufficient size and volume to catch any hydrocarbons that might leak from a stationary vehicle

- r. No maintenance that could result in oil spillages to be done on site.
- s. Fuel, lubricants, transmission and hydraulic fluids shall only be stored in the designated areas.
- t. All spillages from any chemical must be reported to the ECO.
- u. Unless otherwise directed, contaminated soil will be disposed of at appropriate dumping site that is permitted to accept contaminated soil.
- v. All related documents for disposal of hazardous waste are to be copied to the ECO and retained on site to be included in the end of project documents.
- w. Waste to remain on site for periods under the threshold of legislative requirements to acquire permits. Refer to the legal resistor for more detail.
- e. Empty containers in which hazardous substances were kept are to be treated as hazardous waste
- f. The contractor and sub-contractor working on site must ensure that oil, fuel, and chemicals are confined to specific and secure areas throughout the construction period.



*Section through a typical concrete bund*

## 9.5 Preservation of the environment

### 9.5.1 Preservation of flora

The flora on the site plays many important roles but not limited to the following:

The integrity environment, in providing habitat and preservation of biodiversity

- a. No pruning is allowed without the ECO's permission

- b. No collection of plants
- c. No damage by construction activities to vegetation in no go areas
- d. No damage to vegetation outside of the construction footprint
- e. At no time shall the contractor's workforce be allowed to collect firewood from the veldt.

### **9.5.1 Preservation of fauna**

#### **Objectives:**

To avoid damage to or destruction of indigenous fauna.

#### **Actions:**

- a. All open trenches to be checked regularly for trapped fauna that may have fallen into the trenches.
- b. The Contractor shall ensure that all works are undertaken in a manner, which minimizes the impact on the local fauna and shall apply the following specifications with respect to fauna management and protection
- c. The contact detail for animal rescue such as snake and bee removal shall be made available at the construction site, so as to rescue them should they be found on the construction site.
- d. Trenches shall be inspected regularly for fauna that may have fallen into them and become trapped. All fauna found in trenches must be rescued.
- e. Under no circumstances shall any animals be handled, removed, killed, scared or interfered with by the Contractor, his/her employees, his/her sub - contractors, or his/her sub-contractors' employees.
- f. No species of animals may be poached, snared, hunted, captured or willfully damaged or destroyed.
- g. Any incidents of poaching, willful disturbance or damage to wild animals as well as accidental damage to or death of wild animals should be reported to the ECO and recorded. It shall be treated in terms of the law.
- h. The Contractor and his/her employees shall not bring any domestic animals onto site.
- i. The Contractor shall ensure that domestic animals and native animals belonging to the local community are kept away from unprotected works.
- j. The Contractor shall ensure that the work site is kept clean and tidy and free from rubbish, which would attract animal pest species.
- k. Anthills that occur should not be disturbed unless it is unavoidable for construction purposes. Before construction starts, construction workers should be educated with regards to littering and poaching;
- l. No fishing is allowed.

- m. Photographs of sensitive animals (e.g. Otter) is encouraged to be displayed in the construction camp to heighten awareness of the creatures.
- n. Toolbox talks should be provided to employees regarding snakes. All snakes and reptiles on site must be removed by a qualified snake handler and all attempts should be made to ensure snakes and reptiles are not killed or collected.
- o. Nesting sites of birds should not be disturbed as far as possible. The ECO should be notified of any potential bird nest disturbances.
- p. Construction activities should be limited to daylight hours, in order to minimise impacts on nocturnal fauna.
- q. Trucks should travel at a minimum speed to avoid unnecessary killings of animals found on site. All vehicle movement to remain in demarcated areas and not enter the undisturbed vegetation
- r. Animals residing within the designated area shall not be killed nor unnecessarily disturbed. Where sensitive species occur, these shall be relocated by the relevant conservation authority. A cooler box with vermiculite will be used to move hibernating animals to reduce their stress. All relocations are to be reported and ideally photographed.
- s. Identify animal species, populations and nests to be relocated. Relocate these to areas where these will not be at risk. Plan such operations well in advance.
- t. No wild animal may be fed on site.
- u. Regularly undertake checks of the surrounding natural vegetation, in fences and along game paths to ensure no traps have been set. Remove and dispose of any snares or traps found on or adjacent to the site.
- v. Ensure that the Work Site is kept clean, tidy and free of rubbish that would attract animal pests.
- w. Have problem animals and vermin removed by an appropriate organization or authority (i.e. such as the Parks Board, the SPCA or a registered exterminator).
- x. Ensure that domesticated animals belonging to the local community are kept away and are safe from any unprotected Works.
- y. Do not make use of any pesticides, unless approved by the ECO and applied by a qualified registered pest control officer.

### **9.5.2 Scenic quality /Visual intrusion**

This issue covers potential impacts on landscape characteristics, open space quality, tourism activities and unique physical features.

**Objectives:**

To minimise adverse visual impacts associated with new constructions

To significantly minimise adverse impacts on the landscape character and sense of place of the affected area.

**Actions:**

The Contractor shall position all temporary structures as well as temporary plant on site in locations and at elevations which limit visual intrusion on neighbors. The type and colour of roofing and cladding materials shall be selected to reduce reflection.

- a. Damage to the natural environment should be minimized.
- b. Vegetation should be cut only if absolutely necessary.
- c. Weeds hold the soil and do not have to be removed but must be cut prior to them setting seed.
- d. The clearing of all sites should be kept to a minimum and surrounding vegetation should as far as possible be left intact as a natural shield.
- e. The Contractor shall not establish or undertake any activities, which in the opinion of the PM or ECO are likely to adversely affect the scenic quality of the area. The PM may direct the Contractor to refrain from such activities or to take ameliorative actions to reduce the adverse effect of such activities on the scenic quality of the environment.
- f. New access roads should be constructed with consideration the visual impact thereof and may only be approved by the ECO and PM.
- g. No painting or marking of natural features shall be allowed. Marking for surveying and other purposes shall only be with pegs and beacons.
- h. Natural out crops of vegetation, rocky ridges and other natural linear features, should not be bisected. Vegetation on such features should not be cut unless absolutely necessary for construction.
- i. Trees and all woody shrubs should be protected from damage to provide a natural visual shield. Excavated material should not be placed on such plants and movement across them should not be allowed as far as practical.
- j. All packed rock and exposed rock cuttings shall be done in such a manner that it may blend back into the environment as much as practically possible
- k. The finishes of introduced rock work should consider colour with the colour of the natural weathered rocks of the adjacent environment.

- l. Excavated rock material of a different colour from local rock should either be back filled treated to accelerate aging effect of the rock or removed from site and disposed of in another area.
- m. No construction rubble, construction material, refuse, litter or any other material not found naturally in the surroundings should be allowed at any time to be lying around on the construction site.
- n. The PM or ECO may instruct the contractor to screen unsightly construction works where it has become evident that a visual disturbance is been encountered.

### **9.5.3 Archaeological artefacts**

This issue covers potential impacts on monuments, historical and archaeological sites.

#### **Objectives:**

To have no adverse impact on the historical inheritance of the area.

The protection of land considered to be of traditional cultural value.

The protection of known archaeological sites against vandalism, destruction and theft during the construction phase.

To avoid damage to or destruction of previously unknown or excavated archaeological artefacts during construction.

The preservation and appropriate management of new findings should these be discovered during construction.

#### **Actions:**

- a. All archaeological, paleontological and historical sites and buildings older than 60 years are protected in terms of the National Monuments Act (Act 28 of SHARA). In terms of this Act it is an offence to disturb any part of such site or material without a permit. Should an archaeological or other such discovery be made during any excavations.
- b. No artefacts may be removed off site unless authorized by the appropriate authority. Work on the area where the artefacts were found should cease immediately and the Engineer and the ECO be notified as soon as possible. Upon receipt of such notification, the PM or ECO will arrange for the excavation to be examined by an Archaeologist as soon as possible.
- c. The relevant authority shall be informed to ensure that appropriate management
- d. Action is taken immediately in collaboration with the specialist.



- e. Under no circumstances shall archaeological artefacts be removed, destroyed or interfered with by the Contractor, his employees, his sub-contractors or his sub - contractors' employees. Any person who causes intentional damage to archaeological or historical sites and artefacts could be penalised or legally prosecuted in terms on the Act.
- f. A three - strand fence shall protect archaeological sites, which will be at least 2 m outside the extremities of the site. The fence shall be clearly marked with danger tape. Vehicular traffic should not be allowed on archaeological and historical sites, within at least a 5 m radius from the perimeter of the site.
- a) A 15m buffer must be clearly demarcated around suspected graves and these must be considered as No-Go areas. This includes graves outside of the working area that may come into contact with operations of the construction works. An example will be for access routes.
- b) All known and identified archaeological and historical sites should be left untouched.
- c) No stones or rocks associated with a ruin may be removed, moved or changed in any way (painted, whitewashed).
- d) The Contractor shall ensure that none of his employees gain access to any archaeological areas (whether fenced or unfenced) except when authorised to do so by the PM or ECO representative or relevant Archaeological authority.
- e) Work must be stopped until any bones or artefacts are properly assessed by a professional registered heritage specialist and the authority provides permission for work to recommence. The site of the alleged artefact must be cordoned off into a no go area.
- f) Local museums and the South African Heritage Resources Agency (SAHRA) should be informed if any artefacts are discovered in an affected area.
- g) Employees should be aware of procedures to follow in such circumstances.
- h) Any discovered artefacts should not be removed and the ECO should be informed so that necessary action can be taken.
- i) Induction and regular training of staff about handling

## **9.6 Final finishing off standards to leave the site in such a state that will allow for easy site rehabilitation.**

### **Objective**

The objective is to leave the site as close to the original condition or even better than the original condition of the site prior to construction as it practically possible.

## Actions

The table below will form part of the framework of items for final sign off the environmental monitoring before rehabilitation irrespective of which party will undertake rehabilitation.

Progressive sign off of sections may be possible.

The checklist will be signed by the responsible environmental monitoring person, the project manager, the contractor, the environmental co –coordinator, the environmental manager as well party who will undertaking rehabilitation. The following will form part of a checklist used by the ECO for sign off and hand over for rehabilitation.

A retention monetary value may be attached subject to the sign off of the environmental monitoring before rehabilitation.

Required standard for the ECO to be able to sign off.	YES/ NO
<b>ADMINISTRATIVE MATTERS:</b>	
All required documents are available and up to date in the environmental file?	
<b>Comments</b>	
<b>SOCIAL INTEGRATION OF PROJECT TO THE PUBLIC</b>	
All agreed services have been reinstated and when required IAP's have signed them off. (proof in the environmental file	
<b>Comments</b>	
All landowner agreements have been honored and all landowner agreements are available to be handed over for rehabilitation.	
<b>Comments</b>	
<b>THE DE-ESTABLISHMENT OF A CONSTRUCTION CAMPSITE AND WORKING AREA</b>	

Are all items in the establishment of the construction site have been properly and appropriately disestablished?	
<b>Comments</b>	
<b>POLLUTION</b>	
Are there items not listed but outstanding?	
<b>Comments</b>	
All pollution impacts have been satisfactory cleared	
<b>Comments</b>	
All construction materials not required, have been removed.	
<b>Comments</b>	
All unwanted rock and stone have been raked up ready for rehabilitation	
<b>Comments</b>	
All rubble and waste have been cleaned up.	
<b>PRESERVATION OF THE ENVIRONMENT</b>	
Are there items not listed but outstanding?	
<b>Comments</b>	
All storm water requirements have been implemented.	
<b>Comments</b>	
Allen invasive plants have been removed	
<b>Comments</b>	
<del>Top soil was adequately preserved to be used back on-site</del>	
<b>Comments</b>	
<del>Top soil was appropriately returned to the correct areas</del>	
<b>Comments</b>	
<del>All soil levels have been finalized to original gradients alternatively gradients suitable for rehabilitation.</del>	
<b>Comments</b>	
<del>All compacted soils have been ripped and cultivated to 30cm</del>	
<b>Comments</b>	

Are there any other environmental expectations that would prevent a final completion signing off .	
<b>Comments</b>	

## 9 RECORD AND DATA KEEPING

Record Document	Form/Doc Number	Location	Retention Period
PENLTIES PROGRESS REPORT	SAM EAC 00003 R	Shared network drive Under project file of ECO	10 years
ECO WEEKLY INSPECTION	SAM EAC 00005 R	Shared network drive Under project file of ECO	10 years
SITE WEEKLY ECO REPORT	SAM EAC 00010 R	Shared network drive Under project file of ECO	10 YEAR S
EA COMPLIANCE (MONTHLY) REPORT	SAM EAC 00007 R	Shared network drive Under project file of ECO	10 years
SIX MONTHLY FIXED POINT REPORT	SAM EAC 00007 R	Shared network drive Under project file of ECO	10 years
UPFRONT ASSESSOR REPORT	SAM EAC 00007 R	Shared network drive Under project file of ECO	10 years

SITE MONTHLY ECO REPORT	SAM EAC 00005 R	Shared network drive IN SPECIFIC PROJECT FOLDER	5 years
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