

ENVIRONMENTAL MANAGEMENT PROGRAMME

**FOR THE MANAGEMENT OF ACTIVITIES RELATING TO THE PROTECTION OF
THE NATURAL ENVIRONMENT DURING THE CONSTRUCTION AND
OPERATIONAL PHASES:**

**THE PROPOSED ESTABLISHMENT OF A WASTEWATER TREATMENT
WORKS AND ASSOCIATED INFRASTRUCTURE ON THE REMAINDER OF
1409, KAKAMAS SOUTH SETTLEMENT**



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TABLE OF CONTENTS

1. INTRODUCTION	4
2. COMMENCEMENT OF WORKS	10
3. ENVIRONMENTAL CONDITIONS OF APPROVAL	11
4. ISSUES OF CONCERN	11
5. ON-SITE START-UP MEETING	12
6. METHOD STATEMENT	13
7. ENVIRONMENTAL DECLARATION of UNDERSTANDING	14
8. PENALTIES	14
9. RESPONSIBILITY OF THE APPLICANT	15
10. THE SITE ENGINEER / SITE MAIN CONTRACTOR	15
11. THE CONTRACTOR	15
12. SITE PERSONNEL: ENVIRONMENTAL AWARENESS TRAINING	16
13. ENVIRONMENTAL CONTROL OFFICER	16
14. CHANGES TO ENVIRONMENTAL MANAGEMENT PROGRAMME	19
15. RECORD KEEPING	19
16. ENVIRONMENTAL COMPLETION STATEMENT	19
17. MANAGEMENT SPECIFICATIONS (CONSTRUCTION PHASE)	20
17.1 Fauna and Flora	20
17.2 Protection and Rescue of Fauna and Flora (if required)	20
17.3 Clearing of Vegetation, Stripping & Conservation of Topsoil (if required)	21
17.4 Protection of Archaeological & Paleontological remains (if required)	21
17.5 Appropriate use of Machinery	22
17.6 Demarcating and fencing	23
17.7 “NO-GO” Areas	23
17.8 Water, Storm water, Erosion & Sedimentation Control	24
17.9 Fuel, Tar Compounds and Oil	24
17.10 Hazardous Substances	24
17.11 Concrete Works	24
17.12 Fires and smoking	25
17.13 Emergency Procedures	26
17.14 Dust Control (if required)	26
17.15 Solid Waste Management	26
17.16 Toilets and Ablution Facilities	26
17.17 Stockpiling	27
17.18 Preparation of Building Material	27
17.19 Discharge of construction water	27
17.20 Contractors Temporary Camping site and Eating Areas	28
17.21 Traffic, Access Routes and Haul Roads	28
17.22 Site Clean Up and Rehabilitation	28
17.23 Land Management	28
17.24 Socio-Cultural Issues	Error! Bookmark not defined.

18	MANAGEMENT SPECIFICATIONS (OPERATIONAL PHASE)	28
19	TERMS AND ABBREVIATIONS:	30
20	APPENDICES:	34
	APPENDIX 1: START-UP REPORT	35
	APPENDIX 2: PENALTIES FOR NON-COMPLIANCE	37
	APPENDIX 3: DECLARATION OF UNDERSTANDING	41
	APPENDIX 4: INFORMATION ON METHOD STATEMENTS	43
	APPENDIX 5: EXAMPLE OF METHOD STATEMENT	45
	APPENDIX 6: CONTACTOR: ENVIRONMENTAL DAILY CHECKLIST	48
	APPENDIX 7: BASIC RULES OF CONDUCT	50
	APPENDIX 8: ECO/ESO DAILY REPORT/CHECKLIST	54
	APPENDIX 9: ENVIRONMENTAL AUTHORISATION.	62
	APPENDIX 10: RECOMMENDATIONS AS PER ENVIRONMENTAL IMPACT REPORT	63
	APPENDIX 11: DRAWINGS	64
	APPENDIX 12: ANY OTHER RELEVANT DOCUMENTS	65

ENVIRONMENTAL MANAGEMENT PROGRAMME FOR ACTIVITIES RELATING TO THE PROTECTION OF THE NATURAL ENVIRONMENT DURING THE CONSTRUCTION AND OPERATIONAL PHASES

THE PROPOSED ESTABLISHMENT OF A WASTEWATER TREATMENT WORKS AND ASSOCIATED INFRASTRUCTURE ON THE REMAINDER OF 1409, KAKAMAS SOUTH SETTLEMENT

1. INTRODUCTION

This EMPr binds all contractors, sub-contractors and other persons working on the site to adhere to the terms and conditions of the EMPr throughout the construction and operational phases of the above-mentioned Wastewater Treatment Works ("WWTW") and associated infrastructure.

Any other site-specific additional activities decided and agreed upon at the "On Site Start-Up Meeting" must be included to form part of the EMPr.

EMPr Circulation List

Full copies of this EMPr will be made for the ECO, Site Engineer and/or Contractor. Appendices will also be made and circulated where relevant.

Scope

This EMPr addresses the construction phase environmental management ("CEMPr") and operational phase environmental management programme ("OEMPr") and all activities associated with the project. In addition, the EMPr deals with all the requirements of Regulation 19(4) of the EIA Regulations of 2014 (as amended) in GN R. 326, 07 April 2017 as well as any additional specific information requested by the competent authority pertaining to the development proposal. Compliance with this EMPr (which serves as a basis for all the phases of the project) will be monitored by the Environmental Control Officer (ECO). The Construction Engineer/Project Managers, the Contracting Agent(s) and the applicant will be responsible for the implementation of this EMPr.

Site location

The Preferred site alternative is located on Remainder of Erf 1409, Kakamas South Settlement, approximately 500m to the south-west of Alheit. The site slopes gently down from the south to the Orange River in the north and to the Hartbees River in the east, has active agricultural fields to the east and residential buildings and a cemetery immediately to the west and north-west. Please refer to Figure 1 below.

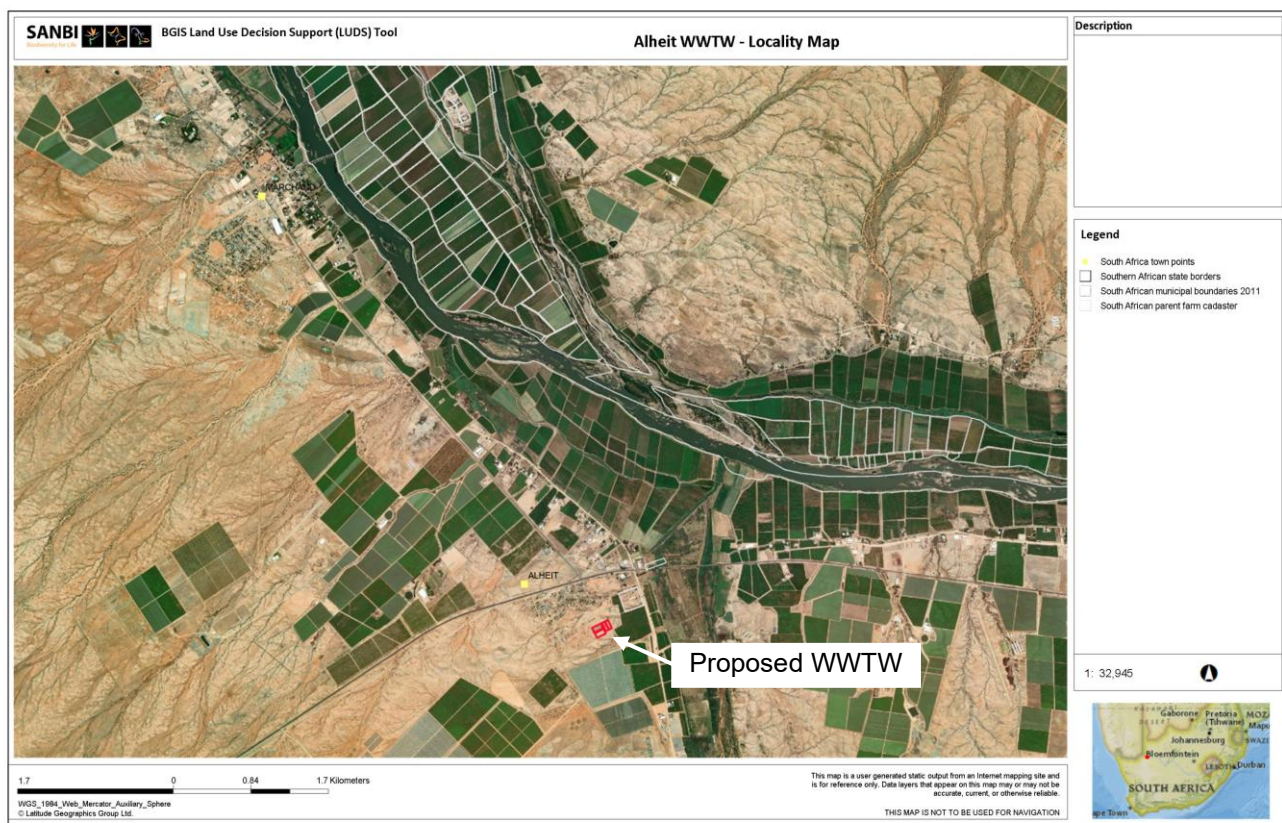


Figure 1: Aerial view of the proposed site

Project Description

The development proposal entails the establishment of a WWTW of approximately 800m³/ day in capacity and some associated infrastructure on the Remainder of Erf 1409, Kakamas South Settlement. The proposed site is located approximately 500m to the south-west of Alheit, immediately west of a cemetery. The proposed WWTW and associated infrastructure will serve the villages of Alheit and Marchand and include *inter alia*, the following:

- Operational Building/Shelter
- Inlet Works (inclusive of Tanker Truck discharge facility)
- Screenings Removal
- Grit Channels
- Flow measurement
- Facultative Ponds x 2 (lined with HDPE membrane)
- Wind powered Floating Aerator/Mixers
- Medium Bubble Diffused Air aeration system Stainless Steel
- Low Pressure Centrifugal Fam c/w Motor
- Electrical Switchgear & DO Control System
- Aerobic Ponds x 2 (lined with HDPE membranes)
- Disinfection facility
- Irrigation equipment for disposal of Effluent on sports fields
- 22kV x 1.5km overhead Electrical Power supply line + Transformer

Approximate site coordinates: 28°45'47.41" S, 20°32'18.04" E.

Access

The proposed site for the WWTW and associated infrastructure is accessible from existing roads.

The receiving environment

This application is for establishing a WWTW and associated infrastructure approximately 500m to the south-west of Alheit. The land parcel considered for the proposed WWTW is the Remainder of Erf 1409, Kakamas South Settlement

Terrestrial biodiversity

According to the Biodiversity Assessment (**Appendix D1**), in accordance with the 2018 Vegetation map of South Africa, Lesotho and Swaziland (Mucina & Rutherford, 2006), the development will only impact on one vegetation type, namely Bushmanland Arid Grassland, a vegetation type considered “Least Threatened” in terms of the NEM: BA “national list of ecosystems that are threatened and in need of protection” (GN 1002, December 2011).

The Animal Species Theme received a High Sensitivity rating on the DFFE Screening Tool due to the potential presence of aves species, Martial eagle (*Polemaetus bellicosus*) and a Medium Sensitivity rating for Ludwig’s Bustard (*Neotis ludwigii*). According to the Biodiversity Assessment (**Appendix D1**),

“The Southern Africa Bird Atlas Project lists 95 bird species observed, including 2 additional species of conservation concern namely:

- The Lanner Falcon (*Falco biarmicus*) – Regionally vulnerable (Globally of “least concern), and
- The Black Stork (*Ciconia nigra*) – Regionally vulnerable (Globally of “least concern).

The pentad overlaps a portion of the Orange River (believed to be the reason for including the Black Stork) and a large area of natural veld to the south of the site (the reason for the inclusion of the Lanner Falcon and the Martial Eagle).

Given the small size, its disturbed nature and location of the proposed site (close to the urban edge) and the almost constant human activity, it is considered highly unlikely that the proposed development will result in any significant additional impact on the breeding or feeding patterns of any of these species, thus, a sensitivity rating for this project is considered Low Sensitive..”

The Biodiversity Assessment (**Appendix D1**) also identified a low rocky ridge to the south showing a quartz layer which supports a few plant species not observed in the lower areas (however not a true quartz vegetation). The vegetation on site is generally considered degraded.

The Plant Species Theme received a Medium Sensitivity rating on the DFFE Screening Tool due to the potential presence of 144 sensitive species. According to the Biodiversity Assessment (**Appendix D1**), the following threatened and protected plant species were identified:

Red list of South African plant species: The Red List of South African Plants online provides up to date information on the national conservation status of South Africa’s indigenous plants (SANBI, 2020).

- No red-listed species observed.

NEM:BA protected plant species: The National Environmental Management: Biodiversity Act, Act 10 of 2004, provides for the protection of species through the “Lists of critically endangered, endangered, vulnerable and protected species” (GN. R. 152 of 23 February 2007).

- No NEM:BA protected species observed.

NFA Protected plant species: The National Forests Act (NFA) of 1998 (Act 84 of 1998) provides for the protection of forests as well as specific tree species (as updated).

- No NFA Protected plant species observed.

NCNCA Protected plant species: The Northern Cape Nature Conservation Act 9 of 2009 (NCNCA) came into effect on the 12 December 2011, and provides for the sustainable utilization of wild animals, aquatic biota, and plants. Schedule 1 and 2 of the Act gives extensive lists of specially protected and protected fauna and flora species in accordance with this act. NB. Please note that all indigenous plant species are protected in terms of this act (e.g., any work within a road reserve).

- *Euphorbia gariepina*
- *Euphorbia spinea*
- *Mesembryanthemum cf. tetragonum*

According to the Biodiversity Assessment (Appendix D1), see below Table 1 for Protected plant species with impact minimisation recommendations.

Table 1: Protected plant species with impact minimisation recommendations.

NO.	SPECIES NAME	COMMENTS	I
1.	<i>Mesembryanthemum cf. tetragonum</i> (=Prenia) NCNCA Schedule 2 protected (all species in this Family protected by default)	Occasionally observed, mostly in disturbed areas.	This is a common widespread species, often considered a disturbance indicator. No Search & Rescue proposed. NB: A NCNCA Permit application will have to be obtained for potential impacts on this species.
2.	<i>Euphorbia gariepina</i> Schedule 1 protected (All plants in this Genus)	Occasionally observed on site and some of the plants is likely to be impacted.	On this property Search & Rescue will not make sense, as it is expected that the whole site will become part of the urban edge eventually. A NCNCA Permit application must be submitted for the removal of these plants.
3.	<i>Euphorbia spinea</i> Schedule 1 protected (All plants in this Genus)	Occasionally observed on site and some of the plants is likely to be impacted.	On this property Search & Rescue will not make sense, as it is expected that the whole site will become part of the urban edge eventually. A NCNCA Permit application must be submitted for the removal of these plants.

The proposed WWTW footprint falls within a Critical Biodiversity Area (CBA) 2 and thus receives a Very High Sensitivity rating on the DFFE Screening Tool for Terrestrial Biodiversity (Figure 2). According to the Biodiversity Assessment (**Appendix D1**), based on the findings of the site verification, it is considered unlikely that the proposed development will have any significant impact on any of the reasons for identifying the CBA. As a result, the impact on conservation priority areas is expected to be Low to Very Low Negative.

The Terrestrial biodiversity assessment indicates that the main potential impacts associated with the proposed development would be the Schedule 3 NCNCA Protected plant species, however, all 3 are common and widespread species.

No fatal flaws or any other obstacles were found with respect to the flora, vegetation, fauna, and terrestrial biodiversity. Even with minimum mitigation it is considered highly unlikely that the development will contribute significantly to any of the following:

- Significant loss of vegetation type and associated habitat.
- Loss of ecological processes (e.g., migration patterns, pollinators, river function etc.) due to construction and operational activities.
- Loss of local biodiversity and threatened species.
- Loss of ecosystem connectivity.

The findings of this assessment suggests that the relative terrestrial biodiversity theme sensitivity should be **LOW TO VERY LOW SENSITIVE** (not Very High Sensitive as proposed in the DFFE screening report).

Surface Water

The proposed WWTW footprint falls within a Critical Biodiversity Area (CBA) 2 and has been given a Very High Sensitivity rating on the DFFE Screening Tool for Terrestrial Biodiversity (Figure 2, refers).

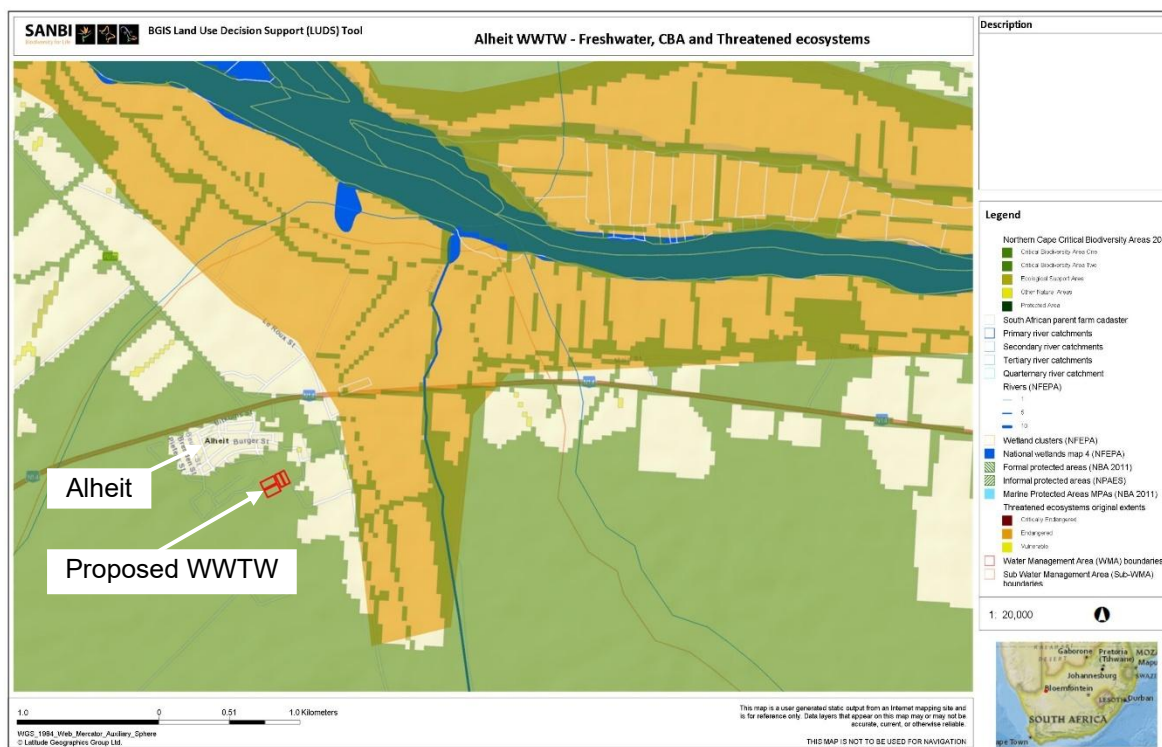


Figure 2: SANBI BGIS image of the Freshwater resources, CBAs and threatened ecosystems in and around Alheit

The proposed WWTW falls into a small 37-hectare sub-catchment to the south of Alheit (outlined in dark blue in Figure 3 below), the drainage line is visible in GoogleEarth images as the lines of Swarthaak (*Senegalia melifera*) shrub. The upper parts of the sub-catchment are still in a reasonable ecological condition, but informal settlements are being established within the upper sections of the catchment and the lower parts are entirely developed into vineyards with canals and roads and a graveyard and this has lowered the ecological significance.

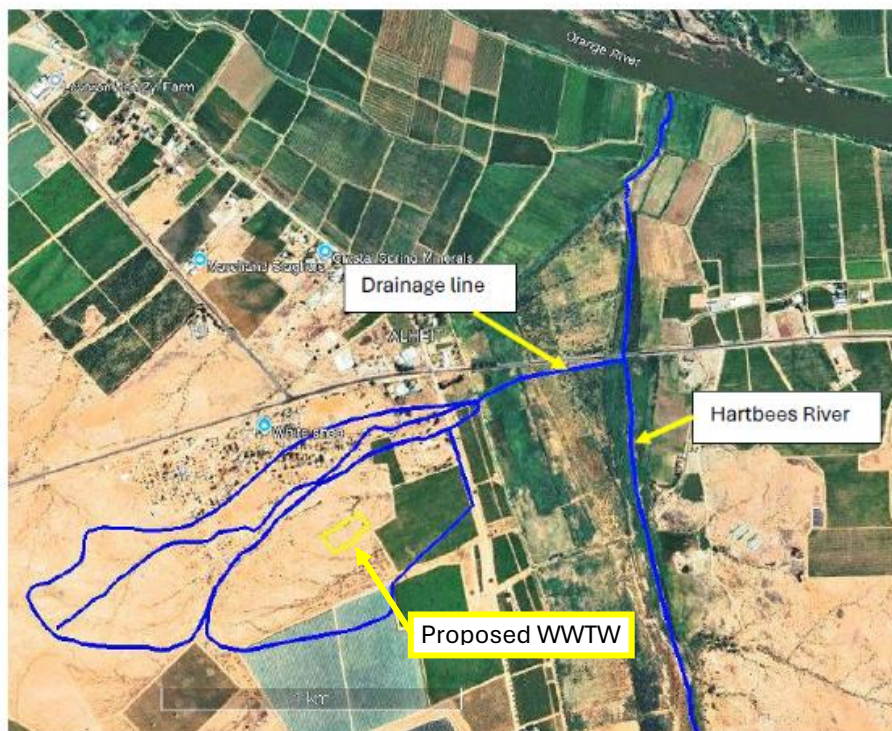


Figure 3: View of sub-catchments as well as drainage lines overlapping the proposed site

The adjacent sub-catchment (outlined in dark blue as we well in Figure 3) is also small, approximately 35 hectares in size and provides drainage to Alheit's southern portion. The adjacent vineyards block a connection to the downstream Hartbees River sub-catchment could be impacted in the event of the proposed WWTW ever overflowing or experiencing some sort of mishap that necessitates the release of inadequately treated wastewater down the sub-catchment.

Recommendations on Impact MITIGATION/ minimisation

The terrestrial ecology specialist, freshwater ecology specialist and heritage impact specialist have included recommendations in their study reports for minimisation of the potential negative impacts of establishing the proposed WWTW and associated infrastructure. The recommendations are included in this EMPr.

Terrestrial biodiversity:

According to the terrestrial biodiversity study report, the establishment of the proposed WWTW and associated infrastructure will result in terrestrial biodiversity impacts of low significance when the recommendations contained in the said report are implemented

Freshwater:

According to the freshwater ecology specialist, the implementation of the recommendations contained in the freshwater ecological study report will help in keeping the potential negative freshwater-related impacts low in significance. The recommendations contained in the freshwater ecological study report are included in this EMPr.

Heritage:

According to the heritage impact study report, the establishment of the proposed WWTW and associated infrastructure will not cause any significant negative heritage-related impacts upon implementation of the required impact mitigation measures.

The recommendations of the heritage specialist for keeping potential impacts low in significance if heritage resources are encountered on the proposed site are included in this EMPr.

Socio-economic:

The proposed development will provide socio-economic benefits during the construction phase through the provision of employment opportunities for local residents in the administrative area of the Kai !Garib Local Municipality and this will help to alleviate the unemployment situation in the area.

In addition, building materials suppliers in the area will enjoy a boost in business during the construction phase, as much of the construction materials required for the proposed development will be sourced locally in order to minimise transportation costs.

The proposed WWTW and associated infrastructure is designed to adequately treat the wastewater of the growing population of Alheit and Marchand for some years to come, thereby contributing towards ending the sewage pollution that has been caused by the existing Kakamas WWTW receiving significantly more wastewater than its design was meant for. The wastewater overwhelming the Kakamas WWTW arrives from sources that include *inter alia*, Alheit and Marchand. The proposed WWTW will therefore contribute towards fulfillment of the constitutional right of the community of Kakamas to an environment that is free of pollution and this is a significant socio-economic benefit. It is noteworthy that the potential negative socioeconomic impacts of the proposed development are of low significance, particularly upon the implementation of the impact mitigation measures contained in this EMPr.

Environmental Authorisation

The comments received on the Draft BAR and the conditions of environmental authorisation will be incorporated in the EMPr.

2. COMMENCEMENT OF WORKS

The site project contractors must timeously be given a copy of the EMPr and any additional information that pertains to site conditions/amendments or deviations from original site plan. This EMPr must form part of the Contractors Contract.

A copy of the EMPr must be kept on site at all times and made available to any relevant authority requesting to see the document.

Before the commencement of works, the contractor must consult with the surrounding community, regarding timing of works and any other issues that the community may consider important to keep in mind.

No work on site must take place until:

- The Environmental Contract is signed between the relevant parties;
- Notice of one week in writing has been given to the competent authority before commencement of any construction activity;
- EMPr has been approved by the relevant authorities;
- On-Site Start-Up Meeting has been held;
- Site and No-Go areas have been demarcated;
- Contractors are in possession of the EMPr and other relevant documentation;
- Contractors have signed the Declaration Of Understanding;
- All mandatory site equipment is in place; and
- On Site Environmental Education & Awareness training session has taken place with all relevant construction personnel present.

NB: Work refers to: Camp Establishment, construction activities.

3. ENVIRONMENTAL CONDITIONS OF APPROVAL

- Conditions Of environmental authorisation
- Original Environmental Impact Report Recommendations – see Appendix 11
- Local Authority Conditions of Approval – if applicable

4. ISSUES OF CONCERN

Issues of concern identified during the application process for environmental authorisation and other relevant issues of concern must be addressed during the “On Site Start-Up Meeting” (OSSM) and reflected in the On-Site Start-Up Report.

The requirements specified in the EMPr and the conditions of environmental authorisation are to be included and to be reflected in the On-Site Start-Up Report (refer to Point 6 under start-up report)

Such activities include but shall not be limited or restricted to:

- Access route;
- Demarcation of working footprint and removal and storage of topsoil material;
- Waste management;
- Mandatory site equipment;
- Establishment of construction site compound and fuel stores;
- Ablution & Toilet Facilities;
- Refuse Management;
- Concrete works;
- Soil Erosion Control;
- Fire fighting equipment & Emergency fire reaction plan; and

5. ON-SITE START-UP MEETING

The mandatory **on-site start-up** meeting that is conducted preferably **14 days but not less than 5 working days** prior to commencement of any site/camp establishment, earthworks and/or construction activities and will relate to additional discussed information that must be complied with during the entire construction phase.

In addition to the above, written notice of seven calendar days must be given to the Competent Authority before any commencement of the authorised activities.

ON-SITE START-UP MEETING REPORT to be attached as Appendix 1 to the EMPr. The Start-Up Meeting Report is to include all site-specific issues and arrangements as discussed and agreed on at the site start-up meeting.

The On-Site Start-Up Meeting additional information pertains to specific site construction agreements that were discussed on site by all the relevant parties and agreed on and must be included in the On Site Start-Up Meeting Report. **(The arrangements and agreements must fall within the conditions as set out in the EA).**

At the on-site start-up meeting (OSSM), the following issues must be addressed:

- The EMPr and other relevant site documents;
- Project to be discussed and all uncertainties are cleared;
- Method statement/s to be discussed;
- Access to the site;
- Materials stockpile and lay down areas to be demarcated;
- Method of stockpiling to be discussed;
- Fire fighting procedures;
- Mandatory fire fighting equipment & fire preventative measures;
- Solid waste removal intentions;
- Placement, type and service of toilets to be agreed on;
- Placement and type of rubbish bins and removal of rubbish to be agreed on; and
- Environmental Education and awareness training session to all contractors and onsite staff/labour.

The following people must attend the on-site Start-Up Meeting:

- A representative of the [Kai !Garib Local Municipality](#);
- Main contractor's representative;
- Site supervisor/ foreman;
- Environmental consultant (EC/ECO); and
- Environmental site officer (ECO/ESO).

Minutes of the on-site Start-Up Meeting will be reduced to a report and circulated to all attendees of the above-named meeting for their perusal and comments if needed. A Non-response is deemed an acceptance of the contents and agreements of the report. **(Appendix 1)**

The main contractor must provide (i) a list of all sub-contractors and their scope of work for the contract and (ii) a time schedule of works.

The On-site Start-up Meeting report will also form part of this Environmental Management Programme (EMPr). If any discrepancies between the start-up report and the EMPr arise, the EMPr will take precedence until clarification on the discrepancy is clarified. If any discrepancies between the EMPr and the EA arises, the EA will take precedence until clarification on the discrepancy is clarified.

IT IS THE RESPONSIBILITY OF THE MAIN CONTRACTORS TO ENSURE THAT ALL SUB-CONTRACTORS, THAT WORK ON THE SITE DURING AND AFTER THE CIVILS CONTRACT, ARE INFORMED OF THE ENVIRONMENTAL CONDITIONS PERTAINING TO THE SITE.

NB! NO WORK WILL START UNTIL THE ABOVE IS IN PLACE AND AGREED ON.

6. METHOD STATEMENT

Method statements from the contractor will be required for specific sensitive actions on request of the authorities, or the ECO. A method statement forms the base line information on which sensitive area work takes place and is a “live document” in that modifications are negotiated between the Contractor and ECO/ Applicant as circumstances unfold. All method statements will form part of the EMPr documentation and are subject to all terms and conditions contained within the EMPr main document.

These documents must be available to the authorities for inspection or on request.

A method statement describes the scope of the intended work in a step-by-step description in order for the ECO and the applicant to understand the contractor’s intentions. This will enable them to assist in devising any mitigation measures, which would minimize environmental impact during these tasks.

The Contractor must submit the method statement before any particular construction activity is due to start. Work must not be commenced with until the ECO and Applicant have approved the method statement.

Method statements must be compiled by the contractor for the ECO and Applicant to consider approving. The contractor must submit written method statements to the applicant. For purposes of the environmental specification, a “Method Statement” is defined as a written submission by the contractor to the applicant setting out the plant, materials, labour and method the contractor proposes for carrying out an activity, in such detail that the Applicant and the ECO are able to assess whether the contractor’s proposal is in accordance with the specifications and/or will produce results that are in accordance with specifications.

The content of the Method statement cannot be changed or altered.

The method statement must cover applicable details with regard to:

- Construction procedures;
- Materials and equipment to be used;
- Getting the equipment to and from site;
- How the equipment/material will be moved while on site;
- How and where material will be stored;
- The containment (or action to be taken if containment is not possible) of leaks or spills of any liquid or material (of any potential hazardous material) that may occur;
- Timing and location of activities;
- Compliance/non-compliance with the Specifications; and
- Any other information deemed necessary by the applicant and the ECO.

The Contractor must abide by these approved method statements, and any activity covered by a method statement must not be commenced with until the applicant and the ECO have approved such Method Statement.

NB: No work must be commenced with until all relevant parties have approved the Method Statement.

Explanation of method statements and a pro forma method statement sheet that must be completed by the Contractor for each activity requiring a method statement is attached as **Appendix 4 and Appendix 5.**

7. ENVIRONMENTAL DECLARATION of UNDERSTANDING

(for the Environmental Management Programme (EMPr))

The purpose of the Environmental Declaration of Understanding agreement between the applicant, the engineer, the contractor and the Environmental Consultant is:

1. To enforce compliance by all parties with the EA and this EMPr;
2. To maintain proof of compliance with the site EA;
3. Applicant to inform all relevant parties of the EA and EMPr (as per condition of the EA);
4. To protect the environment of the site against environmental damage;
5. To mitigate and rehabilitate any damage to the environment; and
6. Ensure that all contractors and sub-contractors are familiar with the EMPr and EA and sign the mandatory Declaration of Understanding indicating their undertaking to work within the framework of the environmental requirements.

This agreement outlines the obligations on the ECO to ensure compliance with the EMPr by all parties.

8. PENALTIES

The applicant (on recommendation by the ECO) reserves the right at all times for the duration of this agreement to impose restrictions and associate penalties on the contractor with respect to the specific nature, timing and extent of construction activities on environmentally sensitive sites.

In instances of non-compliance with the EMPr by the contractor (or any of their employees) or sub-contractor/s (or any of their employees) that move on or off the site, the on-site ECO must issue a written warning indicating the non-conformance to the contractor.

The applicant in consultation with the Environmental Consultant/ECO, must determine the amount to be paid as a penalty in accordance with the Penalties for Non-Compliance Schedule of Tariffs (**Appendix 2**).

Such penalty amount must be produced in writing and presented to the contractor within seven days of the written warning. The applicant may recover penalties by deducting the fine from the offending contractor.

The contractor will be responsible for all costs incurred where emergency procedures are implemented to deal with accidents impacting on the environment as well as the rehabilitation of such damage in conjunction with the ECO and site engineer.

In serious cases, at the discretion of the applicant and the Environmental Consultant/ECO, any multiple offences can be added together.

The ECO (after consultation with Environmental Consultant/ Applicant may also *stop the works or part thereof until the situation is resolved; no extension of time is claimable by the contractor.*

These penalties do not preclude any prosecution under any law or regulation.

This set of procedures must be understood by all relevant on-site project managers / project managers and site workers.

See **Appendix 2** for the Penalties for Non- Compliance.

9. RESPONSIBILITY OF THE KAI !GARIB LOCAL MUNICIPALITY (Applicant)

The applicant is responsible for ensuring compliance with the conditions contained in the EA by any person acting on his behalf, including but not limited to an agent, servant, employee or any person rendering a service to the applicant in respect of the activity, including but not limited to contractors and consultants.

The applicant is responsible for appointing the ECO, Site Engineer and Contractor for the duration of the construction contract and for ensuring that the Site Engineer and Contractor fulfil their obligations in terms of this EMPr.

The applicant and or its representative must notify the competent authority and any other relevant authority, in writing, within 24 hours of any condition of this authorisation not being adhered to.

10. THE SITE ENGINEER / SITE MAIN CONTRACTOR

The Site Engineer/ Site main contractor is responsible for ensuring that the construction contract and daily construction activities as per the original site specifications are implemented in terms of the Environmental Management Programme which includes additional on-site Start-Up Meeting agreements

The Site Engineer and the ECO are expected to develop a close working relationship and to stay in contact with each other.

The Site Engineer issues site instructions to the Contractor and all requests and communications between the ECO and Contractor are via the Site Engineer.

The only exception to this is where the ECO needs to issue a “stop works” order on the Contractor or the Site Engineer if serious environmental harm is about to happen or is happening as a result of construction activity. This “stop-order” must be confirmed by the ECO as soon as practically possible to all affected construction personnel.

When the ECO is not on site, the resident engineer will be responsible for implementation of the EMPr. Any construction and construction related activities that might lead to damage to the environment should be immediately brought to the attention of the site ECO.

The site engineer or the appointed engineer's representative must complete the daily **“ENVIRONMENTAL DAILY CHECKLIST”** (see Appendix 6)

11. THE CONTRACTOR

The Contractor must ensure that all of its sub-contractors, employees, suppliers, agents, etc., are fully aware of the environmental issues detailed in the site EMPr. The Contractor must liaise closely with the Site Engineer and the ECO and must ensure that the works on site are conducted in an environmentally sensitive manner and fully in accordance with the requirements of the EMPr, at all times.

Any main bulk service providers must be advised of the construction activities as well as the requirements of this EMPr and the Contractor is responsible for their activities conducted within their work areas.

All contractors working on site must have proper and competent contractor supervision during their time of contract.

If more than one contractor work on the site simultaneously then the responsibility lies on each contractor to adhere to the conditions of the EMPr and related documents.

This is for the duration of the contract.

The supervisors must work closely with the appointed environmental officer and discuss the daily programme with the appointed environmental officer. Any problems that might lead to damage to the environment must be discussed prior to commencement of the activity.

THE ECO MUST ENSURE THAT ALL CONTRACTORS / SUB-CONTRACTORS HAVE SIGNED THE "DECLARATION OF UNDERSTANDING" (Appendix 3) IN THIS CONSTRUCTION ENVIRONMENTAL MANAGEMENT PROGRAMME BEFORE CONSTRUCTION COMMENCES.

12. SITE PERSONNEL: ENVIRONMENTAL AWARENESS TRAINING

All daily site construction personnel must attend an on-site Induction Environmental Education and Awareness Training (E&AT) session together with any site-specific environmental training they may require to carry out their duties.

All contractor and sub-contractor teams involved in work on site must be briefed on their obligations regarding environmental controls and methodologies in terms of this EMPr prior to commencement of any construction and construction-related activities

The on-site Environmental Education and Awareness Training session must take the form of an on-site environmental talk and where necessary relevant demonstrations conducted by the ECO.

The on-site Environmental Education and Awareness Training session must be aimed at all levels of site contractors, sub-contractors and related site workers & site management.

In the case of new workers coming onto site throughout the construction programme, the site contractor is responsible for ensuring that all new labour arriving on site is made aware of the contents of the EMPr and is briefed on the E&AT.

13. ENVIRONMENTAL CONTROL OFFICER

13.1 Frequency of site visits

An ECO must be appointed for the duration of the construction phase. The ECO must comply with the following:

- Conduct a start-up meeting before construction commences;
- ECO to monitor the development at least once per week (or as specified by the competent authority) until the development is completed;
- Conduct a closing down visit as soon as possible after completion of the development;
- Conduct an Environmental Compliance Audit Report as required in terms of Appendix 7 and Regulation 34 of the EIA Regulations, 2014 (as amended).
- The Environmental Compliance Audit Report requirements are detailed in **Section 13.3** of this EMPr.

13.2 Requirements for the Posts

Environmental Control Officer: [ECO]

- A recognised environmental practitioner with a degree in environmental management and sound knowledge of the environment and environmental management principles.
- An independent person with five or more years of environmental site management and able to ensure EMPr compliance monitoring experience on construction projects.

13.3 Auditing Programme

- This audit programme must be included in the EMPr to comply with the requirements of Appendix 7 of the EIA Regulations, 2014 (as amended).
- The frequency of auditing compliance with the conditions of the environmental authorisation and compliance with the approved EMPr, and where applicable the closure plan, in order to determine whether such EMPr and closure plan continuously meet mitigation requirements and addresses environmental impacts, taking into account processes for such auditing prescribed in terms of the EIA Regulations, 2014.
- The holder of this environmental authorisation must, for the period during which the environmental authorisation and EMPr, and where applicable the closure plan, remain valid—
 - (a) ensure that the compliance with the conditions of the environmental authorisation and the EMPr, and where applicable the closure plan, is audited; and
 - (b) submit an environmental audit report to the competent authority.
- The environmental audit report contemplated in subregulation (1) must—
 - (a) be prepared by an independent person (ECO) with the relevant environmental auditing expertise;
 - (b) provide verifiable findings, in a structured and systematic manner, on
 - (i) the level of performance against and compliance of an organisation or project with the provisions of the requisite environmental authorisation or EMPr and, where applicable, the closure plan;
 - (ii) the ability of the measures contained in the EMPr, and where applicable the closure plan, to sufficiently provide for the avoidance, management and mitigation of environmental impacts associated with the undertaking of the activity;
 - (c) contain the information set out in Appendix 7 of the EIA Regulations, 2014; and
 - (d) be conducted and submitted to the competent authority at intervals as indicated in the environmental authorisation.
- Within seven days of the date of submission of an environmental audit report to the competent authority, the holder of an environmental authorisation must notify all potential and registered interested and affected parties of the submission of that report, and make such report immediately available—
 - (a) to anyone on request; and
 - (b) on a publicly accessible website, where the holder has such a website (if applicable).

13.4 Monitoring responsibilities of the ECO

- The ECO will undertake regular site inspections and to monitor and assist in environmental tasks he/she must compile daily/weekly reports/checklist and submit to the Applicant.
- Is to ensure that the mitigation/rehabilitation measures and recommendations referred to in the Environmental Authorisation are implemented and to ensure compliance with the provisions of the EMPr.
- Must notify the competent authority and any other relevant authority, in writing, within 24 hours of any condition of the EA not being adhered to.
- Is responsible for the environmental issues involved with the construction phase of the project;
- Co-ordinating any aspect of site activity that may have an effect on the environment;
- Must work in close conjunction with the applicant /Site representative, contractors and sub-contractors
- Must identify and demarcate the impact area *i.e.* construction footprint area before any construction activities commence

- Must demarcate the necessary areas for storage of materials, ablutions, eating areas of contract workers, etc.
- Must identify 'No go' areas and areas sensitive to erosion and have these areas demarcated. Environmental awareness of the workers is essential. This must be in the form of an on-site talk and must be conducted at an appropriate technical level
- The ECO will keep a site inspection diary. The purpose of the site diary is to record construction progress and environmental compliance. This information is then recorded in the form of an ECO checklist and/or diary entries and photographic records for visual reference. (Appendix 8).
- These documents must be made available to the authorities for inspection on request. The diary must include meetings/discussions with the contractor and must reflect environmental queries, agreed actions and dates of eventual compliance. These must form part of the official environmental record

13.5 Authority of the ECO

The ECO has the authority to stop works if in his/her opinion there is a serious threat to or impact on the environment caused directly by construction operations.

This authority is to be limited to non-compliance with the EMPr and emergency situations where consultation with the Environmental Consultant is not immediately available.

The ECO is to inform the Environmental Consultant of the reasons for the stoppage as soon as possible. A relevant reason should be supplied to the Applicant/ Site representative as soon as possible after stoppage of such works.

Upon failure by the contractor or his employee to show adequate consideration for the environmental aspects of this contract i.e. wilful/negligent destruction of the environment, the ECO may recommend to the Applicant /site representative to have the contractor's representative or any employee(s) removed from the site or work suspended until the matter is remedied.

No extension of time will be considered in the case of such suspensions and all costs will be borne by the contractor

13.6 Appointment of an ESO. (Environmental Site Officer)

When necessary the ECO may appoint an ESO to carry out the site inspections and the following will apply:

- The ESO is appointed prior to commencement of construction activities, site inspections are decided upon between the Applicant and the ECO depending on the environmental sensitivity of the construction areas and site location.
- The frequency of site inspections is also determined prior to commencement of works but can in consultation with the competent authority change, if the need arises.

13.7 Qualifications of an ESO.

The appointed Environmental Site Officer must fulfil the following criteria:

- Have at least five years' experience as an Environmental Site Officer.
- Have a sound understanding of the contents of the EMPr.
- Must be able to enforce compliance to all relevant site documents.
- Have a basic knowledge of the NEMA and other relevant information.
- A construction background would be an advantage.
- Must be able to work with site personnel and resident engineers.

14. CHANGES TO ENVIRONMENTAL MANAGEMENT PROGRAMME

Although care has been taken to address all known relevant environmental issues for the construction phase, it may become necessary to add or amend certain procedures or instructions to improve the efficiency of the Environmental Management Programme (EMPr).

Only those additions or amendments to this EMPr that will either improve environmental protection or can be proven to not have any significant negative effect to the immediate and surrounding environment will be considered.

Changes or deviations have to be motivated in writing by means of a Method Statement and the same procedures for a standard Method Statement have to be followed.

Any additions or amendments must be submitted by the ECO to the competent authority after the ECO has consulted with the Environmental Consultant and the Applicant. Please note that any additions or amendments to this EMPr must be approved by the competent authority before they can be implemented.

No deviation from the contents of the EMPr is allowed without the above-named prescribed procedures.

15. RECORD KEEPING

All records relating to the implementation of this management plan (e.g. Declaration of Understanding, ECO Checklist and/or diary, Method Statements, etc.) must be kept together and can be retrieved easily. These records must be kept available for scrutiny by any relevant authorities.

Photographs are to be taken of the site prior to, during and immediately after construction, as a visual reference. These photographs must be stored with other records related to this EMPr.

Any environmental non-compliances reported must have the support of sufficient photographic proof to mitigate the non-compliance report.

16. ENVIRONMENTAL COMPLETION STATEMENT

An Environmental Completion Statement is a report by the ECO/EC to the relevant authorities stating completion of the project and compliance with the EMPr and conditions.

The following environmental statements must be completed on completion of all site construction activities and submitted in line of sequence to the relevant office for perusal and reference.

16.1 ESO: ENVIRONMENTAL CLOSING STATEMENT

The ESO must submit an **environmental closing statement** on completion of the construction phase of the development. The environmental closing statement must cover all aspects of daily/weekly construction activities that took place during the ESO site inspections.

16.2 ECO: ENVIRONMENTAL COMPLETION STATEMENT

The ECO must submit an **environmental closing statement** relating to all environmental and technical issues that occurred on site as well as any conclusions regarding incidents such as written warnings, stoppages of works and penalty fines.

16.3 ENVIRONMENTAL AUDIT REPORT

An Environmental Audit Report by the ECO must be submitted by the Applicant to the satisfaction of the competent authority, and the environmental audit report will be conducted and submitted to the Department at intervals as indicated in the Environmental Authorisation.

In terms of Regulation 34 of the EIA Regulations, 2014 (as amended), the holder must conduct environmental audit reports to determine compliance with the conditions of the Environmental Authorisation, the EMPr and submit the Environmental Audit Reports to the Competent Authority. The Environmental Audit Report must be prepared by an independent person and must contain all the information required in Appendix 7 of the EIA Regulations, 2014 (as amended).

The holder must undertake an environmental audit of the construction phase of the development and submit the Environmental Audit report to the Competent Authority within three months after operation has commenced.

The holder must, within seven days of the submission of each of the above-mentioned reports to the Competent Authority, notify all potential and registered Interested and Affected Parties (I&APs) of the submission and make the reports available to anyone on request and on a publicly accessible website (if applicable).

17. MANAGEMENT SPECIFICATIONS (CONSTRUCTION PHASE)

(This EMPr is additional to conditions as set out in the EA)

The most important part of the operational phase will be to ensure that the site is meticulously maintained and that the operations are carefully monitored. The Applicant will remain overall responsible for the environmental performance of the site and must be aware of the legal requirements and obligations. The applicant must also remain aware of the legal action that can be taken against him as a person with regards to negligence leading to environmental pollution.

This section of the Environmental Management Programme (EMPr) is required to address the protection and ongoing management of the natural resources both on and off the site during the operational stages of the development. The overarching goal is to ensure that undue or reasonably avoidable impacts of the proposed development are avoided and that positive impacts of the development are enhanced.

The following points of action must be considered during the operational phase (maintenance activities) to avoid any environmental impacts:

- All maintenance activities will consider the environment and the nearby residences and residents.
- The Applicant will ensure that any maintenance activities that are undertaken are carried out in line with the specifications and recommendations set out in section 17 of this document.
- Any incidents that have resulted in a large negative impact on the environment are to be reported to the competent authority.
- The site must be securely fenced off, with no public access to the installation.

17.1 Visual

The following recommendations for keeping the visual impact minimal must be implemented:

- The Construction phase should be completed as soon as possible
- Post-construction rehabilitation should be completed as soon as possible

17.2 Protection of Fauna and Flora

The following recommendations adapted from the Terrestrial Biodiversity Impact Study Report must be implemented:

- All construction work should be done in accordance with an approved construction phase Environmental Management Plan (EMP) approved by the competent authority.
- A suitably qualified Environmental Control Officer should be appointed to monitor the construction phase in terms of the EMP and any other conditions pertaining to specialist studies.
- Before any work is done the footprint must be clearly demarcated. The demarcation must aim at minimising impacts outside of the approved development footprint. • The recommendations given in Table 11 must be implemented and a Northern Cape Nature Conservation Act permit must be obtained for the potential impacts on the NCNCA protected species.
- All alien invasive species within the footprint and its immediate surroundings must be removed responsibly.
- Care must be taken with the eradication method to ensure that the removal does not impact or lead to additional impacts (e.g., spreading of these species due to incorrect eradication methods);
- Care must be taken to dispose of alien plant material responsibly.
- An integrated waste management approach must be implemented during construction and all waste within the footprint area must be removed and disposed to the local Municipal waste disposal site.
- Construction related general and hazardous waste may only be disposed of at Municipal approved waste disposal sites.

17.3 Freshwater ecology

The following recommendations adapted from the Freshwater Impact Study Report appended to the BAR as Appendix D2 must be implemented:

- The Applicant must attempt to commence with and complete construction during the dry season and must put in place and maintain measures to keep stormwater away from the proposed site during the construction phase
- Maintain buffer areas between the proposed development and drainage lines as much as possible
- Minimise disturbance to the on-site drainage lines so as to preserve the drainage lines as much as possible
- Prevent loose soil and debris from washing away down the on-site drainage lines
- Provide a portable toilet for every 15 workers on the proposed site and the toilets must be tied down to prevent them from being blown over. The toilets must be provided with toilet paper at all times and the waste in the toilets collected regularly and discarded at a WWTW.
- The access roads to the site must be maintained. Stormwater management structures must be constructed to divert runoff from the roads. Erosion of roads must be prevented. No new roads must be added. Use only existing access roads. Limit the footprint to that of the demarcated construction site.

17.4 Protection of Cultural, Archaeological & Paleontological remains

The following recommendations adapted from heritage impact study report appended to the Draft BAR as Appendix D3 must be implemented:

- A distance of at least 30m must be maintained between construction activities and any suspected grave or cemetery.

- Should any human remains or heritage resources be exposed during excavations or any other actions on site, these must immediately be reported to the South African Heritage Resources Agency. Heritage remains uncovered or disturbed during earthworks must not be further disturbed until the necessary approval has been obtained from the South African Heritage Resources Agency.
- If Palaeontological resources are uncovered on the proposed site, the Chance Find Protocol must be implemented immediately. Fossil discoveries must be protected and the ECO/site manager must report to the South African Heritage Resources Agency (SAHRA) so that mitigation (recording and collection) can be carried out.
- Before any fossil material can be collected from the development site, the specialist would need to apply for a collection permit from SAHRA. Fossil material must be housed in an official collection (museum or university), while all reports and fieldwork (at the cost of the Applicant) must meet the minimum standards for palaeontological impact studies proposed by SAHRA (2012).

17.5 Socio-economic

The following recommendations must be implemented:

- Construction workers should be sourced from the local area as much as is practicable.
- Local businesses should be given first preference in the procurement process for service providers and for suppliers of construction materials.
- The Applicant should work through a community liaison officer to ensure that the local community is kept informed on the project and is provided with a channel for addressing any concerns or grievances that may arise.

17.6 Appropriate use of Machinery

The Contractor must, at all times, carefully consider what machinery is appropriate for the task, while minimising the extent of environmental damage and disturbance to the surrounding area.

The contractor must not operate any machinery including a fuel driven compressor outside the demarcated area.

Where practical, all maintenance of plant and machinery used on the site must be performed in workshops. If it is necessary to do maintenance outside of a workshop area, the Contractor must obtain the approval of the Engineer and the ECO prior to commencing activities.

All vehicles and equipment must be routinely inspected for fuel and oil leaks, kept in good working order and serviced regularly. Leaking equipment must be repaired immediately or removed from the Site. When servicing equipment, drip trays must be used to collect the waste oil and other lubricants. Drip trays must also be provided in construction areas for stationary plant (such as compressors) and for "parked" plant (such as scrapers, loaders, vehicles). Drip trays will be kept free of water that will float the oil to overspill. All drip trays / bungs to attain a 120% capacity of the plant fuel / oil capacity.

Appropriate 2.5kg (minimum requirement) dry powder SABS approved and service certified fire-fighting extinguisher must be a mandatory item on all vehicles working and moving on or off the construction site.

17.7 Demarcating and fencing

Final site demarcation must be carried out with all relevant parties (who will be responsible) present for the day-to-day activities on the site, they include;

The applicant	Representative
Environmental Consultant	Environmental Consultant (EC)
Main Contractor	Project Site Manager
Sub-contractor	Project contractor
ECO/ESO	Environmental Control Officer or Site Officer

The proposed site must be demarcated prior to the commencement of any construction activities whatsoever, this includes site establishment, the moving of construction material or any other items onto the site, *etc.*

The site will be demarcated with appropriate strong steel dropper poles. A single strand of orange baler twine is to be attached to the dropper poles to indicate boundaries and no-go areas for site personnel and vehicular movement. (Alternative fencing may be decided upon dependent on site requirements)

The construction area *i.e.*, road, stockpile areas and development footprint *etc.* must be demarcated and fenced off with steel dropper poles and orange baler twine approximately 1 m high is considered adequate. The demarcation will be agreed on during the start-up meeting.

All fencing and fence placement/ positioning must be approved by the ECO on site.

Work areas and access routes must be clearly demarcated to minimise environmental impact.

NB. Steel dropper poles and orange baler twine have proven to be the most environmentally friendly means of on-site demarcation.

In the event that sensitive features are threatened by construction activities, temporary fencing around these areas or the construction area is recommended.

The Contractor must maintain in good order all demarcation, fencing and barriers for the duration of construction activities, or as otherwise instructed. Any temporary fencing removed for the execution of any portion of the works is to be reinstated by the Contractor as soon as practicable. The Contractor at the end of the contract must remove all demarcation, fencing or barriers not forming part of the final works on Site. Once in place the demarcation barriers must not be moved or altered without consultation with the site ESO and the main contractor.

17.8 “NO-GO” Areas

“NO-GO” areas, if so designated by the EMPr, EA or on-site start-up meeting, are certain pre-determined areas where construction activities are prohibited. The contractor must ensure that no person, machinery and/ or equipment enter the “NO-GO” areas at any time during the contract period. If so required by specifications in the EMPr, certain areas must be “NO-GO” areas. The Contractor must ensure that, insofar as he has the authority, no person, machinery, equipment or material enters the designated “NO-GO” areas at any time.

Areas of special importance will be decided upon between the Engineer, Contractor, the ECO, and the landowners and demarcated as “No go” areas on a site plan and fenced off. Such areas are out of bounds to the Contractor and his staff, sub-contractors and their staff or suppliers and their staff and to any other person involved in the construction, without the written permission specified by the ECO.

All private property outside of the construction areas as set out in the site layout plan shall be considered no-go areas.

17.9 Stormwater control and Groundwater

The Applicant must implement the recommendations concerning stormwater that are contained in the freshwater ecology specialist report attached hereto as Appendix D2. Please refer to Section 17.3

17.10 Fuel, Tar Compounds and Oil

A maximum of 25l of fuel can be stored on site.

Basic guidelines to follow if any fuels are to be stored are as follows:

- These areas must comply with general fire safety requirements;
- All vehicles, equipment, fuel and petroleum services and containers must be maintained in a good condition that prevents leakage and possible contamination of soil or water supplies; Drip trays are to be used in these storage areas to prevent contamination of the ground in the event of spillages or leaks;
- No refuelling of vehicles to be allowed on site;
- If required, only small volumes (<25l) of fuel is permitted on site for the fuelling of small plant and equipment;
- Quantities of fuel must not exceed 25 litres at any time;
- All plant / fuel tanks must have a drip tray present to use in the event off accidental spillage of oils and fuels and must contain a capacity level of 120% of the capacity of the plant fuel and oil tanks;
- Drip trays must be used when refuelling small plant or equipment;
- A suitable leak proof container for the storage of oiled equipment (filters, drip tray contents and oil changes etc.) must be established;
- Fuels and oils must be safely located out of harm's way from the elements and safety and fire prevention must be strictly adhered to;
- All spills are to be recorded in the ESO diary;
- A bioremediation/hydrocarbon spill remediation product approved by the ECO must be stored on site and near the fuel stores for any emergencies such as spills. Once a purpose manufactured hydrocarbon spill remediation product has been used or has been used to treat contaminated materials (soil, rubble etc.), it can be disposed of as per general waste provided this is not in excessive quantities; and
- Fuel Storage proposals must be cleared by the ECO before any storage or stockpiling takes place.

17.11 Hazardous Substances

If potentially hazardous substances are to be stored on site, the Contractor must provide a Method Statement detailing the substances/materials to be used, together with the storage, handling and disposal procedures of the materials to the Engineer and the ECO.

Paints: - No paint products must be disposed of on Site and brush/roller wash facilities must be established to the satisfaction of the Engineer and the ECO. Oil based paints and chemical additives and cleaners such as thinners and turpentine must be strictly controlled. A Method Statement detailing the paint management procedures is required.

17.12 Concrete Works

The Engineer (in collaboration with the ECO) must indicate the permitted location of batching plants (including the location of cement stores and sand and aggregate stockpiles), if these are to be present on site, on a site plan. A Method Statement indicating the layout and preparation of such facilities must be submitted.

The cleaning of equipment and flushing of mixers must not result in pollution of the surrounding environment.

All wastewater resulting from batching of concrete must be disposed of via the contaminated water management procedure. Used cement bags must be stored in weatherproof containers to prevent wind dispersion and water contamination. Used cement bags must be disposed of on a regular basis via the solid waste management system and must not be used for any other purpose.

The disposal of cement bags on site must be arranged with the site ECO.

All visible remains of excess concrete must be physically removed and disposed of on completion of cement work. Washing the remains into the ground is not allowed. All excess aggregate must also be removed.

The following recommendations must be implemented to minimise impact:

- Any concrete mixing must take place on top of boarding and/or impermeable sheeting to protect the ground. This board and or sheeting must be removed from the site once the mixing is completed;
- Concrete batching to take place at identified areas only in consultation with the ECO;
- Dry mixing batching areas to be carefully placed in consultation with the ECO;
- If possible/appropriate ready mix concrete must be used;
- Cement bags are to be stored securely out of harm's way from the elements (wind and rain). Bags has to be covered and placed on plastic sheeting;
- Sand and stone to be stored on plastic if it is stored outside the future fenced off site;
- Excess or spilled concrete must be confined within the works area and then removed to a waste site; and
- Wash-down areas must be confined to within the concrete batching area.

NB: In the event of ready-mix concrete deliveries taking place on site the site foreman, must ensure that no wash-down of ready-mix trucks takes place on or around the site, except at the concrete batching area where concrete wastewater may be contained in the existing bunding pit. Any alternative method of disposal must have prior approval of the site ECO.

17.13 Fires and smoking

No fires are allowed. If Smoking is allowed on site, arrangements are to be made for disposal of cigarette buds. No smoking will be allowed outside the agreed upon areas.

Adequate firefighting equipment according to the fire hazard during the construction period must be available on site and in good working order (at least one type ABC (all-purpose) 2.5kg extinguisher and three fire beaters per working area). The persons on site must be trained in the use of such equipment.

The main contractor must provide a list of all authorities involved in firefighting in the region. This list must include emergency contact numbers and must be visible at the site office.

Welding, gas cutting or cutting of metal will only be permitted inside the working areas.

The Contractor must pay the costs incurred to organizations called to put out any fires started by him. The Contractor must also pay any costs incurred to reinstate burnt areas as deemed necessary by the Applicant.

It is required that contractors have available, the emergency telephone numbers of the nearest local Fire Fighting Station and that an emergency firefighting re-action plan has been drawn up with on-site workers and the landowner.

17.14 Emergency Procedures

It is the responsibility of the contractor to assess the potential risks to the environment as a result of the project. As such, the contractor must have the necessary standard emergency operating procedures in place to deal with any potential emergency such as oil spills or fire.

All staff should be made aware of the necessary basic emergency procedures in the event of an emergency including injuries to staff. The appropriate equipment and identified personnel to deal with such basic emergencies should be available on site.

Fire: The Contractor must advise the relevant authority of a fire as soon as a fire starts and must not wait until he can no longer control the fire. The Contractor must ensure that his employees are aware of the procedure to be followed in the event of a fire.

Spills: The Contractor must ensure that his employees are aware of the procedure to be followed for dealing with spills and leaks, which must include notifying the Engineer, the ECO and the relevant authorities. Treatment and remediation of the spill areas must be undertaken to the reasonable satisfaction of the ECO and Local Authority.

17.15 Dust Control (if required)

The Contractor must take all reasonable measures to minimize the generation of dust as a result of construction activities to the satisfaction of the ECO and Local Authority.

17.16 Solid Waste Management

No on-site burying or dumping of any waste materials, vegetation, litter or refuse must occur.

The Contractor must provide problem-animal and weatherproof bins with lids of sufficient number and capacity to store the solid waste. The lids must be kept firmly on the bins at all times. The bins must not be allowed to overfill and must be emptied regularly. The waste from bins may be temporarily stored on site in a central waste area that is weatherproof and scavenger-proof, and which the Engineer and the ECO has approved.

All solid waste must be disposed of off-site at a suitably licensed waste disposal site. The Contractor must supply the ECO with the certificates of disposal. All hazardous waste must be disposed of at a suitably licensed hazardous waste disposal site.

The Contractor must make provision for workers to clean up the Contractor's camp and working areas on a daily basis so that no litter is left lying around and so that the site remains in a neat and tidy state. The Contractor must remove from site the refuse collected at least once a week.

The Contractor is responsible for the establishment of a refuse control system that is acceptable to the ECO.

Disposal arrangements must be made in advance and cleared with the ECO before construction starts.

17.17 Toilets and Ablution Facilities

The Contractor must provide suitable sanitary facilities near the proposed site for all site employees, in agreement with the landowners/ person in control of the land. A minimum of one toilet must be provided per 15 persons at each working area (station).

If portable/chemical toilets are to be used (in agreement with the landowner/ person in control of the land):

- The toilets must be within easy reach of the working area and be in good working condition and cleaned on a daily basis. Toilet paper must be provided. The toilets must be emptied on a weekly basis or when full or when instructed by the ECO on site;

- Disposal arrangements must be made in advance and cleared with the ECO before construction starts. Sanitation provision and servicing must be to the satisfaction of the ECO;
- The Contractor must ensure that toilets are emptied prior to any builders' holidays, and/or weekends;
- Toilets must be of a neat construction and must be provided with doors and locks and must be secured to the ground to prevent them from being blowing over; and

NB. NO BURYING OR BURNING OF ANY WASTE MATERIAL ON OR NEAR THE CONSTRUCTION SITE NOR ANYWHERE ON THE SURROUNDING PROPERTIES IS PERMITTED.

17.18 Stockpiling

Any stockpiling of gravel, cut, fill or any other material must only be allowed in degraded areas. The Contractor must indicate the proposed areas for such operations and method of undertaking such operations in a Method Statement to be submitted to the ECO for approval before any such activity is commenced with. Any areas used for stockpiling must be restored to a state similar to the state before construction work was commenced with and it must be ensured that the erosion potential of these areas is not increased.

The Contractor must ensure that the stockpiled materials do not blow away or wash away or mix with each other. If the stockpiled material is in danger of being washed away or blown away, the Contractor must cover the material with a suitable material, such as hessian, netting or plastic.

17.19 Preparation of Building Material

The Contractor must ensure that any delivery drivers are informed of all procedures and restrictions (including "no go" areas) required to comply with the Specifications. The Contractor must ensure that these delivery drivers are supervised during off-loading, by someone with an adequate understanding of the requirements of the Specifications. Cognisance of vehicle and pedestrian traffic while delivering material must be taken.

All manufactured and/or imported material must be stored within the demarcated area, and if so required, out of the rain. All laydown areas outside of the construction camp are subject to the Engineer and the ECO's prior approval in such a way as to not cause any nuisance or environmental damage.

All building materials are to be prepared at the batching plant, to enable the effects of cement and other substances, and any resulting effluent to be more easily managed.

It is essential that any imported material, *i.e.*, building sand, bedding base sand for pipes *etc.* must be screened and the origins thereof must be identified prior to arriving on the proposed site and this must be approved beforehand by the Engineer / ECO.

17.20 Discharge of construction water

Potentially polluting material of any kind and in any form must be kept, stored, and used in such a manner that any escape can be contained and watercourses not endangered.

Contaminated water includes water that is carrying excess sediment as a result of construction activities. Appropriate protection from rain and flooding must be implemented. Contaminated water that is removed from site must be disposed of at a suitably licensed waste disposal site approved beforehand by the ECO. No contaminated water that does not meet the water quality standards and criteria under the National Water Act may be released into a natural system, whether surface water or groundwater.

17.21 Contractors Temporary Camping site and Eating Areas

The Contractor must designate eating areas for prior approval by the ECO, which must be clearly demarcated once approved. No eating of meals must take place outside these designated areas without the prior approval of the Contractor/ ECO. The feeding or leaving behind of food for animals is strictly prohibited. Sufficient waste bins must be present in this area and emptied regularly.

No overnight camping/ stay on site is allowed. If overnight camping is necessary for security purposes then this must be cleared beforehand with the ECO.

17.22 Traffic, Access Routes and Haul Roads

The Contractor must control the movement of all vehicles and plant including that of his suppliers so that they remain on designated routes. In addition, such vehicles and plant must be routed and operated so as to minimise disruption to regular users of the routes. On public roads adjacent to the site, construction vehicles must adhere to municipal and provincial traffic regulations.

All temporary access routes must be rehabilitated at the end of the contract to the satisfaction of the ECO, if required.

17.23 Site Clean Up

The Contractor must ensure that all structures, equipment, materials and facilities used or created on site for or during construction activities are removed once the project has been completed. The construction site must be cleared and cleaned to the satisfaction of the ECO.

17.24 Land Management

No fences or gates near or on the proposed site must be damaged.

18 MANAGEMENT SPECIFICATIONS (OPERATIONAL PHASE)

The most important part of the operational phase is to ensure that the site is meticulously maintained and that the operations are carefully monitored. The applicant will remain overall responsible for the environmental performance of the site and must be aware of all legal requirements and obligations. The applicant must also be aware of legal action that can be taken against him as a person with regards to negligence that leads to environmental pollution.

This section of the EMPr is required to address the protection and ongoing management of natural resources both on and off the site during the operational stages of the development. The overarching goal is to ensure that the undue or reasonably avoidable impacts of the proposed development are avoided and that the positive impacts of the development proposal are enhanced.

The following points of action must be considered during the operational phase (maintenance activities) to avoid any environmental impacts:

- All maintenance activities must take into account the environment and the surrounding land uses.
- The Applicant must ensure that any maintenance activities that are undertaken are kept in line with the specifications and recommendations set out in Section 17 of this EMPr.
- Any incidents that have resulted in a large negative impact on the environment are to be reported to the competent authority.

18.1. Visual Impact Mitigation

- The Applicant must ensure that before the Contractor finally departs from the site, the topographic characteristics of the site have been returned to a condition similar to before construction work was commenced with.

18.2. Impact Mitigation relating to Sludge and Water

- The land immediately bordering the proposed WWTW should be levelled and landscaped after construction work ends, so as to reduce the likelihood of sand, mud and silt being washed away down the on-site drainage line.
- Daily visual inspection of the WWTW must be conducted for any signs of leakage such as proliferation of wetland vegetation and any leakage discovered must be urgently be sealed.
- The depth of sludge in the oxidation ponds must be measured annually and the sludge sampled and subjected to laboratory tests. It is anticipated that every seven years, the sludge will have accumulated to more than 50% of the capacity of the oxidation ponds and so the sludge will be extracted and disposed of.
- If the results of laboratory testing indicate that the sludge is suitable for usage as fertiliser, the sludge may be dried and then supplied to farmers for usage as fertiliser. However, should laboratory testing indicate that the sludge is unsuitable for usage as fertiliser, the sludge must be disposed of at a suitably licensed waste disposal site determined together with the National Department of Water and Sanitation and the required chain of custody records of disposal must be kept and produced upon request to the relevant officials.
- Monitor quality of treated wastewater and make required adjustments to operations accordingly.
- Make public, the results of the laboratory tests conducted on the treated wastewater discharged by the WWTW
- Groundwater quality must be monitored at a downstream borehole and any adjustments that appear necessary at the WWTW for improving the groundwater quality must be made. In addition, the results of the groundwater quality monitoring must be made public.
- Keep surrounding environment free of litter

18.3. Terrestrial Biodiversity Impact Mitigation

- All alien invasive species must be removed responsibly.
- Care must be taken with the eradication method to ensure that the removal does not impact or lead to additional impacts (e.g., spreading of the AIP due to incorrect eradication methods);
- Care must be taken to dispose of alien plant material responsibly.

19 TERMS AND ABBREVIATIONS:

The following definitions and abbreviations are applied:

DEA&T	Department of Environmental Affairs
DWS	Department of Water and Sanitation
EA	Environmental Authorisation
EIA	Environmental Impact Assessment
EMPr	Environmental Management Programme, although the term Environmental Management Programme is often used interchangeable with <i>Programme</i> .
EMS	Environmental Management System
IEM	Integrated Environmental Management
*ECO	Environmental Control Officer
*ESO	Environmental Site Officer
ER	Engineer's Representative
I&AP	Interested & Affected Party
OSSM	On Site Start-Up Meeting
SAHRA	South African Heritage Resources Agency

Environment means the surroundings within which humans exist and that are made up of:

- the land, water and atmosphere of the earth;
- micro-organisms, plant and animal life;
- any part of the combination of the above two bullets and the interrelationships between them;
- the physical, chemical, aesthetic and cultural properties and conditions of the foregoing that influence human health and well-being.

Potentially hazardous substance is a substance, which, in the reasonable opinion of the Engineer, can have a deleterious (detrimental) effect on the environment.

Method Statement is a written submission by the Contractor to the Engineer or relevant responsible person such as the Project Leader, in response to the Specification, or a request by the Engineer/Project Leader, setting out the plant, materials, labour, method, responsible persons and timeframe that the Contractor proposes using to carry out an activity, identified by the relevant specification or the Engineer/Project Leader when requesting the Method Statement, in such detail that the Engineer/Project Leader is enabled to assess whether the Contractor's proposal is in accordance with the Specifications and/or will produce results in accordance with the Specifications.

The Method Statement shall cover applicable details with regard to:

- construction procedures;
- materials and equipment to be used;
- getting the equipment to and from site;
- how the equipment/ material will be moved while on site;
- how and where material will be stored;
- the containment (or action to be taken if containment is not possible) of leaks or spills of any liquid or material that may occur;
- timing and location of activities;
- compliance/non-compliance with the Specifications;
- any other information deemed necessary by the Engineer/Project Leader.

reasonable means, unless the context indicates otherwise, reasonable in the opinion of the Engineer/Project Leader after he has consulted with a person, not an employee of the client, suitably experienced in "environmental implementation plans" and "environmental management programmes", both as defined in the Environmental Management Act (Act No 107,1998).

solid waste means all solid waste, including construction debris, chemical waste, excess cement/concrete, wrapping materials, timber, tins and cans, drums, wire, nails, food and domestic waste (e.g. plastic packets and wrappers).

contaminated water means water contaminated by the Contractor's activities, e.g. concrete water and runoff from plant/ personnel wash areas.

construction site means the area influenced and affected by the construction activities or under the control of the Contractor, often referred to as "the Site".

contractor's camp means the designated and suitably demarcated areas on the Site within which all site offices and staff facilities are situated and within which equipment will be stored, for instance, borrow areas, batching plant, crusher plant, sand washing plant, workshop, offices, rest areas, ablution areas, etc., whichever is applicable.

construction means the period of the project during which the actual works are carried out, deemed to include site establishment, site preparation, the works, maintenance period and decommissioning.

precautionary principle means the basic principle, that when in doubt or having insufficient or unreliable information on which to base a decision, to undertake actions that will have minimum risk.

Applicant	The person/organisation (usually the holder of the Environmental Authorisation) with rights to undertake the development of the site.
Audit/Monitoring	Regular inspection and verification of construction activities for degree of compliance to the Environmental Management Programme. This section is covered in the Environmental Compliance Audit Report as required in terms of Appendix 7 and Regulation 34 of the Environmental Impact Assessment (EIA) Regulations, 2014.
Bund	Enclosure under/around a storage facility to contain any spillage – the storage capacity of the bund must be 120% of the total capacity of the possible spillage amount
Batch plant	Machinery used on site for the large-scale mixing and production of concrete or plaster and associated equipment and materials.
Construction phase	The construction phase period of a cellular communications Construction site is defined as from the commencement of site establishment up to and including the practical site handover.
Contract	An accepted offer to execute specified work within a stated time for a monetary reward. It takes the form of all the documents and drawings issued when tenders are invited (in which the nature and quantity of the work to be executed are set out), the schedules of which documents have been priced by the contractor for completion within a stated time, and the acceptance, in writing, of the Contractor's price) (source: SABS 0120; 1986). OR The General Conditions of Contract and Special Conditions, Specifications, Drawings, Tender, written records of matters agreed after the submission of the Contractor's tender, Letter of Acceptance and Agreement, together with other documents which the parties have agreed in writing shall form part of the Contract and such amendments or additions to the Contract as may be agreed in writing between the parties (source: GCC, 1990).
Contractor	The natural or juristic person or partnership whose tender has been accepted by, or on behalf of the Employer and where applicable, includes the Contractor's heirs, executors, administrators, trustees, judicial managers or liquidators, as the case may be.
Declaration of Understanding	Form that is signed by all contractors involved in the construction works of their understanding and acceptance of the EMPr and site-specific additions to the EMPr.
Development site	The boundary and extent of development works and infrastructure.
Developer	The developer is the person/body responsible for the development of the project and could be the same as, or different to the Applicant.
Emergency	A situation requiring immediate action and where failure to implement appropriate actions timeously may result in environmental damage.
Engineer	A person who represents the Applicant and is responsible for the technical, environmental and contractual implementation of the works to be undertaken.
Engineer's Representative	The person appointed from time to time by the Engineer in terms of the General Conditions of Contract. The Engineer's Representative shall: • Observe the execution of the Works, examine and test materials and workmanship and receive from the Contractor such information as he shall reasonably require.

- Have the authority:
 - Given to him by any provisions of the Contract.
 - Given to him by the Engineer.
 - To deliver to the Contractor oral or written communications from the Engineer.
 - To receive on behalf of the Engineer oral or written communications from the Contractor.

The powers and authority of the Engineer's Representative would be subject to certain conditions.

Environmental Awareness Course

An environmental education course for the Contractors management staff and labour force which informs them of the requirements of the EMP.

Environmental Completion Statement

A report document submitted to the relevant authority showing that the EMP environmental controls were appropriately implemented on a project.

Environmental Completion Audit

Similar to an Environmental Completion Statement but it is more detailed and will contain detailed information regarding controls and their effectiveness. This document would be required for large projects normally where a professional environmental scientist was appointed as the ECO.

Environmental Management Programme:

A programme for managing potential impacts identified during the approval process. It could consist of one or more of the following components, depending on necessity dictated by the nature of the development:

- Standard Environmental Specification
- Detailed Environmental Specification
- Guideline documents and tools for implementation by the different role players
- The Environmental Education Course
- Standard Revegetation Specification
- Detailed Revegetation Specification

As mentioned earlier, the term Environmental Management Programme is often used interchangeable with Environmental Management *Programme*, and for the purposes of this document will be assumed to have the same definition.

Environmental Authorisation

Environmental Authorisation issued by the competent authority for the authorisation to commence construction under certain environmental conditions.

***ESO (Environmental Site Officer)**

Designation is reserved for suitably qualified environmental site managers, who are to be appointed by the Engineer, and are mainly associated with large and complex developments.

***ECO (Environmental Control Officer)
Environmental Specification**

Designation is reserved for suitably qualified authority or officer acting on their behalf. The ECO is usually a professionally registered Environmental Scientist. For the purposes of this study, this designation is reserved for the combination of the Standard Environmental Specifications and the Detailed Environmental Specifications.

ECO vs. ESO

ECO might also mean the ESO but the ESO does not mean the ECO. The ESO is responsible to the ECO

General Conditions of Contract

A document that sets out the general rights and obligations of the parties to a contract, on such matters as sureties, quality of work, program, supervision, insurance, co-operation with others, provision of plant, material and labour, the regulation of wages, samples, tests, examination, commencement and completion of work, penalties for delay, requirements for maintenance, methods of dealing with defects, variations, measurements and payments, and the settlement of disputes. In South Africa, the most widely accepted general conditions of contract for general civil engineering works is the SAICE General Conditions of Contract for Works of Civil Engineering Construction (sixth edition, 1990).

NO-GO Areas

Areas identified as being environmentally sensitive in some manner and delineated on plan, and on the site with pegs or fencing and which are out of bounds to unauthorised persons. Authorisation must be obtained from the Engineer/Project Leader prior to entry.

**Particular Specification
Project Specification**

A specification that covers construction work involving a specialist type of operation that is not adequately covered in a Standardized Specification.

A specification that describes the Works in general terms (including the locality, the conditions on Site, the extent of the Contract, the construction programme, and the service facilities available and to be taken into consideration) and that may include clauses that amend or amplify or add to any requirement(s) of a standardized

	specification (or standard or particular specification) in the sequence in which the requirements and specifications occur in the contract documents.
Reference Group:	The funding body and major role-players (including the environmental authorities) who may resolve environmental disputes, which could arise between the different role-players on site.
Revegetation Specification Site	This designation is reserved for the combination of the Standard Revegetation Specifications and the Detailed Revegetation Specifications. The boundary and extent of development works and infrastructure, including any areas off the main site on which works are to be carried out in order to allow the development to proceed successfully.
Specification	A technical description of the standards of materials and workmanship that the Contractor is to use in the Works to be executed, the performance of the Works when completed and may include the manner in which payment is to be made. It is essential for the specifications to be clear, concise and to the point, and use should not be made of ambiguous terms or phraseology.
Standard Specification	An established or accepted model specification. In South Africa the most widely accepted standard specification for general civil engineering works is the set of SABS 1200 Standardized Specifications (refer to definition below), however, other Standard Specifications such as BS, AAWA and Standard Water Specifications are also used.
Standardized Specification	A specification that is published by the South African Bureau of Standards (SABS) and that so covers a particular class of civil engineering construction that the specification is generally applicable throughout the Republic of South Africa.
Top material	This refers to any surface material in the construction area, whether it is soil, fine material or stones including vegetation.
Works	The works to be executed in accordance with a contract.

20 APPENDICES:

Appendix 1: SITE START-UP REPORT

Appendix 2: PENALTIES FOR NON-COMPLIANCE

Appendix 3: DECLARATION OF AGREEMENT

Appendix 4: INFORMATION ON METHOD STATEMENTS

Appendix 5: EXAMPLE OF METHOD STATEMENT

Appendix 6: CONTRACTOR/S REPRESENTATIVE: ENVIRONMENTAL DAILY CHECKLIST

Appendix 7: BASIC RULES OF CONDUCT

Appendix 8: ENVIRONMENTAL SITE DAILY REPORT/CHECKLIST

Appendix 9: ENVIRONMENTAL AUTHORISATION.

Appendix 10: RECOMMENDATIONS AS PER ENVIRONMENTAL IMPACT REPORT

Appendix 11: DRAWINGS (SEE ENVIRONMENTAL IMPACT REPORT).

Appendix 12: Other documents.

APPENDIX 1: START-UP REPORT

TO BE INCLUDED AFTER START-UP MEETING

APPENDIX 2: PENALTIES FOR NON-COMPLIANCE

PENALTIES FOR NON-COMPLIANCE

The contractors / sub-contractors must contact the ECO at any stage if unsure about any matter, or if a pollution incident occurs, or vegetation or animals are damaged.

ECO = Environmental Control Officer ESO= Environmental Site Officer

PHASE		
PRE-CONSTRUCTION PHASE	Penalty for Non-compliance	
	Bottom range	Top Range*
Construction area to be marked off before construction starts.		5000
The demarcated area must be maintained throughout the construction phase	500	1000
Site area for stock piling of building material must be demarcated	500	5000
Site area for storing of waste material must be demarcated	500	5000
Fencing off the construction site with mesh fencing of 1.8m, where necessary or other suitable material as agreed on by ECO	500	1000
Sitting of access road/s to be approved by ECO & demarcated with stakes before any construction starts (if applicable)		5000
Temporary route used for construction must be determined on site with ECO (if applicable)	1000	5000
Telecommunications & AC power routes must be determined with the ECO (if applicable)	1000	5000
Sensitive features that may be harmed must be clearly marked or demarcated.	500	2000
Vegetation that may not be removed must be clearly marked or demarcated.	500	5000
Contractor must make the Construction team and all sub-contractors aware of all environmental aspects that could lead to imposition of penalties	100	5000
Contractor to sign Declaration of understanding (DOU) before construction starts		5000
Contractor to assure that all subcontractors be informed and signed DOU	1000	5000
Method statements must be provided on request by the ECO. No work may commence until the Method Statement is accepted by the ECO and Engineer	1000	5000
CONSTRUCTION PHASE		
Information		
A copy of the EMPr & Environmental Authorisation with all the conditions of approval and the relevant Method Statements must be at site at all times.	200	5000
Construction crew behaviour		
Construction crews may not overnight on site.	200	5000
No amplified music allowed on site	100	200
Construction crew must stay within the demarcated construction area. (Applicable in sensitive sites)	50	500
Eating of meals only allowed in demarcated area	50	500
No pets permitted on site		100
Driving, Parking & Storing of machinery and vehicles are only allowed inside demarcated areas and existing roads	1000	5000
Machinery may only be used on the road and may not disturb the vegetation on the sides of the road except if cleared by ECO. Machinery used must be carefully considered to limit environmental damage	500	5000
No vegetation other than that agreed on may be damaged - i.e. no access to areas outside construction area.	500	2000
No individual may cause unnecessary damage to flora and fauna on, around or near the site	20	2000
No littering allowed (incl. cigarette butts)	50	500

Excavations		
No topsoil may be removed or altered outside the demarcated area and/or which was not specified.		2000
Commercial sources of sand, rock and gravel to be cleared with ECO	200	5000
All surplus material to be taken off-site and be disposed of at approved site	500	5000
Toilets		
Sufficient ablution facilities must be provided		3000
Toilets to be secured to prevent them from falling or blowing over.	100	1000
They must be serviced regularly, (according to the manufacturer's instructions) and kept clean.	100	1000
Everybody on site must make use of ablution facilities	50	1000
Fire Prevention		
All mandatory fire fighting equipment (as specified at start-up) must be on site at all times	500	4000
Fire fighting equipment to be in good working order and serviced.	500	2000
No fires, including cooking fires, allowed on site	1000	5000
Concrete & Cement Activities		
Wash-down site of Ready Mix delivery trucks must be pre-determined prior to commencement of the activity.	500	5000
Concrete may only be mixed within the boundaries of the bunding area or demarcated area and/or where was agreed on by the ECO.	500	5000
All excess cement & concrete mixes to be contained on construction site and removed from site when necessary or requested by the ECO	200	5000
Any cement / concrete spillage to be cleaned up immediately.	500	5000
Mixing and storage areas must be appropriately located in demarcated area or as agreed upon at the on-site Start-Up Meeting	500	1000
Dust pollution control		
Ensure that loose building material is covered to prevent dust pollution	100	1000
Water run-off		
Contamination of water bodies, rivers, dams or wetlands must be prevented at all cost	500	5000
Rainwater from construction & building site/s must be channelled, contained & allowed to dry out, so as not to transport any pollutants into the surrounding area. Temporary trenches, straw stabilising, brush cutting can be used	500	5000
Waste control		
Sufficient refuse bins must be placed on site	500	2000
Refuse bins must be cleaned on a regular basis	100	1000
General litter / building refuse must be cleaned up on a regular basis from the site	500	3000
Cement-contaminated water; paint; oil; cement slurries etc. must be stored in watertight containers or as agreed with ECO	500	5000
Store all refuse & waste material in wind & animal proof containers	100	1000
Waste must be disposed of at an official waste deposit site on a regular basis.	500	5000
The absence of or inadequate drip trays or bunding facilities	500	5000
Failure to address oil/fuel leaks from on-site machinery	200	5000
Herbicides		
No herbicides or pesticides whatsoever may be used.	200	2000
Use of generators and fuel powered equipment		
A watertight cover must be place under the power generator equipment to prevent accidental spillage of fuel & oil seeping into the soil.	500	5000
Drip tray must be able to take 120% of fuel on site	500	5000
All waste material generated from the use of this equipment must be contained and removed from the site	500	5000
Mobile fuel powered equipment must be well maintained and must	200	5000

not have any fuel or oil leaks.		
Soil Stabilisation		
Ensure that soil material for filling and stabilisation comes from a source that does not contain seeds alien to the area. The source must be cleared with the ECO.	100	2000
Rehabilitation		
Remove rocks and stones and stock pile in area recommended by ECO	500	5000
Remove all plants that can be used for rehabilitation and store on- or off-site in appropriate manner as agreed with ECO	200	5000
Removal of all old concrete and alien materials from site	500	5000
Site must be cleared of all waste and building material	500	5000

*(Large scale / repeated offence)

APPENDIX 3: DECLARATION OF UNDERSTANDING

DECLARATION OF UNDERSTANDING

I, _____

Representing _____

Declare that the conditions of the authorisation were brought under my attention and that I have read and understood the contents of the Environmental Management Programme (which includes all documents as per Record of Decision).

SITE: _____

Environmental Authorisation ref: _____

I also declare that I understand my responsibilities in terms of enforcing and implementing the Environmental Specifications as set out in the various documents for the aforementioned site.

I also undertake to inform all persons under my supervision of such specifications and contents of the documents.

Signed: _____

Place: _____

Date: _____

Witness 1: _____

Witness 2: _____

APPENDIX 4: INFORMATION ON METHOD STATEMENTS

INFORMATION ON METHOD STATEMENTS

Method Statements are to be completed by the person undertaking the work (i.e. the Contractor). The Method Statement will enable the potential negative environmental impacts associated with the proposed activity to be assessed.

The Method Statement can only be implemented once approved by the ECO.

The Contractor (and, where relevant, any sub-contractors) must also sign the Method Statement, thereby indicating that the works will be carried out according to the methodology contained in the approved Method Statement.

The ECO will use the Method Statement to audit compliance by the Contractor with the requirements of the approved Method Statement.

Changes to the way the works are to be carried out must be reflected by amendments to the original approved Method Statement; amendments require the signature of the ECO denoting that the changed methodology or works are necessary for the successful completion of the works, and are environmentally acceptable. The Contractor will also be required to sign the amended Method Statement thereby committing him/herself to the amended Method Statement.

This Method Statement MUST contain sufficient information and detail to enable the ECO to apply their minds to the potential impacts of the works on the environment. The Contractor will also need to thoroughly understand what is required of him/her in order to undertake the works.

THE TIME TAKEN TO PROVIDE A THOROUGH, DETAILED METHOD STATEMENT IS TIME WELL SPENT. INSUFFICIENT DETAIL WILL RESULT IN DELAYS TO THE WORKS WHILE THE METHOD STATEMENT IS REWRITTEN TO THE ER'S AND ESO'S SATISFACTION. The page overleaf provides a *pro forma* method statement sheet, which needs to be completed for each activity requiring a method statement in terms of the EMPr.

APPENDIX 5: EXAMPLE OF METHOD STATEMENT

METHOD STATEMENT

CONTRACT:..... **DATE:**.....

PROPOSED ACTIVITY (give title of method statement and reference number):

WHAT WORK IS TO BE UNDERTAKEN (give a brief description of the works):

WHERE ARE THE WORKS TO BE UNDERTAKEN (where possible, provide an annotated plan and a full description of the extent of the works):

START AND END DATE OF THE WORKS FOR WHICH THE METHOD STATEMENT IS REQUIRED:

Start Date:

End Date:

HOW ARE THE WORKS TO BE UNDERTAKEN (provide as much detail as possible, including annotated maps and plans where possible):

Note: please attach extra pages if more space is required

DECLARATIONS

1) ENVIRONMENTAL CONSULTANT AND/OR ENVIRONMENTAL CONTROL OFFICER

The work described in this Method Statement, if carried out according to the methodology described, is satisfactorily mitigated to prevent avoidable environmental harm:

(Signed) (Print name)

(Signed) (Print name)

Dated: _____

2) PERSON UNDERTAKING THE WORKS

I understand the contents of this Method Statement and the scope of the works required of me. I further understand that this Method Statement may be amended on application to other signatories and that the ECO will audit my compliance with the contents of this Method Statement

(Signed) (Print name)

Dated: _____

3) Kotulo Tsatsi Energy (Pty) Ltd

The works described in this Method Statement are approved.

(Signed) (Print name) (Designation)

Dated: _____

4) APPROVING AUTHORITY

The works described in this Method Statement are approved.

(Signed) (Print name) (Designation)

Dated: _____

APPENDIX 6: CONTACTOR: ENVIRONMENTAL DAILY CHECKLIST

CONTACTOR/S REPRESENTATIVE: ENVIRONMENTAL DAILY CHECKLIST

SITE: _____

PHASE OF WORK AND % OF COMPLETION: _____

ENVIRONMENTAL ASPECT	YES/ NO (✓ or X)	COMMENTS
• How many workers are on site		
• All new personnel on site are aware of the contents of the EMP and have been through the environmental awareness course.		
• Contractor's camp is neat and tidy and the labourers' facilities are of an acceptable standard.		
• Sufficient and appropriate fire fighting equipment is visible and readily available.		
• Waste control and removal system is being maintained.		
• Refuse bins in place and maintained		
• Toilets are in place and clean		
• Demarcation and other fences are being maintained.		
• What machinery are on site		
• Drip trays are being utilised where there is a risk of incidental spillage		
• Bunds/ drip trays are being emptied on a regular basis (especially after rain).		
• No leakages (oil & fuel) are visible from construction vehicles		
• No go areas, remaining natural features and trees have not been damaged.		
• Dust control measures (if necessary) are in place and are effectively controlling dust.		
• Noise Control measures (if necessary) is in place and is working effectively.		
• Erosion control measures (if necessary) are in place and are effective in controlling erosion. (Access road, site areas etc.)		
• Stockpiles are located within the boundary of the site, do not exceed 2 m in height and are protected from erosion.		

Completed by:..... Sign:..... Date:.....

To be submitted at the end of each week to the Environmental Site Officer (ESO)

Received by:

Environmental Site Officer: :..... Sign:..... Date:.....

APPENDIX 7: BASIC RULES OF CONDUCT

BASIC RULES OF CONDUCT

The following list represents the basic Do's and Don'ts towards environmental awareness, which all participants in this project must consider whilst carrying out their tasks. These are not exhaustive and serve as a quick reference aid.

NOTE: ALL new site personnel must attend an environmental awareness presentation. Please inform your foreman or manager if you have not attended such a presentation or contact the ESO.

DO:

- USE THE TOILET FACILITIES PROVIDED – REPORT DIRTY OR FULL FACILITIES
- CLEAR YOUR WORK AREAS OF LITTER AND BUILDING RUBBISH AT THE END OF EACH DAY – use the waste bins provided and ensure that litter will not blow away.
- REPORT ALL FUEL OR OIL SPILLS IMMEDIATELY & STOP THE SPILL CONTINUING.
- DISPOSE OF CIGARETTES AND MATCHES CAREFULLY. (Littering is an offence.)
- CONFINE WORK AND STORAGE OF EQUIPMENT TO WITHIN THE IMMEDIATE WORK AREA.
- USE ALL SAFETY EQUIPMENT AND COMPLY WITH ALL SAFETY PROCEDURES.
- PREVENT CONTAMINATION OR POLLUTION OF STREAMS AND WATER CHANNELS.
- ENSURE A WORKING FIRE EXTINGUISHER IS IMMEDIATELY AT HAND IF ANY “HOT WORK” IS UNDERTAKEN e.g. welding, grinding, gas cutting etc.
- REPORT ANY INJURY OF AN ANIMAL.
- DRIVE ON DESIGNATED ROUTES ONLY.
- PREVENT EXCESSIVE DUST AND NOISE.

DO NOT:

- REMOVE OR DAMAGE VEGETATION WITHOUT DIRECT INSTRUCTION.
- MAKE ANY FIRES.
- INJURE, TRAP, FEED OR HARM ANY ANIMALS – this includes birds, frogs, snakes, lizards etc.
- ENTER ANY FENCED OFF OR MARKED AREA.
- ALLOW CEMENT OR CEMENT BAGS TO BLOW AROUND.
- SPEED OR DRIVE RECKLESSLY
- ALLOW WASTE, LITTER, OILS OR FOREIGN MATERIALS INTO THE STREAM
- SWIM IN THE DAM.
- LITTER OR LEAVE FOOD LAYING AROUND

Notes:

1. Must any animals such as tortoises, chameleons or snakes be encountered then do not harm them. The ESO or ER must be contacted to remove these safely. The harming of any animal will result in disciplinary action.
2. Construction and heavy machine operators must be particularly sensitive to staying within access routes and prevention of unnecessary damage. Dust and noise is also of particular concern. Ensure that vehicles and machinery do not leak fuel or oils. Refuelling or maintenance must be done within the maintenance camp area only.
3. Alien plant clearing and control work teams must be closely supervised.

BASIESE GEDRAGSKODES

Die volgende lys vertenwoordige die Moets en Moenies vir omgewingsbewustheid wat alle deelnemers aan hierdie projek in ag moet neem tydens die uitvoer van hul take. Hierdie lys is nie volledig nie en dien slegs as 'n vinnige verwysing.

NOTA: ALLE nuwe terreinpersoneel moet 'n aanbieding ten opsigte van omgewingsbewustheid bywoon. Indien u nog nie so 'n aanbieding bygewoon het nie, lig asseblief u voorman of bestuurder in of kontak die Omgewings Terreinbeampte.

MOETS:

- GEBRUIK DIE BESKIKBARE TOILET-GERIEWE – RAPPORTEER VUIL OF VOL GERIEWE.
- MAAK U WERKPLEK SKOON VAN ROMMEL OF BOUROMMEL AAN DIE EINDE VAN ELKE DAG – gebruik beskikbare vullisdromme en verseker dat rommel nie rondwaai nie.
- RAPPORTEER ALLE BRANDSTOF- EN OLIE STORTINGS ONMIDDELLIK – STOP VERDERE STORTING.
- WEES VERSIGTIG MET DIE WEGDOEN VAN SIGARETTE EN VUURHOUTJIES. (rommelstrooi is 'n oortreding.)
- BEPERK WERKAKTIWITEITE EN DIE STOOR VAN TOERUSTING TOT DIE ONMIDDELLIKE WERKAREA.
- GEBRUIK VEILIGHEIDSTOERUSTING EN VOLDOEN AAN ALLE VEILIGHEIDS-MAATREËLS.
- VOORKOM BESOEDELING VAN STROME EN WATERBANE
- VERSEKER DAT 'N BRANDBLUSSER IN WERKENDE TOESTAND BYDERHAND IS WANNEER "WARM" WERK VERRIG WORD bv. Sweis, wegslyp, gasny, ens.
- RAPPORTEER BESEERDE DIERE.
 - RY SLEGS OP AANGEWEESE ROETES.
- VOORKOM OORMATIGE STOF EN GERAAS.

MOENIE:

- PLANTEGROEI VERWYDER OF BESKADIG SONDER DIREKTE INSTRUKSIE NIE.
- ENIGE VURE MAAK NIE.
- ENIGE DIERE DOOD, BESEER, VANG OF VOER NIE, insluitende voëls, paddas, slange, akkedisse, ens.
- ENIGE OMHEINDE OF AFGESPERDE AREAS BINNETREE NIE.
- SEMENT OF SEMENTSASSE LAAT RONDWAAI NIE.
- VINNIG OF ROEKELOOS BESTUUR NIE.
- ENIGE ROMMEL, AFVAL, OLIE OR ENIGE VREEMDE MATERIAAL IN STROME LAAT BELAND NIE.
- IN DIE DAM SWEM NIE.
- ROMMELSTROOI OF KOS LAAT RONDLÊ NIE.

Notas:

1. Indien enige diere soos skilpaaie, verkleurmannetjies of slange teëgekom word, moet hulle nie beseer of dood nie. Kontak die OTB of RI om hulle veilig te verwyder. Die besering van diere sal lei tot dissiplinêre optrede.
2. Operateurs van konstruksie- en swaar masjiene moet veral versigtig wees om binne toegangsroetes te bly en om enige onnodige skade te voorkom. Verseker dat voertuie en masjiene nie olie of brandstof lek nie. Brandstofaanvulling en voertuigonderhoud mag slegs binne die onderhoudsarea gedoen word.
3. Streng toesig moet gehou word oor indringerplantbeheerspanne.

EZIPPHAMBILI EKUNYANZELEKILEYO UKUBA ZENZIWE

Zonke ezi zinto zilandelayo zizinto ekufuneka zenziwe nekufuneka zingenziwanga. Wonke umntu ofikayo kufuneka afundiswe ngemigaqo kupala. Needa yazisa iforman yakho ikuba awukhange uye kufundiswa.

IZINTO EMAZENZIWE

- SEBENZISA IZINDLU ZANGASESE, YAZISA XA KUKHO UMONAKALO.
- ZAMA UKUCOCA APHO UBUSEBENZA KHONA.
- SEBENZISA IMIGQOMO YENKUKUMA UNGAYEKI IPHAPHTIEKE.
- YAZISA XA UBONA IOIL ECHITHSKALAYO OKANYE IPETROL.
- CIMA LOZOLI CIGARETTE XA UGQIBIBILE UKUTSHAYA
- ZONKE IZIXHOBO USEBENZA ZIBUYISELE APHO ZIHLAKA KHONA XA UCGIBILE APHO ZIHLALA KHONA XA UGQIBILE UKUZISEBENZISA.
- ZISEBENZISE IZIKHUSELIXA UZINKIWE.
- SUKUGALELA IZINTO EMLANJENI.
- MASIBEKHO ISICIMA MLILO XAUSEBENZA NGOMLILO.
- YAZISA MSINYANE XA UBONE ISILWANYANA EZONZAKELEYO.
- XAUQHUBA ISITHUTHI HAMBA ENDLELENI QHA UNGAFATHULINJE.
- NAPHINA ZAMAUNGENZI THULI OKANYE INGXOLO XA USEBENZA.

EMAZINGENZIWA

- SUKUSUSA NESIPHINA ISITYALO UNGAKHANGE UXELELWE
- SUKWENZA MLILO NOKUBA SEKUBANDA
- AMAGQARA UKUBULALA IZILWANYANA NOKUZIFIDA AKUVUMELEKANGA
- SUKUNGENA XA KUVALIWE NGAPHANDLE KWE MVUME
- INGXOWA ZESAMENTE MAZINCEDWE ZINGALAHHLWA NJE
- SUKUQHUBA NGESANTYA ESIPHAKAMILEYO
- SUKUGALELE NAYIPHI INTO PHAYA EMLANJENI
- SUKUQUBHA EDAMENI Q OQOSHA YONK INKUKUMA

APPENDIX 8: ECO/ESO DAILY REPORT/CHECKLIST

ECO / ESO SITE VISIT CHECKLIST / REPORT:

PROJECT NAME:
PROJECT & PHASE:

DATE:
LOCATION:

ENVIRONMENTAL ASPECT	1-3 NA	COMMENTS
Note: 1 = Poor, 2 = Average, 3 = Good NA = Not Applicable		
DEMARCATATION METHOD STATEMENT Boundaries of “no go” areas, construction sites, offices, temporary storage areas as well as labourer’s facilities must be demarcated (EMPr and ECO requirements) and maintained for the length of the construction period.		
NO-GO AREAS/PROTECTION OF FAUNA & FLORA Identified “No-Go Areas”, remaining natural veld and indigenous- or significant trees are protected features and must be demarcated for protection from construction damage (including secondary impact). All areas outside of the demarcated construction sites and access roads to be regarded as NO-GO areas unless otherwise agreed upon with the client and ECO. All flora identified to be rescued must be removed and placed in an area specifically allocated and taken care off until re-used in pre-approved way. Identified areas with significant vegetation must be protected as NO-GO areas.		
CLEARING OF VEGETATION & TOPSOIL REMOVAL METHOD STATEMENT Before any construction or earthworks, topsoil must be stripped (>150 mm) and stockpiled for rehabilitation/ landscaping. Stockpiles: must be protected (may not blow or wash away or gets compacted) and stored separately. may not be moved further than 50 m or mixed with any other soil. must be convex and should not exceed 2 m in height. In addition: Cleared areas must be stabilized. Burning or burying of cleared vegetation is prohibited, but may be used for mulch or slope stabilisation on site.		
STOCKPILING METHOD STATEMENT Top- and subsoil’s from trenches must be located within site boundaries, stabilised and may not exceed 2 m in height.		
TEMPORARY STORAGE FACILITIES METHOD STATEMENT Must be demarcated, organised, neat and tidy and of acceptable standards.		
CONSTRUCTION CAMP & SITE OFFICES METHOD STATEMENT Must be demarcated, organised and free of day-to-day litter		

ENVIRONMENTAL ASPECT	1-3 NA	COMMENTS
Note: 1 = Poor, 2 = Average, 3 = Good NA = Not Applicable		
(maintaining good housekeeping standards).		

ENVIRONMENTAL ASPECT	1-3 NA	COMMENTS
Note: 1 = Poor, 2 = Average, 3 = Good NA = Not Applicable		
FUEL STORAGE METHOD STATEMENT Fuel storage areas must be situated within the demarcated construction camp site (or an area approved by the ECO). Bunds must be built (EMPr and ECO requirements) around larger fuel storage areas (accidental spillages). Drip trays must be used (in accordance with EMPr) at all fuel and oil storage and refilling sites and must be cleaned regularly, especially after rain.		
LABOURER'S FACILITIES METHOD STATEMENT Facilities must be of acceptable standards suitably demarcated, well maintained, neat and tidy and with adequate ablution facilities.		
ENTRANCE AND HAUL ROADS METHOD STATEMENT Only approved entrance and haul roads may be used (existing roads and infrastructure). No new roads or parking areas may be developed without written approval from the ECO.		
MANDATORY SITE EQUIPMENT METHOD STATEMENT Mandatory site equipment must be in place, well maintained and in accordance with EMPr and ECO requirements. Sufficient refuse bins must be on site (well placed and conspicuous) and must be cleaned regularly. Fire extinguishers must be readily available, maintained and functional. Drip trays must be used (in accordance with EMPr) at all fuel and oil storage and refilling sites and must be cleaned regularly, especially after rain. Toilets and sanitation facilities must be kept clean neat and hygienic (toilet paper must be available).		
WASTE CONTROL METHOD STATEMENT The contractor is expected to control all construction related waste material and general litter on actual construction sites and its immediate surroundings. Waste management must be in accordance with the EMPr, of acceptable standards, with regular removal of general waste, hazardous waste as well as construction waste (e.g. concrete waste and spoil).		
CEMENT MIXING & BATCHING AREAS METHOD STATEMENT Mixing areas must be approved by the ECO, suitably demarcated and may not result in pollution. Polluted cement water may only be released into sedimentation ponds. Sedimentation ponds must be maintained and cleaned regularly (and		

ENVIRONMENTAL ASPECT	1-3 NA	COMMENTS
Note: 1 = Poor, 2 = Average, 3 = Good NA = Not Applicable		
reinstated after use).		

ENVIRONMENTAL ASPECT	1-3 NA	COMMENTS
Note: 1 = Poor, 2 = Average, 3 = Good NA = Not Applicable		
CONSTRUCTION VEHICLE MAINTENANCE METHOD STATEMENT Construction vehicles must be in good working order and well maintained to prevent oil and fuel leakages and to reduce noise levels. Maintenance areas must be approved by ECO. Refuelling must be done in accordance with the EMP, using drip trays.		
HEAVY EARTHMOVING EQUIPMENT Construction vehicles and equipment may only operate <u>within</u> the demarcated site boundaries (and approved access roads), especially heavy earthmoving vehicles.		
DUST CONTROL METHOD STATEMENT Adequate control measures must be in place to prevent dust pollution as a result of construction activities (especially with regard to entrance-, haul roads and exposed surfaces). Areas of concern must be watered regularly during construction AND periods of strong winds, BUT must take water saving into account.		
EROSION CONTROL METHOD STATEMENT Erosion resulting from works must be controlled. Temporary and permanent drainage works must be maintained. Erosion damage and damage in drainage courses must be reinstated.		
NOISE CONTROL METHOD STATEMENT Effective noise control measures must be in place and acceptable working hours must be kept (deviations must be approval by the ECO).		
ENVIRONMENTAL CONDUCT Environmental conduct of construction personnel must be acceptable (e.g. no burning or burying of refuse; no littering and no cement bags or other construction waste material lying around).		
ARCHAEOLOGICAL & HERITAGE FINDS METHOD STATEMENT Should any archaeological or heritage remains be exposed during excavations or any activity on site, these must immediately reported to The site agent/engineer, the ECO and SAHRA.		
REHABILITATION METHOD STATEMENT On completion of the project or phase, all areas impacted by the construction activities must be reinstated and/or rehabilitated to the satisfaction of the ECO with emphasis on the following: Site offices must be removed and the areas rehabilitated or reinstated to the satisfaction of the ECO.		

ENVIRONMENTAL ASPECT	1-3 NA	COMMENTS
Note: 1 = Poor, 2 = Average, 3 = Good NA = Not Applicable		
Labourer's facilities must be removed and the areas rehabilitated or reinstated to the satisfaction of the ECO. All construction site areas must be rehabilitated or reinstated to the satisfaction of the ECO. All temporary fencing and demarcation must be removed and the areas reinstated to the satisfaction of the ECO. Temporary storage areas must be rehabilitated or reinstated to the satisfaction of the ECO. All remaining construction material must be removed and the areas rehabilitated or reinstated to the satisfaction of the ECO. Any additional disturbed areas must be rehabilitated or reinstated to the satisfaction of the ECO.		
ADDITIONAL METHOD STATEMENTS Method statements must be submitted and approved before commencement of the works and must be available at the site offices.		
ENVIRONMENTAL CHECKLIST The contractor must ensure that the weekly environmental checklist is completed at the end of each week and it must be available at the site offices.		
SPOT FINES & PENALTIES Spot fines and penalties must be recorded and documented by the ECO (in accordance with the EMPr).		
FIXED POINT PHOTOS Photographs must be taken by the ECO, Site Engineer and or Site Manager, prior to, during and immediately after construction as visual reference. These photographs must be stored with other records relating to the EMPr.		

ECO:

ECO OBSERVATION SHEET

[illegible]

APPENDIX 9: ENVIRONMENTAL AUTHORISATION.

APPENDIX 10: RECOMMENDATIONS AS PER ENVIRONMENTAL IMPACT REPORT

APPENDIX 11: DRAWINGS

APPENDIX 12: ANY OTHER RELEVANT DOCUMENTS