

ENVIRONMENTAL MANAGEMENT PLAN FOR THE PROPOSED

CONSTRUCTION AND OPERATION
OF CHARCOAL PROCESSING,
PACKAGING, AND STORAGE
FACILITY ON ERF 3112,
OTJIWARONGO INDUSTRIAL
AREA

OTJOZONDJUPA REGION



TABLE OF CONTENTS

- 1. INTRODUCTION 3**
 - 1.1. Project Activities.....3
 - 1.2. Purpose of the document.....4
- 2. ENVIRONMENTAL MANAGEMENT PRINCIPLES 8**
- 3. ROLES AND RESPONSIBILITIES FOR ENVIRONMENTAL MANAGEMENT 10**
 - 3.1. Communication between Parties 10
 - 3.2. The Biomass Operating Company 10
 - 3.3. Site Managers..... 11
 - 3.4. Environmental Control Officer (ECO)..... 11
 - 3.5. Contractors..... 12
- 4. ENVIRONMENTAL SPECIFICATIONS 13**
 - 4.1. Compliance with the Environmental Specifications 13
 - 4.2. Training and Awareness 13
 - 4.3. Stakeholder Relations 13
 - 4.4. Permits 13
 - 4.5. Road Safety 13
 - 4.6. Access Tracks 14
 - 4.7. Conservation of Biodiversity 14
 - 4.8. Wildlife Poaching 14
 - 4.9. Soil Management and Erosion Control..... 14
 - 4.10. Pollution Control..... 15
 - 4.10.1. Air pollution / Dust emission..... 15
 - 4.10.2. Noise pollution 16
 - 4.11. Waste Management 16
 - 4.12. Hazardous Substances 16
 - 4.13. Fire Prevention 17
 - 4.14. Archaeological Sites..... 17
 - 4.15. Health and Safety 17
 - 4.16. Work Stoppage 18
- 5. OMUTI BIOMASS MITIGATION MEASURES 19**
 - 5.1. Section A: Site Establishment 20

5.2. Section B: Construction Phase24

5.3. Section C: Operational Phase29

5.4. Section D: Post Construction and Operation Phase / Decommissioning
Phase33

6. MONITORING PLAN..... 35

7. CONCLUSION..... 35

APPENDIX A – LIST OF FLORA SPECIES FOUND IN THE AREA (NBRI, 2022)..... 36

LIST OF FIGURES

FIGURE 1 – PROPOSED PROJECT LOCATION, RELEVANT TO THE OTJIWARONGO TOWN 5

FIGURE 2 - OTJIWARONGO ZONATION MAP (OTJI MUN, 2022)..... 6

FIGURE 3 - ERF 321 1 LOCATION, RELEVANT TO THE OTJIWARONGO TOWN (OTJI MUN, 2022) ... 7

LIST OF TABLES

TABLE 1 - PROJECT PHASES AND THEIR CODE OF ACTION 19

TABLE 2 - SITE ESTABLISHMENT MANAGEMENT MEASURES 20

TABLE 3 - CONSTRUCTION PHASE MANAGEMENT MEASURES 24

TABLE 4 - OPERATIONAL PHASE MANAGEMENT MEASURES 29

TABLE 5 – DECOMMISSIONING MANAGEMENT MEASURES..... 33

1. INTRODUCTION

Earth Environmental Services CC (EES) has been engaged by Omuti Biomass Trading cc (herein referred to as Omuti or the proponent) to act on their behalf in obtaining an Environmental Clearance Certificate (ECC) for the proposed construction and operation of a charcoal processing, packaging, and storage facility. The project area is located on Erf 3112 in an industrial-zoned area west of the Otjiwarongo townlands. The site can be accessed via the C33 road that passes by the Otjiwarongo NaTIS to the west. The Erf covers an area of approximately 3.2 hectares. *FIGURE 1* to *FIGURE 3* provides locality maps of the project site.

1.1. Project Activities

Omuti Biomass cc. hereafter referred to as the proponent is of the intention to undertake the following development:

1.1.1. Pre-Construction Activities:

- Ensuring and maintaining environmental authorizations/permits/licences.
- Ensuring environmental awareness for all project personnel (i.e., contractors, sub-contractors and suppliers).

1.1.2. Construction Activities:

- Land clearing and preparation.
- Transporting relevant building material, equipment.
- Construction of associated buildings and other infrastructure.
- Installation of associated electrical services (Generator)
- Installation of associated water pipelines, in conjunction with Otjiwarongo Municipality.
- Preparation of access roads, in conjunction with Otjiwarongo Municipality
- Septic tank

1.1.3. Operational Activities:

- Storage of 200l diesel tank.
- Processing of charcoal of different grades.
- Packaging and Storage of charcoal bags
- Burning of unprocessed charcoal to a minimal extent
- Maintenance of the development.

1.1.4. Decommissioning Activities:

- Removal of all infrastructure not reused during future use of land; and
- Rehabilitation of the land.

1.2. **Purpose of the document**

Earth Environmental Services (EES) has prepared this document as part of the Environmental Scoping and Impact Assessment for Proposed Construction and Operation of Charcoal Processing, Packaging, and Storage Facility on Erf 3112, Otjiwarongo Industrial Area which was conducted in terms of the Environmental Management Act, 2007 (Act No 7 of 2007). This Environmental Management Plan is a live document that has been prepared based on the environmental effects identified in Environmental Scoping and Impact Assessment and should be read in conjunction with the Environmental Scoping and Impact Assessment Report.

The aim of this document is to provide management measures to address the environmental effects that have been identified in the Environmental Scoping and Impact Assessment report and to give possible mitigation measures/recommendations to address these effects. It is essential for personnel involved to fully be aware of the possible environmental issues and the means to avoid or minimize the potential impacts of activities on site.

Furthermore, Omuti Biomass fully understands the legal and policy requirements as a holder and operator of the facility. Impacts identified in the EIA form the basis of a set of environmental specifications that will be implemented on-site. These environmental specifications form the basis for an agreement between the company and the Ministry of Environment, Forestry, and Tourism (MEFT) and these specifications become binding on the operational company.

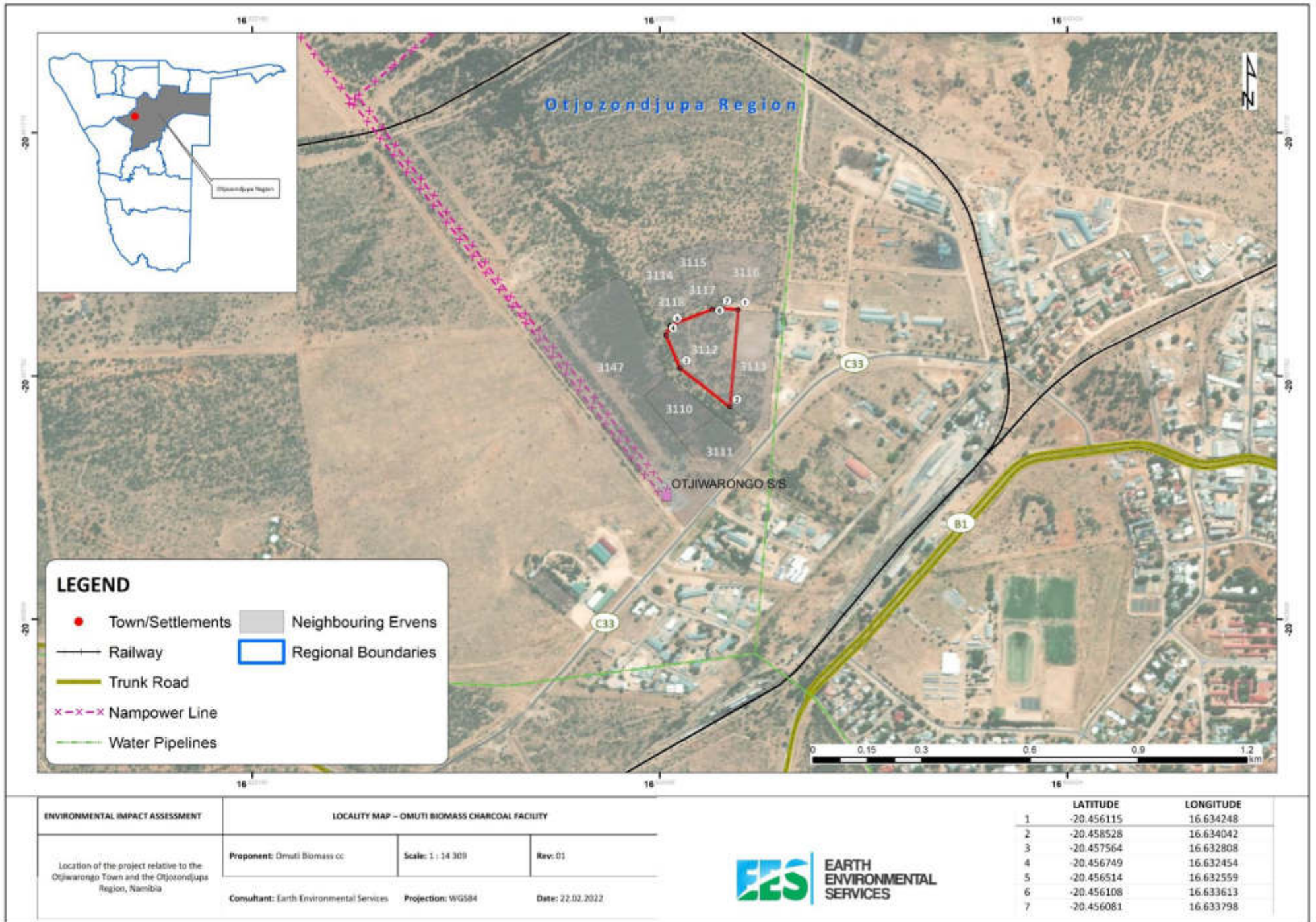


FIGURE 1 – PROPOSED PROJECT LOCATION, RELEVANT TO THE OTJIWARONGO TOWN



FIGURE 2 - OTJIWARONGO ZONATION MAP (OTJI MUN, 2022)



FIGURE 3 - ERF 3211 LOCATION, RELEVANT TO THE OTJIWARONGO TOWN (OTJI MUN, 2022)

2. ENVIRONMENTAL MANAGEMENT PRINCIPLES

Omuti Biomass CC will ensure that all project participants adhere to the following company goals:

- i. All employees will be obliged to undertake activities in an ecologically and socially responsible way. This applies to all consultants, workers, contractors, and subcontractors, as well as transporters, visitors, and anyone else who enters the premises.
- ii. Safeguard the health and safety of project personnel and the public against potential impacts of the project. This includes issues of road safety, precautions against dangers on site, potential hazards; and,
- iii. Promote good relationships with the surrounding settlements and other stakeholders.
- iv. Biophysical Environment
- v. Wise use and conservation of environmental resources, giving due consideration to the use of resources by present and future generations;
 - a. Prevent or minimize environmental impacts;
 - b. Minimize air, water, and soil pollution; and
 - c. Conserve Biodiversity.

In order to achieve the project's goal, the following principles must be followed:

TERM	DESCRIPTION
Accountability and Commitment	The Company Senior Executives and Line managers will be held responsible and accountable for: <ul style="list-style-type: none"> a. Health and safety of site personnel while on duty, b. Environmental impacts caused by construction and operational activities or by personnel engaged in the daily operations of the site.
Competence	The company will ensure a competent workforce through appropriate selection, training, and awareness of all safety, health, and environmental matters.

TERM	DESCRIPTION
Risk Assessment, Prevention, and Control	Identify, assess and prioritize potential environmental risks. Prevent or minimize risks through careful planning and design, allocation of financial resources, management, and workplace procedures. Intervene promptly in the event of adverse impacts arising.
Performance and Evaluation	Set appropriate objectives and performance indicators. Comply with all laws, regulations, policies, and environmental specifications. Implement regular monitoring and reporting of compliance with these requirements.
Stakeholder Consultation	Create and maintain opportunities for constructive consultations with employees, authorities, and other interested or affected parties. Seek to achieve an open exchange of information and mutual understanding in matters of common concern.
Continual Improvement	Through continual evaluation, reports, and innovation, seek to improve performance with regard to social health and well-being as well as environmental management throughout the lifespan of the project.
Financial Provisions for retail activities	In line with the internationally recognised “polluter pays principle” the company will make the necessary financial provision for compliance with the EMP.

3. ROLES AND RESPONSIBILITIES FOR ENVIRONMENTAL MANAGEMENT

3.1. Communication between Parties

Emphasis will be put towards open communication between all parties, in order to reach a proactive approach towards potential environmental issues deriving from the project. This approach should guarantee that environmental impacts are anticipated and prevented, or minimized, rather than adopting a negative “policing” approach after negative impacts have already occurred.

The importance of a proactive approach cannot be over-emphasized, particularly in relation to preventing unnecessary tracks, and damage to vegetation (i.e., protected and endemic species) as these impacts cannot easily be remedied.

3.2. The Biomass Operating Company

The company is ultimately responsible for all stages of the project and the impacts resulting from those activities. The responsible persons will be the company's Environmental Control Officer (ECO) and Managing Director to ensure that:

- The EMP and its environmental specifications are included in contractual documents and it is required that contractors, and subcontractors, consultants etc. do meet the EMP requirements;
- The company and all its subcontractors, consultants etc. comply with all Namibian legislation and policies and any relevant International Conventions;
- Compliance with the environmental specifications is enforced on a day-to-day basis;
- Environmental audits are conducted periodically by a suitably qualified ECO to confirm that the environmental requirements are properly understood and effectively implemented;
- Sufficient budget is provided to implement those measures that have cost implications;
- The Site Manager must commission tree surveys well in advance of planned road construction so that the necessary site visits by forestry personnel and forestry permits are acquired; and,
- Open and effective communication is maintained between all parties concerning environmental management on the project.

3.3. Site Managers

Day-to-day responsibility for environmental management will be assigned to the (Environmental Control Officer (ECO) and Manager Field Operations (MFO) for the duration of the project to:

- Be familiar with the contents of the EMP and applicable sections of the EIA and the measures recommended therein;
- Monitor compliance with the environmental specifications on a daily basis and enforce the environmental compliance on-site by communicating the ECO's directions to all personnel involved;
- In the event of any infringements leading to environmental damage, personnel need to consult with the ECO and seek advice on any remedial measures to limit or rectify the damage;
- Maintain a record (photographic and written) of "before-and-after" conditions on site;
- Facilitate communication between all role players in the interests of effective environmental management; and,

3.4. Environmental Control Officer (ECO)

Omuti Biomass cc must appoint a suitably qualified ECO who is responsible to:

- Undertake environmental audits of overall compliance with the environmental specifications. This should be done at least bi-annually for the project area,
- Submit a site inspection report to the Managing Director and MFO;
- Advise the MFO on interpretation and implementation of the environmental specifications as required; and,
- Make recommendations for remedial action in cases of non-compliance with the environmental specifications.
- The report should be submitted to the MEFT periodically at the time interval stipulated by law.

3.5. Contractors

The contractors will have the responsibility to:

- Familiarize themselves with the requirements of the EMP and comply with the environmental specifications within;
- Notify the ECO through the MFO timeously in advance of any actions that might have significant negative impacts. Mitigatory measures should be discussed and implemented before negative impacts arise;
- Conduct or arrange for environmental training for employees and sub-contractors;
- Undertake rehabilitation measures where required as far as possible, rehabilitation measures should be carried out progressively and not left till the end of the project.

4. ENVIRONMENTAL SPECIFICATIONS

4.1. Compliance with the Environmental Specifications

The activities will be conducted in an environmentally and socially responsible manner. The contractor and all personnel on-site will comply with the environmental specifications contained in this section.

4.2. Training and Awareness

All site personnel and site contractors will receive the training to equip them with the necessary knowledge to comply with the environmental specifications. The MFO will ensure that an appropriate level of training is provided at all levels of site personnel.

4.3. Stakeholder Relations

All site personnel will maintain good relations with the landowners and members of the public. Any complaints received by the ECO will be addressed.

4.4. Permits

All relevant permits shall be obtained from relevant authorities

The removal or relocation of rare and endangered plants will be conserved and should it be removed or relocated it shall be done with the required permits from the Directorate of Forestry.

4.5. Road Safety

The access roads can be dangerous at times due to dust from passing vehicles, poor camber, patches of loose sand, careless drivers and other external factors. All drivers must be aware of these hazards and take precautions to avoid them. Such precautions will include, but not be limited to:

- Complying with speed limits;
- Reducing speed considerably when visibility is poor;
- Being wary of other vehicles
- Travelling with lights on even in daylight;
- Slowing down for animals and birds on the road; and,
- Being cautious of other road users– taking into account reduced visibility due to dust.

4.6. Access Tracks

- No new tracks will be made unless there are no pre-existing tracks, any new tracks or extensions should be established with the permission of the Municipality and other landowners.
- The selected access and site roads will be clearly marked. A single road only will be used to and from each destination. Turning points for vehicles will also be pre-selected and marked. Particular care will be taken to avoid damage to plants.
- Any elevated sites, or sites away from existing tracks, will be accessed on foot rather than by a vehicle.

4.7. Conservation of Biodiversity

- Damage to protected species will be avoided at all cost.

4.8. Wildlife Poaching

NB: It is an offence to poach wildlife.

No animal or bird is to be captured, killed or harmed in any way. Anyone caught violating this law will face suspension from the project and could be liable for prosecution. In a likewise manner, domestic livestock on farms may also not be harmed.

4.9. Soil Management and Erosion Control

- During excavating and clearing the Contractor shall take care to remove as little topsoil as possible. All soil within 100mm of the cleared surface level shall be regarded as topsoil.
- Remove and separately stockpile any subsoil material that can be used for site backfilling.
- Topsoil shall be stockpiled (and seeded) in areas within the site boundary and approved by the Project Engineer in conjunction with the Environmental Consultant, for reuse and restoration.
- Avoid handling soil when wet as this may result in the loss of soil structure and compaction. Soils should not be handled during windy conditions, which may lead to the loss of soil through wind erosion.

-
- Soil erosion must be prevented at all times. Where evidence of soil erosion can and/or is taking place, this should be reported by the Contractor to the Project Engineer or Environmental Consultant.
 - Unnecessary compaction of construction areas must be prevented, to reduce runoff velocity.
 - Suitable erosion measures should be implemented in areas sensitive to erosion such as near water supply points, edges of slopes, etc. These measures could include the use of sandbags, hessian sheets, retention or replacement of vegetation.
 - All the necessary precautions in terms of design and construction of earthworks, cuts, and fills must be taken.

4.10. Pollution Control

Should any incidence occur in terms of spilling, the Contractor (Developer) shall report it immediately to the Developer and the Contractor shall be responsible for containing and cleaning up the spillage. The Contractor (Developer) shall ensure that correct mitigation of the pollution is undertaken.

4.10.1. Air pollution / Dust emission

- Excavations and other clearing activities should only be done during permissible weather conditions to avoid drifting of sand and dust into neighboring areas.
- Soil and sand stockpiles shall be located in sheltered areas not exposed to the wind.
- Retention of vegetation where possible will reduce dust travel.
- Exposed surfaces must be re-vegetated as soon as possible.
- The movement of construction vehicles and other vehicles should be strictly controlled in order to reduce the impact of increased air pollution.
- Adherence to speed limits shall be enforced.
- Sensible and responsible use of equipment which generates dust.
- It is recommended to practice dust monitoring per month in order to take note of the dust emitted at different distances and directions around the project area during operations.

4.10.2. Noise pollution

- Noise levels shall be kept within acceptable limits. All noise and sounds generated shall adhere to SABS 0103 specifications for maximum allowable noise levels for industrial areas.
- Noisy activities must be limited to between 06h00 to 18h00 to avoid disturbance of adjacent landowners.
- Noisy activities should not be allowed on weekends and public holidays unless specific arrangements have been made with the proponent and provided that neighbors have been timeously notified
- Vehicles and operating equipment must be regularly serviced.

4.11. Waste Management

- The area needs to be kept clean, neat, and tidy to the satisfaction of the proponent and ECO. The proponent will provide bins at the worksites and will be responsible for the collection and containment of daily refuse and waste generated by his staff. Bins will be secured in such a way that wind cannot remove papers and plastics. Bins will also be secured against animals around the vicinity.
- No waste will be buried on site. All waste will regularly be removed to an approved waste disposal facility.

4.12. Hazardous Substances

- All containers of fuel, oil, and any other hazardous substances will be kept sealed, and clearly labeled for identification.
- Tanks for fuels, oils, and any other hazardous substances need to be banded to hold 110% of the capacity of the tank to contain any possible spills.
- If any spills occur, clean-up shall occur immediately and disposed of appropriately.

4.13. Fire Prevention

- Ensure an Emergency Response Plan
- No fires are to be left unattended
- Charcoal sourced from farmers should be 100% cured to avoid combustion
- The re burning of charcoal at minimal scale should be conducted during the day on less windy days with full supervision to avoid fly ashes to neighboring land.

4.14. Archaeological Sites

- All archaeological remains are protected under the National Heritage Act (2004) and are not to be destroyed, disturbed, or removed. The Act also requires that any archaeological finds, be reported to the Heritage Council Windhoek (**Tel. 061-244375**). The same applies to rock art sites.
- The ECO will be notified without delay of any archaeological finds.

4.15. Health and Safety

All company personnel will receive a detailed induction upon joining the project and on a regular basis thereafter.

- **Dust:** All staff will receive dust masks and proper PPE to prevent inhalation of potentially charcoal dust while carrying out any dust-producing activities associated with charcoal processing and packaging.
- Eating, drinking, and **smoking** while working with any materials that may contain radioactive or hazardous substances is forbidden. Good personal hygiene is encouraged (e.g., washing hands before eating) to prevent ingestion of potentially hazardous or radioactive materials.
- **Bees:** Bee stings are potentially dangerous to persons who are allergic to them. Bees are attracted to water, so water / liquid should not be left standing.
- **Snakes & Scorpions:** A number of poisonous snake and scorpion species may occur in the area. Therefore, precautions are required which include: -
 - Exercising caution when picking up rocks or equipment from the ground;
 - Looking at the ground when walking; and,
 - Wearing closed shoes and not walking barefoot.

In case of emergency Aspivenin (suction syringe) is permanently available at all work stations for the first aid treatment of snake bites, scorpion stings and bee stings. Antihistamine tablets should also be available for the first aid treatment of allergic reactions to bee stings.

4.16. Work Stoppage

The MFO will have the right to order work to stop in the event of environmental specification infringements that could result in damage to plants, wildlife, or personnel. Work will continue once the situation is rectified and brought to a state of compliance.

In the event of such work stoppage, the Contractor will not be entitled to claim for delays or standing time.

4.17. Compliance Monitoring

During construction and operational activities, the company ECO will conduct site compliance inspections at least once a month. After each inspection the ECO will compile an EMP compliance report for regular submission to the MFO and biannually to the MEFT or as required.

5. OMUTI BIOMASS MITIGATION MEASURES

The following table provides a large-scale overview of all the major environmental management aspects. This table serves to act as a quick reference (by colour), for the detailed mitigation details that follow below. The identified impacts in the Scoping Study are mitigated under these themes.

TABLE 1 - PROJECT PHASES AND THEIR CODE OF ACTION

Phase	Aspect	Mitigation Details
Site Establishment	Access Control	Section A
	Waste disposal	Section A
	Establishing Storage Areas	Section A
	General Environmental Conduct	Section A
Construction	Maintenance of Construction Site	Section B
	Dust/Air Pollution	Section B
	Soil Erosion	Section B
	Stormwater	Section B
	Water Quality	Section B
	Conservation of the Natural Environment	Section B
	Waste Management Procedure	Section B
	Noise and Visual Impact	Section B
Operational	Health and Safety	Section C
	Soil and Groundwater Contamination	Section C
	Air Quality - Dust	Section C
	Noise Impact	Section C
	Biodiversity	Section C
	Waste Management	Section C
	Visual	Section C
Post Construction	Construction Camp Rehabilitation	Section D
	Vegetation Reinstatement	Section D
	Land Rehabilitation	Section D

5.1. Section A: Site Establishment

TABLE 2 - SITE ESTABLISHMENT MANAGEMENT MEASURES

ASPECT	MANAGEMENT DETAILS	RESPONSIBLE PERSONS	FREQUENCY
Access Control	<ul style="list-style-type: none"> • People and vehicle access should be restricted during construction so as to control access to otherwise potentially dangerous excavations and materials. • Movement of construction vehicles potentially impacting on urban infrastructure should be mitigated through the use of appropriate warning signs, and not entering or leaving the site during peak traffic hours. 	Contractor, Project Manager	Throughout this stage of the project
Waste Disposal	<ul style="list-style-type: none"> • Bins and / or skips shall be provided at convenient intervals for disposal of waste within the construction. • Bins should have liner bags for efficient control and safe disposal of waste. • Recycling and the provision of separate waste receptacles for different types of waste should be encouraged • Ensure good housekeeping 	All personnel	Throughout this stage of the project
Establishing Storage Areas	<p><u>General Substances and Materials</u></p> <ul style="list-style-type: none"> • Choice of location for storage areas must take into consideration prevailing winds, distance to water bodies and general on-site topography. • Storage areas must be designated, demarcated and fenced if necessary. • Storage areas should be secure so as to minimize the risk of crime. • They should be safe from access by children and animals etc. • Fire prevention facilities must be present at all storage facilities. 	Contractor, Project Manager	On-going

ASPECT	MANAGEMENT DETAILS	RESPONSIBLE PERSONS	FREQUENCY
Establishing Storage Areas	<p><u>Hazardous Material Storage</u></p> <ul style="list-style-type: none"> • Hazardous substances are those that are potentially poisonous, flammable, carcinogenic, or toxic. Some examples are diesel, petroleum, oil, bitumen, cement, solvent based paints, lubricants, explosives, drilling fluids, pesticides. • Material safety Data Sheets (MSDSs) shall be readily available on site for all chemicals and hazardous substances to be used on site. Where possible and available, MSDSs should additionally include information on ecological impacts and measures to minimize negative environmental impacts during accidental releases or escapes. • Hazardous storage areas must be 110% banded with an impermeable liner to protect groundwater and soil from contamination. The Contractor shall submit a method statement to the Project Manager for approval. • Storage areas containing hazardous substance materials must be clearly signposted. 		
Education of Site Staff on General Environmental Conduct	<p><u>Environmental Education and Awareness</u></p> <ul style="list-style-type: none"> • Ensure that all site personnel have a basic level of environmental awareness training. The proponent must submit a proposal for this training to the ECO for approval. Topics to be covered should include: <ul style="list-style-type: none"> ○ What is meant by “environment”; ○ Why the environment needs to be protected and conserved ○ How construction activities can impact on the environment; ○ What can be done to mitigate against such impacts; 	Environmental Control Officer (ECO), Proponent	During staff induction and ongoing

ASPECT	MANAGEMENT DETAILS	RESPONSIBLE PERSONS	FREQUENCY
	<ul style="list-style-type: none"> ○ Awareness of emergency and spills response provisions; ○ Social responsibility during construction, e.g., being considerate to local residents. ● It is the proponent's responsibility to provide the site with no less than 1 hour's environmental training and to ensure that there is sufficient understanding to pass this information onto the construction and operation staff. ● Use should be made of environmental awareness posters on site. ● The need for a 'clean site' policy also needs to be explained to the construction workers. 		
Education of Site Staff on General Environmental Conduct	<p><u>Workers Conduct on site</u></p> <ul style="list-style-type: none"> ● A general regard for the social and ecological wellbeing of the site and adjacent areas is expected of the site staff. Workers need to be made aware of the following general rules: ● No alcohol / drugs to be present on site. ● No firearms allowed on site or in vehicles transporting staff to / from site (unless used by security personnel). ● Prevent excessive noise. ● Prevent unsocial behaviour. ● Bringing pets onto the site is forbidden. ● No harvesting of firewood from the site or from the adjacent areas. ● Construction staff are to make use of the facilities provided for them, as opposed to ad-hoc alternatives, (e.g., fires for cooking, the use of 	Proponent, Employees, Environmental Control Officer (ECO)	Throughout this stage of the project

ASPECT	MANAGEMENT DETAILS	RESPONSIBLE PERSONS	FREQUENCY
	<p>surrounding areas / bush as a toilet is forbidden).</p> <ul style="list-style-type: none"> • Trespassing on private / commercial properties adjoining the site is forbidden. • Driving under the influence of alcohol is prohibited. • Other than the pre-approved security staff, no workers shall be permitted to live on site. 		

5.2. Section B: Construction Phase

TABLE 3 - CONSTRUCTION PHASE MANAGEMENT MEASURES

ASPECT	MANAGEMENT DETAILS	RESPONSIBLE PERSONS	FREQUENCY
Maintenance of Construction Site	<p><u>Ablutions</u></p> <ul style="list-style-type: none"> Waterless toilets are to be maintained in a clean state and should be moved to ensure that they adequately service the work areas. The Contractor is to ensure that open areas or the surrounding bush are not being used as a toilet facility. Any toilets must be situated out of the 1:100-year flood line of any watercourse 	Contractor, Employees, Environmental Control Officer (ECO)	On-going with Weekly Inspections by ECO
	<p><u>Eating Areas</u></p> <ul style="list-style-type: none"> Eating areas should be regularly serviced and cleaned to ensure the highest possible standards of hygiene and cleanliness. All litter throughout the site should be picked up and placed in the bins provided. 	Contractor Employees, Environmental Control Officer (ECO)	On-going with Weekly Inspections by ECO
	<p><u>Housekeeping</u></p> <ul style="list-style-type: none"> The Contractor shall ensure that his camp and working areas are kept clean and tidy at all times. 	Contractor	On-going with Weekly Inspections

ASPECT	MANAGEMENT DETAILS	RESPONSIBLE PERSONS	FREQUENCY
	<p><u>Waste Disposal</u></p> <ul style="list-style-type: none"> • The Contractor shall ensure that all litter is collected from the work and camp areas daily. • Bins and / or skips should be emptied regularly and waste should be disposed of at a registered landfill site. Waybills for all such disposal are to be kept by the Contractor for review by the Engineer / ECO. • A registered chemical waste company is to be used to remove waste from chemical toilets on site. 	Contractor	On-going with Weekly Inspections by ECO
Dust/Air Pollution	<p><u>Air Quality</u></p> <ul style="list-style-type: none"> • Vehicles travelling along the access road must adhere to the speed limits to avoid creating excessive dust. • Access and other cleared surfaces must be dampened whenever possible and especially in dry and windy conditions to avoid excessive dust • Vehicles and machinery are to be kept in good working order and to meet manufacturers specifications for safety, fuel consumption etc. 	Contractor	On- going
Soil Erosion	<p><u>Conservation of Valuable Soil Resources</u></p> <ul style="list-style-type: none"> • Wind screening and storm water control should be undertaken to prevent soil loss from the site. • Once an area has been cleared of vegetation, the top layer (nominally 150mm) of soil should be removed and stockpiled in a designated area. 	Contractor	On- going

ASPECT	MANAGEMENT DETAILS	RESPONSIBLE PERSONS	FREQUENCY
Stormwater	<p><u>Stormwater Damage Prevention</u></p> <ul style="list-style-type: none"> To prevent storm water damage, the increase in storm water runoff resulting from the construction activities must be estimated and the drainage system accessed accordingly. A drainage programme must be submitted to the Engineer for approval. Temporary cut-off drains and berms may be required to capture stormwater and promote infiltration, or to divert stormwater flow to avoid gulley erosion 	Contractor, Project Manager	Monitoring throughout the duration of the project.
Water Quality	<p><u>Maintenance of Water Quality</u></p> <ul style="list-style-type: none"> Storage areas that contain hazardous substances must be bunded with an approved impermeable liner. Spills in bunded areas must be cleaned up, removed and disposed of safely from the bunded area as soon after detection as possible to minimize pollution risk and reduced bunding capacity. Provision should be made during set up for all polluted runoff to be treated to the Engineers approval before being discharged into the stormwater system (this will be required for the duration of the project). Site staff shall not be permitted to use any watercourse or natural water source adjacent to or within the designated site for the purposes of bathing, washing of clothing or for any construction related activities. Municipal water (or another source approved by the ECO should instead be used for all activities such as washing of equipment or disposal of any type of waste, dust suppression, concrete mixing, compacting etc. 	Environment al Control Officer (ECO)	Regular monitoring

ASPECT	MANAGEMENT DETAILS	RESPONSIBLE PERSONS	FREQUENCY
Conservation of the Natural Environment	<p><u>Fauna and Flora</u></p> <ul style="list-style-type: none"> No vegetation may be cleared without prior permission from the ECO or PM. Trees that are not to be cleared should be marked beforehand with danger tape. The ECO must be given a chance to mark vegetation that is to be conserved before the Contractor begins clearing the site. Care must be taken to avoid the introduction of alien plant species to the site and surrounding areas. Disturbance to birds, animals and reptiles and their habitats should be minimized wherever possible. 	Environmental Control Officer (ECO), Project Manager	Ongoing Monitoring.
Set up of Waste Management Procedures	<p><u>Waste Management</u></p> <ul style="list-style-type: none"> The excavation and use of rubbish pits is forbidden. Burning of waste is forbidden. A fenced area must be allocated for waste sorting and disposal. Individual skips for different types of waste (e.g., 'household' type refuse, building rubble, etc.) should be provided. Littering on site is forbidden and the site shall be cleared of litter at the end of each working day. 	Environmental Control Officer (ECO)	Ongoing monitoring
Noise and Visual Impacts	<p><u>Noise Impacts</u></p> <ul style="list-style-type: none"> Construction vehicles are to be fitted with standard silencers prior to the beginning of construction. Equipment that is fitted with noise reduction facilities will be used as per operating instructions and maintained properly during site operations. 	Environmental Control Officer (ECO)	Ongoing

ASPECT	MANAGEMENT DETAILS	RESPONSIBLE PERSONS	FREQUENCY
	<p><u>Visual Impacts</u></p> <ul style="list-style-type: none"> Storage facilities, elevated tanks and other temporary structures on site should be located such that they have as little visual impact on local residents as possible. Special attention should be given to the screening of highly reflective materials on site. 	Contractor, Environmental Control Officer (ECO)	Ongoing

5.3. Section C: Operational Phase

TABLE 4 - OPERATIONAL PHASE MANAGEMENT MEASURES

ASPECT	MANAGEMENT GUIDELINE	RESPONSIBLE PERSONS	FREQUENCY
Health and Safety	<ul style="list-style-type: none"> • Relevant operational staff must receive training on the correct operation of the storagetanks, as well as maintenance and repair procedures when leaks are detected. • An emergency response plan must be available on site and employees must be familiarwith the plan. • The correct PPE should be used on the site at all times. • Appropriate Health & Safety signage must be placed around the site and on appropriate equipment • Fire extinguishers and sand bags must be readily available onsite and easily accessible. • Firefighting equipment must comply with regulations. Extinguishers - Halogenated hydrocarbon type extinguishers) and be inspected regularly. • No smoking may be permitted on site. • A stocked up first aid kit should be kept on site and there should be designated personnel who works with it. 	All personnel	Throughout operation phase
Soil and Groundwater Contamination	<ul style="list-style-type: none"> • Accidental spills that occur outside of the bund area must be contained and preventedfrom entering the stormwater system. • Spills must be treated with the appropriate spill absorbent. • Any significant spills or leak incidents must be reported in terms of the 	All personnel	Throughout operation phase

ASPECT	MANAGEMENT GUIDELINE	RESPONSIBLE PERSONS	FREQUENCY
	National Environmental Management Act and the Water Act.		
Air Quality	<ul style="list-style-type: none"> • Dust suppression techniques should be employed if the specific operation activity is likely to create dusty atmospheric conditions in excess of the periodic extremes. • Avoid activities that create excessive dust on extremely windy days. • Personnel are required to wear personal protection equipment if excessive dust is created for prolonged working periods. • Employees should work in shifts to avoid prolonged hours of exposure to dust • Employees should be made aware of negative effects of dust inhalation. • Dust monitoring is recommended in order to monitor the amount of dust that the activities emit at different distances and directions around the project area. 	All personnel	Throughout operation phase
Noise	<ul style="list-style-type: none"> • A grievance procedure will be established whereby noise complaints can be received, recorded and responded to appropriately. • Machineries and vehicles (moving and stationed) should be serviced regularly. • A noise management standard operating procedure (SOP) for the activities happening on-site should be developed • Avoid creating unnecessary noise by making sure that equipment that are not in used are always turned off and by avoiding operations during odd hours. • Fit sound mufflers on all machinery where applicable. • Equip employees with proper PPE (noise reduction earmuffs) • Employees should work in shifts to avoid prolonged working hours and consequently prolonged exposure to noise. 	All personnel	Throughout operation phase

ASPECT	MANAGEMENT GUIDELINE	RESPONSIBLE PERSONS	FREQUENCY
Biodiversity Management	<p><u>Fauna and Flora</u></p> <ul style="list-style-type: none"> • No protected vegetation may be cleared without prior permission from the forestry department. • Trees that are not to be cleared should be marked beforehand with danger tape. The ECO must be given a chance to mark vegetation that is to be conserved before the Contractor begins clearing the site (refer to Appendix A). • Care must be taken to avoid the introduction of alien plant species to the site and surrounding areas. • Disturbance to birds, animals and reptiles and their habitats should be minimized Wherever possible. 	All personnel	Throughout operation phase
Waste Management	<ul style="list-style-type: none"> • The domestic waste, which is separated from all paper and organic materials, is taken to the nearest official dumpsite. • Oil from the servicing of the vehicles and machines is collected in drums and is taken together with all other industrial waste that is generated on site to the nearest hazardous waste site. • A certificate of disposal needs to be kept on file. • Storage areas that contain hazardous substances must be bunded with an approved impermeable liner. <p><u>Ablutions</u></p> <ul style="list-style-type: none"> • Waterless toilets are to be maintained in a clean state and should be moved to ensure that they adequately service the work areas. • The Contractor is to ensure that open areas or the surrounding bush are not being used as a toilet facility. 	All personnel	Throughout operation phase

ASPECT	MANAGEMENT GUIDELINE	RESPONSIBLE PERSONS	FREQUENCY
	<ul style="list-style-type: none"> Any toilets must be situated out of the 1:100 year flood line of any watercourse 		
Visual	<ul style="list-style-type: none"> Litter and waste should be effectively managed to avoid visual problems in the area. Buildings and landscaping should receive on-going maintenance to avoid visual decay Ensure great housekeeping. 	All personnel	Throughout operation phase

5.4. Section D: Post Construction and Operation Phase / Decommissioning Phase

TABLE 5 – DECOMMISSIONING MANAGEMENT MEASURES

ASPECT	MANAGEMENT GUIDELINE	RESPONSIBLE PERSONS	FREQUENCY
<p>Construction Camp Rehabilitation</p>	<p><u>Rehabilitation</u></p> <ul style="list-style-type: none"> • All structures comprising the construction and operation camp are to be removed from site. • The area that previously housed the construction camp is to be checked for spills of substances such as oil, paint and fuels, etc. and these should be cleaned up. • All hardened surfaces within the construction camp area should be ripped, all imported materials removed, and the area shall be top soiled and re-grassed using the guidelines set out in appropriate revegetation specifications • The Contractor must arrange the cancellation of all temporary services. • There is minimal information on the decommissioning phase of the operation activities as the project is visioned to be ongoing for many years. 	<p>Proponent and Environmental Control Officer (ECO)</p>	<p>Project completion</p>
<p>Vegetation</p>	<p><u>Reinstatement of Vegetation</u></p> <ul style="list-style-type: none"> • All areas that have been disturbed by construction activities (including the construction camp area) must be cleared of all alien invasive vegetation. • Open areas to be re-planted as per the revegetation specification. • All vegetation that has been cleared during construction is to be removed from site or used as much as per the revegetation 	<p>Contractor and Environmental Control Officer (ECO)</p>	<p>Project completion</p>

ASPECT	MANAGEMENT GUIDELINE	RESPONSIBLE PERSONS	FREQUENCY
	<p>specification, (except for seeding alien invasive vegetation).</p> <ul style="list-style-type: none"> The Contractor is to water and maintain all planted vegetation until the end of the defect liability period and is to submit a method statement regarding this to the Project Manager. 		
Land Rehabilitation	<p><u>Land Rehabilitation</u></p> <ul style="list-style-type: none"> All rubble is to be removed from the site to a registered municipal landfill site. Burying of rubble on site is prohibited. 	Contractor and Environmental Control Officer (ECO)	Project completion

6. MONITORING PLAN

The project monitoring is conducted under the EMP includes:

- (i) **Project readiness monitoring** - Monitoring to check progress on project readiness and close gaps through corrective actions.
- (ii) **Environmental quality monitoring** - To be conducted by a competent authority or person appointed by the proponent, involving the collection and analyses of air quality, noise and water quality data at designated monitoring locations for assessing compliance with applicable environmental quality and emission standards.
- (iii) **EMP compliance monitoring** - To be conducted by the Project Management Consultants to verify EMP compliance during project implementation.
- (iv) **Operational monitoring** - This is required as part of the operations of the subproject and will be undertaken by the relevant government department or a nominated private sector operator.

7. CONCLUSION

This Environmental Management Plan highlights the management measures that will be implemented to mitigate the environmental impacts of the proposed activities. Additionally, it highlights the need / requirements for the Environmental Emergency Preparedness and Response procedure.

The EMP is a legal document, which commits the applicant to comply with all management measures, monitoring programmes and other plans as presented herein. As part of the EMP, monitoring programmes have been provided to manage and control critical components of the environment. This is a live document which may be amended if project activities alter.

APPENDIX A – LIST OF FLORA SPECIES FOUND IN THE AREA (NBRI, 2022)

SPECIES	ENDEMISM	PROTECTED
<i>Acacia fleckii</i> Schinz		
<i>Acacia hereroensis</i> Engl.		
<i>Acacia luederitzii</i> Engl. var. <i>luederitzii</i>		
<i>Acacia nilotica</i> (L.) Willd. ex Delile subsp. <i>kraussiana</i> (Benth.) Brenan		
<i>Acacia reficiens</i> Wawra subsp. <i>reficiens</i>		
<i>Acacia senegal</i> (L.) Willd. var. <i>rostrata</i> Brenan		
<i>Acacia tortilis</i> (Forssk.) Hayne subsp. <i>heteracantha</i> (Burch.) Brenan		
<i>Acanthosicyos naudinianus</i> (Sond.) C.Jeffrey		
<i>Achyranthes aspera</i> L. var. <i>aspera</i>		
<i>Aerva leucura</i> Moq.		
<i>Aloe zebrina</i> Baker		Protected
<i>Alternanthera nodiflora</i> R.Br.		
<i>Aneilema hockii</i> De Wild.		
<i>Anthehora pubescens</i> Nees		
<i>Anthehora schinzii</i> Hack.		
<i>Aptosimum decumbens</i> Schinz		
<i>Asparagus cooperi</i> Baker		
<i>Asplenium cordatum</i> (Thunb.) Sw.		
<i>Barleria kaloxytone</i> Lindau	Endemic	
<i>Barleria lanceolata</i> (Schinz) Oberm.	Endemic	
<i>Bergia polyantha</i> Sond.		
<i>Blepharis obmitrata</i> C.B.Clarke		
<i>Boerhavia coccinea</i> Mill.		
<i>Boerhavia deserticola</i> Codd	Endemic	
<i>Boscia foetida</i> Schinz subsp. <i>foetida</i>		
<i>Bothriochloa insculpta</i> (Hochst. ex A.Rich.) A.Camus		
<i>Brachiaria eruciformis</i> (Sm.) Griseb.		
<i>Brachiaria grossa</i> Stapf		
<i>Brachiaria malacodes</i> (Mez & K.Schum.) Scholz		
<i>Brachiaria schoenfelderi</i> C.E.Hubb. & Schweick.	Endemic	

<i>Cenchrus ciliaris</i> L.		
<i>Chamaecrista biensis</i> (Steyaert) Lock		
<i>Cheilanthes dinteri</i> Brause		
<i>Chenopodium amboanum</i> (Murr) Aellen	Endemic	
<i>Chloris virgata</i> Sw.		
<i>Clematis brachiata</i> Thunb.		
<i>Cleome angustifolia</i> Forssk. subsp. <i>diandra</i> (Burch.) Kers		
<i>Cleome monophylla</i> L.		
<i>Cleome oxyphylla</i> Burch. var. <i>oxyphylla</i>		
<i>Cleome suffruticosa</i> Schinz	Endemic	
<i>Coccinia rehmannii</i> Cogn.		
<i>Coccinia sessilifolia</i> (Sond.) Cogn.		
<i>Colophospermum mopane</i> (J.Kirk ex Benth.) J.Kirk ex J.Léonard		Forestry Protected
<i>Combretum apiculatum</i> Sond. subsp. <i>apiculatum</i>		
<i>Combretum imberbe</i> Wawra		
<i>Commelina benghalensis</i> L.		
<i>Commelina forskaolii</i> Vahl		
<i>Commicarpus decipiens</i> Meikle	Endemic	
<i>Commicarpus pentandrus</i> (Burch.) Heimerl		
<i>Commiphora africana</i> (A.Rich.) Engl. var. <i>africana</i>		
<i>Commiphora angolensis</i> Engl.		
<i>Commiphora nigrescens</i> Engl.		
<i>Corbichonia decumbens</i> (Forssk.) Exell		
<i>Corchorus asplenifolius</i> Burch.		
<i>Corchorus tridens</i> L.		
<i>Corchorus trilocularis</i> L.		
<i>Cotula anthemoides</i> L.		
<i>Crotalaria argyraea</i> Welw. ex Baker		
<i>Crotalaria barnabassii</i> Dinter ex Baker f.		
<i>Crotalaria steudneri</i> Schweinf.		
<i>Croton gratissimus</i> Burch. var. <i>gratissimus</i>		
<i>Cullen tomentosum</i> (Thunb.) J.W.Grimes		
<i>Cynodon dactylon</i> (L.) Pers.		

<i>Cyperus foliaceus</i> C.B.Clarke		
<i>Cyphostemma congestum</i> (Baker) Desc. ex Wild & R.B.Drumm.		
<i>Dactyliandra welwitschii</i> Hook.f.		
<i>Dactyloctenium aegyptium</i> (L.) Willd.		
<i>Dichanthium annulatum</i> (Forssk.) Stapf var. <i>papillosum</i> (A.Rich.) De Wet & Harlan		
<i>Dicoma tomentosa</i> Cass.		
<i>Digitaria seriata</i> Stapf		
<i>Digitaria velutina</i> (Forssk.) P.Beauv.		
<i>Dipcadi glaucum</i> (Burch. ex Ker Gawl.) Baker		
<i>Ehretia alba</i> Retief & A.E.van Wyk		
<i>Elephantorrhiza suffruticosa</i> Schinz		
<i>Enneapogon cenchroides</i> (Licht. ex Roem. & Schult.) C.E.Hubb.		
<i>Eragrostis biflora</i> Hack. ex Schinz		
<i>Eragrostis cilianensis</i> (All.) Vignolo ex Janch.		
<i>Eragrostis echinochloidea</i> Stapf		
<i>Eragrostis nindensis</i> Ficalho & Hiern		
<i>Eragrostis omahekensis</i> De Winter	Endemic	
<i>Eragrostis porosa</i> Nees		
<i>Eragrostis superba</i> Peyr.		
<i>Eragrostis trichophora</i> Coss. & Durieu		
<i>Eriocephalus luederitzianus</i> O.Hoffm.		
<i>Erythrina decora</i> Harms	Endemic	Forestry Protected
<i>Euclea undulata</i> Thunb. var. <i>myrtina</i> (Burch.) Hiern		
<i>Euphorbia inaequilatera</i> Sond. var. <i>inaequilatera</i>		
<i>Evolvulus alsinoides</i> (L.) L.		
<i>Felicia clavipilosa</i> Grau subsp. <i>clavipilosa</i>		
<i>Fingerhuthia africana</i> Lehm.		
<i>Flueggea virosa</i> (Roxb. ex Willd.) Voigt subsp. <i>virosa</i>		
<i>Geigeria acaulis</i> (Sch.Bip.) Benth. & Hook.f. ex Oliv. & Hiern		
<i>Gisekia africana</i> (Lour.) Kuntze var. <i>africana</i>		
<i>Gloriosa superba</i> L.		

<i>Grewia flava</i> DC.		
<i>Grewia flavescens</i> Juss.		
<i>Grewia retinervis</i> Burret		
<i>Harpagophytum procumbens</i> (Burch.) DC. ex Meisn. subsp. <i>procumbens</i>		Protected
<i>Helichrysum tomentosulum</i> (Klatt) Merxm. subsp. <i>aromaticum</i> (Dinter) Merxm.		
<i>Helinus integrifolius</i> (Lam.) Kuntze		
<i>Helinus spartioides</i> (Engl.) Schinz ex Engl.		
<i>Heliotropium nelsonii</i> C.H.Wright		
<i>Heliotropium ovalifolium</i> Forssk.		
<i>Hermannia eenii</i> Baker f.		
<i>Hermannia modesta</i> (Ehrenb.) Mast.		
<i>Hermannia rautanenii</i> Schinz ex K.Schum.		
<i>Hermannia tomentosa</i> (Turcz.) Schinz ex Engl.		
<i>Herbststaedtia odorata</i> (Burch.) T.Cooke var. <i>odorata</i>		
<i>Hibiscus caesius</i> Garcke var. <i>caesius</i>		
<i>Hibiscus calyphyllus</i> Cav.		
<i>Hibiscus dinteri</i> Hochr.	Endemic	
<i>Hibiscus nigricaulis</i> Baker f.		
<i>Hibiscus sulfuranthus</i> Ulbr.	Endemic	
<i>Hiernia angolensis</i> S.Moore		
<i>Hirpicium gorterioides</i> (Oliv. & Hiern) Roessler subsp. <i>gorterioides</i>		
<i>Hyparrhenia rufa</i> (Nees) Stapf var. <i>rufa</i>		
<i>Hypericum lalandii</i> Choisy		
<i>Indigastrum costatum</i> (Guill. & Perr.) Schrire subsp. <i>macrum</i> (E.Mey.) Schrire		
<i>Indigofera filipes</i> Benth. ex Harv.		
<i>Ipomoea dichroa</i> Choisy		
<i>Ipomoea oblongata</i> E.Mey. ex Choisy		
<i>Ipomoea sinensis</i> (Desr.) Choisy subsp. <i>blepharosepala</i> (Hochst. ex A.Rich.) Verdc. ex A.Meeuse		
<i>Ipomoea verbascoidea</i> Choisy		

<i>Justicia heterocarpa</i> T.Anderson subsp. <i>dinteri</i> (S.Moore) Hedrén		
<i>Kirkia acuminata</i> Oliv.		
<i>Kleinia longiflora</i> DC.		
<i>Kohautia caespitosa</i> Schnizl. subsp. <i>brachyloba</i> (Sond.) D.Mantell		
<i>Kohautia cynanchica</i> DC.		
<i>Lantana angolensis</i> Moldenke		
<i>Lantana dinteri</i> Moldenke		
<i>Lapeirousia rivularis</i> Wanntorp		
<i>Leucas martinicensis</i> (Jacq.) R.Br.		
<i>Leucas pechuelii</i> (Kuntze) Gürke	Near Endemic	
<i>Leucosphaera bainesii</i> (Hook.f.) Gilg		
<i>Limeum argute-carinatum</i> Wawra ex Wawra & Peyr. var. <i>argute-carinatum</i>		
<i>Limeum myosotis</i> H.Walter var. <i>confusum</i> Friedrich		
<i>Lonchocarpus nelsii</i> (Schinz) Schinz ex Heering & Grimme		
<i>Lycium eenii</i> S.Moore		
<i>Lycium trothae</i> Dammer		
<i>Macrotyloma axillare</i> (E.Mey.) Verdc. var. <i>axillare</i>		
<i>Maerua parvifolia</i> Pax		
<i>Maerua schinzii</i> Pax		Forestry Protected
<i>Megalochlamys marlothii</i> (Engl.) Lindau		
<i>Melhania virescens</i> (K.Schum.) K.Schum.		
<i>Melinis repens</i> (Willd.) Zizka subsp. <i>grandiflora</i> (Hochst.) Zizka		
<i>Melinis repens</i> (Willd.) Zizka subsp. <i>repens</i>		
<i>Monechma debile</i> (Forssk.) Nees		
<i>Monechma divaricatum</i> (Nees) C.B.Clarke		
<i>Monechma genistifolium</i> (Engl.) C.B.Clarke subsp. <i>genistifolium</i>	Endemic	
<i>Monelytrum luederitzianum</i> Hack.		
<i>Monsonia angustifolia</i> E.Mey. ex A.Rich.		
<i>Montinia caryophyllacea</i> Thunb.		
<i>Nelsia quadrangula</i> (Engl.) Schinz		

<i>Neorautanenia mitis</i> (A.Rich.) Verdc.		
<i>Nerine laticoma</i> (Ker Gawl.) T.Durand & Schinz		
<i>Nidorella resedifolia</i> DC. subsp. <i>resedifolia</i>		
<i>Ocimum americanum</i> L. var. <i>americanum</i>		
<i>Ocimum filamentosum</i> Forssk.		
<i>Ondetia linearis</i> Benth.	Endemic	
<i>Ornithogalum pulchrum</i> Schinz		
<i>Oropetium capense</i> Stapf		
<i>Otoptera burchellii</i> DC.		
<i>Oxygonum alatum</i> Burch. var. <i>alatum</i>		
<i>Oxygonum sinuatum</i> (Hochst. & Steud. ex Meisn.) Dammer		
<i>Ozoroa paniculosa</i> (Sond.) R.Fern. & A.Fern. var. <i>salicina</i> (Sond.) R.Fern. & A.Fern.		
<i>Panicum maximum</i> Jacq.		
<i>Pavonia burchellii</i> (DC.) R.A.Dyer		
<i>Peliostomum leucorrhizum</i> E.Mey. ex Benth.		
<i>Pellaea calomelanos</i> (Sw.) Link var. <i>calomelanos</i>		
<i>Petalidium englerianum</i> (Schinz) C.B.Clarke		
<i>Philenoptera nelsii</i> (Schinz) Schrire		
<i>Plectranthus caninus</i> Roth		
<i>Plectranthus neochilus</i> Schltr.		
<i>Pogonarthria fleckii</i> (Hack.) Hack.		
<i>Pogonarthria leiarthra</i> Hack.	Endemic	
<i>Pollichia campestris</i> Aiton		
<i>Ptycholobium biflorum</i> (E.Mey.) Brummitt subsp. <i>angolensis</i> (Baker) Brummitt		
<i>Ranunculus multifidus</i> Forssk.		
<i>Raphionacme lanceolata</i> Schinz		
<i>Rhamphicarpa brevipedicellata</i> O.J.Hansen		
<i>Rhigozum brevispinosum</i> Kuntze		
<i>Rhus ciliata</i> Licht. ex Schult.		
<i>Rhus marlothii</i> Engl.		
<i>Rhynchosia minima</i> (L.) DC. var. <i>minima</i>		
<i>Rhynchosia minima</i> (L.) DC. var. <i>prostrata</i> (Harv.) Meikle		

<i>Rothea myricoides</i> (Hochst.) Steane & Mabb. var. <i>myricoides</i>		
<i>Schmidtia pappophoroides</i> Steud.		
<i>Seddera suffruticosa</i> (Schinz) Hallier f. var. <i>suffruticosa</i>		
<i>Senna italica</i> Mill. subsp. <i>arachoides</i> (Burch.) Lock		
<i>Sericorema sericea</i> (Schinz) Lopr.		
<i>Sesamum triphyllum</i> Welw. ex Asch. var. <i>triphyllum</i>		
<i>Sesbania macowaniana</i> Schinz		
<i>Setaria pumila</i> (Poir.) Roem. & Schult.		
<i>Solanum capense</i> L.		
<i>Solanum delagoense</i> Dunal		
<i>Solanum tettense</i> Klotzsch var. <i>renschii</i> (Vatke) A.E.Gonç.		
<i>Sorghum halepense</i> (L.) Pers.		
<i>Sporobolus festivus</i> Hochst. ex A.Rich.		
<i>Sporobolus fimbriatus</i> (Trin.) Nees		
<i>Steganotaenia araliacea</i> Hochst. var. <i>araliacea</i>		
<i>Stipagrostis hirtigluma</i> (Steud. ex Trin. & Rupr.) De Winter subsp. <i>patula</i> (Hack.) De Winter		
<i>Striga gesnerioides</i> (Willd.) Vatke		
<i>Tagetes minuta</i> L.		
<i>Talinum arnotii</i> Hook.f.		
<i>Tephrosia oxygona</i> Welw. ex Baker subsp. <i>lactea</i> (Schinz) A.Schreib.		
<i>Terminalia sericea</i> Burch. ex DC.		
<i>Tragus racemosus</i> (L.) All.		
<i>Triaspis hypericoides</i> (DC.) Burch. subsp. <i>nelsonii</i> (Oliv.) Immelman		
<i>Tribulocarpus dimorphanthus</i> (Pax) S.Moore		
<i>Trochomeria macrocarpa</i> (Sond.) Hook.f. subsp. <i>vitifolia</i> (Hook.f.) R.Fern. & A.Fern.		
<i>Urginea altissima</i> (L.f.) Baker		
<i>Urochloa brachyura</i> (Hack.) Stapf		
<i>Urochloa oligotricha</i> (Fig. & De Not.) Henrard		
<i>Vigna frutescens</i> A.Rich. subsp. <i>frutescens</i> var. <i>frutescens</i>		

<i>Waltheria indica</i> L.		
<i>Xenostegia tridentata</i> (L.) D.F.Austin & Staples subsp. <i>angustifolia</i> (Jacq.) Lejoly & Lisowski		
<i>Xerophyta viscosa</i> Baker		
<i>Zehneria marlothii</i> (Cogn.) R.Fern. & A.Fern.		
<i>Ziziphus mucronata</i> Willd. subsp. <i>mucronata</i>		
<i>Zornia milneana</i> Mohlenbr.		