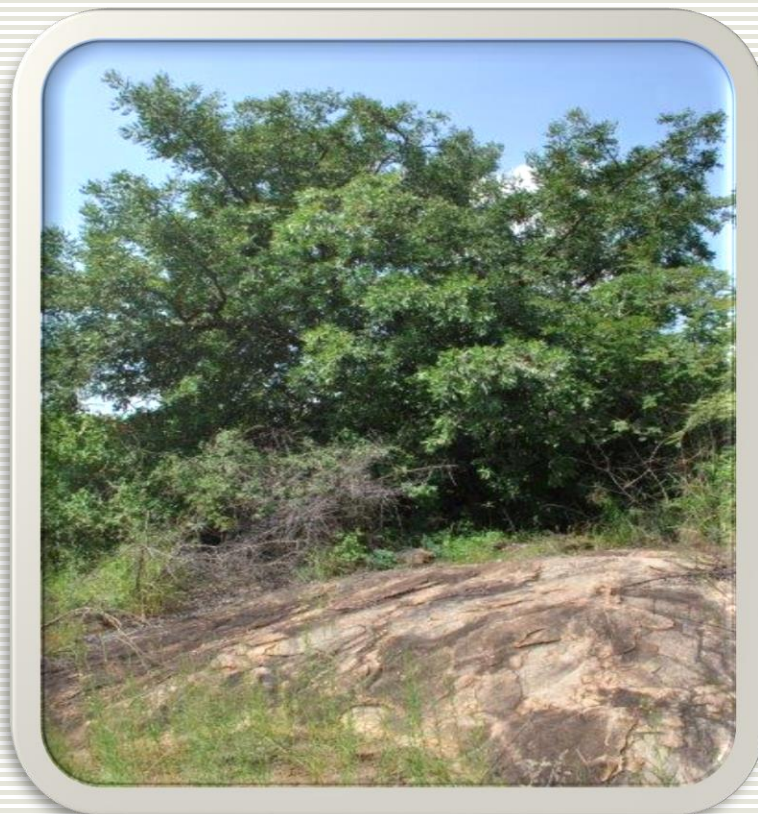


**VALOYI ROYAL
COUNCIL**

**NWAMITWA
RECREATIONAL PARK**

**DRAFT ENVIRONMENTAL
MANAGEMENT PROGRAMME
MARCH 2022**

LEDET Reference:





VALOYI ROYAL COUNCIL

NWAMITWA RECREATIONAL PARK

DRAFT ENVIRONMENTAL MANAGEMENT PROGRAMME

MARCH 2022

Compiled by:

Jacana Environmentals cc

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1 INTRODUCTION AND PROJECT OVERVIEW

1.1 Introduction

Jacana Environmentals cc was appointed by DVM Limpopo (Pty) Ltd on behalf of the Valoyi Royal Council as an independent Environmental Assessment Practitioner to undertake an application for environmental authorisation for the proposed development of a recreational park in the Nwamitwa area in terms of the National Environmental Management Act (NEMA), 1998 (Act 107 of 1998) and GN No. R. 982-986 of 4 December 2014: NEMA: Environmental Impact Assessment (EIA) Regulations, as amended.

The “greening” and development of the area between Khalanga Lodge and Valoyi Vatsonga Cultural Village is an approved community project under the Environmental Protection and Infrastructure Programmes supported by the Department of Forestry, Fisheries and the Environment (DFFE) and forms part of a phased community project that includes the Royal Khalanga Lodge and the Valoyi Vatshonga Cultural Village.

This document serves as the **draft Environmental Management Programme** (EMPr) which is available for comments by Interested and Affected Parties (IAPs) and commenting Authorities for a period of 30 days.

1.2 Environmental Assessment Practitioner (EAP)

Independent EAP	Jacana Environmentals cc
Responsible person	Marietjie Eksteen
Physical address	7 Landdros Mare Street, Polokwane
Postal address	PO Box 31675, Superbia, 0759
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E-mail	marietjie@jacanacc.co.za
Professional Affiliation	<p>Registered Environmental Assessment Practitioner at the Environmental Assessment Practitioners Association of South Africa (EAPASA) – Number 2020/1800</p> <p>Registered as a Professional Environmental Scientist (Pr.Sci.Nat.) at the South African Council for Natural Scientific Professions – Registration No. 400090/02</p> <p>Member of the Land Rehabilitation Society of Southern Africa (LaRSSA): Membership ID 30835</p>
Abbreviated Curriculum Vitae	<p>Marietjie Eksteen is the Managing Member of the consulting firm Jacana Enviromentals cc, an environmental consulting firm based in Polokwane. She is an environmental scientist with 30 years' experience, her main fields of expertise being water quality management, mine water management, environmental legal compliance, and project management. She obtained a Masters' degree in Exploration Geophysics (MSc) from the University of Pretoria in 1993. Since establishing Jacana Enviromentals in 2006, she has been involved in a variety of mine- and industry-related environmental projects serving clients such as MC Mining Limited, South32 SA Coal Holdings, Glencore Operations South Africa, Consol Glass and Silicon Smelters, amongst others. Prior to 2006 she was employed by Pulles Howard & De Lange Inc as an environmental consultant for 2 years. Before consulting, Ms. Eksteen was employed by BHP Billiton as a mine environmental manager at their operations in Mpumalanga, as well as the Department of Water Affairs where she was appointed as a water quality specialist for the mining industry. Her career started off as a geophysicist at Genmin in 1990.</p>
Curriculum Vitae	Refer to Appendix 3.

2 PROJECT DESCRIPTION

2.1 Project Location

The proposed development is situated within Ward 12 of the Greater Tzaneen Local Municipality (GTM) within the Mopane District Municipality (MDM) of Limpopo Province.

The development is situated in the Nwamitwa area next to the road R3248 to Nkambako on a portion of the Remaining Extent of farm Mamtwas Location 461 LT, between the Royal Khalanga Lodge and the Valoyi Vatshonga Cultural Village.

The project development area falls within the jurisdiction of the state under Traditional Council custodianship, in this case the Valoyi Royal Council (Chief Nwamitwa Traditional Council).

Longitude: 30°25'18.92"E Latitude: 23°43'36.93"S

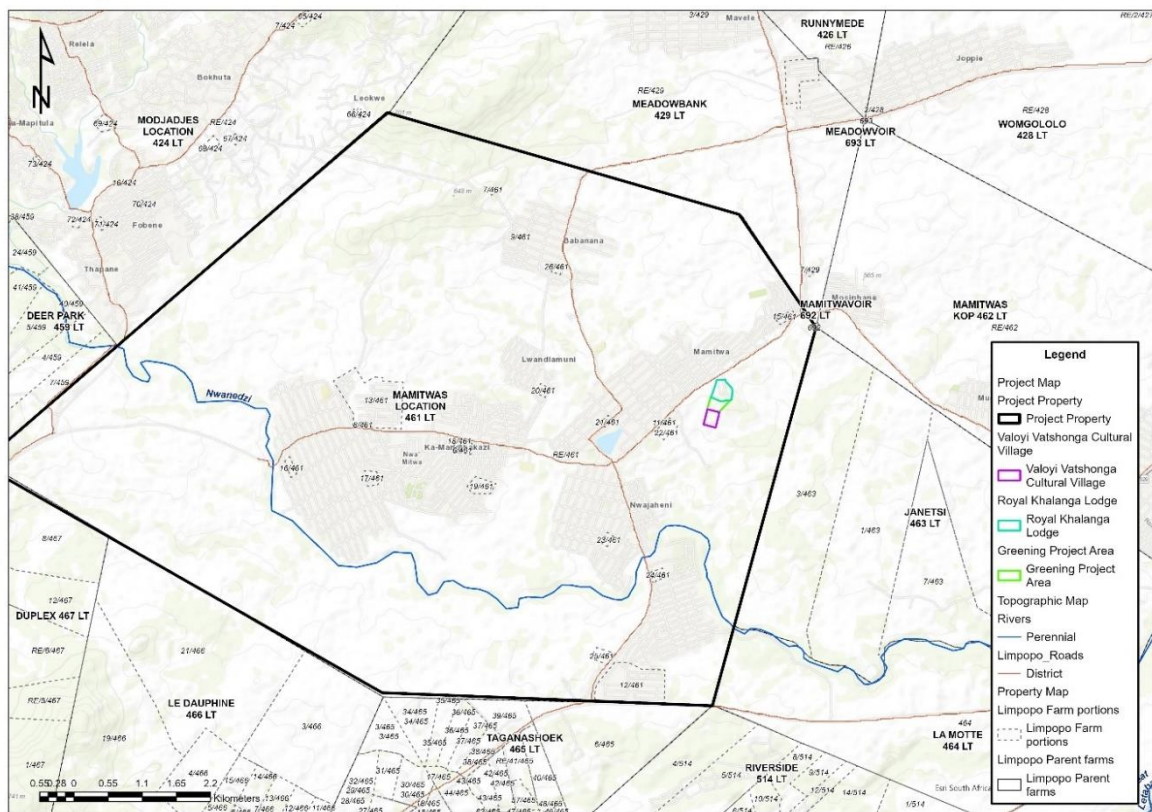


Figure 1: Project Location

2.2 Project Description

The development includes the establishment of picnic facilities and park furniture, braai areas with roofed seating and braai facilities, swimming pools, playground facilities for children, hawkers' stands, park circulation pathways, eco-friendly ablution facilities, park fencing and gates, parking for vehicles and buses/taxis. The area of development is approximately 4 hectares in size.

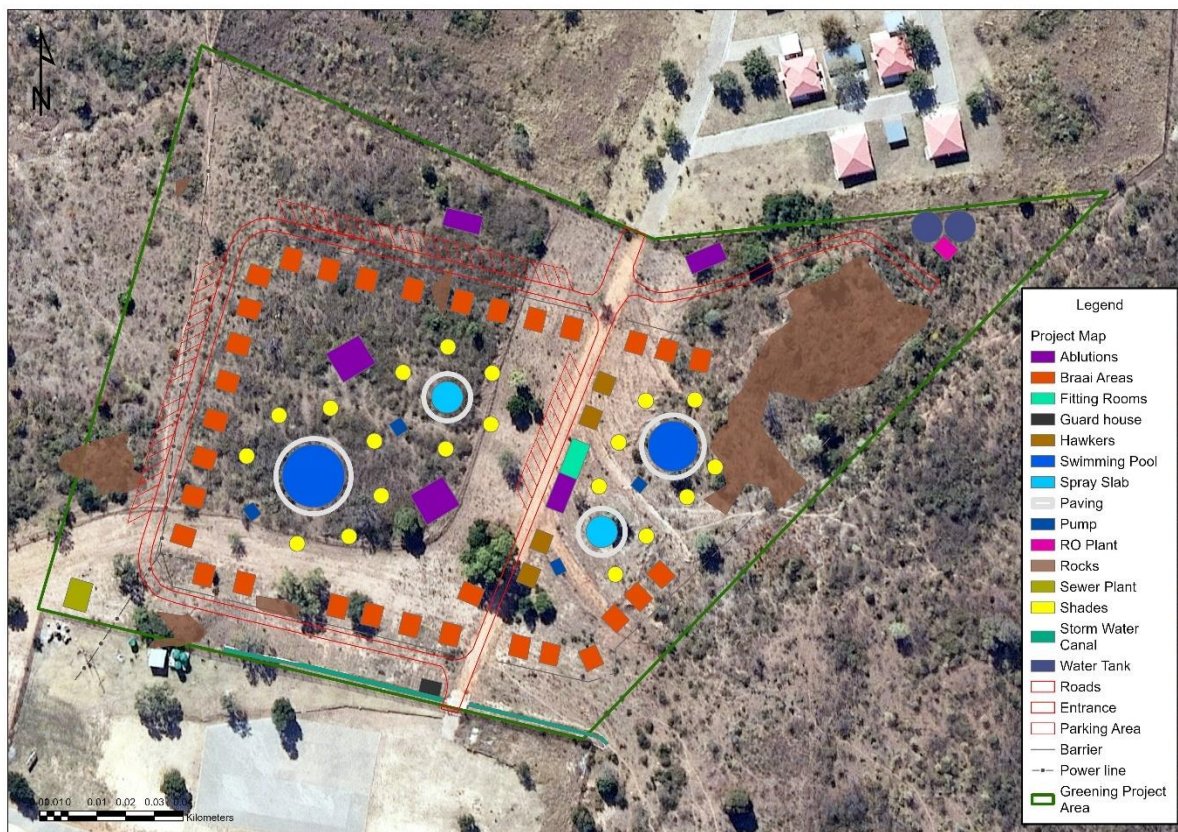


Figure 2: Development Layout Plan

There are no existing boreholes on site and the municipal water supply is inconsistent. A new borehole(s) must be drilled to provide water for the proposed development. The total supply required for a 12-hour period is approximately 1.0 litres/second (or 45 000 litres/day). Two reservoirs/tanks will be constructed with a 50 kL capacity for potable water and 75 kL for fire/pool water. The tanks will be placed on the ground in the north-eastern corner of the development area together with pressure pumps, filters and water softener/RO plant. The RO plant only needs to cater for the potable water, which is in the region of 8.0 kL/day (peak demand).

Three fire hydrants will be provided, two on the extremities of the site, and one in the middle of the development to provide for any fire risks.

There is no existing sewer reticulation in the area, and there are no immediate plans to construct a formal network with treatment works. A new package treatment plant will be installed in the south-western corner of the development area. The treated water will permeate into the soil using a soak-away (French drain) system. Grey water from the sewage package plant will be utilised for irrigation purposes.

The package plant must be able to treat at least 6.5 kL of effluent per day, but to allow for possible changes in occupancy and requirements, the plant will be designed for a daily capacity of 8.0 kL. The plant will be periodically de-sludged (2-year intervals) using vacuum tankers. The effluent will be disposed of at a registered sewage treatment works in the area. No overflow of the plant is envisaged, but if it does occur the overflow will flow into the soak-away system. Soil contamination is a concern, and the treatment plant will be monitored daily. If there is any indication of blockages, vacuum tankers will be brought in to remove the effluent for the required maintenance.

The stormwater run-off from the new development will have a negative influence on the Cultural Village site, and both stormwater and erosion must receive attention as the area does have steep slopes. Strategically placed concrete channels will be placed on the boundary of the site. These channels will divert the stormwater into the natural environment to the east/west of the site.

Solid waste is proposed to feed into the municipal waste stream. Suitable waste bins will be placed within the development footprint which will be cleaned out on regular intervals and disposed at a registered landfill site in the area.

2.3 Site Sensitivity

No cultural heritage sites were identified during the site visit, nor any burial sites (graves). Members of the Valoyi Traditional Authority confirmed that there are no burial sites within the development footprint.

Three protected species in terms of the National Forests Act 84 of 1998 (NFA) were identified, namely *Sclerocarya Birrea* subsp. *caffra* (Marula), *Philenoptera violacea* (Apple leaf) and *Diospyros mespiliformis* (Jackal-berry). An abundance of Marula and Apple leaf trees were noted on the development footprint, varying from very young to mature adults. Only two Jackal-berry trees were noted, both of good size.

The larger protected and other tree species were mapped and overlaid on the infrastructure plan. It is recommended that the trees indicated on *Figure 3* be conserved and that infrastructure are

moved/re-aligned to avoid any damage to these trees. Permits for the destruction of the smaller protected species must be obtained from the Department of Agriculture, Forestry and Fisheries (DAFF) before any bush clearance can be undertaken. It can be considered to replant some of these species within and adjacent to the development footprint as part of the landscaping of the area. Permits will also be required for the relocation of these species.

Parts of the development footprint are severely overgrown with *Dichrostachys cinerea* (Sickle bush) and *Lantana camara* (Lantana), with limited agricultural potential.

Lantana is one of the worst weeds in the world, a Category 1b species in South Africa in terms of the Alien and Invasive Species (AIS) Regulations promulgated in terms of the National Environmental Management: Biodiversity Act 10 of 2004 (NEMBA). Land occupiers are legally obliged to control it, or to remove and destroy it if possible. No trade or planting is allowed. It comprises a complex of vigorous, prolific, man-made hybrids, bred in Europe from unrecorded parents from Central and South America, and spread all over the world as a hardy, ornamental shrub, with multi-coloured flowers. Dispersed by fruit-eating birds, it establishes along fence lines and under trees, where it out-competes indigenous plants and forms impenetrable, prickly thickets that reduce natural pasturage, productivity of cattle farming, access to water supplies and tree plantations, biodiversity and land values. *Lantana camara* is a poisonous invader of veld and plantations. It replaces indigenous species. This plant is poisonous to humans and animals and responsible for livestock mortalities amounting to millions of rands every year in South Africa. It also reduces the grazing potential of the land.

Care should be taken during bush clearance activities to prevent the further proliferation of Lantana on and adjacent to the development.

The site is situated in the B81E quaternary catchment. The closest perennial watercourse is the Nwanedzi River situated approximately 2 km to the south. The present ecological state (PES) of the Nwanedzi River is Class D – Largely Modified. No wetlands are present on the site.

A small, non-perennial drainage line is situated to the west of the site, which flows only during rainfall events. The drainage line diverts stormwater runoff past the Cultural Village, thereby preventing flooding of the facility. It is transected by the access road to the Cultural Village.

The final layout plan overlain on the sensitive receptors is shown in *Figure 3*.

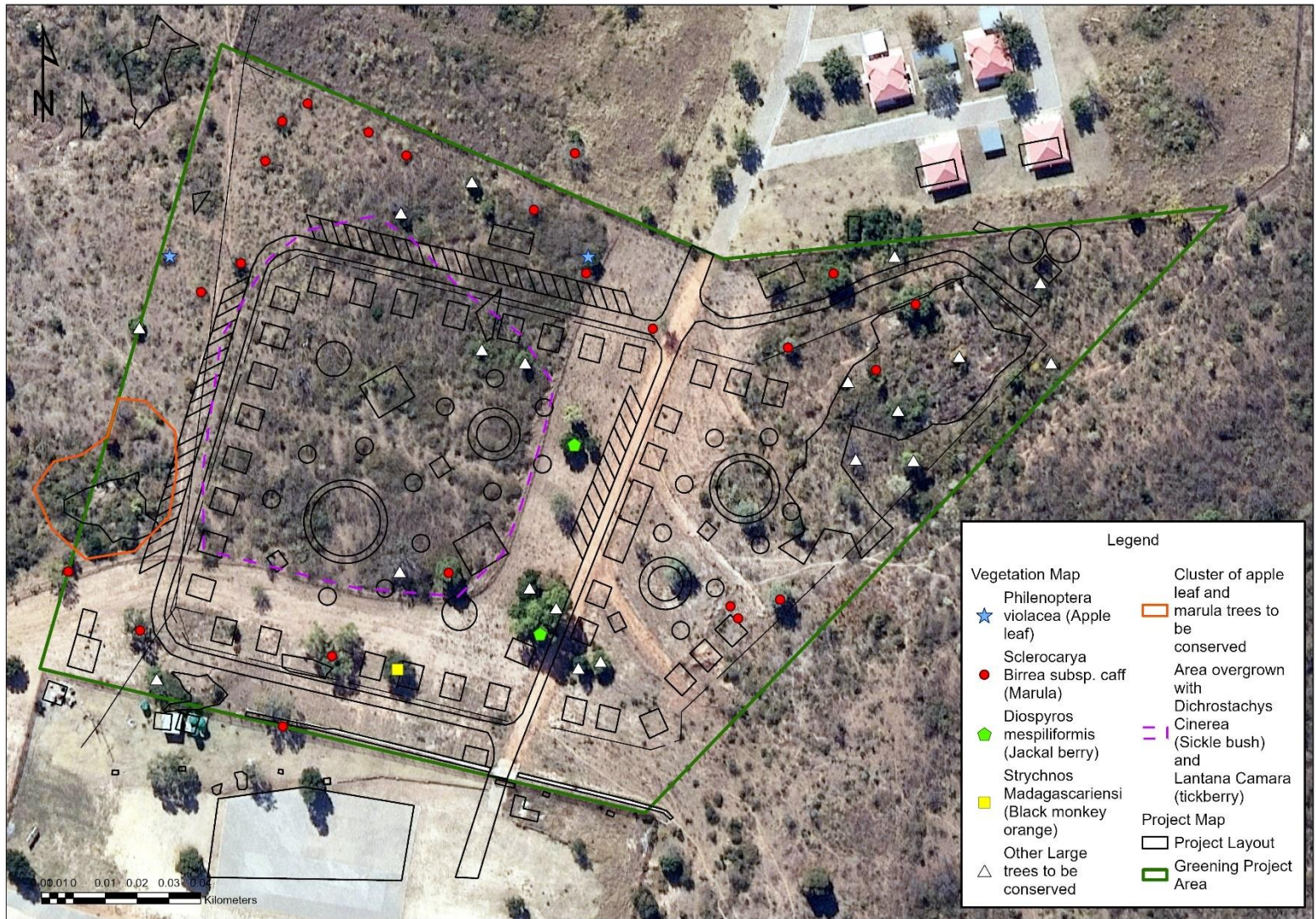


Figure 3: Site Sensitivity Map

2.4 Listed Activities

The project triggers Listed Activities Nos. 27 and 28 in terms of Listing Notice 1 of the 2014 EIA Regulations. Listing Notice 1 triggers a Basic Assessment process contemplated in regulations 19 and 20 of the 2014 EIA Regulations.

Listing Notice	Listed Activity	Development Activity
Listing Notice 1 – Activity 27	The clearance of an areas of 1 hectare or more, but less than 20 hectares of indigenous vegetation.	The proposed development entails vegetation clearance of approximately 4 hectares.
Listing Notice 1 – Activity 28	Residential, mixed, retail, commercial, industrial or institutional developments where such land was used for agriculture, game farming, equestrian purposes or afforestation on or after 01 April 1998 and where such development will occur outside an urban area, where the total land to be developed is bigger than 1 hectare.	The proposed development is situated in an area currently used for agriculture in proximity to the rural village of Nwamitwa.

3 ENVIRONMENTAL IMPACT EVALUATION AND MITIGATION MEASURES

3.1 Proposed Impact Management Outcomes

The impacts that may be caused as result of construction and operational activities include destruction of indigenous vegetation, habitats and protected plant species; soil disturbance and erosion; proliferation of alien and invasive species; waste management; and health and safety impacts.

The proposed impact management outcomes for the project are to:

- Minimise the loss of ecological habitats and protected species;
- Prevent the exploitation of faunal and floral resources;
- Limit the increase of erosion and prevent downstream flooding and sedimentation;
- Prevent further spreading of alien and invasive species on and adjacent to the site;
- Implement sound waste management practices;
- Re-establish indigenous vegetation in disturbed and rehabilitated areas;
- Enable a safe environment for the community with appropriate health and safety measures;
- Prevent any impact on identified and unidentified heritage and cultural resources;
- Ensure appropriate training and skills development for employees; and
- Maximise the benefits to the community in terms of employment and business opportunities.

Appropriate monitoring should be implemented to ensure compliance to the impact management outcomes as proposed.

3.2 Impact and Mitigation

The main negative impacts (Medium-High to High) associated with the project are:

- Impact on protected species *Sclerocarya Birrea* subsp. *caffra* (Marula), *Philenoptera violacea* (Apple leaf) and *Diospyros mespiliformis* (Jackal-berry).
- Proliferation of alien and invasive plant species, in specific *Lantana camara* (Lantana), a Category 1b AIS species.
- Increased flood peaks because of concentration of surface runoff due to reduced vegetation cover and increased impermeable surfaces, leading to erosion/incision of the drainage line/downstream flooding.
- Noise generated from the recreational activities.
- Waste management of general solid/plastic waste generated at the site.

- Inappropriate operation and maintenance of the RO plant resulting in decreased water quality inappropriate for human consumption.
- Safety hazards associated with the recreational activities, including pedestrian accidents, drowning, uncontrolled fires, crime, etc.

Benefits of the project include:

- The recreational park will be able to accommodate approximately 1000 people in a community currently deprived from such amenities. This will contribute to community upliftment and recreational development in the area.
- Creation of temporary and permanent employment during construction and beyond.
- SMME opportunities in maintenance and procurement for local businesses.

Several mitigation measures are possible to avoid, reverse, mitigate or manage these impacts, as presented in Table 1.

Table 1: Identified Impacts and Proposed Mitigation Measures during the Construction and Operational Phases

ID	Potential Impact	Proposed Mitigation measures	Impact Significance (without mitigation)	Impact Significance (with mitigation)
PRE-CONSTRUCTION PHASE				
1.	Three protected species in terms of the National Forests Act 84 of 1998 (NFA) were identified, namely <i>Sclerocarya Birrea</i> subsp. <i>caffra</i> (Marula), <i>Philenoptera violacea</i> (Apple leaf) and <i>Diospyros mespiliformis</i> (Jackal-berry). Poor planning with regards to the placement of infrastructure within close proximity to sensitive and protected species could lead to the destruction of these species.	<ul style="list-style-type: none"> • Prior to construction all protected species should be identified and marked. • The infrastructure layout must be optimised, ensuring that the proposed infrastructure avoid the destruction of protected species as far as possible, especially the mature specimens. • If it is not possible to avoid the protected species, the relevant permits should be obtained for the destruction of these species. • It can be considered to replant some of these species within and adjacent to the development footprint as part of the landscaping of the area. Permits will also be required for the relocation of these species. 	Medium to High	Medium
CONSTRUCTION PHASE				
2.	Soil erosion and dust generation during vegetation clearance activities	<ul style="list-style-type: none"> • The footprint of the proposed infrastructure area should be clearly demarcated to restrict vegetation clearing activities within the infrastructure footprint as far as practically possible. • Vegetation clearance and commencement of construction activities must be scheduled (if practical) to coincide with low rainfall conditions when the erosive stormwater and wind are anticipated to be low. • Bare soils must be regularly dampened with water to suppress dust during the construction phase, especially when strong wind conditions are predicted according to the local weather forecast. • Dust management and suppression should take during the construction phase within all areas where excessive dust is noted. • Internal (circle) road and pathways will be paved. • All disturbed areas adjacent to the infrastructure areas must be paved or re-vegetated with an appropriate indigenous grass mix, if necessary, to re-establish a protective cover. • No areas of open soil to be left unplanted or un-stabilized to prevent erosion. • Temporary erosion control measures must be used to protect the disturbed soils during the construction phase until adequate vegetation has established. 	Medium	Low to Medium
3.	Soil compaction resulting from vehicle movement during construction	<ul style="list-style-type: none"> • Vegetation clearance and commencement of construction activities must be scheduled (if practical) to coincide with low rainfall conditions when soil 	Low to Medium	Low

ID	Potential Impact	Proposed Mitigation measures	Impact Significance (without mitigation)	Impact Significance (with mitigation)
		<p>moisture is anticipated to be relatively low, such that the soils are less prone to compaction.</p> <ul style="list-style-type: none"> • Compacted soils adjacent to the infrastructure footprint can be lightly ripped to at least 50 cm below ground surface to alleviate compaction prior to re-vegetation. 		
4.	Loss of natural topography, soil depth (volume), fertility and organic carbon content	<ul style="list-style-type: none"> • A minimum of 150mm of topsoil will be stripped prior to construction and stockpiled for final rehabilitation. • The construction sites must be fully rehabilitated after construction, including landscaping, placement of topsoil, ripping and vegetation. • The soils are low in clay minerals and organic material, leading to a low nutrient status. Therefore, the soils' chemical characteristics need to be ameliorated by the addition of chemical and organic fertilizers before planting to ensure effective establishment of plant materials. • The soil fertility status should be determined by soil chemical analysis before seeding/re-vegetation. Soil amelioration should be done according to soil analyses as recommended by a soil specialist, to correct the pH and nutrition status before re-vegetation. • The footprint should be re-vegetated with a grass seed mixture as soon as possible, preferably in spring and early summer to stabilize the soil and prevent soil loss during the rainy season. • A short-term fertilizer program should be implemented based on the findings of the soil chemical status after the first year to maintain the fertility status. Fertility treatment should take place for a maximum of 2 to 3 years until the area can be declared self-sustaining. 	Low to Medium	Low
5.	Alteration of natural drainage pattern leading to erosion and downstream flooding	<ul style="list-style-type: none"> • Drainage is mainly by means of surface flow, with storm water flowing onto the lower lying area towards the Cultural Village site. Stormwater attenuation measures will need to be implemented. • Special attention should be given to areas where steep slopes occur. • An appropriate stormwater management plan should be developed to divert the stormwater runoff into the natural environment. • Clean water must be discharged into the natural environment in a non-erosive and controlled manner, and not allowed to form concentrated channels. 	Medium	Low to Medium
6.	Disturbance of natural vegetation and loss of floral and faunal habitat. Loss of floral and faunal species diversity.	<ul style="list-style-type: none"> • All development footprint areas are to remain as small as possible and vegetation clearing must be limited to what is essential, keeping the natural vegetation intact wherever possible. 	Medium	Low to Medium

ID	Potential Impact	Proposed Mitigation measures	Impact Significance (without mitigation)	Impact Significance (with mitigation)
		<ul style="list-style-type: none"> • The footprint of the proposed infrastructure area should be clearly demarcated to restrict vegetation clearing activities within the infrastructure footprint as far as practically possible. • Tree species should be selectively removed to keep the woodland appearance of the area and large trees should be avoided. • All disturbed areas must be re-vegetated with an appropriate indigenous grass mix. • Indigenous trees should be planted where areas are opened to comply with the greening policy of the province. • Reduce water use by using mainly succulent and drought-resistant plants in the landscape design. • Fencing should be friendly to faunal species allowing for movement between areas. This can be achieved by applying culverts and an open mesh. • All open excavations need to be demarcated to prevent animals from falling into these and hurting themselves. • Rock outcrops to be kept in their natural condition. No structures to be built on rock outcrops. 		
7.	Proliferation of alien and invasive plant species in the disturbed areas.	<ul style="list-style-type: none"> • Parts of the development footprint are severely overgrown with <i>Dichrostachys cinerea</i> (Sickle bush) and <i>Lantana camara</i> (Lantana). • Lantana is one of the worst weeds in the world, a Category 1b species in South Africa in terms of the Alien and Invasive Species (AIS) Regulations promulgated in terms of the National Environmental Management: Biodiversity Act 10 of 2004 (NEMBA). Land occupiers are legally obliged to control it, or to remove and destroy it if possible. • Care should be taken during bush clearance activities to prevent the further proliferation of Lantana on and adjacent to the development. • The vegetation waste should be taken to a registered landfill site where the vegetation waste should be compacted and covered with soil to prevent further spreading. • Develop and implement an alien and invasive plant control plan. 	High	Medium
8.	Killing of animals and avifauna on the roads, especially nocturnal animals/birds	<ul style="list-style-type: none"> • All vehicles should remain on designated roads with no indiscriminate driving through adjacent natural areas. • Speed restrictions to be placed on all vehicles within construction area to limit faunal and vehicle collisions. • Construction to be limited to daylight hours. 	Low to Medium	Low

ID	Potential Impact	Proposed Mitigation measures	Impact Significance (without mitigation)	Impact Significance (with mitigation)
		<ul style="list-style-type: none"> Drivers to be educated through the Environmental Awareness Programme about the presence and importance of faunal species and instructed to actively avoid collisions with faunal species, regardless of size. 		
9.	Dumping of construction material in open space areas other than those demarcated for such waste, leading to increased habitat and species loss.	<ul style="list-style-type: none"> Solid waste must be stored on-site in an approved waste disposal area. The waste disposal area should be secured to prevent access by faunal species. The waste should be collected by credible contractors on a regular basis for disposal at a registered landfill site. No waste or construction rubble may be burnt or buried on the site or dumped in the adjacent environment. 	Medium	Low
10.	Accidental spills and/or leakages of hazardous chemicals and hydrocarbons resulting in soil and water contamination.	<ul style="list-style-type: none"> All vehicle re-fuelling is to take place within the contractor laydown area only, within a bunded area. Spill kits must be kept at the Contractor's camp. A Spill Management and Emergency Contingency Plan should be put in place to address clean-up measures should a spill and/or a leak occur, as well as preventative measures to prevent ingress to groundwater. The relevant authorities should be notified in the event of a significant spill. Chemical toilets must be supplied at the construction area. Strict control of chemical ablution facilities during construction must be implemented. Effluent must be disposed of at an approved sewage treatment works. No concrete may be mixed on site, and ready mix must be imported. Any spillages during concrete pouring must be cleaned up immediately in line with the Spill Management procedure. 	Medium	Low
11.	Increased risk of veld fires leading to loss of faunal and floral species as well as alteration of plant diversity.	<ul style="list-style-type: none"> No uncontrolled or unsanctioned fires should be allowed within the construction area. No cooking or open fires are allowed on the construction site to prevent dangerous run-away fires. Each vehicle will be issued with a fire extinguisher. Additional fire extinguishers will be placed on the construction site at accessible points. These extinguishers must be removed to the Contractor's camp each evening. A fire prevention plan should be developed in conjunction with local emergency services. 	Medium	Low to Medium
12.	Exploitation of fauna and flora resources	<ul style="list-style-type: none"> Contractors should not be allowed to exploit the natural environment surrounding the construction site in any way. This includes the removal of plants, collecting of firewood, etc. 	Medium	Low to Medium

ID	Potential Impact	Proposed Mitigation measures	Impact Significance (without mitigation)	Impact Significance (with mitigation)
		<ul style="list-style-type: none"> • No hunting or trapping of faunal species should be allowed within the construction area. • Implement an Environmental Awareness Programme with the contractors and within the surrounding communities. 		
13.	Construction activities will generate noise, but it will mainly be limited to the project site and adjacent properties.	<ul style="list-style-type: none"> • Use of smallest practical available equipment for construction purposes. • Limit construction to daytime. • Establish complaints register with an open line to a relevant person that can act if there is a noise complaint. 	Medium	Low to Medium
14.	Visual impact on the landscape character and Sense of Place associated with the site and surrounding area during construction and topographic alteration of the landscape.	<ul style="list-style-type: none"> • Areas of disturbance should be kept as small as possible, and the areas cleared of natural vegetation and topsoil must be kept to a minimum. • The duration of the construction period must be reduced as far as possible through careful project planning. • Construction activities should be restricted to daylight hours to prevent any disturbance such as floodlights. • Dust management and suppression should take during the construction phase within all areas where excessive dust is noted. • Rock outcrops to be kept in their natural condition. No structures to be built on rock outcrops. 	Low to Medium	Low to Medium
15.	Recovery of sub-surface archaeological or palaeontological sites during construction and/or excavation	<ul style="list-style-type: none"> • A qualified archaeologist must monitor excavation activities. • Any discovery of artifacts, graves or other remains of archaeological interest should be reported to SAHRA. • Activities must cease immediately upon any discovery of cultural or heritage resources and a qualified archaeologist informed to do further assessment and reporting. • Identified sites of cultural and heritage significance must be demarcated until such time that an instruction to resume work is provided to the contractor, following consultation with the regulating authorities. 	Medium	Low to Medium
16.	Impact on the availability of natural resources such as firewood, small mammals for hunting, medicinal plants and subsistence grazing	<ul style="list-style-type: none"> • Identify alternative natural resource areas for utilisation by the community through the Traditional Authority. 	Low to Medium	Low
17.	Heavy machinery and general construction work can be a safety hazard to the local community and road users	<ul style="list-style-type: none"> • Construction vehicles and deliveries on public roads must be limited to daylight hours only. • Dedicated routes to and from the site should be used, with no deviation from the approved routes. • The necessary signage and danger signs should be erected along the routes frequented by other road users. 	Medium	Low to Medium

ID	Potential Impact	Proposed Mitigation measures	Impact Significance (without mitigation)	Impact Significance (with mitigation)
		<ul style="list-style-type: none"> Speed limits of heavy vehicles should be restricted to 40km/h. Strict access to the construction site should be maintained at all times. Warning signs should be erected at potentially dangerous construction areas and road intersections. Deep excavations should be demarcated to prevent access by humans and animals. 		
18.	Creation of temporary construction employment	<ul style="list-style-type: none"> Priority employment from the local community. 	Medium (positive)	Medium (positive)
19.	Opportunities in local SMME Construction and Procurement	<ul style="list-style-type: none"> Identification of procurement opportunities that can be ringfenced for local businesses. 	Medium (positive)	Medium (positive)
OPERATIONAL PHASE				
20.	Altered surface runoff patterns due to reduced vegetation cover and increased impermeable surfaces. Increased flood peaks because of concentration of surface runoff leading to erosion/incision of the drainage line/downstream flooding.	<ul style="list-style-type: none"> An appropriate stormwater management plan should be developed to divert the stormwater runoff into the natural environment. Special attention should be given to areas where steep slopes occur. Clean water must be discharged into the natural environment in a non-erosive and controlled manner, and not allowed to form concentrated channels. The stormwater canals must be kept clean of debris to ensure its functionality. Regular assessment of erosion and sedimentation must take place along the stormwater canals. 	Medium to High	Medium
21.	Pollution of surface and groundwater because of accidental spillages of chemicals and hazardous material during site maintenance activities.	<ul style="list-style-type: none"> All vehicle re-fuelling is to take place within a designated area only, within a bunded area. A Spill Management and Emergency Contingency Plan should be put in place to address clean-up measures should a spill and/or a leak occur, as well as preventative measures to prevent ingress to groundwater. Hydrocarbon storage and work areas (workshops etc.) should be bunded to prevent clean surface water runoff from being contaminated by these dirty surface areas. Bulk facilities to be concrete lined and bunded to capacity of 110%. Reclamation of soils in the event of accidental spillage. Spills should be cleaned up immediately in line with the Spill Management and Emergency Contingency Plan. Authorities should be notified of all spills. 	Low to Medium	Low

ID	Potential Impact	Proposed Mitigation measures	Impact Significance (without mitigation)	Impact Significance (with mitigation)
		<ul style="list-style-type: none"> • Hazardous material and chemicals must be stored in a concrete bunded enclosed area with strict access control. • The Material Safety Data Sheets (MSDS) of all chemicals and hazardous material stored on site must be kept at the Maintenance Storage Area for easy access in the event of a spill. • Spill kits must be kept at the Maintenance Storage Area. 		
22.	Operational activities will generate noise, but it will mainly be limited to the project site and adjacent properties.	<ul style="list-style-type: none"> • Use of smallest practical available equipment for operational purposes. • The pumps must be fully enclosed to reduce the noise impact. • Use of low noise generating plant and equipment. • Plant and equipment to be kept in good repair. • Noise regulations to be developed for the recreational facility, with strict time limit for noise activities (e.g. 22:00). • Establish complaints register with an open line to a relevant person that can act if there is a noise complaint. 	Medium to High	Medium
23.	Sources of fugitive dust emissions from vehicle entrainment on unpaved roads and disturbed areas.	<ul style="list-style-type: none"> • Internal (circle) road and pathways will be paved. • All disturbed areas adjacent to the infrastructure areas must be paved or re-vegetated with an appropriate indigenous grass mix, if necessary, to re-establish a protective cover. • No areas of open soil to be left unplanted or un-stabilized to prevent erosion. • Re-vegetated areas should be irrigated with grey water to maintain vegetation cover and prevent excessive dust. 	Low to Medium	Low
24.	Visual impacts from night-time lighting impacting on receptors accustomed to a low district brightness during night-time.	<ul style="list-style-type: none"> • A lighting engineer may be consulted to assist in the planning and placement of light fixtures for the development to reduce visual impacts associated with glare and light trespass. • Placement of lighting outside of the recreational area should be limited to security lighting at the main entrance. • Outdoor lighting must be strictly controlled. • The use of high light masts and high pole top security lighting should be avoided. Any high lighting masts should be covered to reduce sky glow. • Care should be taken when selecting luminaries to ensure that appropriate units are chosen and that their location will reduce spill light and glare to a minimum. Only “full cut-off” light fixtures that direct light only below the horizontal must be used. • Censored and motion lighting may be installed at the ablution and fitting rooms to prevent use of lights when not needed. 	Medium	Low to Medium

ID	Potential Impact	Proposed Mitigation measures	Impact Significance (without mitigation)	Impact Significance (with mitigation)
		<ul style="list-style-type: none"> • Minimum wattage light fixtures should be used, with the minimum intensity necessary to accomplish the light's purpose. • The use of low-pressure sodium lamps, yellow LED lighting, or an equivalent reduces skyglow and wildlife impacts. Bluish-white lighting is more likely to cause glare and attract insects. 		
25.	The utilisation of the recreational area will generate solid/plastic waste. If waste is not managed appropriately it will proliferate into the surrounding communities and natural areas.	<ul style="list-style-type: none"> • Solid waste is proposed to feed into the municipal waste stream. • Suitable waste bins must be placed within the development footprint which will be cleaned out on regular intervals. • The waste bins must be primate friendly to prevent waste picking. • The waste should be collected by credible contractors on a regular basis for disposal at a registered landfill site in the area. 	Medium to High	Low to Medium
26.	Inappropriate maintenance activities could lead to the proliferation of alien vegetation on and adjacent to the site	<ul style="list-style-type: none"> • Ongoing eradication and control of declared weed and invader plant populations in and around the recreational area and access road must be introduced – alien and invasive plant control / maintenance plan. • Regular monitoring by a qualified specialist to identify any alien and invasive species that need to be eradicated. 	Medium	Medium
27.	Poor sewage handling can lead to odours, soil contamination, water quality impacts and health related issues	<ul style="list-style-type: none"> • Design of sewage plant should be environmentally and structurally sound and all possible precautions should be taken to prevent spillage or seepage into the down-gradient environment. • It must be ensured that the design and construction of the sewage plant prevents failure. • An Operations and Maintenance Plan must be developed for the sewage plant. • Appropriate training must be provided for the sewage plant operator(s). • The sewage plant will be periodically de-sludged (estimated at 2 yearly intervals) using vacuum tankers. The sludge will be disposed at a registered sewage treatment works. • Grey water will be used for the irrigation of the lawns, thereby reducing the volume of water discharged to the soak-away (French drain). • No overflow of the sewage plant is envisaged, but if it does occur the overflow will flow into the soak-away system. • The sewage plant will be monitored daily. If there is any indication of blockages, vacuum tankers will be brought in to remove the effluent for the required maintenance. 	Medium	Low to Medium

ID	Potential Impact	Proposed Mitigation measures	Impact Significance (without mitigation)	Impact Significance (with mitigation)
28.	Inappropriate operation and maintenance of the RO plant could lead to decreased water quality inappropriate for human consumption	<ul style="list-style-type: none"> • It must be ensured that the design and construction of the RO plant prevents failure. • An Operations and Maintenance Plan must be developed for the sewage plant. • Appropriate training must be provided for the RO plant operator(s). • Weekly monitoring of the potable water to be conducted to prevent any health issues. • Chlorine to be added to the swimming pool water to reduce the potential for diseases. 	Medium to High	Medium
29.	Safety hazards associated with the recreational activities, including pedestrian accidents, drowning, uncontrolled fires, crime, etc.	<ul style="list-style-type: none"> • The speed on the access and internal circle road will be minimised to 20km/h. This will be done through road signs and strategically placed speed-humps. • The whole park area will be fenced with a barrier to protect children from running in front of vehicles. • Access to the park areas will be through designated entrances. • The depth of the swimming pools is 1.5m, with a water depth of 1.2m. The spraying slabs are 0.15m deep, with a water depth of 0.1m. • Dedicated life savers will be appointed to prevented drowning incidences. • Three fire hydrants be placed in the development, two on the extremities of the site and one in the middle to manage any uncontrolled fires. • Conduct regular full risk assessment and have procedures in place to deal with emergency incidents. • Establish on-site emergency equipment and appoint safety staff. • Implementing strict access control to the recreational site. • Liaison with existing community policing forums and project security to properly secure the project area and surrounding area. 	Medium to High	Medium
30.	The recreational area will be able to accommodate approximately 1000 people in a community currently deprived from such amenities. This will contribute to community upliftment and recreational development in the area	<ul style="list-style-type: none"> • This is a positive outcome of the project and there are no prescribed mitigation measures to enhance the benefits. 	Medium to High (positive)	Medium to High (positive)
31.	Creation of permanent operational employment	<ul style="list-style-type: none"> • Priority employment from the local community. • Skills development programmes for maintenance activities on site (sewage and RO plant operations), safety personnel and lifeguards. 	Medium (positive)	Medium (positive)
32.	Opportunities in local SMME Maintenance and Procurement	<ul style="list-style-type: none"> • Identification of procurement opportunities that can be ringfenced for local businesses. 	Medium (positive)	Medium (positive)

3.3 Spill Management Procedure

3.3.1 Minor Risk Incident

- Assess the situation and determine the hazard and extent of the spill, taking into account the quantity of the spillage and the danger of the substance. Refer to Material Safety Data Sheet (MSDS) of the substance spilled to identify hazard.
- Contact the Site Manager, detailing the substance, quantity, severity, location and possible environmental impact.
- Demarcate the area where the substance was spilled.
- Contain the spill with the correct control measures i.e. sand, spill-sorb, bunding, spill kits, etc. Refer to the MSDS of the substance spilled for correct handling and control of the spill.
- The Site Manager must contact the relevant person(s) to attend to the situation.

3.3.2 Major Risk Incident or Emergency

- Assess the situation and determine the hazard and extent of the spill, taking into account the quantity of the spillage and the danger of the substance. Refer to MSDS of the substance spilled to identify hazard.
- Raise the alarm and evacuate the area.
- Contact the Site Manager, detailing the substance, quality, severity, location and possible environmental impact.
- Demarcate the area where the substance was spilled.
- If possible try to contain the spill with the correct control measures i.e. bunding, etc.
- Ensure not to endanger anyone or yourself by doing this. Refer to MSDS of the substance spilled for correct handling and control of the spill.
- The Site Manager must contact the relevant person(s) to attend to the situation.

3.3.3 Hydrocarbon Spills or Leaks from Machinery

All areas affected by spills of hydrocarbons will be remedied immediately, in line with the Spill Management Procedure. Soil rehabilitation by land farming, or other means will be initiated immediately, and the necessary measures will be taken to ensure that pollution of surface water and groundwater does not occur.

3.3.4 Major Emergency Event Reporting

A serious event that could lead to danger to the public or the environment (death or sustaining impact on the environment) must include an external report to the national and provincial department and the municipality containing the:

- Nature of the incident
- Substances and quantities and accurate effect on persons and environment
- Initial measures to minimise impacts
- Causes of the incident
- Avoidance measures

For more information on the detail of reporting requirements, refer to:

- Section 30 of National Environmental Management Act (Act 107 of 1998); and
- Section 20 of National Water Act (Act 36 of 1998).

3.4 Responsibility for Implementation of EMPr

The responsibility for ensuring the effective implementation of the EMPr as described in this report is that of the Contractor and the Site Engineer during Construction. During the Operational Phase, the responsibility lies with the holder of the Environmental Authorisation, the Valoyi Royal Council.

Responsibilities may be delegated but records of such delegation should be maintained.

4 PERFORMANCE MONITORING AND REPORTING

4.1 Construction Phase

Regular monitoring of the EMPr and management measures must be carried out by the Contractor and Site Engineer to ensure that the provisions of the EMPr are adhered to. Ongoing and regular reporting of the progress of the implementation of the EMPr must be done, including:

- Inspections and monitoring will be carried out on the implementation of the EMPr.
- Visual inspections on erosion and physical pollution will be carried out daily.
- Any emergency or unforeseen impact will be reported as soon as possible.
- An assessment of environmental impacts that were not properly addressed or were unknown when the EMPr was compiled will be carried out and added as a corrective action.

A typical construction monitoring plan is provided in Table 2, but should be reviewed to take into consideration site conditions and implementation procedures as stipulated by the Site Engineer.

Table 2: Construction site monitoring and auditing plan

Possible Impact Identified	Functional Requirement for Monitoring programmes	Frequency
Natural vegetation	Identification and demarcation of protected and rare plant species by environmental specialist prior to construction.	Identification complete Demarcation prior to construction
	Application for destruction permit for removal of any protected plant species.	Prior to removal of protected trees
Graveyards / heritage sites	Identification of graveyards and/or heritage sites by qualified archaeologist prior to construction.	Completed
Erosion	Inspect access roads and construction areas.	Weekly
	Rehabilitate eroded areas.	As required
Water and Soil Pollution	Check if waste is removed from site and disposed in appropriate containers at the Contractors' camp.	Daily
	Ensure regular waste disposal at an approved landfill site.	Weekly
	Check the status of the chemical toilets. Ensure that effluent from chemical toilet is disposed at an approved sewage works.	Weekly
	Check if storage facility for chemicals / hydrocarbons is adequately bunded and lined.	Daily
	Ensure that all chemicals/hydrocarbons have a MSDS available.	Prior to construction, check weekly
	Ensure that adequate spill kits are available on site for any clean-up operations.	Prior to construction, check weekly
	Check if any spills are evident, and that immediate clean-up evident.	Daily
	Check that all vehicles are supplied with a drip tray.	Daily (evening)
	Check that all hydrocarbons and chemicals are removed from site, for safe storage at the Contractors' camp.	Daily (evening)
	Inspect construction areas for hydrocarbon spills.	Daily
Veld fires	Check that open fires are not made.	Daily
	Check availability of fire extinguishers.	Daily (morning)
	Ensure that all fire extinguishers are removed from site for safe storage at the Contractors' camp.	Daily (evening)

Possible Impact Identified	Functional Requirement for Monitoring programmes	Frequency
Fauna	Ensure that all excavations are clearly demarcated to prevent animals from falling into these.	Daily
Security	Discuss access to site and unauthorized people on site with Site Engineer.	Weekly
General	Recording any complaints and incidents.	Continuous
	Determine if construction is conducted as per EMPr.	Weekly
	Conduct external EMrP performance assessment.	Monthly

Note: A Pre-Construction checklist is provided in Annexure 1. This must be updated as construction progresses.

An external ECO must be appointed to conduct monthly compliance audits during construction. A comprehensive report must be compiled following each external audit and submitted to the Site Engineer, the Valoyi Royal Council and the relevant authorities.

4.2 Operational Phase

A comprehensive monitoring and maintenance plan should be developed and implemented for the operational phase, in conjunction with the Department of Forestry, Fisheries and the Environment (sponsor), the Greater Tzaneen Local Municipality and the Mopane District Municipality.

As a minimum the following should be included in the monitoring and maintenance programme:

- The sewage treatment plant must be monitored daily. If there is any indication of blockages, vacuum tankers must be brought in to remove the effluent for the required maintenance.
- Weekly monitoring of the potable water must be conducted to prevent any health issues.
- The stormwater canals must be kept clean of debris to ensure its functionality. Regular assessment of erosion and sedimentation must take place along the stormwater canals.
- Ongoing eradication and control of declared weed and invader plant populations in and around the recreational area and access road must be introduced – alien and invasive plant control / maintenance plan.
- The sewage treatment plant must be periodically de-sludged (estimated at 2 yearly intervals) using vacuum tankers. The sludge must be disposed at a registered sewage treatment works.

5 ENVIRONMENTAL AWARENESS PLAN

The Environmental Awareness Plan will be guided by the EMPr for the project, as well as the potential environmental impacts that are identified during the course of the construction activities. In general, the objectives of the environmental awareness plan will be to:

- Ensure that all employees understand the Environmental Procedures and commitments of the EMPr;
- Ensure that information regarding the environment is communicated effectively and is readily accessible to all relevant parties; and
- Ensure that environmental communication and interactions are documented and recorded and accessible.

The following procedure is envisaged to ensure that the employees (both contractual and permanent) are aware of the potential environmental impacts associated with the construction activities, as well as how to manage incidental impacts:

- Weekly HSEC talks will be conducted on site by the Contractor during the construction phase.
- The HSEC talks will be scheduled for Monday mornings before work commences for the week.
- The Site Engineer will ensure that the HSEC talks take place and provide the Contractor with topics for discussion.
- A new topic will be discussed every week. The talk topics will be guided by on-site circumstances and impacts identified during the course of the construction activities.

Examples of environmental awareness training topics are presented in Table 3 and Annexure 2.

Table 3: Environmental Awareness Training Topics

Risk	Mitigation Measure	Training required
Fire hazard	Awareness raising on fire risk activities.	Awareness raising Fire-fighting training
Surface and groundwater	Awareness raising on possible water pollutants. Need for water conservation.	Awareness raising
Waste management	Danger of litter and spillages to the environment.	Awareness raising
Heritage	Awareness raising on possibility of occurrence of sub-surface heritage features and the procedure to be followed should such features be excavated / encountered.	Awareness raising
Fauna & Flora	Awareness raising about the presence and importance of faunal and floral species, instructed not to exploit any of the natural resources.	Awareness raising

6 ANNEXURES

ANNEXURE 1: Contractor Checklist

ANNEXURE 2: Environmental Awareness Training Topics

ANNEXURE 3: Curriculum Vitae – EAP

ANNEXURE 1
CONTRACTOR CHECKLIST

Table A-2: Initial Contractor Checklist (Pre-Construction)

Aspect	Requirements	Status
Protected and sensitive tree species	Clearly demarcate all protected and sensitive tree species.	
	Identify, remove and replant (into suitable containers) plants that will be replanted after rehabilitation.	
	Apply for destruction permits before removal of any protected tree species that cannot be avoided.	
Alien / invasive species	Clearly mark the alien & invasive species that need to be removed during construction.	
Footprint area	Survey and clearly demarcate the construction works area – no disturbance will be allowed outside of this footprint area.	
Vehicles and equipment	Compile a list of all vehicles and equipment, including a water bowser, that will be utilized during construction.	
	Fit all vehicles with fire extinguishers.	
	Issue all vehicles and equipment with suitably sized drip trays.	
	Ensure pre-use vehicle inspection lists are compiled for daily use.	
Chemicals and hydrocarbons	Compile a list of all chemicals and hydrocarbons that will be used during construction.	
	Ensure that Material Safety Data Sheets (MSDS) are obtained for all chemicals and hydrocarbons.	
	Purchase the necessary spill kits for the chemicals and hydrocarbons, as advised in the MSDS.	
	Ensure that a suitably sized area, bunded and plastic lined, are constructed at the Contractors' camp for safe storage of all chemicals and hydrocarbons.	
	Order sufficient chemical toilets for the construction site.	
	Ensure maintenance agreement is in place for cleaning of chemical toilets.	
	Obtain directive from Tzaneen LM for a suitable sewage treatment works for disposal of effluent of chemical toilets.	

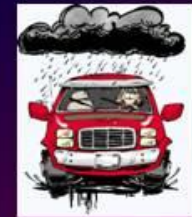
Aspect	Requirements	Status
Waste management	Obtain sufficient waste bins for general and hazardous waste, for placement at the Contractors' camp.	
	Obtain directive from Tzaneen LM for suitable landfill sites for disposal of: <ul style="list-style-type: none"> • General waste (food, plastics, etc.) • Hazardous waste (hydrocarbons, chemicals) • Building rubble • Alien and invasive vegetation waste 	
Health & Safety	Develop environmental awareness training module for induction purposes.	
	Train employees and sub-contractors on the requirements of the EMP, ensuring a clear understanding of the requirements and no-go areas.	
	Identify appropriate employees for fire-fighting training.	
	Ensure that sufficient PPE for employees and sub-contractors are purchased.	

ANNEXURE 2
ENVIRONMENTAL AWARENESS TRAINING TOPICS



ROAD SAFETY

- Always wear your seat belt.
- Keep following distances.
- Always make sure your vehicle is mechanically sound and well-maintained.
- Drive defensively - always be prepared for the unexpected.
- Give your undivided attention to your driving.
- Obey warning and information signs.
- Don't drink & drive. Be aware of effects of prescription medicine.
- Look out for pedestrians-especially children on holiday.



TALK TOPIC

- **Most veld fires are started by people being careless. All fires start small! But when the weather is hot, dry and windy a small fire can quickly become a threat to life and property.**

To stop these fires from happening:

DO

- ✓ **Get rid of hot ash and coal from heating and cooking in a safe place where there is no plant material or rubbish that can catch alight.**
- ✓ **Always work in a open, cleared area when working with power tools.**
- ✓ **Power tools like angle grinders, welders and chainsaws make sparks which can ignite the surrounding veld.**
- ✓ **Keep the area around your home clear of material that can burn, such as firewood, kindling and garbage.**

DON'T

- × **Burn rubbish on a hot and windy day, as the fire can easily spread and cause a wildfire.**
- × **Throw away burning cigarette ends!**
- × **Leave an open fire unattended.**
- × **If you see someone playing carelessly with fire, then tell them to stop.**

Veld fires often start close to the home, and can cause injuries, death and loss of personal belongings

Veld fires can hurt people and animals

ENVIRONMENTAL PROTECTION - TREES

❖ **The importance of trees:**

- ✓ **Provide shade for humans, houses, animals, birds, and smaller trees or shrubs and reduce evaporation of water from soil by the sun;**
- ✓ **Can create a pleasant and beautiful environment;**
- ✓ **Help to conserve energy and reduce air pollution;**
- ✓ **The roots of trees help bind the soil and reduce soil erosion;**
- ✓ **Produce timber for future use such as furniture, building material, poles and paper;**
- ✓ **Supply oxygen that we breathe and they take in carbon dioxide which we do not need;**
- ✓ **Provide food for domestic animals and wild animals. Humans also eat fruits from the trees; and**
- ✓ **Trees are used for firewood which is used for cooking and heating in winter; and**
- ✓ **Many indigenous trees are used as medicine to cure diseases.**

❖ **Let us make our immediate environment to be rich in biodiversity.**

❖ **Remember trees in our surroundings will attracts birds and other small animals.**

TALK TOPIC - HAZARDOUS SUBSTANCES

Hazardous substances are chemicals or other substances that can harm health

e.g. **CEMENT**

Cement is used in construction every day.

It can hurt you by

- coming into contact with your skin
- coming into contact with your eyes
- being inhaled.

Dry Cement

When you empty a bag of cement, the dust can irritate your skin. The dust reacts with sweat or damp clothing to form a corrosive solution.

Cement dust can also get in your eyes, causing redness, burns, or blindness. Inhaling cement dust irritates your nose and throat. It can also cause choking and trouble breathing.

Wet Cement

Cement is also hazardous when it's wet—in mortar or concrete. If it gets inside your boots or gloves, or soaks through your clothes, it can cause burns and skin ulcers.

The burns caused by cement may be slow. You may not feel anything until several hours later. That's why it's important to wash cement off your skin right away.

Do not kneel or rest any part of your body on wet concrete.

WORKING SAFELY WITH CONCRETE



- eye protection**
Such as goggles
- protective clothing**
Such as plastic overalls
- protective footwear**
Such as gumboots
- protective gloves**
Such as leather



ANNEXURE 3
CURRICULUM VITAE – EAP