



# LEFATSE

Environmental Planning Services (PTY) Ltd

## **Environmental Management Programme**

Proposed Hertzogville township establishment: Erven 1315 and 1316, Malebogo; Magisterial District Boshof, Free State Province

**Applicant: Tokologo Local Municipality**

**October 2021**

**DESTEA Ref. No.: EMB/12/21/24**

**NEAS Ref: FSP/EIA/0000399/2021**

**Lefatse Environmental Planning Services (Pty) Ltd. (Reg no. 2016/047456/07)**

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# Environmental Management Programme

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## 1. PROJECT DESCRIPTION

Lefatse Environmental Planning Services (Pty) Ltd. was appointed by LSB Group to manage an application for Environmental Authorisation in terms of the Environmental Impact Assessment (EIA) Regulations, 2014 (as amended) promulgated under the National Environmental Management Act (NEMA), 1998 (Act 107 of 1998) (as amended) for Phase 1 of the proposed Hertzogville township development on Erven 1315 and 1316, Malebogo EXT 3. Tokologo Local Municipality aims to ultimately provide approximately 2000 residential stands as identified in the Integrated Development Plan (IDP) through the community participation process by means of a phased approach.

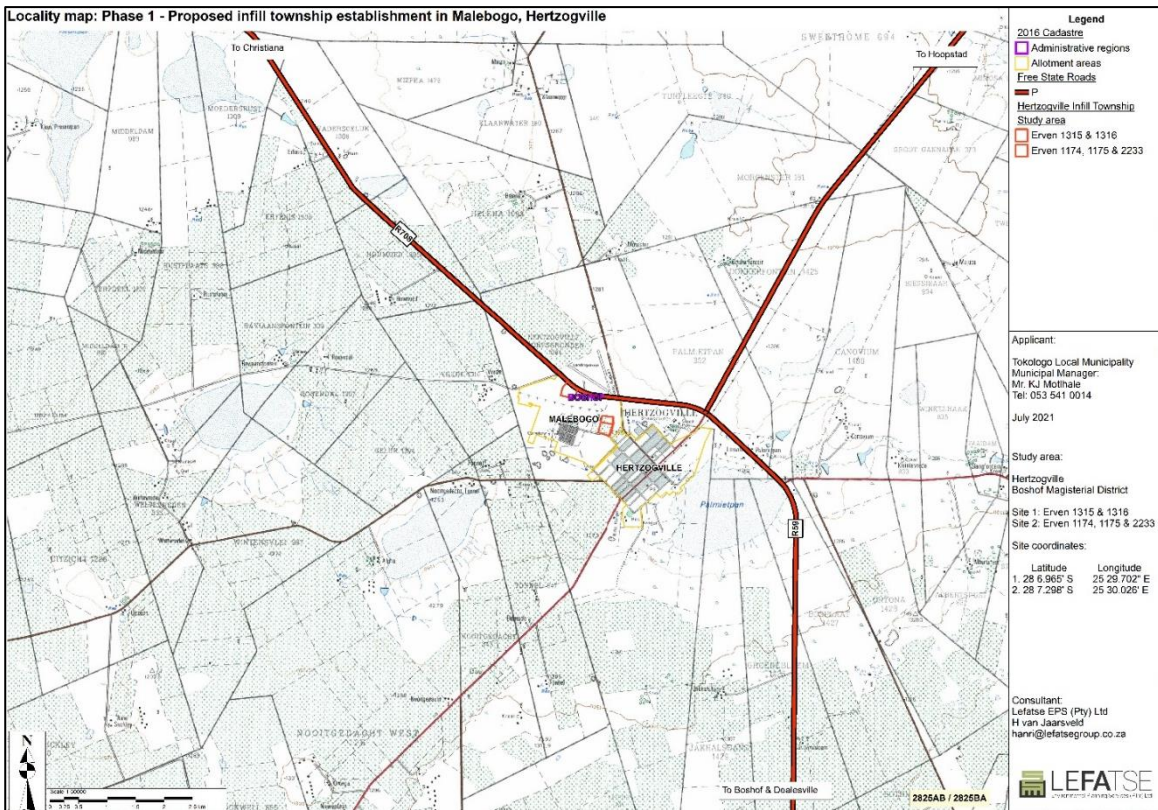
This application is for Phase 1 of the proposed project, which entails the establishment of  $\pm 124$  new residential erven at an average erf size of  $\pm 350\text{m}^2$  together with the development of the associated services (i.e. electricity, road network, stormwater management, sewer and water).

### 1.1 Regional Setting

The proposed project is in Hertzogville situated in the administration region of Boshof in the Tokologo Local Municipality, Lejweleputswa District Municipality (DC18) (Figure 1). All erven applicable to this application is situated within Municipal Ward 3. Refer to Figure 2 for an indication of Erven 1315 and 1316 identified for development in relation to the surrounding area and land uses. Also refer to Table 1 for the property information of the erven identified for Phase 1 development.

**Table 1: Property information of the respective erven identified for the proposed project.**

Description	Study area	
	1315	1316
<b>Erf</b>	1315	1316
<b>21 Digit Code</b>	F00400050000131500000	F00400050000131600000
<b>Extent</b>	5.368 ha	1.446 ha
<b>Zoning</b>	School	Park
<b>Status quo</b>	Existing illegal settlement.	Existing illegal settlement. Unrehabilitated gravel excavation.
<b>Site coordinates</b>	S -28.115693 E 25.492823	S -28.116092 E 25.495176
<b>Parent farm</b>	Hertzogville Dorpsgronden 1084/35	Hertzogville Dorpsgronden 1084/35
<b>Allotment township (Town code)</b>	F0040005	F0040005
<b>General Plan</b>	1142/2004	1142/2004
<b>Landowner</b>	Tokologo Local Municipality	Tokologo Local Municipality



**Figure 1: Locality map of Phase 1 of the proposed township development in Malebogo, Hertzogville**



**Figure 2: Malebogo Erven 1315 & 1316 in relation to surrounding erven and services.**

## 1.2 Activities associated with the project

The following related activities will be associated with this proposed project:

- Reutilisation and rezoning of existing Erven 1315 (i.e. zoned school erf) and 1316 (i.e. zoned park) ordained as part of General Plan 1142/2004 for the establishment of formal residential stands.
- Formalising erven which may include moving existing informal houses that resulted from illegal settlement on these erven by the local community to allow practical and cost-effective service delivery.
- Installation of internal services (including water, sewer, electricity) that would connect to the existing municipal services. According to the Bulk Services Report: Hertzogville Infill Planning – Erf 1315 and 1316 (2021), the design standards of these services are proposed to be of the same standard and capacity than the existing services in the existing Malebogo development which is below the thresholds of current listed activities in terms of the listing notices under the EIA Regulations, 2014 (as amended).
- Establishment of an internal road network.

The activities expected to be associated with the different phases of the proposed project are described below.

### Planning Phase

- Create ±124 new residential erven at an average erf size of ±350m<sup>2</sup>.
- Planning and concept designing to address identified issues and physical restrictions and/or constraints to develop a layout plan for approval in terms of the Spatial Planning and Land Use Management Act (SPLUMA) (Act 16 of 2013) and the Municipal Planning Bylaw (MLUP). Factors taken into consideration include the following:
  - a) Flood line determination.
  - b) Geotechnical constraints.
  - c) Civil engineering services constraints: both internal and external (bulk) services.
  - d) Electrical engineering services constraints: Both internal and external.
  - e) Environmental constraints.
  - f) Traffic impact constraints.
- Change in layout details and land use zoning of existing Erf 1315 and Erf 1316 Malebogo Ext. 3.
- Erf 1315 is a school erf (General Plan SG 1142/2004) and is no longer required for its education purposes due to the integration of education assets in Hertzogville.

- Erf 1316 (1.4465 ha) is currently zoned “Park” (General Plan SG 1142/2004) which is not functional as it contains an historic gravel excavation pit and could therefore not be utilised in its full extent for normal development. The proposed project will entail the closure of this park for reutilisation to enhance the area and create a practical site layout. The physical pit with a 10 m buffer will remain a land use zoned “Park/open space” and the objective is to fill and rehabilitate this historic excavation pit with excess excavation material that may emanate during the construction of the services.

#### Construction Phase

- Site establishment.
- Clearance of vegetation and topsoil of areas to be disturbed for houses and internal services.
- Formalising of erven in accordance with the approved site layout.
- Possible moving of existing houses to an area better suited than where they are and to align with the approved site layout. This will also allow practical and cost-effective establishment of internal services.
- Establishment of internal access roads, storm water management measures and services. According to information currently available, the extent of these activities are below the thresholds of the listed activities under the EIA Regulations, 2014 (as amended) and will be of the same standard and capacity than that of the existing services of Malebogo.
- Possible future establishment/construction of houses by beneficiaries identified by the Municipality as part of its Sustainable Human Settlements project.
- Fill and rehabilitate the historic excavation pit with excess excavation material that may emanate during the construction of the linear services. (Dependant on material availability).

#### Operational Phase

- Residential development.
- Internal service delivery (i.e. services including electricity, sewer and water).
- Public road use.

#### Decommissioning Phase

- Due to the nature of the project, decommissioning is not currently envisioned for this project. For purposes of this application, discussion under the “Decommissioning Phase” will be focussed on the rehabilitation of disturbed areas after township establishment and construction of services have ceased.
- Removal of any construction material remaining on site on completion of establishment of services.

- Removal of any remaining construction rubble as well as waste material produced during construction of the internal services and disposal thereof at the Hertzogville landfill site.
- Local rehabilitation and landscaping of disturbed areas related with the proposed project, e.g. temporary linear excavations during the construction of services.

## **2. SCOPE**

A Basic Assessment process in terms of regulations 19 and 20 of the EIA Regulations, 2014 as amended was commenced with as part of the EA application. This included baseline and specialist assessments, public consultation and the development of an Environmental Management Programme (EMPr).

This EMPr includes minimum management measures recommended for implementation during construction, as well as a recommended monitoring plan for use by the Municipality and/or appointed contractor. Once construction has been finalised, the residential development and associated activities will be managed by Tokologo Local Municipality and legislated in terms of other legislative frameworks, e.g. SPLUMA, 2013 (Act 16 of 2013), Service Level Agreement, etc. The proposed project is permanent in nature. For purposes of this management plan, management measures discussed under the Decommissioning Phase are limited to rehabilitation activities to be undertaken at areas disturbed by construction activities (e.g. site camp and linear excavations for pipelines).

The objective of the EMPr is to prevent and/or limit the potential environmental impacts or risks that have been identified during the impact assessment (Annexure F1 of the BAR).

## **3. DETAILS OF THE EAP**

The details of the person responsible for the assessment and preparation of this report are as follow:

Environmental Assessment Practitioner:

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Qualifications of the practitioner:

B.Sc. Microbiology and Zoology

B.Sc. Honours in Zoology

Magister in Environmental Management

Summary of the practitioner's expertise:

H van Jaarsveld has been involved in environmental management since 2007. Personal experience includes amongst other: Coordination of environmental courses presented at the Centre for Environmental Management, UFS; Project management; Applications for Environmental Authorisation in terms of NEMA, 1998 (Act 107 of 1998) and related regulations, including waste licences and atmospheric emission licenses; Application of Integrated Water Use Licenses in terms of the NWA, 1998 (Act 36 of 1998); Environmental compliance auditing on especially road construction projects and mining related operations.

#### **4. ASSUMPTIONS, KNOWLEDGE GAPS AND LIMITATIONS**

The following assumptions, uncertainties and knowledge gaps/limitations were identified:

- During the assessment it was assumed that the information provided by the applicant, comments (if any) from Interested and/or Affected Parties (I&APs) and stakeholders as well as input from the specialists were true, correct to the best of their knowledge and unbiased.
- Potential seasonal limitations during the time of the ecological review assessment.
- The Phase 1 Archaeological Impact Assessment (AIA) and Phase 1 Palaeontological Impact Assessment (PIA) as part of the Heritage Impact Assessment were limited to desktop studies.
- Due to the type and nature of the proposed development, it is expected to be permanent. The operational activities related to the proposed development will be managed by Tokologo Local Municipality and legislated in terms of other legislative frameworks, e.g. SPLUMA, 2013 (Act 16 of 2013), Service Level Agreement.
- Management measures described in this EMPr therefore mainly focussed on the Planning- and Construction Phases, as well as rehabilitation after construction.

#### **5. IMPACT MANAGEMENT OUTCOMES**

The potential impacts/risks that were identified during the Environmental Impact Assessment expected to be associated with the proposed development include the following:

- Clearance and transformation of natural vegetation of the study area;
- Habitat loss and effect on the general biodiversity;
- Loss of sensitive species during construction and collection thereof after establishment of the township area;
- Change in storm water flow due to the construction activities and overall development and built-up areas;
- Establishment and spread of alien vegetation;
- Erosion and loss of topsoil;
- Loss of the potential for the development of “public amenities” due to a change in land use, e.g. rezoning of Erf 1316 from “park” to “residential erven”;
- Potential pollution to the surrounding environment due to waste generation;
- Dust generation during construction;
- Elevated noise levels during construction;
- Damage or destruction of objects of potential heritage importance;
- Health and safety risk to employees and local community on site during construction;
- Impact on the general aesthetics of the area and immediate visual impact;
- Risk of veld fires;
- Positive impact on employment opportunities; and
- Positive impact of addressing housing need in the Tokologo Local Municipal area.

The main impact management outcomes of the Environmental Management Programme and implementation thereof are:

- To develop management measures for implementation during the Planning- and Construction Phases, as well as rehabilitation of the environment after construction.
- To avoid and/or minimise potential environmental impacts that were identified to be associated with the proposed development.
- Limit the physical footprint of disturbance and avoid the more sensitive areas (if any).
- To document design phase guidelines, specifying methods by which contractors must conduct themselves to minimise any negative impacts on the environment, and enhance opportunities through this development.
- Comply with prescribed environmental management standards or practices that may be applicable to the proposed development.

## **6. RECOMMENDED ENVIRONMENTAL MANAGEMENT / MITIGATION MEASURES AND MONITORING**

Information gathered from the baseline study, specialist studies, site assessment and involvement from I&APs were used to identify the potential impacts expected to be associated with the proposed development. The actual occurrence of some of these impacts may be unlikely due to the specific nature and site layout.

Refer to Table 2 for the minimum environmental management and mitigation measures recommended for implementation during the planning and construction phases of the development, as well as rehabilitation after construction to avoid and/or limit the potential environmental impacts.

It is also important that monitoring of the implementation of the environmental management action is undertaken to ensure compliance with the conditions within the Environmental Authorisation (if considered for approval) and the EMPr specifications, as well as to identify problems or issues of non-conformance for appropriate corrective action to be implemented to minimise the impact. Refer to Table 3 for a recommended monitoring programme to be followed during construction and rehabilitation after construction.

**Table 2: Recommended environmental management/mitigation measures**

Activity / Aspect	Recommended management/mitigation	Performance indicator	Phase	Responsible person
Change in land use	<ul style="list-style-type: none"> <li>- The necessary approval and change in land use from COGTA must be obtained prior to commencement of settlement and construction.</li> <li>- Implementation of the preferred site layout of ±124 residential stands of 350 m<sup>2</sup> and a buffer of 10 m from the historic unrehabilitated gravel pit.</li> <li>- The formalisation of the residential stands will allow for practical and functional lay down areas and routes for other services, e.g. electricity lines and pipelines.</li> </ul>	<ul style="list-style-type: none"> <li>- Approved general plan and rezoning.</li> <li>- Approved site layout plan.</li> <li>- Formalised residential erven that can be serviced by the municipality.</li> <li>- Limit disturbance to the physical footprint.</li> <li>- Assist in future maintenance.</li> </ul>	During Planning	Applicant; Appointed Town planner
Site preparation, landscaping and construction of associated services (i.e. water, sewer, electricity and roads)	<ul style="list-style-type: none"> <li>- A Designated Environmental Officer (DEO) should be appointed and must be responsible for the daily environmental aspects related with the construction activities on site.</li> <li>- Keep a photograph record of the site before any clearance during construction.</li> </ul>	<ul style="list-style-type: none"> <li>- Record of appointed DEO on file.</li> <li>- Photographic record on file.</li> </ul>	During commissioning	Site manager; Appointed contractor
	<ul style="list-style-type: none"> <li>- Limit removal of vegetation and topsoil to areas directly affected by the proposed development as per approved site layout, e.g., road network, residential units, services, etc.</li> </ul>	<ul style="list-style-type: none"> <li>- Limited physical footprint of disturbance.</li> <li>- Limit occurrence of erosion and remedy through reinstatement of eroded areas.</li> <li>- Limit nuisance dust generation.</li> </ul>	During construction	Site manager; Appointed contractor
	<ul style="list-style-type: none"> <li>- No poaching and/or unpermitted collection of plants or animals will be allowed on site.</li> </ul>	<ul style="list-style-type: none"> <li>- No harm to animals because of construction activities or poaching.</li> <li>- Avoid destruction of sensitive plant species.</li> </ul>	During construction and rehabilitation after construction	Site manager; Appointed contractor

Activity / Aspect	Recommended management/mitigation	Performance indicator	Phase	Responsible person
Site preparation, landscaping and construction of associated services (i.e. water, sewer, electricity and roads)	<ul style="list-style-type: none"> <li>- Clear any proclaimed weed or invasive vegetation on disturbed areas before seeding. The use of chemical substances should be used in accordance with the user specifications.</li> </ul>	<ul style="list-style-type: none"> <li>- No alien vegetation establishment on site or on stockpiles.</li> </ul>	During commissioning and construction	Site manager; Appointed contractor
	<ul style="list-style-type: none"> <li>- No open fires must be allowed by construction workers on site.</li> </ul>	<ul style="list-style-type: none"> <li>- No incidents of uncontrolled fires.</li> </ul>	During construction and rehabilitation after construction	Site manager; Appointed contractor
	<ul style="list-style-type: none"> <li>- Storm water management measures such as diversion berms and flow retention measures must be implemented to control storm water on site.</li> <li>- A crossfall will be provided within the design of the roads to allow stormwater to accumulate on one side of the street from where it will be controlled to a defined discharge point into the natural surroundings.</li> </ul>	<ul style="list-style-type: none"> <li>- Well-functioning storm water controls with the capacity to provide for high rain events.</li> <li>- No damming of storm water on the development site or access roads.</li> <li>- Drainage of storm water to the surrounding environment.</li> <li>- No erosion and loss of topsoil.</li> </ul>	During construction and rehabilitation after construction.	Site manager; Appointed contractor; Engineer
	<ul style="list-style-type: none"> <li>- Good housekeeping and implementation of Environmental Best Practices should be maintained on site.</li> </ul>	<ul style="list-style-type: none"> <li>- Well managed site without environmental incidents and with limited risks.</li> <li>- Limit the visual impact from the passing road and surrounding area.</li> </ul>	During construction and rehabilitation after construction	Site manager; Appointed contractor
	<ul style="list-style-type: none"> <li>- Any excavation and landscaping as part of construction must be done to acceptable slopes and rehabilitated after construction.</li> </ul>	<ul style="list-style-type: none"> <li>- Allow appropriate drainage of storm water.</li> <li>- Ensure a safe construction site.</li> <li>- Rehabilitated and stabilised slopes after construction.</li> </ul>	During construction and rehabilitation after construction	Site manager; Appointed contractor

Activity / Aspect	Recommended management/mitigation	Performance indicator	Phase	Responsible person
<p>Site preparation, landscaping and construction of associated services (i.e. water, sewer, electricity and roads)</p>	<ul style="list-style-type: none"> <li>- Topsoil must be removed prior to commencement of construction.</li> <li>- Topsoil must be stored in an area not prone to erosion and should be used for rehabilitation and landscaping purposes after construction has been finalised.</li> <li>- Topsoil stockpiles should not exceed a height of 2m.</li> <li>- Any contaminated soil and the contaminant will be removed and placed into suitable receptacles for disposal at a facility registered to dispose of such material (potentially hazardous).</li> <li>- Movement of heavy vehicles will be limited to the access roads.</li> </ul>	<ul style="list-style-type: none"> <li>- Topsoil available for use during rehabilitation of disturbed areas after construction.</li> <li>- Establishment of natural vegetation after rehabilitation.</li> <li>- No erosion and loss of topsoil.</li> <li>- No disposal of contaminated soil or contaminants on site.</li> <li>- Limit unnecessary disturbance and compaction of soils.</li> </ul>	<p>During construction and rehabilitation after construction</p>	<p>Site manager; Appointed contractor</p>
	<ul style="list-style-type: none"> <li>- Should any object or site of heritage importance be unearthed, construction activities in the immediate vicinity will be stopped and the South African Heritage Resource Agency (SAHRA) will be contacted.</li> </ul>	<ul style="list-style-type: none"> <li>- No damage to any object or site of heritage importance.</li> </ul>	<p>During planning, commissioning and construction</p>	<p>Site manager; Appointed contractor</p>
	<ul style="list-style-type: none"> <li>- Barricades and visible markings should be placed at open excavations and areas under construction.</li> <li>- On site security personnel (if any) will be working in shifts. No permanent residing will occur at the site camp.</li> <li>- No construction workers will be residing at the site camp but will be commuted to and from site daily.</li> <li>- Construction activities must be limited to daytime working hours, e.g. 07:00 – 18:00, unless where otherwise arranged.</li> </ul>	<ul style="list-style-type: none"> <li>- Avoid safety risks.</li> <li>- No record of complaints of nuisance noise outside normal working times.</li> <li>- Compliance with relevant legislation.</li> </ul>	<p>During construction and rehabilitation after construction</p>	<p>Security; Site manager; Appointed contractor</p>

Activity / Aspect	Recommended management/mitigation	Performance indicator	Phase	Responsible person
Site preparation, landscaping and construction of associated services (i.e. water, sewer, electricity and roads)	<ul style="list-style-type: none"> <li>- No permanent storage of potential hazardous substances, e.g. fuel and oil, on site. Contractors should transport any fuel or substances necessary during construction to site in acceptable and sealable containers.</li> <li>- Potential hazardous substances temporary kept on site should be kept in a secured and bunded area with an impermeable lining to prevent pollution to the surrounding environment.</li> <li>- Any spillage of petrochemical- and cement products must be cleaned immediately.</li> <li>- Drip trays must be used at stationary construction vehicles to prevent any spillages.</li> <li>- Any gas cylinders should be stored in a designated and well-ventilated area.</li> <li>- In the case of a major spill the responsible departments (i.e. DWS and DESTEA FS) should be notified within 24 hours.</li> </ul>	<ul style="list-style-type: none"> <li>- No safety risks and spillage incidents related with potential hazardous substances, e.g. fuel, oil, etc.</li> <li>- No incidents of gas leakages or explosions.</li> </ul>	During construction and rehabilitation after construction	Site manager; Appointed contractor
	<ul style="list-style-type: none"> <li>- All construction vehicles operational on site should be in good working condition.</li> <li>- No major repairs will be done on equipment on site but at a workshop as far possible.</li> <li>- Drip trays shall be implemented during emergency repairs and refuelling of construction vehicles to prevent any spillage.</li> </ul>	<ul style="list-style-type: none"> <li>- No spillages or disposal of oil, diesel, etc. on site.</li> <li>- No excessive air emissions.</li> <li>- Noise levels within allowable perimeters.</li> </ul>	During construction and rehabilitation after construction	Site manager; Appointed contractor

Activity / Aspect	Recommended management/mitigation	Performance indicator	Phase	Responsible person
<p>Site preparation, landscaping and construction of associated services (i.e. water, sewer, electricity and roads)</p>	<ul style="list-style-type: none"> <li>- Nuisance dust is expected to be low due to the type of activity to be undertaken. However, dust suppression may be required if nuisance dust during construction is above acceptable limits.</li> <li>- Speed limits of 40km/h or less should be enforced on construction vehicles on the access road.</li> <li>- Re-vegetate areas disturbed by construction activities and available for rehabilitation as soon as possible to limit any exposed areas.</li> </ul>	<ul style="list-style-type: none"> <li>- No record of complaints of nuisance dust.</li> <li>- Compliance with relevant legislation.</li> <li>- No incidents of collisions between construction vehicles and members of the public.</li> </ul>	<p>During construction and rehabilitation after construction</p>	<p>Site manager; Appointed contractor</p>
	<ul style="list-style-type: none"> <li>- Construction workers on site must be given an induction on environmental awareness.</li> <li>- PPE will be provided to construction workers on site. No person or contractor will be allowed within construction areas on the property without the necessary PPE.</li> <li>- All employees working with construction equipment and machinery should be properly trained in their specific tasks to limit injuries.</li> <li>- The relevant Occupation and Safety regulation must be adhered to throughout construction and rehabilitation activities.</li> </ul>	<ul style="list-style-type: none"> <li>- Signed record of induction of each contractor's team on site.</li> <li>- Informed employees.</li> <li>- No fatal incidents or major injuries.</li> </ul>	<p>During construction and rehabilitation after construction</p>	<p>Site manager; Appointed contractor</p>
<p>Waste management</p>	<ul style="list-style-type: none"> <li>- An adequate number of temporary toilet facilities must be situated on site for use by construction workers and should be cleaned at least once per week (or more if required).</li> </ul>	<ul style="list-style-type: none"> <li>- No use of the surrounding environment by construction workers for toilet activities.</li> <li>- No pollution to any storm water drainage system.</li> </ul>	<p>During construction and rehabilitation after construction</p>	<p>Site manager; Appointed contractor</p>



Activity / Aspect	Recommended management/mitigation	Performance indicator	Phase	Responsible person
Waste management	<ul style="list-style-type: none"> <li>- Appropriate waste management and waste minimisation shall be implemented on site.</li> <li>- It is recommended that excess subsoil and topsoil emanating from excavations during construction of the services associated with the proposed development that will not be used for final rehabilitation of these areas be used as backfilling to rehabilitate the historic gravel pit on Erf 1316 (provided it is approved).</li> <li>- All sections of the NEM: Waste Act, 2008 (Act 59 of 2008) pertaining to the disposal of waste must be adhered to.</li> <li>- Construction rubble and inert waste generated during construction of the services will be loaded on tipper trucks and disposed of at Hertzogville landfill site.</li> <li>- General waste will be collected in appropriate bins on site and disposed of at Hertzogville landfill site on a regular basis.</li> <li>- Hazardous waste (including used oil/grease) should be contained in closed containers for appropriate disposal at a recognised hazardous waste facility or collected by a company registered for further management/disposal of such waste or substances.</li> <li>- Hazardous waste spills will be cleaned immediately, and contaminated soil will be disposed of described for hazardous waste or substances.</li> </ul>	<ul style="list-style-type: none"> <li>- No littering and/or disposal of any waste on site.</li> <li>- No construction rubble and inert waste on site.</li> <li>- Minimise waste generation.</li> <li>- Compliance with relevant legislation and municipal by-laws (if applicable).</li> <li>- Reduce risk of injury and instability of dwellings adjacent to the historic gravel pit.</li> </ul>	During construction and rehabilitation after construction	Site manager; Appointed contractor; Applicant

Activity / Aspect	Recommended management/mitigation	Performance indicator	Phase	Responsible person
Waste management	<ul style="list-style-type: none"> <li>- Waste during occupation of the residential units is expected to be limited to domestic solid waste. It is recommended that the municipality collect solid waste at designated “pick-up” points within Malebogo for disposal at Hertzogville landfill site on a weekly basis. This is dependent on the Service Level Agreement of the municipality.</li> <li>- Effluent generated during the occupation of the residential units will be limited to normal sewage. This will be incorporated into the existing municipal bulk services. The internal sewage reticulation system will join into the existing municipal system for treatment at the existing Hertzogville Waste Water Treatment Works.</li> <li>- Ensure that the existing treatment works has the capacity to meet the demand of the development.</li> <li>- Implement a maintenance management plan for monitoring and repair of the sewage line and/or treatment works to ensure proper functioning.</li> </ul>	<ul style="list-style-type: none"> <li>- Avoid disposal of solid waste on site.</li> <li>- No discharge of sewage on site or the surrounding environment.</li> </ul>	During operation	Applicant (Local Municipality)
Rehabilitation after construction	<ul style="list-style-type: none"> <li>- Disturbed areas should be reinstated as such areas become available for rehabilitation.</li> <li>- Final rehabilitation of the disturbed surface areas will be dependent on the end land use of the applicant. Minimum rehabilitation of areas available for final rehabilitation should include topsoiling, landscaping and sloping, establishment of vegetation and weed clearing.</li> </ul>	<ul style="list-style-type: none"> <li>- Limited disturbed footprints at any given time.</li> <li>- Final rehabilitated area after construction.</li> <li>- Limit the impact on the aesthetic value of the area after construction.</li> <li>- Safe area after construction.</li> <li>- No residual infrastructure and/or equipment on site after construction.</li> </ul>	During construction and rehabilitation after construction	Site manager; Appointed contractor

Activity / Aspect	Recommended management/mitigation	Performance indicator	Phase	Responsible person
	<ul style="list-style-type: none"> <li>- Compacted surface areas related with construction activities will be ripped before being top soiled.</li> <li>- All equipment and other items used during construction will be removed from site after construction has finished and rehabilitation has been finalised.</li> <li>- Any remaining waste material of any description shall be removed from the site and disposed of at Hertzogville landfill site.</li> <li>- Any potentially hazardous waste should be removed and disposed of appropriately and not at the general landfill site. No disposal of any waste will be allowed on the property.</li> </ul>			
Environmental monitoring and reporting	<ul style="list-style-type: none"> <li>- Any complaints received during construction must be recorded and measures must be implemented to address it where possible.</li> <li>- The dust and noise levels must be managed, and remedial measures must be implemented in the event of any excessive dust or noise above acceptable levels.</li> <li>- Continuous visual checks will be undertaken to identify areas of establishment of invasive vegetation within the development footprint and controlled accordingly.</li> <li>- The effectiveness of the storm water management measures must be verified during and after rain events.</li> <li>- Ongoing visual checks for hydrocarbon spills will be undertaken and any spillage cleaned.</li> <li>- The condition of the access road must be checked continuously and maintained accordingly.</li> </ul>	<ul style="list-style-type: none"> <li>- Record of any complaints received, and measures implemented to address these complaints.</li> <li>- Dust and noise levels complying with the relevant legislation.</li> <li>- Minimal invasive vegetation on site.</li> <li>- No erosion and loss of soil.</li> <li>- No hydrocarbon spillages on site.</li> <li>- Well maintained access road.</li> <li>- No vehicle accidents on the access road because of poor driving conditions or speeding.</li> </ul>	During construction and rehabilitation after construction	Site manager; Appointed contractor

**Table 3: Recommended environmental monitoring programme**

Activity / Aspect	Impacts requiring monitoring	Functional requirements for monitoring	Roles & responsibilities	Monitoring & reporting frequency
Change in land use	<ul style="list-style-type: none"> <li>- Conditions of approved site layout and/or zoned land use.</li> </ul>	<ul style="list-style-type: none"> <li>- Verify compliance with conditions of approvals, permits and final site layout.</li> </ul>	Applicant	<ul style="list-style-type: none"> <li>- Final review of the approved general plan and site layout during planning.</li> <li>- Visual checks and confirmation from the appointed contractors that construction activities are undertaken within the footprints and confines of the approved site layout and construction plans during construction.</li> </ul>
Site preparation, landscaping and construction of associated services (i.e. water, sewer, electricity and roads)	<ul style="list-style-type: none"> <li>- Clearance of vegetation.</li> <li>- Establishment of invasive vegetation.</li> <li>- Destruction or removal of sensitive plant species.</li> <li>- Impact on terrestrial fauna.</li> <li>- Erosion and loss of topsoil.</li> <li>- Change of storm water flow and ponding of storm water on site.</li> <li>- Damage or destruction of objects/artefacts of heritage importance.</li> </ul>	<ul style="list-style-type: none"> <li>- Visual checks.</li> <li>- Verify compliance with conditions of approved construction plans, the EA and EMPr.</li> <li>- Verify compliance with the site layout, land use and Service Level Agreement.</li> <li>- Identify non-compliances.</li> <li>- Monitor functionality of management measures.</li> <li>- Monitor key parameters, e.g. noise levels, erosion, etc.</li> </ul>	Site manager; Appointed contractor; DEO; ECO (if appointed as part of this project).	<ul style="list-style-type: none"> <li>- Weekly visual checks for erosion and extent of vegetation clearance. Reinstatement eroded areas and implement preventative measures.</li> <li>- Weekly visual checks for establishment of declared weeds or invasive plants. Clear and reinstate affected areas.</li> <li>- Daily visual checks for spillage and/or leakage of substances with pollution potential, e.g. fuel, oil and sewage. Clean any spillage immediately and repair leakages.</li> <li>- Weekly visual checks for disposal of waste on site. Remove any waste regularly for disposal at Hertzogville landfill site.</li> <li>- Report environmental incidents as soon as possible.</li> <li>- Regular visual checks for damage to access roads used during construction. Maintain the access road and repair when necessary, during construction.</li> <li>- Monitor the flow of storm water via visual checks and implement additional measures, e.g. diversion berms, flow retention measures, etc. where</li> </ul>

Activity / Aspect	Impacts requiring monitoring	Functional requirements for monitoring	Roles & responsibilities	Monitoring & reporting frequency
				<p>necessary. Ensure that no ponding of water at construction works occur.</p> <ul style="list-style-type: none"> <li>- Report findings of objects of potential heritage importance to the site manager immediately.</li> <li>- Record incidents and non-compliances in accordance with EA conditions and relevant legislation.</li> </ul>
Waste management	<ul style="list-style-type: none"> <li>- Spillage and/or disposal of construction waste.</li> </ul>	<ul style="list-style-type: none"> <li>- Visual checks.</li> <li>- Verify compliance with conditions of the EA, EMPr and the Service Level Agreement.</li> <li>- Identify non-compliances.</li> </ul>	<p>Site manager; Appointed contractor; DEO; ECO (if appointed as part of this project)</p>	<ul style="list-style-type: none"> <li>- Weekly checks for signs of disposal of waste of any type on site. Clear any areas where disposal has occurred and reinstate the footprint.</li> </ul>
Operation of the extended municipal services	<ul style="list-style-type: none"> <li>- Spillage of untreated sewage.</li> <li>- Bulk service demand.</li> <li>- Power failures and electrical demand.</li> </ul>	<ul style="list-style-type: none"> <li>- Verify compliance with the Service Level Agreement.</li> <li>- Identify non-compliances.</li> <li>- Verify capacity of existing municipal services.</li> </ul>	<p>Applicant (Municipality); Eskom</p>	<ul style="list-style-type: none"> <li>- Scheduled visual checks for any signs of leakage from the service pipelines. Any leakages should be repaired and the affected footprint reinstated if necessary.</li> <li>- Record incidents and non-compliances in accordance with EA conditions and relevant legislation during all phases of the development.</li> <li>- Visual checks and monitoring to ensure the existing treatment works and municipal services have the capacity to meet the additional demand of the proposed development. Implement improvements when and where necessary.</li> </ul>

Activity / Aspect	Impacts requiring monitoring	Functional requirements for monitoring	Roles & responsibilities	Monitoring & reporting frequency
Rehabilitation after construction	<ul style="list-style-type: none"> <li>- Establishment of natural vegetation.</li> <li>- Establishment of alien vegetation.</li> <li>- Erosion and loss of topsoil.</li> <li>- Spillage of petrochemicals.</li> <li>- Disposal of waste.</li> <li>- Redundant construction equipment on site.</li> </ul>	<ul style="list-style-type: none"> <li>- Visual checks.</li> <li>- Verify compliance with conditions of the EA and EMPr.</li> <li>- Verify compliance with the Service Level Agreement.</li> <li>- Identify non-compliances.</li> <li>- Monitor key parameters.</li> </ul>	<p>Site manager; Appointed contractor; DEO; ECO (if appointed as part of this project)</p>	<ul style="list-style-type: none"> <li>- Weekly visual checks for erosion and extent of establishment of vegetation. Reinstate eroded areas.</li> <li>- Weekly visual checks for establishment of declared weeds or invasive plants. Clear and reinstate affected areas.</li> <li>- Daily visual checks for spillage and/or leakage of substances with pollution potential during rehabilitation. Clean any spillage immediately and repair leakages.</li> <li>- Visual checks for disposal of waste on site during rehabilitation. Remove any waste after final rehabilitation for disposal at Hertzogville landfill site.</li> <li>- Report environmental incidents as soon as possible.</li> <li>- Record incidents and non-compliances in accordance with EA conditions and relevant legislation.</li> </ul>

## 7. PROCEDURES FOR RECORDING, REPORTING AND CORRECTIVE ACTION

A Designated Environmental Officer (DEO) must be appointed by the appointed contractor during the Construction Phase. The DEO will be responsible to ensure that the EMPr, Environmental Best Practice and conditions of the Environmental Authorisation are implemented during the Construction Phase of the project. The DEO will also be responsible for environmental monitoring, unless otherwise specified by the municipality or appointed site agent.

The following records are recommended to be maintained by the DEO and/or appointed site agent during construction to demonstrate compliance with the EMPr and EA specifications:

- Daily log of site activities by the supervisor of each contractor, including aspects such as waste disposed of; fuels and chemicals list deliveries; Major spillage; adverse weather that may have an influence on construction activities.
- Records of results from ongoing monitoring of listed aspects during construction.
- Environmental issues arising on the site during construction.
- Minutes of meetings held regarding environmental management.
- Method statements received and approved.
- Observations made during the site visits will be recorded and photographs taken to demonstrate both compliance and non-compliance with the specifications in the EMPr.
- Cases of non-conformance with the EMPr and Environmental Authorisation.
- Environmental incident report and corrective action taken.

Reporting must further be done in accordance with the conditions stipulated in the Environmental Authorisation and any other legislative framework that may be applicable to the proposed development.

Issues of non-conformance noted by the responsible persons must be communicated to the site manager, who will be responsible for ensuring that the relevant parties are informed of the non-conformance and that appropriate corrective action is taken. Environmental issues must be addressed at regular site meetings between the contractors, site manager and developer. The DEO will present a verbal report from his logbook of any environmental concerns or issues that have arisen, and of corrective actions that have been taken. Outstanding corrective actions will be discussed and agreed to at these meetings. Issues relating to complaints or comments received from the public will also be discussed at these meetings. Minutes of environmental meetings will be prepared by the DEO and copied to all attendees before the next meeting. The frequency of the site

meetings must be agreed by the Site manager, DEO, the contractors and other relevant parties prior to the commencement of the project.

It is important to note that the Applicant will ultimately remain responsible for compliance with the conditions of the Environmental Authorisation (if considered for approval) and implementation of the Environmental Management Programme. A contractual agreement towards the responsibilities of each role player (i.e. applicant, appointed service providers, etc.) is recommended and should be kept on file by the applicant and appointed service providers throughout all phases of the project.

## **8. ENVIRONMENTAL AWARENESS PLAN**

NEMA, 1998 (Act 107 of 1998) states that any costs incurred to remedy environmental damage must be borne by the person responsible for that damage (polluter pays). It is therefore imperative that the applicant and any appointed contractors to the proposed project during construction read through and understand the requirements of this document and any proceeding documents pertaining to environmental requirements before construction commences.

NEMA, 1998 (Act 107 of 1998) states that everyone is required to take reasonable measures to ensure that they do not pollute the environment. Reasonable measures include informing and educating employees about the environmental risks of their work and training them to operate in an environmentally acceptable manner.

In terms of this:

- The applicant and appointed contractor must take note and comply with the environmental requirements applicable with the proposed project;
- The applicant and appointed contractor, in conjunction with members of the environmental team (if applicable), must meet with the construction workers to explain the environmental requirements of the Environmental Management Programme;
- A register must be kept of all employees attending the environmental awareness meeting(s);
- The appointed contractor must have an internal environmental awareness plan to create awareness and convey important information to their staff;
- This internal environmental awareness plan should include as minimum the basic environmental aspects and potential risks relevant to the specific project and surroundings. This may include measures to be implemented during construction to prevent environmental impacts, e.g. waste management, prevention of spillage of contaminants, etc.;



- The appointed contractor must have key personnel/supervisors with formal environmental training on site realising their role in protecting the environment and ensuring that construction is conducted in a controlled manner limiting environmental impacts;
- Awareness can be created through the placement of graphic information related to conservation on site.
- Scheduled “toolbox” talks must include health and safety as well as environmental aspects;
- Induction on health and safety and environmental awareness must be done on all appointed contractors and sub-contractors at the start of their employment on site during the construction phase; and
- A record of environmental training, induction and “toolbox” talks must be kept by the appointed contractor on site and made available for inspection on request.

The induction must contain as minimum:

- The environmental policy of the appointed contractor.
- The role of each employee to conserve the environment in accordance with the policy.
- The impact that the employee’s action or work could have on the environment.
- Emergency procedures and the individuals to contact in the event of an environmental incident, e.g. major spillage of fuel.