

1. BACKGROUND

1.1 INTRODUCTION

There is an irreversible trend in South Africa where people migrate to urban areas in search of a better life and economic sustainability. This resulted in an ever growing need for residential development within South Africa. It is a known fact that the National Government, Provincial Government and Local Authorities must make an extra ordinary effort to ensure rapid delivery of housing. A lot has been done since 1994, but there is still a backlog that needs to be addressed urgently.

Terraplan Town Planner has been approached by the applicant VIPCON to investigate the potential of establishing a residential Township on the Remaining Extent of Portion 2 of the Farm Langverwacht 293 I.T, Ermelo, Msukaligwa Local Municipality in Mpumalanga Province, to be known as Bahlangene Extension. The objective of this study is to determine if a sustainable housing settlement can be established and what the development potential of the land is.

The applicant, **VIPCON PROPERTY DEVELOPERS & PROJECT MANAGEMENT** has appointed **WANDIMA ENVIRONMENTAL SERVICES** as independent consultants, to undertake an Environmental Impact Assessment (EIA) process for the proposed establishment of a Residential Township, Bahlangene Extension, on the Remaining Extent of Portion 2 of the Farm Langverwacht 293 I.T, Msukaligwa Local Municipality, Gert Sibande District of Mpumalanga Province.

The aim of the Environmental Impact Assessment is to ensure that:

- Potential environmental impacts associated with the proposed activities are identified and mitigation measures are suggested;
- Public Participation Process is conducted, i.e. to afford any Interested and/or Affected Party (I&AP) sufficient opportunity to provide comments; and
- Sufficient information is submitted to decision makers in order to ensure an informed decision making process.

1.2 PROJECT MANAGERS

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1.3 TERMS OF REFERENCE

Wandima Environmental Services Pty (Ltd) was appointed as an independent Environmental Assessment Practitioner (EAP) by **Vipcon Property Developers & Project Management**, to conduct an Environmental Impact Assessment (EIA) Process for the project in accordance to the National Environmental Management, Act no 107 of 1998 (NEMA), Regulations GN R543, 2010. Potential environmental impacts, direct and indirect, positive or negative, that are associated with the proposed project will be identified, assessed and reported on. Mitigations measures will be suggested through the environmental planning and control processes in the Environmental Management Program (EMPr).

In terms of section 24 of the NEMA, 1998 (Act No. 107 of 1998), the proposed construction of the Residential Township cannot commence without an Environmental Authorization (EA) from the Competent Authority. According to Regulation 543, the following listed activity is triggered:

GNR 545, Listing Notice 2 Activity 15 of NEMA Regulations, 2010: *The physical alteration of undeveloped, vacant or derelict land for residential, retail, commercial, recreational, industrial or institutional use where the total area to be transformed is 20 hectares or more.*

An application to downgrade the S&IER process to BA process was lodged and subsequently approved by the Competent Authority on 16 January 2015.

1.4 REGULATING AUTHORITY

An application was lodged with the Gert Sibande District's Department of Agriculture, Rural Development, Land and Environmental Affairs (DARDLEA), formerly known as Mpumalanga Department of Economic Development, Environment and Tourism (MDEDET). The Department acknowledged receipt hereof on the **18th of November 2013**. DEDET reference number is **17/2/3/GS-220** and the responsible officer is **Ms. Thabile Mahlaku**.

1.5 ASSUMPTIONS

For the purpose of this report it has been assumed that all information received from the developer, specialists and project manager has been correct.

2. DESCRIPTION OF THE PROJECT AND THE ENVIRONMENT

2.1 DESCRIPTION OF THE PROJECT

The proposed Bahlangene Residential Township will be approximately 205.4264 ha in extent, this will include residential erven, business area, schools, community facilities (e.g. Churches, crèches, community hall etc.), public open spaces and 1 stand that will be used by the Municipality. See Figure 1 for the Proposed Layout Plan.

Table 1: The size and number of stands for each activity of the development

Zoning	Number of erven	Size (ha)
Residential 1 (400m ²)	332	
Residential 1 (300m ²)	2492	
Residential 3	6	6,6940
Business 1	2	2,4751
Educational	2	7,0153
Municipality	1	0,2570
Special	78	
Public open spaces	7	
Public roads		
Total of development		205,4264

The farm RE/2 Langverwacht 293 I.T, is being held under Title Deed T15853/2002, and ownership vests with Mr. Pieter De Jager. However, an offer to purchase has already been signed making the land available for development. A water pipeline servitude is registered on the property. The servitude comprises a total of +/- 4.5 ha.

2.2 NEED AND DESIRABILITY

The need for the intended development could be motivated as follows:

- According to the Msukaligwa Municipality Integrated Development Plan (MMIDP) 2007-2012, the estimated housing backlog at the municipality stood at 4690 units. Of the seven towns in the municipality, Ermelo contributed more than half (53%) of this backlog. This proposed Township development seeks to address the housing backlog facing the Msukaligwa Local Municipality as well as the country as a whole.
- The Municipality had planned to use the land South of Ermelo town, for housing development where there are +/- 200ha of land and the challenge for the municipality was funding for the township establishment and provision of services. Needless to say with the shortage of housing as it is in the country and the province, the housing project identified so long ago but held by funding issues, hopes and expectations had been raised amongst the people who are in desperate need of housing.
- The proposed Bahlangene residential township development is located 3.2km south east of Ermelo and 0.8km east of the N11. The site is best located to benefit the Ermelo community and other communities around Msukaligwa in terms of affordable housing provision.
- The development will contribute to public service as is of high importance to the government and that it needs help in assisting the growth and upgrade of any such service made available to the public.

The desirability of the proposed project can be motivated as follows:

- The proposed site is accessed off the N11 National Road which runs 0.8km east of the development site. The necessary applications with the Department of Public Works Roads and Transport will be done in ensuring access to the development site meets the departmental requirements.
- It is envisaged that the proposed development will not have a negative impact on the surrounding land uses because the area is vacant with not much activity except for cattle grazing. Also taking into account that the site is closer to the Ermelo Central Business District.

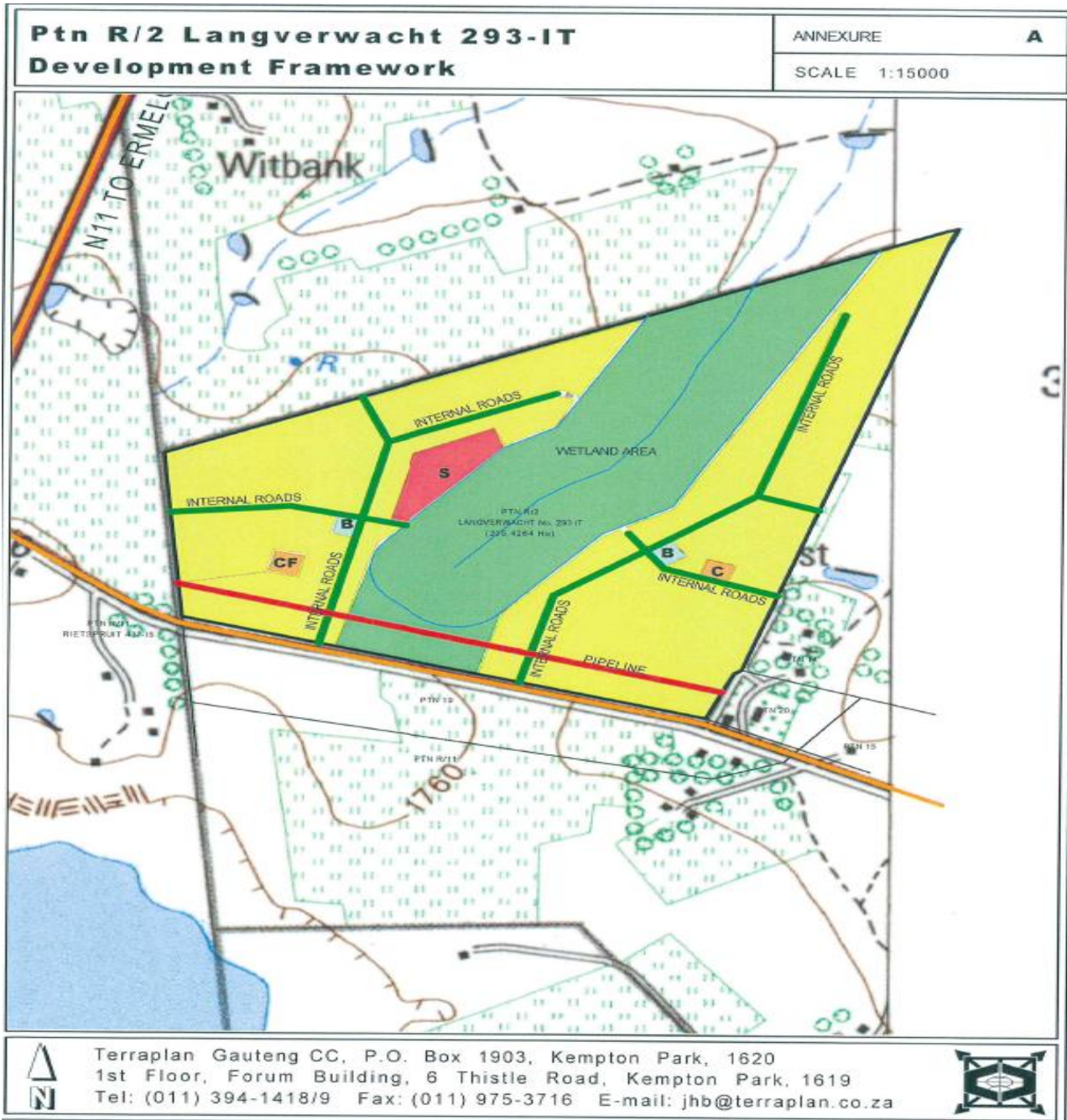


Figure 1: Proposed Layout Plan

2.3 DESCRIPTION OF THE PROPOSED DEVELOPMENT AREA

2.3.1 Location of the Proposed Site

The proposed development site is located on the Remainder of Portion 2 of the Farm Langverwacht 293-IT, 3.25km South East of Ermelo CBD and 0.8km east of the N11 National road to Amersfoort. The site is under the jurisdiction of the Msukaligwa Local Municipality at co-ordinates 26° 33'46.03"S and 29° 59'33.47"E. (See figure 2)

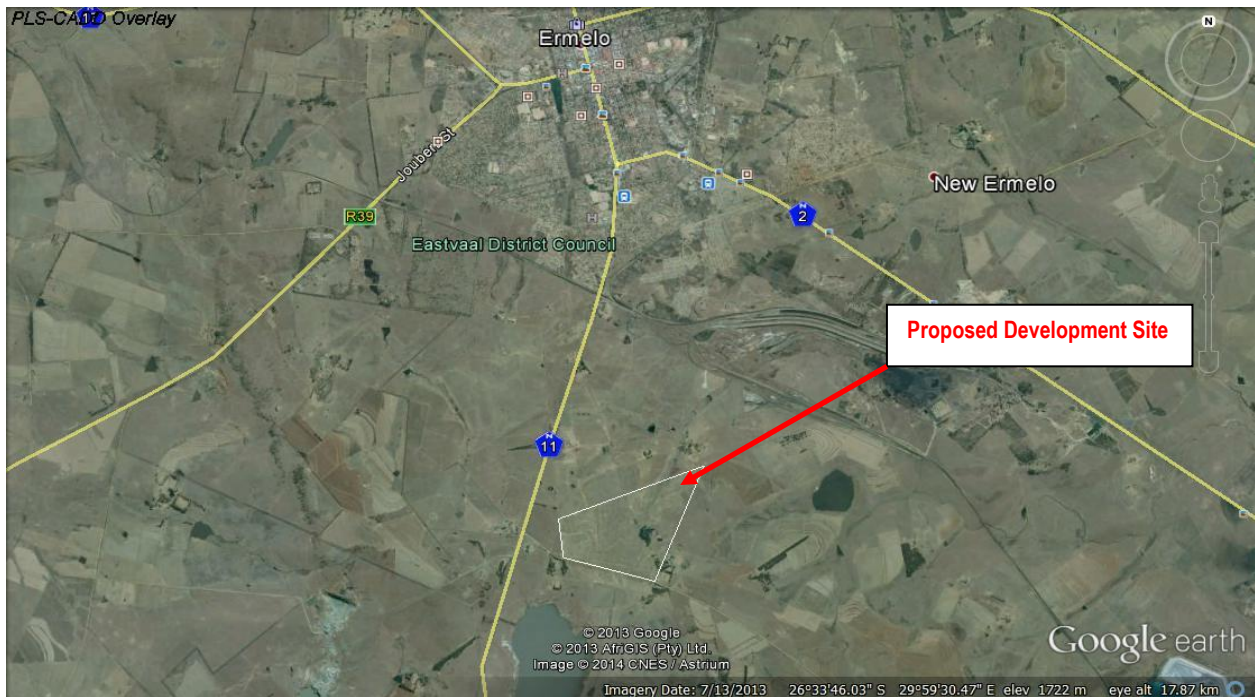


Figure 2: Proposed Development Site

2.3.2 Land Use

According to the Msukaligwa Local Municipality the site is zoned as "Agricultural". Generally the land use of the site is farming and livestock grazing. Land uses for the neighbouring areas are Agriculture, Residential and Coal Mining.

2.4 DESCRIPTION OF THE AFFECTED ENVIRONMENT

The purpose of providing this information is to understand the possible effects of the proposed project on the environment. The concept of sustainability underpinning this Environmental Impact Assessment (EIA) considers three interrelated dimensions of the environment, viz. the social, economic and biophysical dimensions. For an option or project to be sustainable, it needs to demonstrate economic viability, social equity and soundness, and ecological integrity within a framework of good governance. All three of these dimensions of sustainability need to be taken into account when assessing a proposed option or project, taking due consideration that the three dimensions are seldom in perfect balance, often dictated by local circumstances. The affected environment can be described as:

2.4.1 Climate

The climate of the area is humid. Rainfall occurs mainly in early summer, from 620mm in the west to 830mm in the east (Mean Annual Precipitation 694 mm). Mean Annual Temperature of 14°C prevails, with temperatures higher in the west than in the east. Winters are cold and summers are mild. Incidence of frost is very high.

2.4.2 Topography

The topography of the study region is slightly moderately undulating grassland plains, with occasional low hills and pan depressions. The altitude (elevation) of the region is high and tends to vary mostly between 1420 -1625 m. There is no rocky ridges or outcrops present.

2.4.3 Geology and Soils

According to the Geotechnical investigation, the site is underlain by sandstone, shale and siltstone (very fine-grained sedimentary rock) with coal beds at the bottom of the sedimentary succession of the Vryheid Formation belonging to the Karoo Sequence. The term siltstone is used to include all sedimentary rocks composed predominantly of silt-sized or smaller particles. It is not unusual for a lenticular body of coarse sandstone to occur within a predominantly argillaceous (fine-grained) horizon.

Dolerite in the form of dykes and sills has intruded into the host rock along planes of weakness and are often encountered within the sedimentary succession. The site is covered with recent deposits in the form of silty and sandy colluvium and/or gullywash. Ferricrete, classed as pedogenic material, was encountered as abundant concretions and cobbles within the site soils or as a fairly well developed layer at the base of the colluvium or gullywash.

A pebble marker horizon was encountered sporadically across the site and this represents the most recent major geological unconformity in the soil profile and occurs at the base of the transported soil. This is generally a zone of high permeability as it contains abundant gravel.

No rock outcrop was observed on site although several large dolerite boulders were noted on surface within the central eastern portion of the site. Ferricrete is present on surface within the farm road along the eastern boundary of the site and also exposed in some of the larger drainage/erosion gullies.

2.4.4 Terrestrial Ecology

2.4.4.1 Flora

According to the Terrestrial Ecology report, the vegetation units of Mucina & Rutherford (2006) were used as reference. The combination of the available literature with the survey results made stratification of vegetation communities possible. The site was also intensively searched for important species and the potential for Red Data Book (RDB) and other important species. The objective of this exercise was to identify distinct vegetation types and to establish their integrity and representation in the study area. (See Figure 3 below)

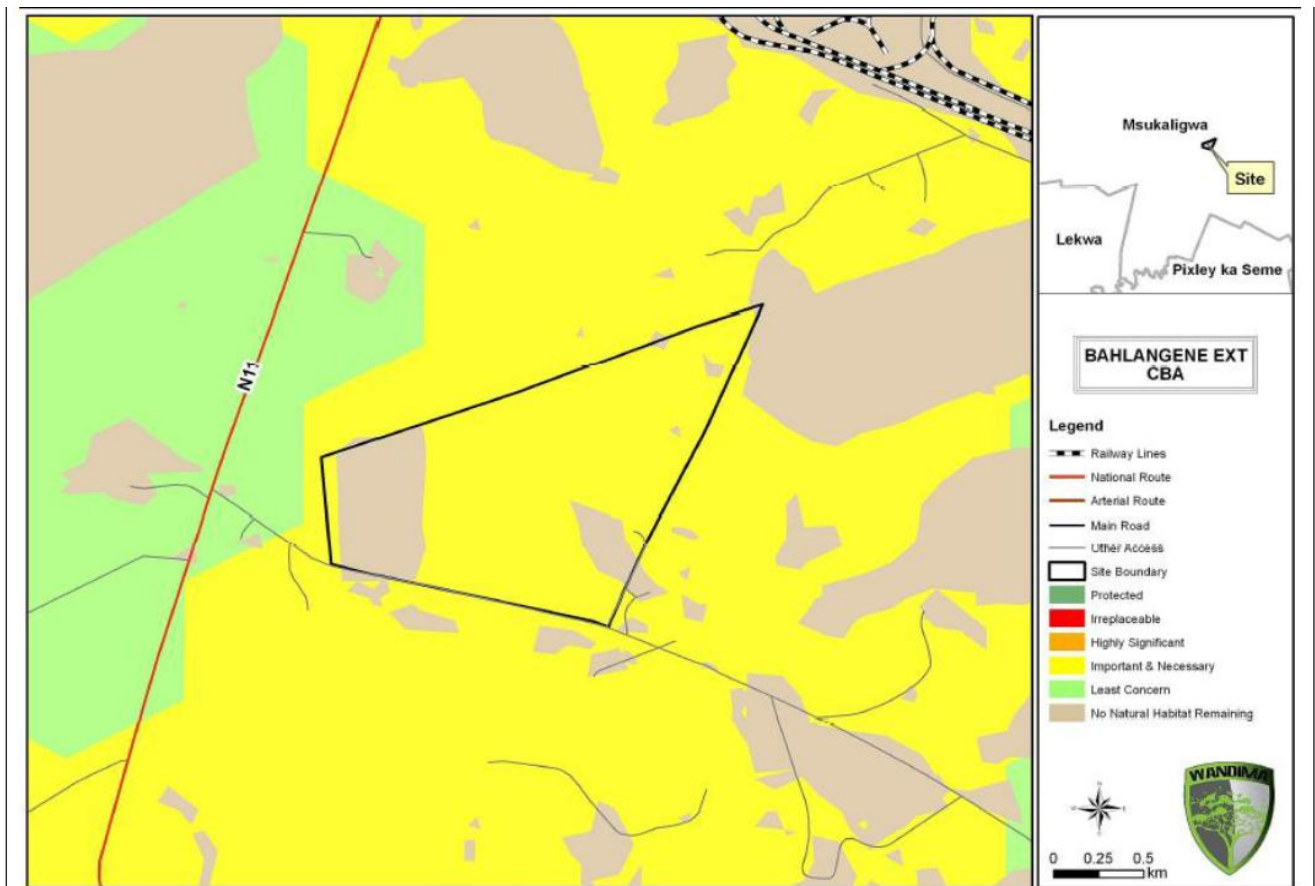


Figure 3: The sensitivity of the vegetation (MBCP, 2010)

The Vegetation of the site is comprised of undulating grassland places plains, with small scattered patches of dolerite outcrops in areas. Short closed grassland cover, largely dominated by a dense *themeda triandra* sward, often severely grazed to form a short lawn. (See Figures 4.1 - 4.4 below).

Graminoids: *Andropogon appendiculatus*, *Brachiaria serrata*, *Digitaria monodactyla*, *D.tricholaenoides*, *Elionurus muticus*, *Eragrostis capensis*, *E. chloromelas*, *E. plana*, *E. racemosa*, *Harporchloa falx*, *heteropogon contortus*, *Microchloa caffra*, *Panicum natalence*, *Setaria nigrirostris*, *S. sphacelata*, *Themeda triandra*, *trichoneura grandiglumis*, *Tristachya leucothrix*, *Abildgaardia ovate*, *Andropogon schirensis*, *Aristida bipartite*, *A. congesta*, *A. junciformis subsp, galpinii*, *A. stipitata subsp. Graciliflora*, *Bulbostylis context*, *Chloris virgata*, *Cymbopogon caesius*, *C. pospischilii*, *Cynodon dayctylon*, *Digitaria diagonalis*, *D. ternata*, *Diheteropogon amplexens*, *eragrostis curvula*, *koeleria capensis*, *Panicum coloratum*, *Setaria incrassate*.

Herbs: *Berkheya setifera*, *Vernonia natalensis*, *V. oligocephala*, *Acalypha peduncularis*, *A. wilmsii*, *Berkeya insignis*, *B. pinnatifida*, *Crabbea acaulis*, *Cynoglossum hispidum*, *Dicoma anomala*, *Haplocarpha scaposa*, *Helichrysum caespitium*, *H.rugulosum*, *Hermannia coccocarpa*, *H. depressa*, *H. transvaalensis*, *Ipomoea crassipes*, *I. oblongata*, *Jamesbrittenia silenoides*, *Pelargonium luridum*, *Pentanisia prunelloides subsp. Latifolia*, *Peucedanum magalismontanum*, *Pseudognaphalium luteo-album*, *Rhynchosia effuse*, *salvia repens*, *Schistostephium crataegifolium*, *Sonchus nanus*, *Wahlenbergia undulate*

Succulent Herb: *Euphorbia clavarioides* var. *truncata*.

Geophytic herbs: *Boophone disticha*, *Eucomis automnalis* subsp. *Clavata*, *Hypoxis villosa* var. *oblique*, *Zantedeschia albamaculata* subsp. *Macrocarpa*.

Tall shrubs: *Diospyros austro-africana*, *D.lycioides* subsp. *Guerkei*.

Low Shrubs: *Anthospermum rigidum* subsp. *Pumilum* (d), *Helichrysum melanacme* (d), *Chaetacanthus costatus*, *Euphorbia strita* var. *cuspidate*, *Gnidia burchellii*, *G. capitata*, *Polygala uncinata*, *Rhus discolor*.



Figure 4.1: View of the site on the south-eastern section.



Figure 4.2: Wetland found on site.



Figure 4.3: A large section of the site has been ploughed



Figure 4.4: Cattle grazing on site

2.4.4.2 Fauna

The faunal investigation was based on desktop study verified by cross referencing with available habitats of the study area, so as to establish the faunal potential of site. All reptiles, amphibians, mammals and birds observed during field trip and floral surveys were recorded. Also recorded was any characteristic evidence of presence or activity such as droppings, spoors, diggings, burrows etc. Within certain habitats such as rocky outcrops, the area was actively searched for reptile species characteristic of these areas or species of conservation concern which were identified beforehand as potentially occurring at the site. By method of elimination (based on available habitats and the taxon's biology and known distribution), lists of faunal representation for the study area was assembled.

a) *Mammals*

A few species of small mammals will use the natural habitats on the site. The mobility of most such mammals will ensure that they can adapt or relocate if disturbed by the activities. During the site visit an interesting sighting of a Steenbok (*Lingcina*) *Raphicerus campestris* was made on an adjacent farm.

b) *Amphibians.*

Frogs will utilize the aquatic and terrestrial habitats on the site for various reasons, such as breeding purposes. Frogs are rather sensitive to pollution and ecological imbalances, which is why the presence of frogs in an area indicates that the habitat is healthy and of good ecological integrity. It is not anticipated that frog species will be adversely affected if the mitigation measures outlined in the Terrestrial Report and EMP are implemented.

c) *Reptiles.*

Rocky habitats are of high importance to reptiles. Though this habitat does not occur on the site, it is expected that all natural habitats will be utilized by reptile species on this property. It is not anticipated that these species will be adversely affected if given the necessary protection and habitat conservation.

2.4.5 Surface and Ground Water

According to the Wetland Assessment Report, the study region has several small streams, depression pans and rivers. The region has a relatively high rainfall regime and during the summer rain season these streams and rivers fill up quickly. The sandy soils and undulating landscape facilitate seepage and subsurface water flow, which very often allow for continued water seepage and movement into these water bodies long after rainy seasons and even into the dry, winter months in some cases where the catchment areas are large. No large perennial rivers were observed in the study area, only few small streams, wetland, farm dam and drainage lines were observed. A man made impoundment (farm dam) is present in the north part of the farm. During field investigations these watercourses were identified and are considered to be sensitive (No-Go) zones.

2.4.6 Air Quality

This area is a farming community comprising of agricultural activities and residential areas the air quality is considered good. The proposed development will not have a negative impact on the air quality except during the construction phase. Heavy motor vehicles will be transporting material to and from the site and dust will be generated since the road leading to the site is a gravel road. The impact will be insignificant and for a short period.

2.4.7 Noise

Current noise levels of the area are typical of farming activity noise i.e. livestock, traffic noise and household noise, etc. Noise levels will not be affected from what they are at present, the noise from construction activities will only last for the duration of the construction phase. Construction will take place during working hours (8:00-17:00) and therefore the impact will be insignificant and for a short period during construction phase.

2.4.8 Visual

The area where the proposed activities will take place is largely agricultural lands with cultivation and livestock no negative impacts on the visual aesthetics are anticipated. The planting of indigenous trees can mitigate possible negative visual impacts for neighbouring owners.

2.4.9 Heritage Impact Assessment.

According to the Heritage Impact Assessment report, three (3) unmarked graves were identified on the remaining extent of Portion 2 of the Farm Langverwacht 293 IT, Ermelo. The graves were identified by a former worker Mr. Joseph Madonsela (resided on the farm from 1971 – 1988). The graves belong to his family members (father, son and daughter).

The graves are situated in the established wattle plantation in the central section of the farm and are regularly visited by family members. After consultation with the family members, the developer may apply for a permit from SAHRA to relocate the graves by a professional grave relocater, to a site as agreed upon by the family.

In addition, ruins of a historic building were identified on site, however, the ruins are severely compromised by later additions.

2.4.10 Socio Economic Environment

It is anticipated that the proposed Township Establishment will have far reaching positive impacts to the local society and community of Msukaligwa Municipality at large. The project will create temporal employment opportunities for the locals during the construction phase, provide affordable housing and access to social services and economic opportunities that will be within reasonable distance from the development.

2.4.10 Access Roads

The proposed access into the development will be obtained from the existing N11 National Road and the secondary will be from the D260 gravel road. The D260 is currently a rural road and will be formalized and surfaced to meet the requirements of the Bahlengene Township development.

The proposed development will be serviced by one access. The access will be located on the southern boundary of the development and will link directly onto Road D260.

2.5 Alternatives Considered

- **Activity Alternatives**

Up-market housing and blocks of flats were considered but these would be out of the financial reach of the target population earmarked to benefit from this development.

No activity alternatives were considered for this project as the developer owns the proposed site, and a need for a residential development has been identified by both the client and the Msukaligwa Local Municipality

- **Site Alternatives**

The Municipality had planned to use the land South of Ermelo town, for housing development where there are +- 200ha of land and the challenge for the municipality was funding for the township establishment and provision of services. Needless to say with the shortage of housing as it is in the country and the province, the housing project was identified so long ago but held by funding issues, hopes and expectations had been raised amongst the people who are in desperate need of housing.

- **No-go Alternatives**

This is the option of not implicating the development. Meaning that the area will not be utilised for the proposed development and at the same time aid the backlog of sufficient and abdicate housing provision resulting in possible informal settlements breeding on the very same property. Also, the fact that possible job opportunities for locals will be forfeited especially during the planning and construction phases respectively.

3. LEGISLATIVE CONTEXT OF A BA STUDY

3.1 ENVIRONMENTAL IMPACT ASSESSMENT PROCESS

The BA has been undertaken in accordance with the requirements of the EIA Regulations, 2010 and the National Environmental Management Act (NEMA), 1998 (Act No. 107 of 1998). Activities identified in terms of the 2010 Regulation, R543 may not commence without environmental authorization from the competent authority, in respect of which the investigation, assessment and communication of activities must follow the EIA procedure as described in Section 22. An application has been lodged at the DARDLA, formerly known as MDEDET, according to Section 21 of R543 of the EIA regulations, 2010. **The following activity is registered under GN 545 (LN1), 2010:**

- **GNR 545 of 2010, Activity 15 (iii):** *Physical alteration of undeveloped, vacant or derelict land for residential, retail, commercial, recreational institutional use where the total area to be transformed is 20 hectares or more*

The Listing Notice requires the applicant to undertake S&IER. However, a downgrading application was lodged with the Competent Authority and duly accepted due to the fact that the environmental issues and concerns of the development can be addressed in a Basic Assessment Report.

The Basic Assessment process will be undertaken in two stages namely Draft and final BA phase:

3.1.1 Draft Basic Assessment Phase:

After the project has been registered with the Competent Authority, a Public Participation Process (PPP) commenced according to Section 54 of Regulation 543. The public were invited on the 5th of December 2013 to register as Interested and Affected Parties (I&AP) and to comment on the Draft BA Report that will be available for comments. Notifications regarding the availability of the Draft BAR will be e-mailed to all registered I&APs and also published in the local newspaper. The report includes the description of the proposed project, an assessment of the environmental impacts and a draft EMPr.

3.1.2 Final BA Phase:

The final BA Process will consist of the following phases:

- The impact assessment phase during which the environmental impacts of issues identified by I&AP's are re-evaluated to determine their potential impacts and the mitigations thereof;
- The Reporting phase, during which the findings and recommendations are integrated into a Final BA Report;
- A twenty one (21) day comment period for Government Departments on the draft-final BAR, and
- The decision making phase during which the authorities decide whether the project should go ahead and what conditions would apply if it is approved.

3.2 OTHER LEGISLATIVE REQUIREMENTS

Other legislation, plans and policies that are related to this proposed project are listed in Table 2.

Table 2: Other legislations related to the proposed township development.

LEGISLATION	IMPLICATIONS
Nature Conservation ordinance, 1974 (Act no 19 of 1974)	The protection of fauna and flora.
Conservation of Agricultural Resources Act, 1983 (Act no 43 of 1983)	Legislation – control of invasive alien plants.
Division of land ordinance, 1986 (Ordinance 20 of 1986)	Management of municipal areas.
Environmental Conservation Act, (Act no 73 of 1986)	Conservation of natural areas
Physical Planning Act, 1991 (Act no 125 of 1991)	Planning of municipal areas in an orderly manner.
Occupational Health and Safety Act, 1993 (Act no 85 of 1993)	The protection of the health and safety of workers in the construction and operational phase of the development.
Development and Facility Act, 1995 – DFA (Act no 67 of 1995)	Planning of municipal areas in an orderly manner.
The Constitution of the Republic of South Africa, 1996 (Act No 108 of 1996)	Section 24 of the Constitution provides for the environment that is not harmful for the health and people's wellbeing. The proposed development should be done following environmental impact assessment procedures to ensure a sustainable environment for all.
National Building Regulations and Building Standards Act, 1997 (Act no 103 of 1997)	Control building standards to prevent houses that are a danger for the residents.
National Environmental Management Act 1998 - NEMA (Act No 107 of 1998)	The development must be socially, environmentally and economically sustainable.
Local Government: Municipal Structures Act, 1998 (Act no 117 of 1998)	Regulation of building standards.
Mpumalanga Conservation Act, 1998 (Act 10 of 1998)	Provides for the management and conservation of Mpumalanga's biodiversity.
National Forest Act, 1998 (Act No 84 of 1998)	Protection of endangered trees according to the list mentioned in the act.
National Roads Act (No. 7. 1998)	To make provision for a national roads agency for the Republic to manage and control the Republic's national roads system and take charge, amongst others, of the development, maintenance and rehabilitation of national roads within the framework of government policy.
National Water Act, 1998 (Act No 36 of 1998)	Legislation which gives a mandate to DWF to maintain good water quality.
National Heritage and Resources Act, 1999 (Act no 25 of 1999)	The protection of heritage areas.
Promotion of Access to Information Act, 2000 (Act No2 of 2000)	Legislation that allows the public access to information about activities that influence their well-being and to make contributions to decision making
Electricity Regulation Act (No. 4, 2006)	Ensure reliability of electrical supply.
National Health Act, 2003 (Act No 61 of 2003)	The development must be developed and operate according this regulations.
National Environmental Management : Biodiversity Act, 2004 (Act no 10 of 2004)	The protection of the national biodiversity.
NEMA (Act 107 of 1998 and GN R385 (Regulations of NEMA, Chapter 5) and GN 386 & 387 (Listed Activities), 2006	Give the Department of Environment a change to evaluate possible impacts and the management there off.
Spatial Development Framework (SDF), 2006	Sound future municipal planning. The development has to be part of the future planning of MLM.

4. ENVIRONMENTAL IMPACTS AND ISSUES

4.1 INTRODUCTION

The proposed establishment of a Township will have positive and negative environmental impacts. The positive impacts on the environment were identified and will be used to enhance the environment. The negative impacts were identified and mitigation measures are proposed to minimize the adverse impacts on the receiving environment. These mitigation measures are tabled in an Environmental Management Program (EMPr).

4.2 KEY ISSUES IDENTIFIED

Key issues identified within the proposed project were:

Environment

Social issues

Bulk services – roads, sewerage management, water and electrical supply.

4.3 ANTICIPATED IMPACTS AND RECOMMENDATIONS

4.3.1 ENVIRONMENT

4.3.1.1 Topography

Anticipated impacts:

The topography of the study region is slightly moderately undulating grassland plains, with occasional low hills and pan depressions. The altitude (elevation) of the region is high and tends to vary mostly between 1420 -1625 m. There is no rocky ridges or outcrops present.

Recommendations:

Sensitive areas such as the wetland area and man-made dams should be protected and no activities or development are allowed in these areas. Only the planned building/constructed areas may be cleared from vegetation.

4.3.1.2 Geology & Soils

Anticipated impacts:

The proposed project will have a potential to encourage avenues for erosion in the footprint of the site during the construction and post construction phases. Intensive utilisation of service and access roads by construction vehicles may cause loss of stability of road surfaces which will result in soil erosion through wind and surface water run-off. Occasional deviation from the access and service roads by heavy construction machinery might result in most of the road-side vegetation being trampled thereby disabling the roots in their binding effect on the soil. This will enable surface run-off to cut the edges of the roads into undesired and uneven slopes. Newly created access roads might encourage erosion if not properly designed especially if located on steep slopes.

Recommendations

It is imperative that movement of equipment and machinery be restricted to designated roads to access the site. Newly established access roads during the construction phase should be designed in such a way that steep slopes are avoided. If unavoidable, surface run-off humps should be made to direct the flow into the streams and vegetated surfaces in mitigation against soil erosion. Unused/abandoned roads or disturbed terrains should be tilled and reseeded with local vegetation during rehabilitation. Excavated areas should be backfilled to avoid unnecessary accumulation of surface water and high velocity overflow. Disturbed steep slopes should be supported with surface rock gladding or vegetation. Stipulations of the Environmental Management Programme (EMPr) should be adhered to during the construction phase of the project until decommissioning.

4.3.1.3 Flora and Fauna

Anticipated impacts:

The main conservation concern is the loss of flora and fauna, especially protected species, during construction of the residential units and associated infrastructures. Vegetation removal will also be required for the purpose of construction. Impacts on both fauna and flora will be inevitable and this will result in habitat fragmentation and ultimate loss of a fair amount of vegetation and displacement of faunal species surviving in that particular habitat. A variety of bird species, reptiles and mammals are nomadic in the area and during construction displacement of terrestrial animals, insects and reptiles might occur. Also, the construction crew will be tempted to kill animals (snakes and reptiles) when they come across them, to hunt down birds and mammals, as well as felling trees to make firewood. Deviation of heavy machinery from designated access roads might account for most of the vegetation being trampled thereby destroying the habitat of smaller faunal species. Construction of the residential units and associated infrastructure might have an insignificant impact on the vegetation but recommendations to mitigate any possible impact has to be implemented.

Recommendations:

The contractor should stick to the engineer's designs and recommendations by the consultant. There is a variety of reptiles, amphibians, insects, mammals and birds that occur in this type of habitat. Care should be taken during the planning and construction phases to restrict the development to areas of lower biodiversity sensitivity. Vegetation removal should be restricted to areas where the development is to take place and undesired tree felling or vegetation removal should be avoided at all costs. Construction workers should be discouraged from killing of animals and birds for relish as this might interfere with the livelihood of the ecosystem and will encourage poaching. Activities associated with the construction should have an element of conservation through avoiding undesired destruction of wildlife within the site.

4.3.1.4 Surface and Ground Water

Anticipated Impact:

During construction phase, construction activities will have direct impact to the water bodies found on site and surrounding environment, if not well monitored. Sewage drainage during operation will have high impacts on the water quality and impose health threat to the surrounding water course if not well maintained.

Recommendations:

It is the responsibility of the Developer to insure a maximum protection of the surrounding water course. It is highly recommended that the wetland area and the surrounding water courses are well fenced to minimise the potential impacts that may occur. It is recommended that the developer construct drainages between the residential area and the wetland area to reduce flood.

4.3.1.5 Air Quality**Anticipated impacts:**

This area is surrounded by agricultural farms with agricultural activities and the air quality is considered good. The proposed development will not have a negative impact on the air quality except during the construction phase. Increased vehicular traffic and numbers of construction crew during site clearance are likely to increase dust emission and ambient noise levels. Construction activities on site will lead to noise and dust from construction vehicles when they move in and out of the construction site for, excavation, loading, hauling and dumping of construction materials. Because of the temporary nature of site clearance, the impact is rated as insignificant, however, construction will be on-going, hence the duration of the impact.

Recommendations

Dust emission on access roads should be limited by using dust suppression methods such as water spraying through the use of water tanker lorry, equipped with a mounted water pump engine. It is the responsibility of the contractor to ensure that dust and noise generated during site clearance and construction does not encroach on the aesthetic freedom of the surrounding areas.

4.3.1.6 Noise Pollution**Anticipated impacts:**

Current noise levels of the area are typical of farming activity noise i.e. livestock, traffic noise and household noise etc. Noise levels will not be affected from what they are at present, the noise from construction activities will only be present during the construction phase and during working hours (8:00-17:00). The impact will be insignificant.

Recommendations:

Construction vehicles should be serviced regularly and be kept in good working condition at all times to prevent them from making high pitched roaring sounds. Construction has to be carried out during working hours – 8:00 until 17:00. If it is necessary that construction has to be done after working hours, neighbours have to be notified and permission has to be given by the neighbours.

4.3.1.7 Visual Impact**Anticipated impacts:**

The area where the proposed activities will take place is largely dominated by agricultural activities and the site is closer to and existing housing development called Ermelo Extension 32-34. No negative impacts on the visual aesthetics are anticipated.

Recommendations:

Buildings can be painted earth colours to blend in with the environment. Fast growing trees can be planted to mitigate any possible negative visual impact on the border of the property.

4.3.18. Heritage Impact assessment

- **Anticipated Impacts**

According to the Heritage Impact Assessment report, three (3) unmarked graves were identified on the remaining extent of Portion 2 of the Farm Langverwacht 293 IT, Ermelo. The graves were identified by a former worker Mr. Joseph Madonsela. The graves belong to a Madonsela who were residing on the farm from 1971 – 1988. They are situated in the established wattle plantation in the central section of the farm and are regularly visited by family members.

In addition, ruins of a historic building were identified on site, however, the ruins are severely compromised by later additions.

- **Recommendations**

Mitigation measures are required for the graves as well as the ruin, to prevent development activities impacting negatively on the sites. The three graves are regularly visited by family members. After consultation with the family members, the developer may apply for a permit from SAHRA to relocate the graves by a professional grave relocater, to a site as agreed upon by the family.

The ruin is older than 60 years and in terms of section 34 of the NHRA, it will have to be recorded and documented before an application can be made to the relevant PHRA for a demolition permit. Based on the findings of this report, Adansonia Heritage Consultants cc, states that there are no compelling reasons which may prevent the proposed development to continue, provided that the client adheres to the mitigation measures, as specified above.

4.3.2 SOCIAL ISSUES

- **Anticipated impacts:**

It is anticipated that the development will have far reaching positive impacts to the local society and community such as availability of residential areas and job creation during the construction phase.

The proposed project will attract commercial and business investment, as well as deem the provision of the essential social infrastructure viable.

4.3.4 BULK SERVICES

4.3.4.1 Roads – Access Roads to the property.

- **Anticipated impacts**

The proposed access into the development will be obtained from the existing N11 National road and the secondary road will be from the D260 road. The D260 is currently a rural road and will be formalized and surfaced to meet the requirements of the Bahlengene Township development.

The proposed development will be serviced by one access. The access will be located on the southern boundary of the development and will link directly onto Road D260.

- **Recommendations**

An intersection upgrade onto the N11 will be required. The necessary applications with SANRAL and the Department of Public Works Roads and Transport will be done in ensuring that access to the development meets with the department's and SANRAL's requirements.

4.3.4.2 Sewerage Management.

- **Anticipated impacts:**

The Bahlengene Extension falls within the existing Ermelo bulk service area. The existing Waste Water Treatment Plant is located to the north of the proposed Bahlengene Township. The elevation of the existing WWTW inlet works is 1,679m AMSL. The low point at the Bahlengene Development site is at 1,736m AMSL. The location of the low point and the location of the treatment plant are divided by a water course at 1,716m AMSL watershed with a maximum altitude of 1,742m AMSL.

It is therefore a requirement to pump the sewage generated by the development to the existing Municipal sewer system. A sewer pumping station will be provided. An alternative to the sewer pumping system would be the construction of a new WWTW for the Ermelo Drainage area south of the watershed.

- **Recommendations:**

According to the Civil Engineering Services report, the current capacity of the Waste Water Treatment Plant is 8Mld. This capacity is barely enough to cater for the current Ermelo town extents. The current planning of the Municipality is to spend an additional R 12m within the near future to upgrade the treatment plant in terms of mechanical and electrical equipment and to design the next phase of the actual capacity upgrade of the waste water treatment plant.

The responsibility for the provision of bulk sewer services in terms of treatment capacity will not be that of the developer. The Local Council is the services provider. A bulk services contribution towards the provision of bulk sewer services will be payable to Council, and Council will provide such bulk services.

4.3.4.3 Water Supply.

- **Anticipated impacts**

Ermelo Town area is serviced by 4 balancing reservoirs with a combined capacity of 19.47MI/day. The Bahlengene Extension falls within the existing Ermelo bulk water supply service area and water to the development will be provided from the southern reservoir cluster north west of the proposed development.

Raw water is currently supplied to the town of Ermelo via a raw water supply scheme with DWAS being the service providers for raw water. The Ermelo Water Treatment Works, located at the reservoir cluster, has a capacity of 14 MI/d. Water will be pumped from the WWTW command reservoir site and piped up to a dedicated reservoir for the proposed Bahlengene development.

- **Recommendations:**

A booster pumping station will have to be introduced to pump water from the existing reservoir cluster to the proposed Bahlengene reservoir. The reason being that the current reservoir cluster groundlevel elevation is 1,773m AMSL and the development high end is at 1,780m AMSL. Gravitational flow cannot be achieved from the existing reservoir cluster.

According to the Civil Engineering Services Report, the responsibility for the provision of bulk water infrastructure in terms of treatment capacity, storage and bulk pipelines will not be the responsibility of the developer. The Local Council is the services authority and the services provider. A bulk water services contribution towards the provision of water services will be payable to Council and Council will provide such infrastructure and services.

4.3.4.4 Electrical Supply.

The bulk electrical supply for this development will be taken from the Municipal 88/11kV Eskom supply point on the southern side of Ermelo, next to the railway line. Bulk power will be distributed from here with a 5km 11kV overhead line, to the border of the proposed development.

The overhead line route will run (on municipal property) along the northern boundary of the railway line to the road reserve towards the N11 (Amersfoort) Road, running in or just adjacent to the western side of the road reserve to the Emigatie road junction with the Amersfoort road. From here the route will be crossing the Amersfoort road on the northern side of the Emigatie road, extending to the boundary of the proposed development.

The cable distribution to each house will be done with underground cables running in the road reserves of the proposed development.

All potential impacts with their associated recommendations are summarised in Table 3 below.

Table 3: Issues identified, their potential impacts and recommendations for specialist studies

ISSUE	POTENTIAL IMPACT	RECOMMENDATIONS
Topography	The topography of the site is slightly moderate with undulating grassland plains. The altitude (elevation) of the region is high and tends to vary mostly between 1420 -1625 m. There is no rocky ridges or outcrops present. Erosion possibility is high during the construction phase if areas to be constructed are cleared and left bare.	<ul style="list-style-type: none"> Only the planned building/constructed areas may be cleared from vegetation to prevent erosion. Cleared areas have to be re-vegetated after construction to prevent erosion of bare areas. No additional studies required.
Geology and soils	The proposed project will have a potential to encourage avenues for erosion in the footprint of the site during the construction and post construction phases. Intensive utilisation of service and access roads by construction vehicles may cause loss of stability of road surfaces which will result in soil erosion through wind and surface water run-off. Occasional deviation from the access and service roads by heavy construction machinery might result in most of the road-side vegetation being trampled thereby disabling the roots in their binding effect on the soil. This will enable surface run-off to cut the edges of the roads into undesired and uneven slopes.	<ul style="list-style-type: none"> Movement of equipment and machinery to be restricted to designated roads to access the site. Newly established access roads during the construction phase should be designed in such a way that steep slopes are avoided. Surface run-off humps should be made to direct the flow into nearby drainage lines, streams and vegetated surfaces to mitigation possible soil erosion. No additional studies required
Flora (Vegetation)	The main conservation concern is the loss of flora especially protected species, during construction of the proposed Township, site offices and storage facilities. Vegetation removal will also be required for the purpose of construction.	<p>Minimized impact on vegetation by</p> <ul style="list-style-type: none"> Avoiding sensitive habitats. Making use of existing access roads and disturbed areas. Positioning of the structure on pre-selected sites of low floral importance. No additional studies required
<i>Invader species</i>	Due to the increased levels of grazing activity at the site and the large amount of disturbance and bare soil associated with the development, ideal conditions for the invasion of alien plants will be created. As there is already evidence of alien plant invasion at the site e.g. tall khakhi weed and shrubby milkweed, it could prove difficult to keep alien plants out of the disturbed areas. Within the croplands this is not a significant issue as these areas are already dominated by alien species and their biodiversity potential is low.	<ul style="list-style-type: none"> Vegetation clearing and soil disturbance should be kept to a minimum. Natural re-vegetation of disturbed areas such as road verges should be encouraged. Seed of indigenous species collected on site could be used to re-vegetated cleared areas. All alien plants observed at the site should be removed on a regular basis. No additional studies required.
<i>Protected plant spp</i>	No protected plant species were found on the proposed site.	<p>Construction staff has to be aware of protected species.</p> No additional studies required.
Fauna	High levels of human activity will be associated with the development, these activities pose several different risks to the fauna of the site, including collisions with vehicles and fires. A variety of bird species, reptiles and mammals are nomadic in the area and during construction displacement of terrestrial animals, insects and reptiles might occur. Also, the construction crew will be tempted to kill animals (snakes and	<ul style="list-style-type: none"> Vehicles must adhere to a speed limit, 30-40 km/h is recommended for light vehicles and a lower speed for heavy vehicles. All construction and maintenance vehicles must stick to properly demarcated and prepared roads. Off-road driving should be strictly prohibited.

ISSUE	POTENTIAL IMPACT	RECOMMENDATIONS
	reptiles) when they come across them, to hunt down birds and mammals.	<ul style="list-style-type: none"> Littering should be strictly forbidden and waste generated by staff or at the compound should be disposed of in an appropriate manner, preferably off-site. No additional studies required
Surface & Ground Water quality	The proposed project shows to have significant positive impact on the natural environment and local water course. During construction phase, construction activities will have direct impact to the watercourse and surrounding environment, if not well monitored.	<p>It is the responsibility of the Developer to insure a maximum protection of the surrounding water course. It is highly important to note the following</p> <ul style="list-style-type: none"> It highly recommended that the wetland area and the surrounding water courses are well fenced to minimise the potential impacts that may occur The farm dam has to be protected by fence and monitored. This is a means to offset any negative impact the construction might have. Littering should be strictly forbidden and waste generated by staff or at the compound should be disposed off in an appropriate manner, preferably off-site. All hazardous materials <i>inter alia</i> paints, turpentine and thinners must be stored appropriately to prevent these contaminants from entering the environment. All waste construction material should be removed to an approved waste disposal site. No additional studies required
Air quality	Dust can be created during the construction phase. No significant impact is anticipated.	No additional studies required
Noise pollution	Noise can be created during the construction period. Noise will be an insignificant impact.	No additional studies required
Visual	Insignificant impact.	Indigenous trees can be planted to mitigate any possible negative impact. No additional studies required
Socio-economic	It is anticipated that the proposed Township Establishment will have far reaching positive impacts to the local society and community of Msukaligwa at large. The project will create temporal employment opportunities for the locals during the construction phase, provide affordable housing and access to social services and economic opportunities that will be within reasonable distance from the development.	No additional studies required
BULK SERVICES		
Roads	The proposed access into the development will be obtained from the existing N11 national road and the secondary will be from the D260 road.	<p>An intersection upgrade onto the N11 will be required.</p> <p>The necessary applications with SANRAL and the Department of Public Works Roads and Transport will be done in ensuring that access to the development meets with the department's and SANRAL's requirements.</p>

ISSUE	POTENTIAL IMPACT	RECOMMENDATIONS
Sewerage	<p>Sewerage for the proposed development will connect to the existing Municipal WWTW. The elevation of the existing WWTW inlet works is 1,679m AMSL. The low point at the Bahlengene Development site is at 1,736m AMSL.</p> <p>It is therefore a requirement to pump the sewage generated by the development to the existing Municipal sewer system</p>	<p>The current capacity of the Waste water treatment plant is 8Mld. This capacity is barely enough to cater for the current Ermelo town extents.</p> <p>It is a requirement to upgrade the treatment plant in terms of mechanical and electrical equipment and to design the next phase of the actual capacity upgrade of the waste water treatment plant.</p>
Water Supply	<p>The Bahlengene Extension falls within the existing Ermelo bulk water supply service area and water to the development will be provided from the Southern reservoir cluster North West of the proposed development.</p>	<p>A booster pumping station will have to be introduced to pump water from the existing reservoir cluster to the proposed Bahlengene reservoir. The reason being that the current reservoir cluster ground level elevation is 1,773m AMSL and the development high end is at 1,780m AMSL. Gravitational flow cannot be achieved from the existing reservoir cluster.</p>
Electricity Supply	<p>MLM has to supply electricity</p>	<p>The bulk electrical supply for this development will be taken from the Municipal 88/11kV Eskom supply point on the southern side of Ermelo, next to the railway line. Bulk power will be distributed from via a 5km 11kV overhead line, to the border of the proposed development.</p>

4.4 ASSESSMENT OF SIGNIFICANCE

4.4.1 IDENTIFICATION OF IMPACTS

The following was done to determine possible impacts:

- determine the current environmental conditions (i.e. baseline) against which to assess impacts;
- determine the future changes in the receiving environment baseline if the project does not proceed;
- an understanding of the proposed activity in sufficient detail; and
- all findings from the Basic Assessment process was taken into account.
- Comments from I&AP were incorporated in the mitigation of impacts.

The classification of an issue as a 'key issue' during the Basic Assessment phase does not necessarily imply that an impact of high significance will result. The significance of the impact can only be ascertained once a specialist assessment has been conducted. After such an assessment, it is possible that a key issue may turn out to have an impact of low or no significance.

4.4.2 ASSESSMENT OF IMPACTS

The methodology for assessing impacts and assigning significance to the key issues is according to "Guideline 5: Assessment of alternatives and Impacts in support of the Environmental Impact Assessment Regulations, 2006" published by DEAT in June 2006. The description and prediction of the impacts include the following components:

Nature of impact

Describes the type of effect that a proposed activity would have on the environment (“what would be affected and how?”)
indicates whether the impact is direct, indirect or cumulative;
indicates whether the impact occurs during the construction, operations or decommissioning phases of the project.

Magnitude / Intensity of the impact

Low	where no environmental functions and processes are affected
Medium	where the environment continues to function but in a modified manner
High	where environmental functions and processes are altered such that they temporarily or permanently cease

Extent / location

whether the impact would be site specific and limited to the immediate area of the development site	
local	limited to within approximately 5km of the site
regional	Limited to the region
National/ international	National impact

Duration

the lifetime of the impact, whether the impact is permanent or reversible	
short-term	(0 – 5 years),
medium-term	(5 - 15 years),
long-term	(>15 years but where the impacts would cease after the operation of the site); and/or whether the impact is intermittent or continuous.

Probability

considers the likelihood of the impact occurring	
improbable	low likelihood
probable	distinct possibility
highly probable	most likely
definite	impact would occur regardless of prevention measures

Significance

Based on a synthesis of the above predictions, the significance of the impact shall be evaluated as follows:	
Low	Where the impact would not have an influence on the decision or require to be significantly accommodated in the project design.
Medium	Where it could have an influence on the environment which would require modification of the project design or alternative mitigation.
High	Where it could have a ‘no-go’ implication for the project unless effective measures are taken to avoid or mitigate the impact.

The degree of confidence with respect to the assessment of significance in the prediction of the impacts is based on the availability of information. The significance of impacts was evaluated before mitigation was suggested (“as predicted” impacts). Most impacts are mitigated or will have a low impact after mitigation. The predicted impacts before mitigation were analysed and summarised in Table 3. Also summarised is if the impacts will be positive or negative impacts.

4.4.3 MANAGEMENT ACTIONS AND MONITORING

The following was done to suggest management and monitoring actions of possible impacts:

- Where negative impacts are identified, mitigation objectives and mitigation actions (i.e. ways of avoiding or reducing negative impacts) is set. Where no mitigation is feasible, this will be stated and the reasons given.
- Where positive impacts are identified, actions to enhance the benefit will be recommended.
- Quantifiable standards for measuring the effectiveness of mitigation and enhancement will be set. In addition, monitoring and review programmes will be recommended in order to assess the effectiveness of mitigation.
- The suggested management actions to mitigate possible negative impacts are summarised in Table 5.

Table 4: Assessment of predicted impacts **before mitigation** measurements are applied in the operational phase

Issue	Nature of impact	Direct / indirect / cumulative	Extent / Location	Duration	Magnitude / intensity	Probability	Significance	Status
Topography	Gentle slopes - Erosion	Direct	Site	Long-term	Medium	Definite	Medium	Negative
Geology and soils	Erosion	Direct	Local	Long-term	Medium	Definite	Medium	Negative
Flora (Vegetation)	Impact on the Grassland biome / vegetation	Direct	Site	Long-term	Medium	Probable	Medium	Negative
Fauna	Biodiversity of indigenous animal species.	Indirect	Site	Short-term	Medium	Probable	Medium	Negative
Surface & Ground water	Direct impact to the water bodies.	Direct & Indirect	Local	Long-term	High	Definite	High	Negative
Air quality	Dust during construction phase.	Direct	Site	Short-term	Medium	Probable	Medium	Negative
Noise pollution	Noise created by construction vehicles.	Direct	Site	Short-term	Medium	Probable	Medium	Negative
Visual	No significance impact	Indirect	Site	Long-term	Medium	Improbable	Medium	Negative
Socio-economic	Job creation, Boost local economy	Direct	Regional	Long-term	High	Definite	High	Positive
Roads	<ul style="list-style-type: none"> High traffic volumes, busses and cars. Upgrading of access road. High traffic volumes, busses and cars. Upgrading of N11. 	Direct	Regional	Long Term	High	Highly Probable	High	Negative
Sewerage	Sewerage can have a negative impact.	Direct	Local	Long term	Medium	Probable	Low	Negative
Water Supply	MLM Capacity To supply the proposed development	Direct	Regional	Long term	Medium	Highly Probable	High	Negative
Electricity Supply	Electricity is a country wide problem.	Direct	Regional	Long term	Medium	Highly Probable	High	Negative

Table 5: Assessment of predicted impacts **after mitigation** measurements are applied in the operational phase

Issue	Nature of impact	Direct / indirect / cumulative	Extent / Location	Duration	Magnitude / intensity	Probability	Significance	Status
Topography	Gentle slopes - Erosion	Direct	Site	Short-term	Low	Improbable	Low	Negative
Geology and soils	Erosion	Direct	Local	Long-term	Low	Probable	Low	Negative
Flora (Vegetation)	Impact on the Grassland biome / vegetation	Direct	Site	Long-term	Low	Improbable	Low	Negative
Fauna	Biodiversity of indigenous animal species.	Indirect	Site	Short-term	Low	Improbable	Low	Negative
Surface & Ground water	Direct impact to the water bodies	Direct & Indirect	Local	Long-term	Medium	Probable	Medium	Negative
Air quality	Dust during construction phase.	Direct	Site	Short-term	Low	Probable	Low	Negative
Noise pollution	Noise created by construction vehicles.	Direct	Site	Short-term	Low	Improbable	Low	Negative
Visual	No significance impact	Indirect	Site	Long-term	Low	Improbable	Low	Negative
Socio-economic	Job creation, Boost the local economy.	Direct	Regional	Long-term	High	Definite	High	Positive
Roads	<ul style="list-style-type: none"> • High traffic volumes, busses and cars. Upgrading of access road. • High traffic volumes, busses and cars. Upgrading of N11. 	Direct	Regional	Long term	Low	Highly Probable	Low	Negative
Sewerage	Sewerage can have a negative impact.	Direct	Local	Long term	Medium	Probable	Low	Negative
Water Supply	MLM Capacity To supply the proposed development	Direct	Regional	Long term	Medium	Highly Probable	High	Negative
Electricity Supply	Electricity is a country wide problem	Direct	Regional	Long term	Medium	Highly Probable	High	Negative

Table 6: Suggested management actions to mitigate possible negative impacts.

Issue	Potential impact	Management actions	Monitoring of impacts
Topography	The topography of the site is slightly moderate with undulating grassland plains. The altitude (elevation) of the region is high and tends to vary mostly between 1420 -1625 m. There is no rocky ridges or outcrops present. Erosion possibility is high during the construction phase if areas to be constructed are cleared and left bare.	<ul style="list-style-type: none"> Only the planned building/construction areas may be cleared from vegetation to prevent erosion. Cleared areas have to be re-vegetated after construction to prevent erosion of bare areas. 	Monitor the effectiveness of gabions on a yearly basis and establishment of vegetation on a monthly basis.
Geology and soils	The proposed project will have a potential to encourage avenues for erosion in the footprint of the site during the construction and post construction phases. Intensive utilisation of service and access roads by construction vehicles may cause loss of stability of road surfaces which will result in soil erosion through wind and surface water run-off. Storm water accumulate around the pillars can cause erosion.	<ul style="list-style-type: none"> Movement of equipment and machinery to be restricted to designated roads to access the site. Newly established access roads during the construction phase should be designed in such a way that steep slopes are avoided. 	Monitor the effectiveness of storm water plan yearly. Monitor the effectiveness of gabions yearly.
Flora (Vegetation)	Vegetation removal will also be required for the purpose of construction. Movement of construction vehicles, if not using existing roads. Position of site office and storage area on sensitive habitat.	<p>Minimized impact on vegetation by</p> <ul style="list-style-type: none"> Avoiding sensitive habitats. Making use of existing access roads and disturbed areas. Positioning of the structure on pre-selected sites of low floral importance. Vegetation clearing and soil disturbance should be kept to a minimum. Natural re-vegetation of disturbed areas such as road verges should be encouraged. Seed of indigenous species collected on site could be used to re-vegetated cleared areas. All alien plants observed at the site should be removed on a regular basis. 	ECO has to monitor planning phase for future roads and position of site office and storage area (if necessary for the development). Monitor on a yearly basis for Declared alien plants, according to CARA and Henderson, 2001. Be aware of the protected plant species list (red data list).
Fauna	The impacts on large and small terrestrial fauna, including mammals, reptiles and amphibians.	<ul style="list-style-type: none"> Vehicles must adhere to a speed limit, 30-40 km/h is recommended for light vehicles and a lower speed for heavy vehicles. All construction and maintenance vehicles must stick to properly demarcated and prepared roads. Off-road driving should be strictly prohibited, Littering should be strictly forbidden and waste generated by staff or at the compound should be 	Monitoring of faunal species.

Issue	Potential impact	Management actions	Monitoring of impacts
		<p>disposed of in an appropriate manner, preferably off-site.</p> <ul style="list-style-type: none"> Construction staff has to be aware of protected species. 	
Surface & Ground water quality	The proposed project will have significant impact on the natural environment and local water course. During construction phase, construction activities will have direct impact to the wetland and surrounding environment	<p>It is the responsibility of the Developer to insure a maximum protection of the surrounding water bodies It is highly important to note the following</p> <ul style="list-style-type: none"> It highly recommended that the wetland area and the surrounding water bodies are well fenced to minimise the potential impacts that may occur The farm dam has to be protected by fence and monitored. This is a means to offset any negative impact the construction might have. Littering should be strictly forbidden and waste generated by staff or at the compound should be disposed of in an appropriate manner, preferably off-site. All hazardous materials <i>inter alia</i> paints, turpentine and thinners must be stored appropriately to prevent these contaminants from entering the environment. All waste construction material should be removed to an approved waste disposal site. 	<p>Monitor the water quality (silting effect) of the stream daily.</p> <p>Monitor gabions on a monthly basis.</p>
Air quality	Dust can be created during the construction phase. No significant impact is anticipated.	<ul style="list-style-type: none"> Spray dust roads if necessary 	Daily monitoring of dust created by construction vehicles.
Noise pollution	Noise can be created during the construction period.	<ul style="list-style-type: none"> Work in working hours (8:00-17:00). 	No monitoring needed.
Visual	No significant impact is anticipated.	<ul style="list-style-type: none"> Indigenous trees can be planted to mitigate any possible negative impact. 	No monitoring needed.
Socio-economic	The project will have a positive impact, it will create work opportunities during the construction phase,	<ul style="list-style-type: none"> Use local people for low skilled work. 	No monitoring needed.
BULK SERVICES			
Roads	The proposed access into the development will be obtained from the existing N11 National Road and the secondary will be from the D260 road.	<p>An intersection upgrade onto the N11 will be required.</p> <p>The necessary applications with SANRAL and the Department of Public Works Roads and Transport will be done in ensuring that access to the development meets with the department's and SANRAL's requirements</p>	
Sewerage	Sewerage for the proposed development will connect to the existing Municipal WWTW. The elevation of the existing WWTW inletworks is 1,679m AMSL. The low	The current capacity of the Waste water treatment plant is 8Mld. This capacity is barely enough to cater for the current Ermelo town extents.	MLM must monitor the sewer system monthly to avoid blockage.

Issue	Potential impact	Management actions	Monitoring of impacts
	<p>point at the Bahlengene Development site is at 1,736m AMSL.</p> <p>It is therefore a requirement to pump the sewage generated by the development to the existing Municipal sewer system</p>	<p>It is a requirement to upgrade the treatment plant in terms of mechanical and electrical equipment and to design the next phase of the actual capacity upgrade of the waste water treatment plant.</p>	
Water Supply	<p>The Bahlengene Extension falls within the existing Ermelo bulk water supply service area and water to the development will be provided from the Southern reservoir cluster North West of the proposed development.</p>	<p>A booster pumping station will have to be introduced to pump water from the existing reservoir cluster to the proposed Bahlengene reservoir. The reason being that the current reservoir cluster ground level elevation is 1,773m AMSL and the development high end is at 1,780m AMSL. Gravitational flow cannot be achieved from the existing reservoir cluster.</p>	No monitoring needed.
Electricity Supply	MLM has to supply electricity	<p>The bulk electrical supply for this development will be taken from the Municipal 88/11kV Eskom supply point on the southern side of Ermelo, next to the railway line. Bulk power will be distributed from here via 5km 11kV overhead line, to the border of the proposed development.</p>	No monitoring needed.

5. PUBLIC PARTICIPATION PROCESS

5.1 BACKGROUND

The Public Participation Process was undertaken in accordance with the EIA Regulation R543, 2010, Section 54 (1-8). The involvement of I&AP's encourages them to comment during the Draft BA phase of the project. This process also identifies issues in order to enhance the social and environmental benefits, whilst minimizing social and ecological costs to the project.

Public participation gives I&APs the opportunity to raise their concerns regarding the proposed development. In terms of EIA Regulations, R543, 2010, Section 55, a register of all I&AP has to be kept. According to Section 56(1) a registered I&AP is entitled to comment in writing on all written submissions including draft reports that was made available to the competent authority by the applicant. I&AP's were informed and involved from the initiation to promote participation and transparency.

5.2 METHODOLOGY

5.2.1 IDENTIFICATION OF INTERESTED AND AFFECTED PARTIES (I&AP'S)

The key I&AP's were identified and registered during December 2013 and January 2014. The key I&AP's includes different Government Departments, the District Municipality, the Msukaligwa Local Municipality and the neighbouring land owners (100 m from the proposed project).

5.2.2 BACKGROUND INFORMATION DOCUMENT (BID)

The main objective of the BID is to inform and introduce the proposed project to any affected and interested parties. The BID was handed out to neighbours and e-mailed on request to the direct neighbours that were not available to receive the BID.

5.2.3 ADVERTISEMENT

Advertisements were placed in the Highvelder Newspaper on 05 December 2013 to announce the proposed development and to provide the public the opportunity to register as I&AP.

5.2.4 SITE NOTICES

Laminated site notice (60 X 42 cm) were placed at key points along the proposed development site on 05 December 2013.

5.2.6 PUBLIC MEETING

An open day and public meeting was conducted on Tuesday, 11 February 2014. The attendance register and minutes of the meeting is included in the PPP report attached as Appendix E.

5.2.7 ISSUES AND RESPONSES

Environmental issues associated with the proposed project were identified and those which have to be considered a risk were summarised and discussed in Table 3. Suggested management actions to mitigate possible impacts and the monitoring thereof is summarized in Table 4. The issues mentioned by the I&AP and the response there-off is attached in Appendix E.

6. CONCLUSIONS AND RECOMMENDATIONS

The assessment has revealed that the project will have positive and negative impacts. From the analysis given in the specialist reports and other site impact assessments, the proposed development will have the minimal negative impacts ecologically and a high positive impact on the socio-economy environment. It is however recommended that the mitigation measures presented in the Environmental Management Program (EMPr) be fully implemented. The proposed project is surrounded by agricultural and mining activities and the impact on fauna will therefore be minimal.

The negative impacts can be mitigated with measures proposed to minimize the adverse impacts on the receiving environment in the EMPr. The negative impacts that have to be considered a risk are:

- Rehabilitation of constructed areas after construction
- Prevention of erosion.
- Protection of natural/pristine vegetation and fauna species in the natural areas.
- Mitigate visual impact by planting indigenous vegetation.
- Prevent noise pollution in the construction and operational phase.
- Prevent Surface and Groundwater pollution.

This project can have positive impacts on the natural, social and social –economic environment and is highly recommended by the EAP. The positive impacts are:

- The proposed residential Township will create job opportunities during the construction phase.
- The proposed project will be development pillars on previous agricultural fields and minimum impacts on the flora and fauna are foreseen.
- Biodiversity can be improved if indigenous vegetation will be used for landscaping of the development.
- An extra income for some of the households involved with the project during the construction phase.

This project could have a positive social and social-economic impact on the community with minor negative impacts on the environment if mitigations are implemented. The negative impacts are mitigated and is addressed in the EMPr. The ECO has to compile quarterly audit reports for the Compliance Section of DARDLEA till end of construction.

7. REFERENCES

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