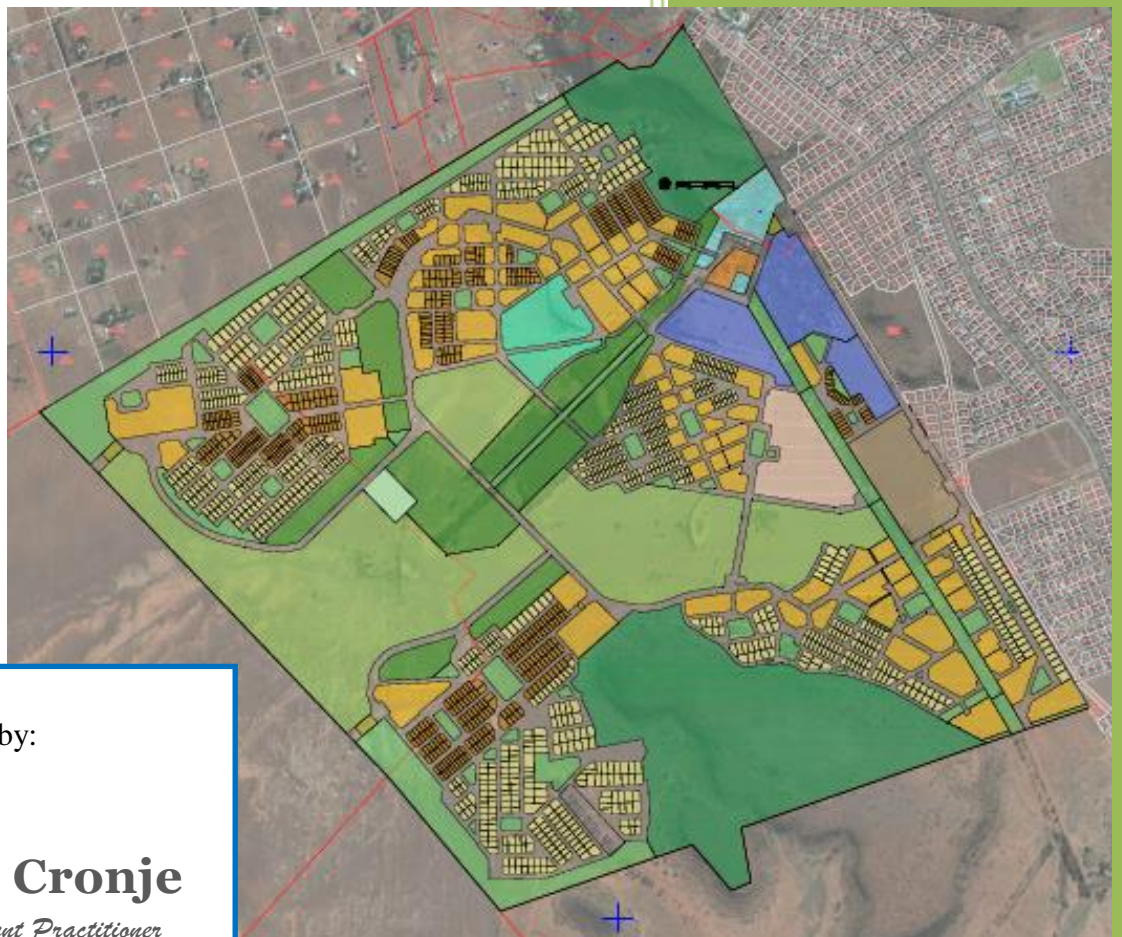




# Draft EIA Report

Proposed development on Farms Brandkop 702 & De Vlakte 1950,  
Bloemfontein



Compiled by:

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## EXECUTIVE SUMMARY

The applicant, namely Combined Developers, together with the landowner, Mr Gustav Fichardt (Brandkop Landgoed), proposes to develop Portion 6 and the Remainder of Farm Brandkop 702 and a portion of Farm De Vlakte 1950, Bloemfontein (the site). The proposed development consists of a residential component with five distinct village nodes with single residential and group housing, hotel and conferencing facilities, a lifestyle and recreational centre, a commercial component for tourism and retail, an office park, a school, farm and equestrian centre and associated civil and electrical service and road infrastructure.

The proposed development site is located on the western edge of Bloemfontein, adjacent to Pellissier. The site measures 6 13.1944ha.

The overall terms of reference for this assessment exercise are to:

- Conduct an in-depth investigation into biophysical and socio-economic aspects, focusing on key issues;
- Address the issues that were identified during the scoping process and investigation, which are associated with this planned project;
- Advise the applicant on the potential impacts (positive and negative impacts) of their planned development, as well as the implications for the design, construction and operational phases of the project;
- Facilitate public input on environmental and social matters;
- Identify possible measures to mitigate the potential impacts of the planned project;
- Address the cumulative impact of all aspects of the planned development as well as recommend possible mitigating measures.

The following potential issues were identified during the scoping phase:

- Destruction of natural vegetation
- Impact on wetlands
- Soil suitability
- Bulk service infrastructure, which includes:
  - Water provision
  - Electrical infrastructure

- Roads
- Sanitation
- Solid waste disposal
- Visual impact
- Socio-economic impact

Specialist studies undertaken include:

- Sensitive Area Assessment
- Vegetation Assessment
- Fauna Report
- Phase 1 Heritage Impact Assessment
- Soil Suitability Report
- Bulk Civil Services Report
- Electrical Services Report
- Traffic Impact Study
- Socio-economic Study

Sustainable development and best environmental practices are the driving forces behind this proposed development. Specialist input was obtained during the planning phase of the development and was incorporated into the site development plan. Sensitive and historic areas will be conserved and enhanced by the development.

The no-go alternative, i.e. keeping the site in its current state and not proceeding with the propose development, is not recommended, as the sensitive natural areas and historical features on the site would further deteriorate if left as is.

An Environmental Management Programme (EMPr) is required for the activity to minimize any negative impacts during the different phases of the development, especially the construction phase and is included in Annexure 6 of this report.

There is no obvious environmental reason for Environmental Authorisation to be denied.

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# 1. INTRODUCTION

## 1.1. PROJECT BACKGROUND

The applicant, namely Combined Developers, together with the landowner, Mr Gustav Fichardt (Brandkop Landgoed), proposes to develop Portion 6 and the Remainder of Farm Brandkop 702 and a portion of Farm De Vlakte 1950, Bloemfontein (the site). The proposed development consists of a residential component with five distinct village nodes with single residential and group housing, hotel and conferencing facilities, a lifestyle and recreational centre, a commercial component for tourism and retail, an office park, a school, farm and equestrian centre and associated civil and electrical service and road infrastructure.

The development site is located on the western edge of Bloemfontein, adjacent to the Pellissier residential suburb. Two koppies are located on site, namely Brandkop and Platkop.

Parts of the farm are currently used as grazing for cattle. The historic manor house and associated buildings on site will be preserved and incorporated into the development.

## 1.2 OBJECTIVES OF THE EIA PROCESS

The objectives of the Environmental Impact Assessment process are described in Appendix 3 of the National Environmental Management Act (Act 107 of 1998) (NEMA): Environmental Impact Assessment Regulations No. R. 982 of December 2014:

- Determine the policy and legislative context within which the activity is located and document how the proposed activity complies with and responds to the policy and legislative context;
- Describe the need and desirability of the proposed activity, including the need and desirability of the activity in the context of the preferred location;
- Identify the location of the development footprint within the preferred site based on an impact and risk assessment process inclusive of cumulative impacts

and a ranking process of all the identified development footprint alternatives focusing on the geographical, physical, biological, social, economic, heritage and cultural aspects of the environment;

- Determine the –
  - nature, significance, extent, duration and probability of the impacts occurring to inform identified preferred alternatives; and
  - degree to which these impacts –
    - can be reversed;
    - may cause irreplaceable loss of resources, and
    - can be avoided, managed or mitigated;
- Identify the most ideal location for the activity within the preferred site based on the lowest level of environmental sensitivity identified during the assessment;
- Identify, assess, and rank the impacts the activity will impose on the preferred location through the life of the activity;
- Identify suitable measures to avoid, manage or mitigate identified impacts; and
- Identify residual risks that need to be managed and monitored.

### **1.3 APPLICABLE LEGISLATION AND GUIDELINES**

This process has been conducted in terms of the relevant legislative requirements, namely:

- National Environmental Management Act (Act No 107 of 1999)
- National Biodiversity Act (Act No 10 of 2004)
- National Heritage Resources Act (Act No 25 of 1999)
- National Water Act (Act 36 of 1998)

The NEMA Environmental Impact Assessment Regulations, 2014 (Government Notices No. R. 982, 983, 984 and 985 of 4 December 2014) determine the Environmental Impact Assessment (EIA) process that should be followed for certain listed activities, which may have a detrimental effect on the environment.

The proposed development includes certain listed activities that require environmental authorization prior to commencement.

The relevant activities are listed below:

NEMA Regulations No. R. 983 of 4 December 2014 (Listing Notice 1):

Activity 11:

***“The development of facilities or infrastructure for the transmission and distribution of electricity –***

- (i) outside urban areas or industrial complexes with a capacity of more than 33 but less than 275 kilovolts; or*
- (ii) inside urban areas or industrial complexes with a capacity of 275 kilovolts or more.”*

Activity 28:

***“Residential, mixed, retail, commercial, industrial or institutional developments where such land was used for agriculture or afforestation on or after 01 April 1998 and where such development:***

- (i) will occur inside an urban area, where the total land to be developed is bigger than 5 hectares; or*
- (ii) will occur outside an urban area, where the total land to be developed is bigger than 1 hectare;*

*excluding where such land has already been developed for residential, mixed, retail, commercial, industrial or institutional purposes.”*

NEMA Regulations No. R. 984 of 4 December 2014 (Listing Notice 2) (Full EIA):

Activity 15:

***“The clearance of an area of 20 hectares or more of indigenous vegetation, excluding where such clearance of indigenous vegetation is required for-***

- (i) the undertaking of a linear activity; or*
- (ii) maintenance purposes undertaken in accordance with a maintenance management plan.”*

Application for Scoping and EIA has therefore been made to the Free State Department of Economic, Small Business Development, Tourism and Environmental Affairs (DESTE).



## 2. ENVIRONMENTAL ASSESSMENT PRACTITIONER

### 2.1 DETAILS OF ENVIRONMENTAL ASSESSMENT PRACTITIONER (EAP) WHO PREPARED THE REPORT

Marguerite Cronje  
P.O. Box 29729  
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9310

### 2.2 EXPERTISE OF THE EAPS TO CARRY OUT THE SCOPING PROCEDURES

#### **Me. Marguerite Cronje**

#### **Key qualifications:**

- Key competencies and experience include environmental impact assessment, environmental management and monitoring (>10years).

#### **Education:**

- B.Sc. (Zoology), University of the Free State, SA, 2002
- B.Sc. Honours (Zoology), University of the Free State, SA, 2003
- M.Sc. Diploma (Equine Science), University of Edinburgh, UK, 2005
- Masters in Environmental Management, University of the Free State, SA, 2008.

#### **Conferences:**

- 10 years of Environmental Impact Assessments in South Africa – Somerset West (2008)
- Free State Provincial Waste Summit – Bloemfontein (2010)
- IAIA Conference – Thaba Nchu (2013)
- IAIA Conference – Port Elizabeth (2016)

### 3. PROJECT INFORMATION

#### 3.1 PARTICULARS OF APPLICANT

##### Combined Developers

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Contact person: Nicholas Simons

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#### 3.2 SITE DETAILS

The proposed development site is located on the western edge of Bloemfontein, adjacent to Pellissier. The site measures 6 13.1944ha and is located on Portion 6 of the Farm Brandkop 702, the Remainder of Farm Brandkop 702 and a portion of Farm the Farm De Vlakte 1950, which are currently zoned for agriculture. The details of the relevant Farms are listed below:

Table 1: Farm details

Farm Name	Size of Farm (ha)	SG 21 digit code
Portion 6 of Farm Brandkop 702	5.1155	F00300000000070200006
Remainder of Farm Brandkop 702	1036.7756	F00300000000070200000
Farm De Vlakte 1950	544.6544	F00300000000195000000

#### 3.3 DESCRIPTION OF THE PROPOSED DEVELOPMENT

The proposed development entails five village nodes with a variety of residential types in the form of single residential and group housing, hotel and conferencing facilities, lifestyle and recreational centre, commercial component including tourism

and retail amenities, an office park, a school, farm services centre, equestrian centre with paddocks for horses, landscaped area, facilities for weddings, religious gatherings etc., natural areas (Brandkop and Platkop) which will be linked by corridors of agricultural land and public open spaces, agricultural areas and associated roads network, civil and electrical services required. An urban design master plan is shown in Figure 1 and the details of proposed land uses are indicated in Table 2 below.



Figure 1: Urban design of proposed development (refer to Annexure B for a larger image)

Table 2: Land Use Table

LAND USE	NO. OF ERVEN	AREA (HA)	% OF AREA	NO. OF UNITS
Single Residential	1 210	75	12.3	1210
Group Housing	352	17	2.78	352
General Residential / Town Housing	75	59	9.66	2961
Commercial	3	19	8.08	567
Retirement Village (Mixed Title)	1	9	1.51	346
Hotel	1	8	1.3	
Streets	1	109	17.78	
Sport and Recreation	2	7	1.22	
Farm Service Centre	1	2	0.30	
Heritage and Tourism	2	7	1.14	
Entrance Control	4	1	0.17	
School	1	9	1.51	
Intensive Agriculture	11	43	7.05	
Extensive Agriculture	4	95	1.53	
Private Open Space	68	62	10.09	
Conservation and Recreation	2	89	14.59	
<b>TOTAL</b>	<b>1738</b>	<b>613</b>	<b>100</b>	<b>5436</b>

Refer to the proposed site development plan in **Annexure B**.

The proposed development will also include the following service infrastructure:

- Water provision
- Storm water drainage
- Electrical infrastructure
- Roads
- Sanitation
- Solid waste disposal

Refer to the specialist reports in Annexures 5.6, 5.7 and 5.8 for more detail.

An access management (entrance control) system is proposed for the Brandkop development. Five accesses, with a possibility for a sixth, are proposed.

**Access 1** (primary access) to be located on the extension of Volkspele Drive. It is foreseen that this access will service Villages 1, 2 and A. Additionally, the precinct area consisting of the Farm Tourism (Historic Homestead), Commercial Precinct, Hotel and Conference Centre, Farm Service Centre and Stables / Equestrian Evening areas are all likely to be serviced by Access 1.

**Access 2** is to be located on the eastern side of the development with indirect access of Pellissier Drive. It is foreseen that this access will provide access to the school and Villages 1 and 5.

**Access 3** is to be located on the south-eastern corner of the development through the Brandkop Municipal Development with indirect access from the Jagersfontein Road (R706). It is foreseen that this access will provide access to the school, the commercial precinct and Villages 1 and 5.

**Access 4** is to be located on the western boundary of the development towards the south with direct access to the future inner ring road. It is foreseen that this access will provide access to Village 4.

**Access 5** is to be located in the north-western corner of the development with direct access off the future ring road. It is foreseen that this access will provide access to Village 3.

**Access 6** (possible) is to be located on the northern side of the development with direct access of the future inner ring road. It is foreseen that this access will provide access to Villages 1 and 2.

The conservation and protection of natural areas within the development site requires access management to limit firewood collection, squatting in open areas, erosion and illegal dumping.

The proposed development site has recently been included within the urban edge (dotted blue line) of the Mangaung Spatial Development Framework (SDF). The area has also been amended on the SDF from being green in terms of the Mangaung Open Space System (MOSS) to yellow, allowing residential development. Refer to Figure 2 below.

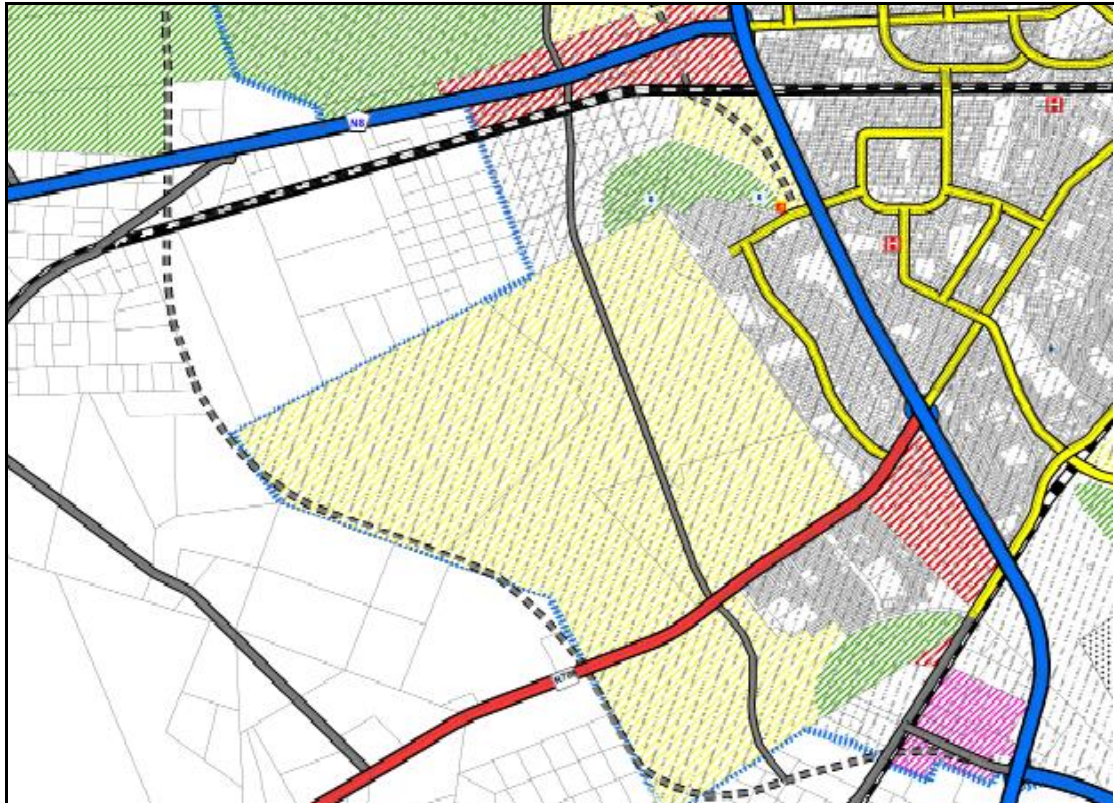


Figure 2: Extract of Mangaung Metro Municipality Micro Framework Map 2016 showing the proposed development site area within the urban edge (dotted line).

### 3.4 ENERGY EFFICIENCY

The Draft Sustainability Framework Report (2016) compiled by the Dennis Moss Partnership for the propose Brandkop development has made design recommendations with regard to the developer's and home owners' commitments towards sustainability. The following extract is taken from their report:

#### 3.4.1 Design Interventions

The planning and design of the urban space and related buildings would be informed by the principles of passive solar design, namely:

- (i) Building orientation
- (ii) Thermal massing
- (iii) Shading
- (iv) Ventilation
- (v) Insulation
- (vi) Landscape design

Buildings in the proposed development are to be predominantly orientated to the north. Where not possible, buildings will face north-east or north-west. Buildings would be designed to collect, store and radiate heat inside the building to maintain higher night-time temperatures in winter, while in summer excessive internal heating of the building is avoided.

### **3.4.2 Judicious Landscaping**

The landscaping plans to be prepared will ensure that vegetation is placed wisely around buildings to enhance and contribute to the value of spaces. The placing of deciduous trees on the northern side of buildings will help to reduce the temperature inside the building in summer and provide warmth and natural light in winter.

Evergreen trees are appropriate to the shade north-western side of buildings for the afternoon sun. The size of the mature tree is a major consideration. The lower the branches, the more shade will be provided on the ground. If more sunlight infiltration was required in winter, the lower branches may be pruned.

Air flow during hot spells is vital. Deciduous creepers on a pergola will help to keep the air below the pergola cool. Heat can be reflected by using paving material with a lighter shade colour material. Permeable hard surfaces, e.g. paving that allows water to penetrate, will reduce the overall temperature of such paving. Soil moisture levels may be retained by adding mulch on a regular basis.

To keep paving surfaces cooler, daytime heat absorption and reflection would be minimised. Accordingly, the aim would be to limit the exposure of large areas of hard surface to direct sunlight by means of tree shading. The addition of trees and shrubs to the landscape improves the flow of cool air.

The use of regionally indigenous plant species would be mandatory. From a functional perspective, species would be selected for both their biodiversity value and their climate amelioration capabilities. Water run-off would be managed by making the soil as absorptive as possible. Rain water would be collected in swales and low points and the landscape would be shaped into terraces where required to slow the runoff and collect rainwater.

### **3.4.3 Green Infrastructure**

Green infrastructure refers to principles that recognize the need to promote sustainable development in landscape design and construction. With regard to the use and management of storm water, specific aspects need to be considered relating to links between runoff, water quantity and quality. The basic principle is to reduce, retain, and treat runoff at source. The reduction in the volume of storm water, that will normally be piped, can be achieved by creating catchment areas in the topography of the land, e.g. swales or retention ponds. These areas can be planted which would enhance the spreading and slowing down of water flow, and help to protect the topsoil and subsoil. Rain water from roofs and paved areas would also be guided into these areas. Large hard surface areas would be limited and, where possible, permeable paving would be incorporated to allow storm to infiltrate the subsoil and to augment streamflow. The construction of vegetated swales next to paved and parking areas along streets are effective measures that can be instituted to enhance the collection of storm water and improve groundwater stocks. Trees can be incorporated into swales. Planted areas would be covered with organic material (e.g. wood chips) to reduce water evaporation and to increase the water absorption and retention capabilities of the swales. The routes of water runoff provide an opportunity to link open spaces and therefore improve the health and diversity of the ecology.

### **3.4.4 Technological Interventions**

This implies that best-practice technologies would be investigated and considered to give effect to climate neutrality in the proposed development. Specific reference is made to the possible use of the following:

- (i) Promotion of energy efficiency: the use of energy efficient electrical and associated appliances in all buildings would be promoted. Applicable measures include:
- (ii) Installation of a Building Management System which controls all energy related appliances, lighting, heating and cooling, which could contribute to promote energy savings.
- (iii) Low energy lighting in and around buildings and public spaces.



- (iv) Solar water heating or appropriate air-source heat pump system.
- (v) Grid-tied renewable energy generation.

#### **3.4.5 Promotion of Water Use Efficiency**

The following measures are to be considered:

- (i) Installation of suitable rainwater harvesting systems, e.g. permeable paving and underground water tanks installed to catch rainwater from roofs.
- (ii) Only plants with low water requirements would be selected for landscaping. Plantings would be undertaken in distinct hydro-zones where plants use the same amount of water.
- (iii) The irrigation system would be designed to be energy-efficient and water-efficient.
- (iv) The installation of water efficient fittings (e.g. dual-flush toilets, low flow showers, aerate taps) would be mandatory in all buildings.
- (v) Permeable paving would be considered on road sections, driveways and parking areas.

### **3.5 NEED AND DESIRABILITY**

The most recent (2016) Spatial Development Framework (SDF) of the Mangaung Metro Municipality earmarks the area within which the proposed development site is located as “yellow” for future residential development. The proposed development is therefore in line with projects identified as priorities within the Municipality’s Integrated Development Program (IDP).

The location of the site on the western edge of Bloemfontein, directly adjacent to Pellissier, allows for the natural expansion of the city of Bloemfontein. Development of this kind is also expected to boost the economy of Bloemfontein, provide housing and business opportunities, and create employment, thereby benefitting the community.

Additional service infrastructure will need to be upgraded where the capacity is inadequate for the proposed development. Bulk civil and electrical services, as well

as a traffic impact assessment, have been commissioned to investigate how the proposed development can be catered for.

The Brandkop Farm has been in the Fichardt family for over 150 years. The preservation and incorporation of the historically-rich farmstead and surrounding structures, as well as the culturally significant groves of trees, into the proposed development provides for a unique incentive. The no-go option involves keeping the status quo, which is farmland. The need for Bloemfontein to expand will eventually compromise this.

The proposed site plan has also taken sensitive areas identified on the site, such as the koppies, ridges, drainage lines, etc. into consideration and accommodated them in conservation and recreation areas and open spaces.

A mixed-use development is planned for Portion 5 of the Farm Brandkop 702, which is adjacent to and to the south of this site.

The proposed development is not expected to impact negatively on people's health and wellbeing. The sense of place and visual character, i.e. natural area, currently being experienced will be impacted on, but the proposed development aims to leave the koppies undeveloped and allows for areas for agriculture and open spaces. The Dennis Moss Partnership has also spent much time in preparing an aesthetically pleasing development concept and design with sustainability being the main goal. A Report on the Sustainability Framework for the proposed development has been compiled by the Dennis Moss Partnership and is available on request.

The proposed development can also be considered the most financially viable option for the developer and landowner.

An Economic Impact Assessment has also been undertaken and is included in Annexure 5.9 and demonstrated the benefit the proposed development would have on the economy in terms of creation of additional jobs, generations of business sales, improved quality of life an increase in disposable income.

### 3.6 DESCRIPTION OF FEASIBLE AND REASONABLE ALTERNATIVES

**3.6.1 Site alternatives:** As the developer and landowner would like to develop the particular site, site alternatives are therefore not applicable for this project.

**3.6.2 Activity alternatives:** The proposed activity was identified by the developer to consist of a multi-faceted urban development. The option of not proceeding with the development is the only activity alternative. No other activities were considered for the site due to the assessed need and feasibility of the proposed activity / development.

**3.6.3 Design alternatives:** Various layout and design alternatives were considered by the applicant, urban designers / architects and town planners, taking terrain and environmental constraints identified during the planning phase into account, with the preferred site development plan being the result. Refer to Annexure B for the preferred design option.

**3.6.4 No-go option:** The no-go option means keeping the status quo, i.e. not transforming the site for urban development. The site is currently zoned for agriculture. The old farmstead has historical value but requires conservation. The site is located within the urban edge of Bloemfontein, adjacent to Pellissier. A new Municipal development is proposed south of the site and sensitive areas are currently at risk of uncontrolled entry and looting.

## 4. PUBLIC PARTICIPATION

### 4.1 INTRODUCTION AND OBJECTIVES

As an important component of the EIA process, the public participation process involves public inputs from Interested and Affected Parties (I & APs) according to Chapter 6 of the NEMA 2014 EIA Regulations (No. R. 982 of 4 December 2014). I & APs may comment during the EIA of the proposed project.

The key objectives of the public participation process are to:

- Identify a broad range of I & APs, and inform them about the proposed project.
- Understand and clearly document all issues, underlying concerns and suggestions raised by the I & APs, and
- Identify areas that require further specialist investigation.

### 4.2 METHODOLOGY

#### 4.2.1 Identification of key I & AP's

Key I & AP's, are the following types of organizations:

- Surrounding landowners
- Environmental organizations
- Authorities
- GOs
- NGOs
- Business and civic organizations

See **Annexure D** for a list of I & AP's.

#### 4.2.2 Notification of potential I & AP's of EIA:

##### i) Newspaper advertisement: (Annexure D)

<i>Die Volksblad</i>	22 June 2016
<i>Bloemfontein Courant</i>	23 June 2016

ii) **On site notices:** On site notices were also placed at prominent places at and near to the site on 22 June 2016 allowing 30 days for public response (**Annexure D**).

#### 4.2.3 Public comments

The draft Scoping Report was circulated end of August 2016 for a 30-day comment period and comments received are included in Annexure D.

Currently the draft EIA Report is being circulated to interested and affected parties for comment.

#### 4.3 SUMMARY OF KEY ISSUES RAISED / COMMENTS BY THE I & AP's

Table 3: Summary of comments received during the public participation process

<b>COMMENTS RECEIVED DURING THE PUPLIC PARTICIPATION PROCESS</b>			
<b>Comments on draft Scoping Report</b>			
<b>Correspondence date</b>	<b>Comment from:</b>	<b>Comment</b>	<b>Response</b>
27 September 2016	Nadia McCrindle	The impact of the increase in traffic and how traffic flow will be supported in the Pellissier area are concerns.	Refer to Annexure 5.8 for the Traffic Impact Study or Section 5.2.8 for a summary thereof.
		Water provision and the strain on water supply.	Refer to Annexure 5.6 for the Bulk Civil Services Report or Section 5.2.6 for a summary thereof.
		How will the development affect the nature reserve and the animal and plant life?	The part of the Brandkop koppie that falls within the development site will remain for conservation and recreation purposes. Open space and conservation areas are also

			incorporated (see Annexure B). Also see Annexures 5.1, 5.2 and 5.3.
		Will blasting occur and what are the safety precautions?	It is not yet certain whether any blasting would be necessary. Blasting permits would need to be obtained any blasting will be required.
		Impact on Pellissier house prices.	It is expected that, due to the nature of the proposed development and the variety of services (commercial, recreational and educational), the development will have a positive impact on house prices in the local area. Also refer to the Socio-economic Study in Annexure 5.9.
		What type of religious gatherings is planned?	Religious gathering areas would not be designated to a specific religion and would most probably be multi-functional areas and community based.
		What will the implications be if planned school is not built, as nearby schools are already full?	An erf would be designated for a school, so no other activity would be able to replace a school. It is also to the benefit of the developer to be able to offer a school as part of the development.
16 September 2016	Department of Water & Sanitation	EIA Reports and relevant studies should be forwarded to the Department before the development commences.	Noted.
		Adequate service delivery capacity is required.	Noted. Refer to Annexure 5.6.
		Solid waste management should be included in the Environmental Management Plan (EMP).	Noted. The draft EMP is included in Annexure 6.
		Environmental sensitive areas and water resources such as wetlands, streams and rivers should be noted and impacts thereon mitigated.	Refer to Annexure 5.1 for the Sensitive Area Assessment undertaken.
		The National Water Act (Act 36 of 1998) must be adhered to at all times.	Noted.
		Volumes of waste water to	Refer to Annexure 5.6 for the

		be produced and clean water required, should be indicated.	Bulk Civil Services Report or Section 5.2.6 for a summary thereof.
7 September 2016	Mangaung Metro Municipality: Environmental Management	Necessary legislation and guidelines must be considered in the preparation of reports.	Noted.
		A detailed EMP is required and should indicated implementation time periods, rules and responsibilities, and environmental awareness.	Noted. See the draft EMPr in Annexure 6.
		Energy efficient technologies should be demonstrated.	Refer to Section 3.4.
		The Municipality's Town and Regional Planning division and the Department of Agriculture should be consulted for the proposed change of land use.	Noted and in process.
		Compliance documentation should be forwarded to the Municipality.	Noted.
<b>Inputs prior to draft Scoping Report circulation</b>			
29 June 2016	Brandkop Conservancy	Green belts should be established to allow access for leisure users.	Publicly accessible conservation and recreation areas are provided for in the proposed development
		The noise from the Kwaggafontein mill could impact negatively on the proposed development.	Noted.

Refer to **Annexure D** for correspondence received from I&AP's on the draft Scoping Report.

## 5. ENVIRONMENTAL ASPECTS

### 5.1 DESCRIPTION OF THE ENVIRONMENT

#### 5.1.1 Biophysical Environment

The altitude of the site varies from approximately 1400 to 1480 m.a.s.l. and there are two koppies on site, namely Brandkop to the north and Platkop to the south.

The site slopes gradually from the south east to the north west. There are a number of drainage lines across the site as well as man-made dams.

##### 5.1.1.1 Climate

The area lies within a summer rainfall region with an average annual rainfall of 500 mm. There is a large difference between summer and winter average temperatures with frost regularly occurring in winter.

##### 5.1.1.2 Geology of area

The site is situated within the Beaufort Group (Karoo Supergroup) and is represented by late Permian, Adelaide Subgroup sedimentary rocks, made of sandstone and mudstone layers. Dykes and sills are present in the form of the two koppies. Superficial deposits of the Quarternary age cap the site.

##### 5.1.1.3 Terrain forms & habitats

Table 4: Terrain form and habitats area on site

Terrain form		Habitat types	
Hill top	X	Grassland	X
Hill side	X	Karoo	
Flat	X	Karroid (plateau of Platkop)	X
Valley		Natural forest	
River bank		Plantations	
Drainage line	X	Ploughed or fallow fields	



Foot slope	X	Riparian	
		Savanna	
		Shrub	
		Wetland	X
		Other	

The Sensitive Area Assessment is included in Annexure 5.1.

#### 5.1.1.4 Soils of area

The soils at the site vary between shallow rocky, deep sandy and deep clayey. The soil types include Arcadia, Mispah, Glenrosa, Hutton, Bainsvlei, Bloemdal, Oakleaf, Swartland and Sepane.

A land suitability study, with regard to the soils on site, was undertaken and is included in Annexure 5.5. Refer to Section 5.2.5 for a summary of the findings.

#### 5.1.1.5 Vegetation of area

The study area falls within the Grassland Biome (Mucina & Rutherford, 2006) and the vegetation type on site is the endangered Bloemfontein Dry Grassland (Gh5). The plateau of Platkop is a sensitive ecosystem which belongs to the endangered Bloemfontein Karroid Grassland (Gh8).

A vegetation assessment of the site was undertaken and is included in Annexure 5.2. Also refer to Section 5.2.2 below.

#### 5.1.1.6 Animals (moths, butterflies, reptiles, fish, birds & mammals) of the area

A fauna assessment of the site was undertaken and is included in Annexure 5.3, which includes a list of red data species that could be found in the area, identifies sensitive habitats and assesses potential impacts.

#### 5.1.1.7 Aquatic systems

The site drains from the south east towards the north west. Drainage lines were identified across the site and wetland areas delineated. There are a number of man-made dams are also present on site.

An evaluation of the wetlands was undertaken as part of the sensitive area assessment, which is included in Annexure 5.1.

### **5.1.2 Socio-economic Environment**

The Mangaung Local Municipality is comprised of Bloemfontein, Botshabelo and Thaba Nchu, of which Bloemfontein is the economical hub of the municipal area. According to the Mangaung Local Municipality's Integrated Development Plan (IDP) of 2016/2017, based on the 2011 census, the population of Mangaung is 747 431, and that of Bloemfontein being 256 534. Bloemfontein is considered the sixth largest city in South Africa and is also the judicial capital. Bloemfontein is located on the N1 route between Gauteng and the Western Cape and on the N8 between Kimberley in the west and Lesotho to the east. The economy of the city is strongly driven by community services, trade, finance and transport.

An Economic Impact Assessment Report was compiled to determine the way in which the direct benefits and costs of the proposed development affect the economy and is included in Annexure 5.9.

#### **5.1.2.1 Surrounding land uses**

The site is situated adjacent to and to the west of the Pellissier residential suburb. The Kwaggafontein smallholdings are located along the north western boundary of the site. Portion 6 of the Farm Brandkop 702 is to the south of the site, where a mixed use development is planned on the Municipal land. The rest of the Farm De Vlakte 1950, mainly used for grazing, is to the west. Also refer to the locality plan in Annexure A.

#### **5.1.2.2 Historical, archaeological or cultural sites**

The farm house, certain structures and tree groves located on site are considered historically significant and will be conserved. A heritage impact assessment was done and is included in Annexure 5.4.

## 5.2 SUMMARY OF FINDINGS AND RECOMMENDATIONS OF SPECIALIST STUDIES

The necessary specialised studies and specialised processes were performed according to Appendix 6 of the NEMA 2014 Regulations (No. R. 982 of 4 December 2014). Specialised studies relevant to the project include:

### 5.2.1 Sensitive Area Assessment

A study to determine the sensitive areas such as rocky outcrops, drainage lines and wetlands on the site and to address the impacts the proposed development will have on these areas.

#### Enviro-Nich Consulting

P.J. du Preez  
P.O. Box 11945  
Universitas  
Bloemfontein  
9321  
Tel: 082 3764404  
Email : greenrsa@gmail.com

Area of expertise: Ecology and Wetland Specialist

#### Findings and Recommendations

- Sensitive areas such as rocky outcrops and wetlands on site were identified, delineated and assessed.
- Rocky outcrops on Platkop belong to the Bloemfontein Karroid shrubland (Gh8) (Mucina & Rutherford 2006) and a number of protected species occur in this vegetation type.
- A number of small wetlands and drainage lines were identified, which need to be protected.
- A 45m buffer zone around wetlands and man-made dams was determined.
- No protected species were found in wetlands and drainage lines on site.
- Care must be taken not to negatively affect the sensitive rocky outcrops and wetland ecosystems (wetlands and man-made dams).
- Development / construction within 500m from watercourses require an application for a Water Use Licence to the Department of Water and Sanitation.

- Measures to control erosion must always be applied.
- No dumping of building waste or spoil material from the development should take place on areas other than a licenced landfill site.
- Weed control measures must be applied to eradicate the noxious weeds in wetlands and drainage lines.
- An Environmental Control Officer (ECO) must be appointed to oversee that the aspects as stipulated in the Environmental Authorisation, are being carried out properly.

Refer to Sensitive Area Assessment Report in Annexure 5.1.

### **5.2.2 Vegetation Report**

A vegetation survey to assess the value of the plant diversity of the site.

#### **Omni Eko**

P.O. Box 30305

Pellissier

Bloemfontein

9322

Tel : 083 4505355

Fax : 086 6249573

Area of expertise: Fauna and Flora Specialist

### **Findings and Recommendations**

- Development activities may not be allowed to impact the areas identified for protection.
- All protected areas must be fenced off before the start of construction.
- All exotic, and especially invasive plant species must be eradicated. This must be accompanied by a long-term monitoring and a follow-up clearing program.
- No firewood may be collected in the veld.
- No plant collection should be allowed on site.
- Illegal squatting should not be allowed.

- Only local indigenous trees and shrubs must be planted in the open areas along the roads.
- Strict control measures must be in place to monitor rehabilitation activities.
- Plant species of special concern should be removed and rehabilitated on completion of the project. The site should be rehabilitated as close as possible to its original condition.
- Construction camp and site offices must be removed and rehabilitated on completion of the project. The site should be rehabilitated as close as possible to its original condition.
- Topsoil should be removed from the development footprint and stockpiles for use in rehabilitation efforts. Topsoil is considered to be a minimum of  $\pm 300$ mm thickness of the natural soil, including all vegetation and organic matter.
- Weeds appearing on stockpiled topsoil shall be removed by hand before seeding.
- Measures to prevent erosion such as berms, gabions, and mats must also be installed where necessary.
- A list of indigenous ornamental plants that will be recommended must be made available.

Refer to Annexure 5.2 for the Flora Report.

### **5.2.3 Fauna Report**

A fauna survey to assess the value of the diversity of indigenous animals on the site.

**Omni Eko**

P.O. Box 30305

Pellissier

Bloemfontein

9322

Tel: 083 4505355

Fax : 086 6249573

Area of expertise: Fauna and Flora Specialist

### **Findings and Recommendations**

- The farm still has a surprisingly healthy and diverse population of indigenous plant species and communities which provide an ideal habitat for small indigenous fauna.
- To conserve animal diversity, undisturbed areas must be protected from invasion by exotic plants.
- All exotic plant species must be cleared. This must be accompanied by a long-term monitoring and follow up clearing program.
- No firewood may be collected in the veld.
- No plant collection or gathering of firewood should be allowed on site.
- The vegetation outside the development footprint should be rehabilitated as close as possible to natural veld, creating a safe sanctuary for animals.
- No fauna may be harmed or disturbed on the property.
- Strict control measures must be in place to monitor rehabilitation activities.

Refer to Annexure 5.3 for the Fauna Report.

#### **5.2.4 Phase 1 Heritage Impact Assessment**

A Phase 1 Assessment to evaluate the palaeontological, heritage and historical significance of the site.

**L. Rossouw & H.J. Haasbroek**

National Museum

P.O. Box 266

Bloemfontein

9300

Tel: 084 2505992

Email: lloyd@nasmus.co.za

Area of expertise: Palaeontology and Heritage Specialist

### **Findings and Recommendations**

#### **Palaeontology:**

- It is unlikely that the proposed development will affect palaeontological heritage resources within the superficial component (Quaternary overburden).

- The palaeontological significance of the Quarternary overburden at Brandkop is considered to be very minor, assigned a field rating of Generally Protected C (GP.C).
- The likelihood of impact on palaeontological material from fresh sedimentary bedrock strata, which may occur further away from the koppies, is considered low.
- If *in situ* fossils material is exposed as a result of excavations into fresh sedimentary bedrock, it should be reported to SAHRA and a Palaeontologist asap.
- Capped sedimentary bedrock unaffected by dolerite intrusions that underlies the low topography terrain between the koppies, is assigned a field rating of Generally Protected B (GP.B).

#### Archaeology:

- It is unlikely that the proposed development will result in any significant archaeological impact at the site.
- The site is regarded as of low archaeological significance and is assigned the rating of Generally Protected C (GP.C).

#### History:

- The farm house, cottage, graveyard, stone-walled component, surrounding structures and dam walls are older than 60 years of age, and are of significant historical value and any alteration to or destruction of these structures will be in contravention of Section 34 and 36 of the National Heritage Resources Act.
- The structure and integrity of the Brandkop farmstead and associated historical structures are conserved and developed in accordance with heritage legislation (e.g. where restoration is required in order to save structure).
- The farmstead and associated historical structures are assigned a rating of Local Significance Grade 3A.
- The groves, trees associated with historical settlements or farmsteads, that are older than 60 years, are generally protected as heritage sites with cultural significance. Their removal or

destruction will require the appropriate consent and a destruction permit from the relevant heritage authorities.

- The historical groves should be preserved. They are assigned a rating of Local Significance Grade 3A.

Refer to Annexure 5.4 for the full report.

#### **5.2.5 Soil Suitability**

An evaluation of the soils of the site and their suitability for difference land uses.

##### **J.J. van Tol, R.H. van der Merwe & P.A. le Roux**

University of the Free State

P.O. Box 339

Bloemfontein

9300

Tel: 051 4012386

Area of expertise: Soil and Ecohydrology Specialists

#### **Findings and Recommendations**

- Soils plays several roles in the natural ecosystem.
- To mitigate the impact of agriculture and urban land-use types on the contribution of the soil in the ecosystem, the role of the different soil types must be taken into consideration in planning.
- The soils of Brandkop farm varies between shallow rocky, deep sandy and deep clayey, which support a variety of ecosystems.
- The plant population is an indicator of the role soils play in the distribution of water in the landscape (soil hydrology).
- Eight soil types occur on the farm:
- The suitability of soils for stable urban structures span the extremes found in South Africa. It is from best to worst: Mispah/Glenrosa, Hutton/Bainsvlei/Bloemdal, Tukulú/Oakleaf, Sepane/Swartland and Arcadia.
- Digging of trenches for municipal services is a serious problem on the Mispah, Swartland and Glenrosa soils, because they are shallow.



- Crop production under irrigation and conventional dryland agriculture best matches the soils in the order Bainsvlei/Bloemdal, Hutton, Tukulu/Oakleaf and Arcadia.
- Recreation use does not have strict requirements and all the soils are suitable depending on the type of activity.
- Specialised dryland cropping with Infield Rainwater Harvesting suit the Hutton, Bainsvlei, Bloemdal, Tukulu, Oakleaf, Swartland, Sepane and Arcadia soils.
- Requirements for on-site sewage disposal matches the Bainsvlei soils best and can be applied on several of the other soils.

Please note that this land suitability study was undertaken as part of the planning phase to determine the suitability of the soils on site for proposed development. Refer to the full Report in Annexure 5.5 for more detail.

#### **5.2.6 Bulk Civil Services Report**

A report on the bulk civil services to demonstrate the provision of infrastructure required for the proposed activity.

##### **Bigen Africa Services (Pty) Ltd**

Pieter de Wet  
P.O. Box 1070  
Bellville  
7535  
Tel: 021 9196976  
Fax : 021 9192508

Area of expertise: Consulting civil and structural engineers

#### **Findings and Recommendations**

##### **Bulk water:**

- The estimated water demand for the development is 6 567.9kℓ/day with a peak flow of 567.3ℓ/second.
- Bulk water supply to the Pellissier area is mainly from the Bloemwater distribution and storage zones.
- The Welbedacht reservoir has sufficient spare capacity to accommodate the development.
- Pellissier and Lourierpark are supplied directly from the Welbedacht reservoir through a 600mm diameter municipal main supply line.

- It is proposed that a 450mm diameter pipe be constructed from the 600mm diameter pipeline in Pellissier Drive to the eastern boundary of the development.

Sewer:

- The estimated sewage demand for the development is 5 050.1kℓ/day.
- The nearest existing sewer outfall with spare capacity is a 150mm diameter pipe located on the eastern side of the site in Lantern Drive, which gravitates to the main outfall sewer for Pellissier, the southern part of Fichardt Park, the Windmill Casino and Fauna. This eventually ends at the Welvaart Waste Water Treatment Works (WWTW).
- The Welvaart WWTW has a spare capacity of 2.7Mℓ/day, therefore able to accommodate 54% of the development.
- For the Brandkop development to expand by more than 54%, the Welvaart WWTW will have to be upgraded.
- For the first phase, an interim pump station and accompanying rising main will need to be constructed on the northern boundary of the site.
- When the spare capacity of the sewage network has been reached, a new permanent pump station will be constructed in the north western corner of the site.

Storm water:

- Refer to plan in Annexure 5.6.

Solid waste removal:

- The Mangaung Metro Municipality has confirmed that there is sufficient spare capacity to accommodate the development.

The Bulk Services Availability Report and its accompanying plans are included in Annexure 5.6.

### **5.2.7 Electrical Services Report**

A report on the electrical services to demonstrate the capacity demand and provision of electricity required for the proposed development.

#### **FCE Consulting Engineers**

Coenie van der Merwe  
39 Brebner Street  
Westdene  
Bloemfontein  
9301  
Tel: 051 4038596  
Fax : 051 4301776

Area of expertise: Electrical engineers

#### **Findings and Recommendations**

- The proposed area for this development is currently not serviced with electrical infrastructure that could cater for high electrical load densities such as for urban areas.
- The proposed development falls within the current supply area of Centlec and falls within the SDF.
- The first phase of the development will have a load requirement of 3MVA and is to take place over a period of three years.
- The entire development will have a load capacity of 15 – 20 MVA.
- Only 1 MVA is available on the existing Centlec infrastructure and that new electrical infrastructure would have to be established.
- In order to develop this development to its full capacity, a 132KV overhead powerline and 15-20MVA distribution centre must be built.

See Annexure 5.7 for the full Electrical Engineering Services Report.

### **5.2.8 Traffic Impact Study**

An assessment to determine the traffic impact of the proposed development.

#### **WSP Group Africa**

Richard Raven  
1<sup>st</sup> Floor  
46 2<sup>nd</sup> Avenue  
Bloemfontein  
9301

Tel: 051 4471586  
Email: richard.raven@wspgroup.co.za

Area of expertise: Consulting traffic engineers

### **Findings and Recommendations**

- The development can generate 5 268 trips during the AM-Peak period, 5 609 trips during the PM-Peak period and 3 178 trips during the Saturday Peak period if fully developed. (A traffic lane can at most accommodate about 1800 vehicles per hour.)
- The provision of the future Inner Ring Road and Municipal Road across the Brandkop Raceway will be required for the full development. A re-alignment of the inner ring road will be required.
- Five (with a possible sixth) accesses are envisaged for the proposed development. The main access as an extension of Volkspele Drive, another will connect indirectly onto Pellissier Drive. A third access is envisaged on the south-eastern corner of the development and connect to the Jagersfontein Road through the Brandkop municipal project. Two further accesses are envisaged on the western side of the development with access onto the future inner ring road. The sixth possible access is to be located on the northern side of the development with access onto the future inner ring road.
- Other latent developments such as the Lourierpark extension, the Brandkop Municipal development, the Brandkop Raceway development, and the Cecilia Park development will also make use of the main routes that the proposed development will utilize. The holistic capacity requirements and necessary practically possible road upgrades need to be established.

Refer to Annexure 5.8 for more detail on the Traffic Impact Study undertaken.

#### **5.2.9 Socio-economic Impact Study**

An assessment to determine the socio-economic impact of the proposed development was undertaken by:

**Urban-Econ Development Economists**

Lakeview Office Park  
137 Muckelneuk Drive  
Brooklyn  
Pretoria  
Tel: 012 3428686  
Email: pta@urban-econ.com

Area of expertise: Property development economists

**Findings and Recommendations**

The total impact of the proposed development has been calculated as:

- R23,36 billion in the construction phases and R1,35 billion in operational expenditure of impact value of new business sales experienced.
- R7.33 billion in GDP contribution during the construction phase and R857 million with regard to operational GDP contribution.
- 27 277 jobs created / sustained during the construction phase and 1 923 sustainable jobs created during operations.
- R3,82 billion in income can be expected to be generated during the construction phase with R558 million in income during the operation phase.
- The proposed Brandkop development is anticipated to generate approximately R131 622 368 per annum in property rates once fully constructed.

The Economic Impact Assessment with more detail on the separate Villages (phases) of the proposed development is included in Annexure 5.9.

## 6. IMPACT ASSESSMENT

### 6.1 METHODOLOGY

Impact assessment must take into account the nature, scale and duration of effects on the environment and whether such effects are positive (beneficial) or negative (detrimental). Each issue / impact is also assessed according to the project stages from planning, through construction and operation to the decommissioning phase (if applicable). Where necessary, the proposal for mitigation or optimisation of an impact is noted. A brief discussion of the impact and the rationale behind the assessment of its significance has also been included.

A rating system is applied to the potential impact on the receiving environment and includes an objective evaluation of the mitigation of the impact. In assessing the significance of each issue the following criteria is used:

<b>Nature</b>	A brief description of the environmental aspect being impacted upon by a particular action or activity is presented.								
<b>Extent (Scale)</b>	<p>Considering the area over which the impact will be expressed. Typically, the severity and significance of an impact have different scales and as such bracketing ranges are often required. This is often useful during the detailed assessment phase of a project in terms of further defining the determined significance or intensity of an impact.</p> <table> <tr> <td>Site</td> <td>Within the construction site</td> </tr> <tr> <td>Local</td> <td>Within a radius of 2 km of the construction site</td> </tr> <tr> <td>Regional</td> <td>Between 2 and 30 km from the site</td> </tr> <tr> <td>National</td> <td>The whole of South Africa</td> </tr> </table>	Site	Within the construction site	Local	Within a radius of 2 km of the construction site	Regional	Between 2 and 30 km from the site	National	The whole of South Africa
Site	Within the construction site								
Local	Within a radius of 2 km of the construction site								
Regional	Between 2 and 30 km from the site								
National	The whole of South Africa								
<b>Duration</b>	<p>Indicates what the lifetime of the impact will be.</p> <table> <tr> <td>Short-term</td> <td>The impact will either disappear with mitigation or will be mitigated through natural processes in a span shorter than the construction phase</td> </tr> <tr> <td>Medium-term</td> <td>The impact will last for the period of the construction phase, where after it will be entirely negated</td> </tr> <tr> <td>Long-term</td> <td>The impact will continue or last for the entire operational life of the development, but will be mitigated by direct human action or by natural processes thereafter</td> </tr> <tr> <td>Permanent</td> <td>The only class of impact which will be non-transitory. Mitigation either by man or natural process will not occur in such a way or in such a time span that the impact can be considered transient</td> </tr> </table>	Short-term	The impact will either disappear with mitigation or will be mitigated through natural processes in a span shorter than the construction phase	Medium-term	The impact will last for the period of the construction phase, where after it will be entirely negated	Long-term	The impact will continue or last for the entire operational life of the development, but will be mitigated by direct human action or by natural processes thereafter	Permanent	The only class of impact which will be non-transitory. Mitigation either by man or natural process will not occur in such a way or in such a time span that the impact can be considered transient
Short-term	The impact will either disappear with mitigation or will be mitigated through natural processes in a span shorter than the construction phase								
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Long-term	The impact will continue or last for the entire operational life of the development, but will be mitigated by direct human action or by natural processes thereafter								
Permanent	The only class of impact which will be non-transitory. Mitigation either by man or natural process will not occur in such a way or in such a time span that the impact can be considered transient								
<b>Intensity</b>	<p>Describes whether an impact is destructive or benign.</p> <table> <tr> <td>Low</td> <td>Impact affects the environment in such a way that natural, cultural and social functions and processes are not affected.</td> </tr> <tr> <td>Medium</td> <td>Effectuated environment is altered, but natural, cultural and social functions and processes continue albeit in a modified way.</td> </tr> <tr> <td>High</td> <td>Natural, cultural and social functions and processes are altered to extent that they temporarily cease.</td> </tr> </table>	Low	Impact affects the environment in such a way that natural, cultural and social functions and processes are not affected.	Medium	Effectuated environment is altered, but natural, cultural and social functions and processes continue albeit in a modified way.	High	Natural, cultural and social functions and processes are altered to extent that they temporarily cease.		
Low	Impact affects the environment in such a way that natural, cultural and social functions and processes are not affected.								
Medium	Effectuated environment is altered, but natural, cultural and social functions and processes continue albeit in a modified way.								
High	Natural, cultural and social functions and processes are altered to extent that they temporarily cease.								

	Very high	Natural, cultural and social functions and processes are altered to extent that they permanently cease.
<b>Probability</b>	Describes the likelihood of an impact actually occurring.	
	Improbable	Likelihood of the impact materializing is very low.
	Possible	The impact may occur.
	Highly probable	Most likely that the impact will occur.
	Definite	Impact will certainly occur.
<b>Significance</b>	Significance is determined through a synthesis of impact characteristics. It is an indication of the importance of the impact in terms of both physical extent and time scale, and therefore indicates the level of mitigation required.	
	Low impact	No permanent impact of significance. Mitigatory measures are feasible and are readily instituted as part of a standing design, construction or operating procedure.
	Medium impact	Mitigation is possible with additional design and construction inputs.
	High impact	The design of the site may be affected. Mitigation and possible remediation are needed during the construction and/or operational phases. The effects of the impact may affect the broader environment.
	Very high impact	The design of the site may be affected. Intensive remediation as needed during construction and/or operational phases. Any activity which results in a "very high impact" (negative) is likely to be a fatal flaw.
<b>Status</b>	Denotes the perceived effect of the impact on the affected area.	
	Positive (+)	Beneficial impact
	Negative (-)	Deleterious or adverse impact
	Neutral Impact is neither beneficial nor adverse.	
	It is important to note that the status of an impact is assigned based on the <i>status quo</i> – i.e. should the project not proceed. Therefore not all negative impacts are equally significant.	

## 6.2 VEGETATION DESTRUCTION

Assessment: Vegetation Destruction						
<b>Nature</b>	A portion of the natural vegetation on the site (51.2%) will be transformed by the development of erven and subsidiary infrastructure, thereby resulting in loss of animal life too.					
	<b>Extent</b>	<b>Duration</b>	<b>Intensity</b>	<b>Probability</b>	<b>Significance</b>	<b>Status</b>
<b>Without Mitigation</b>	Local	Permanent	Very high	Highly probable	High	Negative
<b>With Mitigation</b>	Site	Long term	Medium	Highly probable	Medium	Negative

### Mitigation Recommendations

See specialist report recommendations in Section 5.2.2.

### **Planning phase**

- Sensitive areas, like the rocky outcrops on Plantkop and Brandkop will be left undeveloped and retained for conservation and recreation purposes.
- A search and rescue exercise, to remove and transplant those protected plant specimens that will be destroyed during the construction phase, must be conducted before construction commences.
- The development areas should be demarcated before construction commences so that unnecessary destruction of natural vegetation is prevented.

### **Construction phase**

- Care should be taken to limit destruction of the natural vegetation unnecessarily.
- All human movement and activities must be contained within designated construction areas in order to prevent peripheral impacts on surrounding natural habitat;
- No fire-wood may be collected in the veld.

### **Post Construction phase**

- Species, especially grasses, trees and shrubs occurring in the region must be used to rehabilitate disturbed areas.
- An alien control and monitoring programme must be developed starting during the construction phase and to be carried over into the operational phase.
- Erosion should be prevented as far as possible and attended to, as serious erosion may occur at barren areas.

## **6.3 IMPACT ON WETLANDS**

As seasonal drainage lines transect the site, a wetland specialist was appointed to evaluate the wetlands and make recommendations regarding development on the site.



Assessment: Wetlands						
<b>Nature</b>	Possible damage to wetland areas due to development / construction activities.					
	Extent	Duration	Intensity	Probability	Significance	Status
<b>Without Mitigation</b>	Regional	Long term	High	Highly probable	High	Negative
<b>With Mitigation</b>	Site	Medium term	Medium	Possible	Low	Negative

### Mitigation Recommendations

#### Planning phase

- A Water Use Licence will need to be obtained from the Department of Water and Sanitation for and development / construction within 500m from a water course / wetland area.
- Sensitive wetland areas with a 45m buffer zone should be demarcated before construction commences so that unnecessary destruction of natural vegetation is prevented.

#### Construction phase

- All human movement and activities must be contained within the designated construction areas to prevent peripheral impacts on surrounding natural habitat.
- Measures to control erosion must always be applied.
- No dumping of building waste or spoil material should take place.
- Weed control measures must be applied to eradicate the noxious weeds in wetlands and drainage lines.

#### Post Construction phase

- Measures to control erosion must always be applied.
- No dumping of building waste or spoil material should take place.
- Weed control measures must be applied to eradicate the noxious weeds in wetlands and drainage lines.

## 6.4 SOIL SUITABILITY

Assessment: Soil Suitability						
<b>Nature</b>	Possible secondary impacts like erosion if the soil suitability of the site is not suited to development and installation of services.					
	<b>Extent</b>	<b>Duration</b>	<b>Intensity</b>	<b>Probability</b>	<b>Significance</b>	<b>Status</b>
<b>Without Mitigation</b>	Local	Long term	Very high	Highly probable	High	Negative
<b>With Mitigation</b>	Site	Medium term	Medium	Possible	Low	Neutral

### Mitigation Recommendations

See specialist report recommendations in Section 5.2.5.

#### Planning phase

- The Soil Suitability assessment undertaken assisted in the planning of the layout of the proposed development.

#### Construction phase

- Erosion should be prevented as far as possible and attended to, as serious erosion may occur at barren areas.

#### Post Construction phase

- Erosion should be prevented as far as possible and attended to, where necessary.

## 6.5 BULK INFRASTRUCTURE

The proposed development will include the following infrastructure that could have possible impacts on the environment. These include:

- Water provision
- Storm water drainage
- Electrical infrastructure
- Roads
- Sanitation

- Solid waste disposal

Bulk civil services and electrical services reports for the proposed development have been compiled and are included in Annexures 5.6 and 5.7.

<b>Assessment: Bulk Infrastructure</b>						
<b>Nature</b>	Increase in load on the available bulk services.					
	<b>Extent</b>	<b>Duration</b>	<b>Intensity</b>	<b>Probability</b>	<b>Significance</b>	<b>Status</b>
<b>Without Mitigation</b>	Regional	Permanent	High	Definite	Very high	Negative
<b>With Mitigation</b>	Local	Long term	Medium	Possible	Medium	Neutral / Positive

### **Mitigation Recommendations**

#### **Planning phase**

- A 450mm diameter pipe needs to be constructed from the 600mm diameter pipeline in Pellissier Drive to the eastern boundary of the development to accommodate the water demand for the development.
- For the Brandkop development to expand by more than 54%, the Welvaart WWTW would need to be upgraded.
- Necessary pump stations and accompanying rising mains need to be constructed (sewage).
- A 132KV overhead powerline and a 15-20MVA distribution centre need to be constructed for the development at its full capacity.
- Construction within 500m from watercourses require a Water Use Licence prior to commencing.

#### **Construction phase**

- Care should be taken to limit destruction of the natural vegetation unnecessarily.
- All human movement and activities must be contained within designated construction areas in order to prevent peripheral impacts on surrounding natural habitat;

- Topsoil should be removed where trenches are to be excavated and used for rehabilitation once services have been installed.
- Erosion must be prevented at all times.

#### **Post Construction phase**

- Species, especially grasses, trees and shrubs occurring in the region must be used to rehabilitate disturbed areas.
- Weed eradication is required until vegetation has established, where applicable.
- Erosion should be prevented as far as possible.

### **6.6 VISUAL IMPACT**

The visual impact of the proposed development in the landscape is the function of several factors of which the viewing distance, visual absorption capacity and landform are measurable. Other factors are difficult to categorize because they are subjective viewpoints.

The visual impact for the proposed development is largely due to:

- The extent of the proposed development.
- Distance from roads.
- The visual absorption capacity of the surrounding landscape.

The critical viewpoints for this development would be surrounding residences of Pellissier and Kwaggafontein, as well as walking trails near Brandkop.

A visual impact assessment was not deemed necessary as the proposed development is within the urban edge of Bloemfontein, the koppies will not be developed and the proposed development has been designed to be aesthetically pleasing, with large areas being left open.

<b>Assessment: Visual Impact</b>						
<b>Nature</b>	The landscape will be altered by the development.					
	<b>Extent</b>	<b>Duration</b>	<b>Intensity</b>	<b>Probability</b>	<b>Significance</b>	<b>Status</b>
<b>Without Mitigation</b>	Regional	Long term	Medium	Definite	High	Negative
<b>With Mitigation</b>	Regional	Long term	Medium	Highly probable	Low	Neutral

### **Mitigation Recommendations**

#### **Planning phase**

- The Brandkop and Platkop koppie are left undeveloped.
- Aesthetically pleasing designs and visual integrity principles have been incorporated into the site development plan.

#### **Construction phase**

- Construction sites must be kept neat and tidy at all times.
- All human movement and activities must be contained within designated construction areas.
- No dumping of construction debris is allowed, especially within the open space areas.

#### **Post Construction phase**

- A landscaping plan needs to be implemented.

## **6.7 TRAFFIC IMPACT**

Due to the extent of, and the increase of trips anticipated as a result of the proposed development, a traffic impact study has been undertaken. This study has been undertaken and is included in Annexure 5.8.

Assessment: Traffic Impact						
<b>Nature</b>	Increase in traffic on surrounding roads.					
	<b>Extent</b>	<b>Duration</b>	<b>Intensity</b>	<b>Probability</b>	<b>Significance</b>	<b>Status</b>
<b>Without Mitigation</b>	Regional	Permanent	High	Definite	Very high	Negative
<b>With Mitigation</b>	Local	Long term	Medium	Possible	Medium	Negative / Neutral

### Mitigation Recommendations

See specialist report recommendations in Section 5.2.8.

### Planning phase

- Provision of the future Inner Ring Road and Municipal Road across the Brandkop Raceway is required.
- Five (with a possible sixth) accesses are envisaged.

### Construction phase

- Not applicable.

### Post Construction phase

- Not applicable.

## 6.8 SOCIO-ECONOMIC IMPACT

The proposed development will have an effect on different levels of economic activity in the area and benefit the economy by creating jobs, generating business sales, improving quality of life and increasing disposable income. Refer to the Report in Annexure 5.9.

Assessment: Socio-economic impact						
<b>Nature</b>	Effects on the level of economic activity in the area due to a new development and infrastructure.					
	<b>Extent</b>	<b>Duration</b>	<b>Intensity</b>	<b>Probability</b>	<b>Significance</b>	<b>Status</b>
	National	Long term	Medium	Highly probable	High	Positive

## 7. ENVIRONMENTAL IMPACT STATEMENT

### 7.1 SUMMARY OF KEY FINDINGS

- Sensitive areas were identified and are accommodated in the site development plan.
- Large areas (approximately 150ha) will be maintained for conservation, recreation and as open spaces.
- Plant and animal diversity will be conserved in undisturbed areas.
- The historical manor house, farmstead and associated historical structures, like the tree grove, will be conserved.
- It is unlikely that the proposed development will affect palaeontological heritage resources, nor result in any archaeological impacts.
- Necessary engineering services can be provided.
- Traffic can be accommodated with necessary road upgradings.
- Significant job creation (27 277 jobs during construction and 1923 during the operational phase), new business sales, GDP growth and locally generated income are anticipated.

### 7.2 SUMMARY OF POSITIVE & NEGATIVE IMPACTS

Table 5: List of positive and negative impacts

Positive	Negative
Socio-economic boost to the region.	Destruction of natural vegetation within the development footprint.
Upgrade of bulk services.	Possible damage to wetland to wetland areas due to construction activities.
	Possible secondary impacts like erosion if soil type is not suited to development and installation of services.
	Increase in load on available bulk services.
	Visual impact due to landscape being altered.
	Increase in traffic.

Refer to the raft EMPr in Annexure 6 for recommended mitigation measures.

### **7.3 ASSUMPTIONS AND LIMITATIONS**

#### **7.3.1 Assumptions**

The information obtained from all the specialist studies is accurate.

#### **7.3.2 Limitations**

Vegetation cover at the site may have limited a complete inspection of the ground for surface remnants of archaeological or historical material.



## 8. CONCLUSION & EAP DECLARATION

Sustainable development and best environmental practices are the driving forces behind this proposed development. Most specialist input was obtained during the planning phase of the development and was incorporated into the site development plan. Sensitive and historic areas will be conserved and enhanced by the development. The no-go alternative, i.e. keeping the site in its current state and not proceeding with the proposed development, is not recommended, as the sensitive natural areas and historical features on the site would further deteriorate if left as is.

An Environmental Management Programme (EMPr) is required for the activity to minimize any negative impacts during the different phases of the development, especially the construction phase. The EMPr contains guidelines and recommendations for minimizing the impacts identified during the EIA as well as address the rehabilitation of disturbed areas. A Draft EMPr is included in Annexure 6 of this report. With responsible construction and rehabilitation practices, most negative impacts anticipated can be mitigated.

A well planned and very professionally designed development is proposed for a site which already lies within the urban edge of Bloemfontein. The proposed development's expected economic boost to the area will be beneficial to Bloemfontein.

In light of the above and in the view of the Environmental Assessment Practitioner (EAP), the information contained in this report and the documentation attached hereto are sufficient to make a decision in respect of the activity applied for. There is no obvious environmental reason for Environmental Authorisation to be denied.

The EAP declares that the EIA process was conducted objectively and the information provided in this report is correct. All comments and inputs from I&AP's received to date have been included. Specialist input and recommendations have been included.

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Marguerite Cronje

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Date

## 9. REFERENCES

DENNIS MOSS PARTNERSHIP (2016). *Brandkop Development: 2nd Draft Sustainability Framework*.

MANGAUNG METRO MUNICIPALITY (2016). *Reviewed Integrated Development Plan (IDP) 2016/17*.

MUCINA, L. & RUTHERFORD, M.C. (eds) (2006). *The vegetation of South Africa, Lesotho and Swaziland*. Strelitzia 19. South African National Biodiversity Institute, Pretoria.

SMITHERS, R. (1986). *Land Mammals of Southern Africa*. Johannesburg: MacMillan, South Africa Ltd.