DRAFT ENVIRONMENTAL IMPACT REPORT:

THE ESTABLISHMENT OF A RURAL VILLAGE ON THE REMAINING EXTENT OF THE FARM TOEVLUGT 320 JS, MIDDELBURG

Report prepared for: Botshabelo Community Development Trust

Report dated: October 2013 (draft)

Report number: EIA 2011/01

DEDET reference number: 17/2/3 N-167

Prepared by:
Clean Stream Environmental Services
P.O. Box 647
Witbank
1035
Tel: 013 – 697 5021
Fax: 013 – 697 5021
E-mail: info@cleanstreamsa.co.za

Author: A. Erasmus and R. Janse van Rensburg

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1. INTRODUCTION

The project applicant, *Botshabelo Community Development Trust,* intends to establish a rural village on the Remaining Extent of the farm Toevlugt 320 JS, Middelburg. Approximately 1000 'Residential 1' stands, a business stand, community facilities and a combined school are proposed. The site is located within the Botshabelo Nature Reserve, approximately 9 km north of Middelburg along the N11 national road.

The Botshabelo Nature Reserve forms part of a farm that was purchased in 1865 by Alexander Merensky, with the intent to establish a missionary. The mission station was called Botshabelo, meaning 'Place of Refuge'. Between 1860 and 1865, two missionaries (Alexander Merensky and Heinrich Gruntzner) decided to extend their missionary work to the Swazi and Pedi people. The ruler of the area, Chief Sekhukune, suppressed Christianity and ordered Merensky to leave his country. Merensky and his followers (including remnants of the Kopa tribe) subsequently started the Botshabelo Mission Station.

The Mission Station eventually developed into a small town, where the gospel was proclaimed, people received education and where commerce and industry were practised. A fort (Fort Wilhelm) was also constructed to protect the Mission Station against any possible attacks by Chief Sekhukune. By 1873, there were 1315 people living at Botshabelo.

In 1972, the city council of Middelburg purchased Botshabelo, which is now a historical town surrounded by a nature reserve. The fort (now called Fort Merensky) was restored and is now in the possession of the Simon van der Stel Foundation. The Botshabelo Nature Reserve was developed to promote tourism and includes various hiking trails, accommodation and a Ndebele village.

The Remaining Extent of the farm Toevlugt 320 JS, which forms part of the Botshabelo Nature Reserve, was awarded to the Botshabelo Community Development Trust in 2005 as part of a Land Claim. The community (930 beneficiaries) indicated that they intend to resettle on the said property. The Steve Tshwete Local Municipality subsequently agreed to assist the community to establish a township on their land.

The entire property is 2 755 ha in extent, of which approximately 130 ha will be utilized for the rural village.

The Minister of Environmental and Water Affairs listed in terms of Sections 24(2) and 24D of the National Environmental Management Act, 1998 (Act No. 107 of 1998), a number of activities that require an environmental impact assessment (either a Basic Assessment or a full Environmental Impact Assessment) before undertaking these activities.

The proposed development would involve the following listed activities as identified in terms of Section 24(2) and 24D of the National Environmental Management Act, 1998:

Listing	Description
GN R545-Listing Notice 2	***15.*** *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; except where such physical alteration takes place for: (i) linear development activities; or (ii) agriculture or afforestation where activity 16 in this Schedule will apply.*
GN R546-Listing Notice 3	***4.*** *The construction of a road wider than 4 metres with a reserve less than 13,5 metres.*
	14. *The clearance of an area of 5 hectares or more of vegetation where 75% or more of the vegetative cover constitutes indigenous vegetation, except where such removal of vegetation is required for:(1) purposes of agriculture or afforestation inside an area identified in spatial instruments adopted by the competent authority for agriculture or afforestation purposes; (2) the undertaking of a process or activity included in the list of waste management activities published in terms of section 19 of the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008) in which case the activity is regarded to be excluded from this list; (3) the undertaking of a linear activity falling below the thresholds in Notice 544 of 2010.*

In order to obtain environmental authorisation, a Scoping Report and an Environmental Impact Assessment Report must be compiled as described in Regulations 26 to 35 of the Environmental Impact Assessment Regulations, 2010, promulgated in terms of Section 24(5), 24M and 44 of the National Environmental Management Act, 1998 (Act 107 of 1998).

Clean Stream Environmental Services was appointed as independent environmental consultant to conduct the required environmental impact assessment and compile the necessary documentation. Subsequently, Clean Stream Environmental Services compiled a draft and final scoping report:

Title:	Scoping Report: The establishment of a rural village on the Remaining Extent of the farm Toevlugt 320 JS, Middelburg
Report compiled by:	Botshabelo Community Development Trust
Report prepared for:	Clean Stream Environmental Services
Report dated:	August 2012 (draft) and October 2012 (final)
Report number:	EIA 2011/01
DEDET ref. number:	17/2/3 N-167

The scoping report was submitted to the authorities (i.e. Department of Economic Development, Environment and Tourism, Department of Water Affairs, Steve Tshwete Local Municipality and Mpumalanga Tourism and Parks Agency) for evaluation. In addition, the draft and final scoping report were made available to interested and affected parties (I&AP's) and stakeholders for comment as indicated in Section 4 of this document. Based on the findings of the scoping phase and the comments received from the authorities, stakeholders and I&AP's (see Section 4 of this document), it was decided to commission the required specialist studies and continue with the full environmental impact assessment phase.

The aim of the environmental impact assessment phase was as follows:

- To supplement information contained in the Scoping Report regarding the natural and social environments of the site to be affected by the proposed development;
- To assess the potential impacts of the proposed development on the environment;
- To identify and recommend mitigation measures to minimize the potential impact of the development on the environment;
- To compile an Environmental Management Plan (EMP), which will include the recommended mitigation measures;
- To provide the Department of Economic Development, Environment and Tourism with sufficient information to make an informed decision regarding the proposed development.

2. DESCRIPTION OF THE ACTIVITY

This section provides:
- An indication of who the applicant is;
- An indication of what activity is to be undertaken;
- A brief overview of the proposed development and its associated infrastructure.

2.1 Details of the project applicant and environmental consultant

Name and address of applicant: Botshabelo Community Development Trust P.O. Box 3907 Polokwane 0700	
Contact person:	Ms. Mabel M. Motsifane
Telephone number:	-
Fax number:	013-245 9900
Cell number:	082 717 9209
e-mail address:	motsifanemabel@yahoo.com

Name and address of environmental consultant: Clean Stream Environmental Services P.O. Box 647 Witbank 1035	
Contact persons:	Mrs. A. Erasmus *Pr. Sci. Nat.* Ms. R. Janse van Rensburg
Cell number:	083 271 8260
Telephone number:	(013) 697 5021
Fax number:	(013) 697 5021
e-mail address:	adie@cleanstreamsa.co.za riana@cleanstreamsa.co.za

A copy of the Curriculum Vitae of both Mrs. A. Erasmus and Ms. R. Janse van Rensburg are provided in Appendix 2 together with a list of projects completed to date.

A copy of the completed application form and the declaration of independence by the applicant and environmental consultant are provided in Appendix 1.

2.2 Nature of the activity/development

The project applicant, *Botshabelo Community Development Trust,* intends to establish a rural village on the Remaining Extent of the farm Toevlugt 320 JS, Middelburg. Approximately 1000 'Residential 1' stands, a business stand, community facilities and a combined school are proposed. The site is located within the Botshabelo Nature Reserve, approximately 9 km north of Middelburg along the N11 national road.

The proposed development would involve the following listed activities as identified in terms of Section 24(2) and 24D of the National Environmental Management Act, 1998:

Listing	Description
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2.3 Scoping and Environmental Impact Assessment process description

Diagram 1 provides a schematic description of the Environmental Impact Assessment process to be followed. This process is strictly according to the above-mentioned Regulations. The aim of the process is to ensure that the environmental impacts are considered, the relevant I&APs are consulted and the decision making authorities are provided with sufficient information to make an informed decision.

The decision making authority is the Mpumalanga Department of Economic Development, Environment and Tourism (DEDET). This Department will decide to grant or refuse the approval of the project. On approval, an Environmental Authorisation and Record of Decision will be issued in the name of the project applicant.

The project applicant will be responsible for complying with the conditions set in the Environmental Authorisation and Record of Decision.

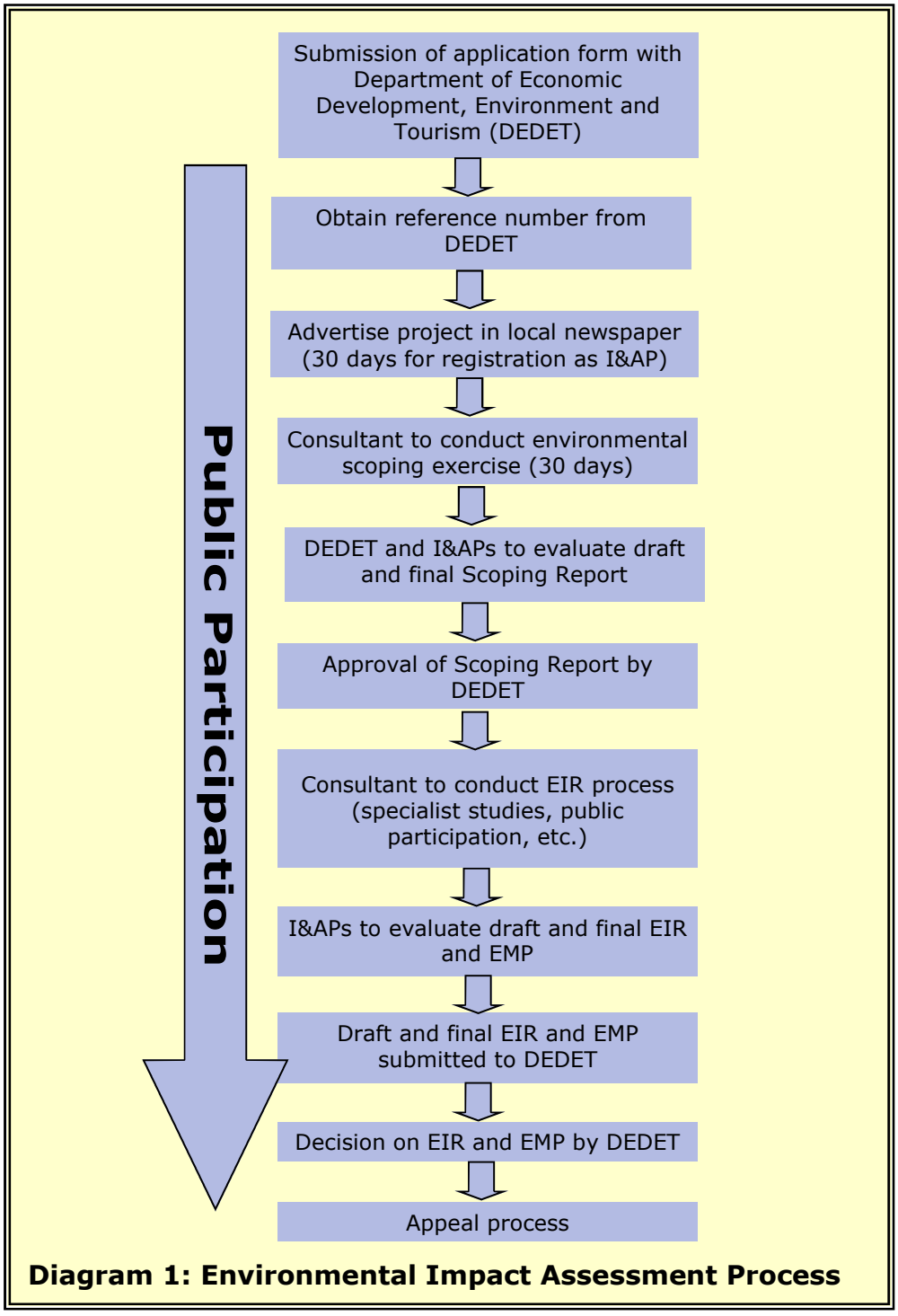


Diagram 1: Environmental Impact Assessment Process

2.4 Reason for project

The property on which the rural village is planned, was awarded to the Botshabelo Community Development Trust in 2005 as part of a Land Claim. The community indicated that they intend to resettle on the said property. According to the community, various legal processes were completed in the past in order to try and resettle on the said property. However, the necessary funding was never available to complete the resettling process.

In 2011, the Steve Tshwete Local Municipality managed to secure the required funding and agreed to assist the community to establish a township on their land.

2.5 Detailed description of the development and all relevant components

This section provides an overview of the proposed activity as originally indicated in the Scoping Report. It should be noted that a description of the alternative layout plans (including the preferred alternative) is provided in Section 6 of this report.

The Botshabelo Community Development Trust intends to establish a rural village on the Remaining Extent of the farm Toevlugt 320 JS, Middelburg. The site is located within the Botshabelo Nature Reserve, approximately 9 km north of Middelburg along the N11 national road (Figure 5.1).

The entire property is 2 755 ha in extent, of which approximately 130 ha will be utilized for the rural village.

Figure 2.1 provides an indication of the original layout plan (as presented in the Scoping Report) designed by Urban Dynamics Town and Regional Planners (2011) (hereafter referred to as Urban Dynamics). A copy of the Township Establishment Memorandum compiled by Urban Dynamics (2011) is provided in Appendix 3.

According to Urban Dynamics (2011), the proposed development will comprise of the following (Figure 2.1):

Zoning	Land use	No. of Stands	Average Size	% of Area	Area of Stands
Residential	Residential	1000	518.97 m^2	40.56%	51.90 ha
Business	Business	1	7620.58 m^2	0.59%	0.76 ha
Institutional	Community facility	3	3628.77 m^2	0.85%	1.08 ha
	Combined school	1	61862.96 m^2	4.84%	6.19 ha
Public Open Space	Park	26	19765.39 m^2	40.16%	51.39 ha
Street	Internal			13%	16.63 ha
Total		**1031**		**100%**	**127.95 ha**

Residential:
The average residential stand size will be 518.97 m^2 as agreed with the community during a community meeting at the start of the planning process. Approximately 41 % of the total area will comprise residential land uses.

Business:
The business stand (7 620.58 m^2) will be located in the centre of the development (Figure 2.1), which will make it accessible to all residents. The business stand could be used for a number of business activities including a small shopping area and taxi rank.

Institutional land use:
The institutional land use includes the 3 community facilities and the 1 combined school. The 3 community facilities will cater for uses such as churches, crèches, community halls, old age homes, clinics, etc. depending on the needs of the community.

The combined school will cover an area of 6.19 ha according to the Guidelines for Human Settlement Planning and Design.

Public Open Space:
A total of 26 public open spaces will be provided (Figure 2.1). The public open spaces make provision for stormwater management, fire breaks, buffer zones, soccer fields and wetlands present on site. Approximately 40% of the layout consists of public open spaces.

In terms of fire breaks, a park strip is provided around the entire development to safeguard the residents from veld fires during the dry season and to prevent fires from spreading from the development onto the surrounding land (Figure 2.1).

A 10 metre park strip will also be provided along the eastern boundary of the site to try and limit any potential impact from the development on the adjoining airfield.

Access road:
It is proposed that access to the development be obtained from the existing gravel road located on the northern boundary of the site (Figure 2.1). The gravel road connects with the N11 national road.

An alternative access road would be the existing access road to the Botshabelo Nature Reserve. However, this road is used by tourists who visit the historical site and cultural village. According to Urban Dynamics (2011), the intention is to keep residents and tourists separate.

The local distributor roads will be 16 m wide and the internal access roads will be 10 wide.

RESIDENTIAL SITES

THE AVERAGE SIZE OF RESIDENTIAL SITES ARE 518,97m²
THE MINIMUM STAND SIZE IS 500m²
THE RULING SIZE OF RESIDENTIAL SITES ARE 25m x 20m
THE MINIMUM WIDTH OF REGULAR RESIDENTIAL SITES ARE 20m
MINIMUM WIDTH OF PANHANDLE ACCESSES ARE 4m

ROADS

RESERVE WIDTHS OF ALL INTERNAL STREETS ARE 10m UNLESS OTHERWISE INDICATED ON THE PLAN
SPLAYS ON ALL STREETS ARE 5m x 5m UNLESS OTHERWISE INDICATED ON THE PLAN
THE WIDTH OF ALL TURNING CIRCLES SHOULD NOT BE LESS THAN 16m IN DIAMETER
MAXIMUM SLOPE ON ROADS 1 : 65
MINIMUM SLOPE ON ROADS 1 : 220

CONTOURS / CO-ORDINATES

CONTOURS ARE BASED ON STANDARDS LAID DOWN IN REGULATION 21(2) OF THE TOWN PLANNING AND TOWNSHIPS ORDINANCE (TVL) 25 OF 1965 AS AMENDED.
GEODETICAL SYSTEM : WGS 84
CONSTANTS Y : N.A. X : N.A.
DATE PLANE : SEA LEVEL

DIMENSIONS AND SIZES

ALL DIMENSIONS SHOWN ON THE PLAN ARE APPROXIMATE AND SCALE IN METRES

LAND SURVEYOR

BASE PLAN MAPPING WAS DONE BY THE FIRM JOHAN MEIRING LAND SURVEYOR AND I, THE UNDERSIGNED, HEREBY CERTIFY THE BASE PLAN INFORMATION

LAND SURVEYOR (PRINT):..... REG.No.....

(SIGN):..... DATE :.....

FLOODWATER

IT IS CERTIFIED THAT THE PROJECT AREA IS NOT AFFECTED BY FLOODWATERS IN TERMS OF THE SPECIFICATIONS LAID DOWN BY CLAUSE 144 OF THE WATERACT (ACT 36 OF 1998)

CIVIL ENGINEER (PRINT):.....PR.ENG. REG.No.....

(SIGN):.....

FIRM : STRYDOM & MALAN

DATE :.....

CIVIL ENGINEER'S CONSENT

IT IS HEREBY CERTIFIED THAT THE LAYOUT HAS BEEN CONSIDERED ACCEPTABLE BY STRYDOM & MALAN BEING THE CONSULTING ENGINEER APPOINTED BY THE CLIENT.

(PRINT):.....PR.ENG. REG.No.....

(SIGN):.....

FIRM : STRYDOM & MALAN

DATE :.....

GEOLOGICAL

THIS IS TO CERTIFY THAT THE TOWNSHIP LAYOUT ON THIS PLAN IS IN ACCORDANCE WITH THE PROVISIONS AND RECOMMENDATIONS AS SET OUT IN THE ENGINEERING GEOLOGICAL REPORT.

ENGINEERING GEOLOGIST (PRINT):.....

(SIGN):.....

FIRM : ENGEOLAB CC

DATE :.....

ZONE	NHBRC CLASS	RECOMMENDATIONS
1A	C,S	NORMAL CONSTRUCTION
1B	R,C,S	NORMAL CONSTRUCTION. USE POWERFUL EXCAVATORS
2A	C1,S1	MODIFIED NORMAL CONSTRUCTION
2B	P	MODIFIED NORMAL CONSTRUCTION WITH SUB-SURFACE DRAINAGE
2C	C2,S2	MODIFIED NORMAL CONSTRUCTION
2D	P	SIGNIFICANT DRAINAGE REQUIRED. ALTERNATIVELY RESERVE FOR RECREATION OR NO DEVELOPMENT.

TOWN PLANNER

NAME: JN HAMMAN
TOWN PLANNER TRP (SA) REG. NO: A/525/1987

SIGNATURE:

DATE: 31/08/2011

Figure 2.1: Layout Plan No. 1 ***(taken from Urban Dynamics, 2011)***

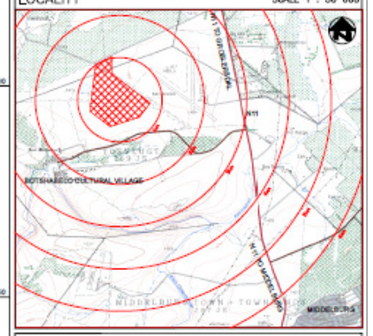
PROJECT

PROPOSED TOWNSHIP

BOTSHABELO RURAL VILLAGE

SITUATED ON A PORTION OF THE REMAINDER OF THE FARM TOEVLUGT 320-JS
LOCAL AUTHORITY : STEVE TSHWETE LOCAL MUNICIPALITY
DISTRICT : NKANGALA DISTRICT MUNICIPALITY

LOCALITY SCALE 1 : 50 000



LAND USE

Legend

	Land Use	No. of Stands	% of Area	Area of Stands
	Residential	1000	40.56%	51.90 ha
	Community facility	3	0.85%	1.08 ha
	Business	1	0.59%	0.76 ha
	Combined School	1	4.84%	6.19 ha
	Park	26	40.16%	51.39 ha
	Internal Street		13.00%	16.63 ha
	TOTAL	**1031**	**100%**	**127.95 ha**

GENERAL NOTES

THE FIGURE A,B,C,D,E,F,G & A REPRESENTS THE OUTSIDE BOUNDARY OF THE PROPOSED TOWNSHIP BEING APPROXIMATELY 127,95ha IN EXTENT.

- OUTSIDE BOUNDARY OF TOWNSHIP
- GEOTECHNICAL ZONES
- 16m BUILDING RETRICTION
- LINE OF NO ACCESS
- WETLAND AREA
- 50m WETLAND BUFFER

INDEMNITY

URBAN DYNAMICS MAKES NO WARRANTY OF ANY KIND, EXPRESSED OR IMPLIED, WITH REGARD TO THE DATA AND SHALL NOT BE HELD LIABLE IN ANY EVENT FOR ANY INCIDENTAL OR CONSEQUENTIAL DAMAGES IN CONNECTION WITH OR ARISING OUT OF THE USE OF THIS DATA. THIS DATA REMAINS THE SOLE PROPERTY OF THE CLIENT AND MAY ONLY BE USED FOR THE PURPOSES OF A PROJECT WITH THE PRIOR WRITTEN APPROVAL OF THE CLIENT.

AMENDMENTS

No.	DESCRIPTION	DATE	BY
1	COMMUNITY FACILITIES ADDED	31/08/2011	MZB
2	ZONES AMENDED AS PER GEOTECHNICAL REPORT	30/03/2012	MZB

DESIGNED	J.N. HAMMAN	COPYRIGHT RESERVED
DRAWN	M.Z. BOTHA	
APPROVED		
DATE	02-08-2011	
SCALE	1 : 2 500	
DRAWING No.	MID-293_2	
FILE NAME :	MID-293	

CLIENT

BOTSHABELO COMMUNITY DEVELOPMENT TRUST / STEVE TSHWETE LOCAL MUNICIPALITY

URBAN DYNAMICS
TOWN AND REGIONAL PLANNERS
URBAN DYNAMICS MPUMALANGA INC.
(REG. NO 95/03010/21)
PHOENIX BUILDING, 44 VOS STREET
MIDDELBURG 1055
TEL : (013) 2432629/2430856
FAX (013) 2432320

2.6 Services required

The Steve Tshwete Local Municipality proposes to install services (i.e. water, sewage, roads, electricity, etc.) in accordance with the minimum standard for rural villages as indicated in the Steve Tshwete Local Municipality policy. The Botshabelo Community Development Trust will be responsible for the initial costs of the services. After installation, the services will be handed over to the Steve Tshwete Local Municipality who will be responsible for the maintenance of the services.

According to Urban Dynamics (2011), early discussions with the community revealed that the level of services proposed by the municipality is not acceptable to the Botshabelo Community Development Trust. However, limited funds are available for the proposed development. Funding for the installation of the preferred level of services (i.e. waterborne sewage and bulk water supply) is currently not available.

2.6.1 Electricity

Currently, no electrical services are present on site. During the construction phase, electricity (if needed) would most probably be obtained from generators supplied by the contractor.

Electricity for the proposed development will be obtained from either the Steve Tshwete Local Municipality or Eskom. The choice of supplier will be determined during a later stage of the development and will depend on the costs involved.

It is estimated that the proposed development will require 3.6 MVA (calculated at 3 KVA ADM per household). There is an existing 11 kVA overhead supply line in the area to which the development can be connected. However, this line will have to be upgraded.

The following design parameters were recommended by RDV Consulting Electrical Engineers:

- Supply voltage – 11 000 Volt
- Supplier – Steve Tshwete Local Municipality
- Reticulation methodology – Midblock overhead system with pole mounted transformers at regular intervals;
- Area lighting – 30 m high mast lights situated at strategic positions throughout the development.

2.6.2 Water

Currently, no potable water is present on site. During the construction phase, the contractor would have to provide potable water to the site workers. Water for dust suppression would have to be obtained from boreholes within the Botshabelo Nature Reserve. No water may be abstracted from the nearby stream/pans unless a water use license is obtained from the Department of Water Affairs.

During the operational phase, water will be obtained from boreholes, which will be supplied by the Steve Tshwete Local Municipality. Three (3) potential borehole sites have been identified. The boreholes will be operated either by windmills and/or hand pumps.

Water will be pumped to high level water tanks and then distributed to pillar taps, which will be placed within a 100 m walking distance from all stands.

The following table provides an indication of the proposed standards for the infrastructure as based on the 'Human Settlement Planning and Design' guidelines under the patronage of the Department of Housing:

Average demand	20 l/capita/day
Pipe material	uPVC (main line) and HDPE house connections
Cover to pipe	800 mm minimum
Pillar taps	20 mm diameter

2.6.3 Sewage

Currently, no infrastructure for the disposal of sewage is present on site. During the construction phase, the contractor would have to provide chemical toilets.

Biological toilets will be provided for each stand. No details regarding the type of biological toilets to be installed are currently available. The biological toilets will be provided outside the houses and will have to be maintained by the Steve Tshwete Local Municipality.

2.6.4 Waste Disposal

During the construction phase, building rubble and domestic waste will have to be collected and disposed of by the contractor at the Middelburg (Rietfontein) Waste Disposal Site.

During the operational phase, refuse will be collected by the Steve Tshwete Local Municipality's refuse removal unit and will be disposed of at the Middelburg (Rietfontein) Waste Disposal Site. According to Urban Dynamics (2011), approximately 17 500 kg of domestic waste will be generated per week, based on 1 kg per person per day.

2.6.5 Access road

It is proposed that access to the development be obtained from the existing gravel road located on the northern boundary of the site (Figure 2.1). This road connects to the N11 national road and provides access to the farms located north and northwest of the proposed site.

An alternative access road would be the existing access road to the Botshabelo Nature Reserve. However, this road is used by tourists who visit the historical site and cultural village. According to Urban Dynamics (2011), the intention is to keep residents and tourists separate.

The local distributor roads will be 16 m wide and the internal access roads will be 10 wide. Internal roads will also be of a gravel standard, constructed to a 5 – 7.4 m width.

2.6.6 Storm water control measures

According to Urban Dynamics (2011), open concrete storm water drains will be constructed to drain surface water from the internal roads. The major access roads will include surface runoff in the road reserve combined with strategically placed catch pits and storm water pipes.

Provision was made in the layout plan for stormwater management between stands (Public Open Spaces; Figure 2.1).

2.7 Applicable legislation, policies and/or guidelines

Table 2.1 provides an indication of legislation, policies and/or guidelines applicable to the said project.

Table 2.1: Applicable legislation, policies and/or guidelines

Title of legislation, policy or guideline:	Administering authority:	Aim of legislation, policy or guideline
The Constitution of the Republic of South Africa, 1996 (Act 108 of 1996)		To establish a Constitution with a Bill of Rights for the RSA.
Development Facilitation Act, 1995 (Act 67 of 1995)		To provide for planning and development.
Town Planning and Townships Ordinance, 1986 (Ordinance 15 of 1986)		
Environment Conservation Act, 1989 (Act 73 of 1989)	Department of Economic Development, Environment and Tourism	To control environment conservation.
National Environmental Management Act, 1998 (Act 107 0f 1998)	Department of Economic Development, Environment and Tourism	To provide for the integrated management of the environment.
National Environmental Management: Air Quality Act, 2004 (Act 39 of 2004)	Department of Economic Development, Environment and Tourism	To reform the law regulating air quality in order to protect the environment by providing reasonable measures for the prevention of pollution and ecological degradation and for securing ecologically sustainable development while promoting justifiable economic and social development; to provide for national norms and standards regulating air quality monitoring, management and control by all spheres of government; for specific air quality measures; and for matters incidental thereto.
National Environmental Management: Biodiversity Act, 2004 (Act 10 of 2004)	Department of Economic Development, Environment and Tourism	To provide for the management and conservation of South Africa's biodiversity within the framework of the National Environmental Management Act, 1998; the protection of species and ecosystems that warrant national protection; the sustainable use of indigenous biological resources; the fair and equitable sharing of benefits arising from bioprospecting involving indigenous biological resources; the establishment and functions of a South African Biodiversity Institute; and for matters connected therewith.
National Environmental Management: Waste Act, 2008 (Act 59 of 2008)	Department of Economic Development, Environment and Tourism	To reform the law regulating waste management in order to protect health and the environment by providing for the prevention of pollution and ecological degradation and for securing ecologically sustainable development.
Environmental Impact Assessment Regulations, 2010 (Government Gazette No. 33306 of 18 June 2010)	Department of Economic Development, Environment and Tourism	Regulations pertaining to environmental impact assessments.
National Water Act, 1998 (Act 36 of 1998)	Department of Water Affairs	To control water management aspects.
Natural Heritage Resources Act, 1999 (Act 25 of 1999)	South African Heritage Resources Agency	This legislation aims to promote good management of the national estate, and to enable and encourage communities to nurture and conserve their legacy so that it may be bequeathed to future generations.
Conservation of the Agricultural	Department of Agriculture,	To provide control over the utilization of the

Title of legislation, policy or guideline:	Administering authority:	Aim of legislation, policy or guideline
Resources Act, 1983 (Act 43 of 1989)	Forestry and Fisheries	natural resources of the Republic in order to promote the conservation of soil, the water sources and the vegetation and the combating of weeds and invader plants; and for matters connected therewith.
Occupational Health and Safety Act, 1993 (Act 85 of 1993)	Department of Labour	
Health Act, 1977 (Act 63 of 1977)	Department of Health	To promote public health.
Mpumalanga Nature Conservation Act, 1998 (Act 10 of 1998)	Mpumalanga Tourism and Parks Agency	To control nature conservation.
Various by-laws of the Steve Tshwete Local Municipality	Steve Tshwete Local Municipality	To regulate land use with the Steve Tshwete Local Municipal area.
Integrated Development Plan for the Steve Tshwete Local Municipality	Steve Tshwete Local Municipality	Broad spatial framework guidelines for the Steve Tshwete Local Municipality.
Spatial Development Framework for the Steve Tshwete Local Municipality	Steve Tshwete Local Municipality	Spatially based policy guidelines whereby changes, needs and growth in the region can be managed to benefit the whole community.

3. FINDINGS OF THE SCOPING PHASE

This section provides:
- A summary of the findings of the scoping phase;
- An indication of additional studies required;
- An indication of additional public participation required.

3.1 Summary of findings

Through the scoping phase, it was determined that the main issues of concern are with regards to potential impacts on:
- The Botshabelo Nature Reserve (natural vegetation and animal life);
- The Middelburg Aeroclub;
- The surrounding farms (agriculture, safety and security);
- Groundwater;
- The Botshabelo historical village and Fort Merensky (archaeological/cultural).

In order to investigate the identified issues, the project was to proceed to the Environmental Impact Assessment phase.

3.2 Additional studies required

The following specialist studies were recommended as part of the EIA phase:
- Vegetation survey;
- Animal survey (terrestrial);
- Phase 1 heritage impact assessment;
- Wetland delineation survey;
- Groundwater/geohydrological study;
- Socio-economic impact assessment;
- Traffic study.

Vegetation study
De Castro and Brits Ecological Consultants was appointed to conduct a detailed vegetation survey. The findings are discussed in Section 5.7 and Section 8 of this report.

The terms of reference for the vegetation study were as follows:

- Determination of the Vegetation Type/Types in accordance with the most current national vegetation map (Mucina and Rutherford, 2006) and local vegetation studies, as well as proximity and relationship to any Centre of Endemism (Van Wyk and Smith 2001).
- Broad-scale structural classification of the vegetation into homogenous units following the approach of Edwards (1983). A description of the dominant and characteristic species identified within the broad-scale plant communities comprising each of these units. These descriptions to be based on visual estimates of cover/abundance and density following established vegetation survey techniques (Kent and Coker, 1996).
- Vegetation/habitat types to be mapped on the basis of available information (aerial photography, soil types, geology).
- Each identified vegetation unit to be briefly described in terms of its sensitivity and conservation importance.

- Compilation of a species list (to provide an accurate indication of the floristic diversity) according to latest taxonomic treatments used by the South African National Biodiversity Institute (Germishuizen *et al*., 2006). List of alien invasive species, as listed in the Conservation of Agricultural Resources Act (Act No.43 of 1983).
- Determination of the occurrence, or possible occurrence, of threatened and/or sensitive plant species, as per Raimondo *et al*. (2009), on the basis of field surveys, historical distribution records obtained from the PRECIS database of the National Botanical Institute, and available literature.
- Further botanical assessments required to be identified and Terms of Reference recommended.

Faunal study (terrestrial and aquatic)
A faunal study was undertaken by Dr. Andrew Deacon. The findings are discussed in Section 5.8 and Section 8 of this report.

The terms of reference for the faunal study were as follows:

- Describe the potential habitats available to fauna expected to occur within the area to be affected;
- Identify expected impacts on the area due to the proposed developments;
- Provide recommendations regarding appropriate mitigation and/or management measures to be implemented should the proposed activities be authorised.

Phase 1 Heritage Impact Assessment
A Phase 1 Heritage Impact Assessment (as required in terms of the National Heritage Resources Act, 1999 (Act No. 25 of 1999)) was conducted by Dr. Julius Pistorius, an accredited archaeologist. The findings are discussed in Section 5.13 and Section 8 of this report.

The terms of reference for the Phase 1 Heritage Impact Assessment were as follows:

- To establish whether any of the types and ranges of heritage resources as outlined in Section 3 of the National Heritage Resources Act (No 25 of 1999) occur in the Project Area and, if so, to determine the nature, the extent and the significance of these remains.
- To establish if any of these heritage resources will be affected by the proposed new residential development and, if so, to evaluate what appropriate mitigation measures could be taken to reduce the impact of the proposed residential development on these remains.

Wetland delineation survey
A wetland delineation study was undertaken by Wetland Consulting Services (Pty) Ltd. The findings are discussed in Section 5.9 and Section 8 of this report.

The terms of reference for the wetland study were as follows:

- Conduct a desktop and field investigation of the wetlands and/or riparian areas within the study area;
- Delineate and map the wetland and/or riparian areas;

- Classify wetlands according to HGM (see Marneweck and Batchelor, 2002; Kotze, Marneweck, Batchelor, Lindley and Collins, 2004; SANBI 2009);
- Determine the Present Ecological State (PES) and Ecological Importance and Sensitivity (EIS) of wetlands on site using WET-Health and the DWAF scoring system (DWAF, 1999);
- Undertake a functional assessment of the identified wetland systems (WET-EcoServices); and
- Provide a report detailing all the information.

Groundwater/geohydrological study
Engeolab cc. was appointed to conduct a groundwater/geohydrological study. The findings are discussed in Section 5.10 and Section 8 of this report.

The main objective of the investigation was to determine whether sustainable groundwater source(s) (yielding some 96m³ per day) are available on site. To this end, the scope of work included the following:

- Assess the groundwater potential of the site;
- Assess the development status and usage of existing groundwater resources on the proposed development site and its immediate surroundings.
- Investigate alternative resources to groundwater.

Socio-economic assessment
A socio-economic study was conducted by Plan Associates Town and Regional Planners Inc. in order to address the issues of concern raised by surrounding landowners. The findings are discussed in Section 5.18 and Section 8 of this report.

The objectives of the study were as follows:

- Conduct a socio-economic assessment study of the beneficiaries of the Botshabelo Community Development Trust;
- Outline the comments and issues raised by Interested and Affected Parties;
- Identify and evaluate the development impacts of the proposed rural village;
- Recommend mitigation measures for the possible impacts of the proposed development; and
- Provide an Action Plan Framework.

Traffic study
A traffic study was undertaken by WSP SA Civil and Structural Engineers (Pty) Ltd. The findings are discussed in Section 5.16 and Section 8 of this report.

The traffic study investigated access to the proposed site as well as the potential impact of the development traffic on the N11 national road and the gravel road.

The scope of work included the following:

Data collection
- Traffic Counts /Traffic Surveys

- Site Visit & Measurement of Intersections Geometrics

Traffic, analyses, drawing & report

- Traffic Data Collation.
- Trip Generation, Distribution & Assignment.
- Intersections Analyses.
- Locality Plan.
- Geometric Layout Plan (Accesses).
- Access & Traffic Impact Study Report

Liaison & submission

- Liaison / Discussion with Road Authorities
- Submission of Report

3.3 Additional public participation

The following additional public participation was recommended in the Plan of Study for EIA:

Evaluation of the Scoping Report

The draft Scoping Report (dated: August 2012) will be submitted to the Department of Economic Development, Environment and Tourism for evaluation purposes. A hard copy of the document will also be forwarded to the following authorities for evaluation (40-day period):

- Department of Water Affairs;
- Mpumalanga Tourism and Parks Agency;
- Steve Tshwete Local Municipality.

An electronic copy of the Scoping Report will be made available during the above-mentioned period to the interested and affected parties and stakeholders consulted and/or registered as part of the scoping process.

The availability of the draft Scoping Report for review will be advertised in the Middelburg Observer.

The various departments, stakeholders and interested and affected parties will be requested to forward any comments on the report to the consultant within the 40 day period provided. A register will be kept of all comments received in terms of the evaluation of the report. These comments will then be included and addressed in a final Scoping Report.

The final Scoping Report will once again be made available to interested and affected parties and stakeholders for comment (21-day period), whereafter it will be submitted to the Department of Economic Development, Environment and Tourism.

A hard copy of the Draft and Final Scoping Reports will be left at the Gerard Sekoto Public Library as well as the Botshabelo Nature Reserve offices. An electronic version will be made available on the company website (www.cleanstreamsa.co.za) and on cd (on request).

The Environmental Impact Report will be compiled once the Final Scoping Report has been approved by the Department of Economic Development, Environment and Tourism.

Public meeting
A public meeting will be held during the EIA phase in order to inform and obtain further issues of concern from interested and affected parties. Identified interested and affected parties will be informed of the public meeting.

An advertisement will also be placed in the local newspaper, Middelburg Observer, in order to inform I&APs of the intended public meeting.

Minutes of the meeting will be taken and included as part of the Environmental Impact Report (EIR).

Evaluation of the Environmental Impact Report (EIR)
A copy of the draft and final Environmental Impact Reports will be made available for evaluation purposes. A period of 40 days will be provided for the evaluation of the draft report, whereas a period of 21 days will be provided for the evaluation of the final report.

Informing Interested and Affected Parties of the Record of Decision
On receipt of the Environmental Authorisation and Record of Decision (positive or negative decision), all identified interested and affected parties (see Section 4 of this report) will be informed by means of facsimile, e-mail or telephonically that the Environmental Authorisation and Record of Decision with regards to the project have been issued. Information w.r.t. the appeal procedure will also be provided.

An advertisement in this regard will also be placed in the Middelburg Observer, in order to inform I&APs of the decision.

A copy of the Environmental Authorisation and Record of Decision will be made available on the company website (www.cleanstreamsa.co.za).

4. DESCRIPTION OF PUBLIC PARTICIPATION PROCESS

This section provides:
- An overview of the public participation process followed during the Scoping phase (Sections 4.1 to 4.4);
- Details of comments received on the draft and final scoping reports (Section 4.5);
- Comment received during public meeting (Section 4.6);
- The way forward in terms of public participation (Sections 4.7 and 4.8);
- Summary of all the comments received to date – comments and response report (Table 4.14).

4.1 Advertising of the project

4.1.1 Press advertising

A block advert (150mm x 95mm), according to the Environmental Impact Assessment Regulations, 2010, was placed in the local newspaper, Middelburg Observer, on Friday, 22 June 2012. A copy of the advert is provided in Appendix 5.

4.1.2 On-site advertising

Notices according to the Environmental Impact Assessment Regulations, 2010, were displayed at the following locations:

- On-site at the Botshabelo Nature Reserve entrance (A1; Figure 4.1, Photo 1);
- At the gravel access road on the northern boundary (A1; Figure 4.1; Photo 2);
- Within Botshabelo on the hiking trail notice board (A3; Figure 4.1; Photo 3);
- On the northern fence of the site (A3; Figure 4.1, Photo 4)
- At the Gerard Sekoto Library (A3; Figure 4.1, Photo 5);
- At the Steve Tshwete Local Municipality (A3; Figure 4.1, Photo 6);
- A copy of the notice (English) was also loaded onto the company website: www.cleanstreamsa.co.za.

A copy of the notice (English) is provided in Appendix 5.

It should be noted that a notice of 594 mm x 841 mm (A1) was displayed at the Botshabelo Nature Reserve entrance gate and at the gravel access road on the northern boundary. The rest of the notices were 416mm x 295mm (A3) in size.

No notices were placed on any alternative sites investigated.

4.1.3 Informing I&APs via the internet

Interested and affected parties were also informed via the above-mentioned adverts and notices that a copy of the following documentation could be downloaded from the Clean Stream Environmental Services website (www.cleanstreamsa.co.za) from Friday, 22 June 2012:

- Copy of the notice;
- Background Information Document (BID; Appendix 6).

This information was available on the website for the duration of the scoping phase.

A copy of the webpage printouts is provided in Appendix 5.

4.1.4 Feedback from advertising process

No persons registered as interested and affected parties in terms of the advertising process (site and newspaper advertising) within the 30 day registration period provided. However, a few persons did phone regarding employment and stands.

An e-mail (dated: 30 July 2012; Appendix 5) in this regard was forwarded to Ms. M. Seshweni of the Department.

Photo 1: Botshabelo Nature Reserve Entrance

Photo 2: Adjacent to the gravel access road

Photo 3: Hiking trail notice board

Photo 4: Northern fence

Photo 5: Gerard Sekoto Library

Photo 6: Steve Tshwete Local Municipality

Figure 4.1: On-site notices displayed (from 22 June to 23 July 2012)

4.2 Relevant authorities

4.2.1 The Department of Economic Development, Environment and Tourism

The Department of Economic Development, Environment and Tourism (DEDET) was consulted with regards to the proposed development.

The following documentation was submitted to the Department (eMalahleni office) on 29 May 2012 (Appendix 1):

- Application for authorisation in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998), (as amended) and the Environmental Impact Assessment Regulations, 2010.

A letter from the Department (dated: 20 June 2012; Ref: 17/2/3 N-167; Appendix 7) was received acknowledging receipt of this documentation and indicating the responsible officer (Ms. M. Seshweni) for the said project.

A site visit with Ms. M. Seshweni of the Department and Ms. R. van Rensburg of Clean Stream Environmental Services was held on Tuesday, 4 September 2012.

The issues raised by Ms. Seshweni are indicated in Table 4.1 and a response provided in Table 4.14.

Table 4.1: Issues raised by the Department of Economic Development, Environment and Tourism

Comment
Will the development be manageable?
Require a letter from the Steve Tshwete Local Municipality indicating that they will be responsible for the management of the development, especially in terms of service provision and waste removal.
It must be ensured that there is sufficient groundwater available for the development.
The groundwater quality must be tested to ensure that it is suitable for domestic use.
It must be ensured that water abstraction for the proposed development does not impact on the groundwater supply of the surrounding landowners.
The 50-m buffer zone around the pans and wetlands will suffice.
It is agreed that the following specialist species must be conducted: ▪ Archaeological study ▪ Wetland study ▪ Vegetation study ▪ Animal study ▪ Traffic impact study ▪ Social impact study ▪ Geotechnical study ▪ Geohydrological study.

4.2.2 Steve Tshwete Local Municipality

The Steve Tshwete Local Municipality is assisting the applicant (Botshabelo Community Development Trust) with the said application. However, a background information document (Appendix 6) was e-mailed (dated: 10 July 2012; Appendix 7) to Mr. M. Mahamba and Mr. P. Ndlovu of the Steve Tshwete Local Municipality in order to obtain their comment. ***No comments were received.***

4.2.3 Nkangala District Municipality

A background information document (Appendix 6) was forwarded (facsimile dated: 10 July 2012; Appendix 7) to the Development and Planning Unit of the Nkangala District Municipality. ***No comments were received.***

4.2.4 Department of Water Affairs

A background information document (Appendix 6) was forwarded (e-mail dated: 10 July 2012; Appendix 7) to the Department of Water Affairs in order to obtain their concerns with regards to the proposed development. ***No comments were received.***

4.2.5 Department of Agriculture, Rural Development and Land Administration (agriculture)

A background information document (Appendix 6) was forwarded (e-mail dated: 10 July 2012; Appendix 7) to the Department of Agriculture, Rural Development and Land Administration (official – Mr. J. Venter) in order to obtain the Department's concerns with regards to the proposed project. ***No comments were received.***

4.2.6 Department of Agriculture, Forestry and Fisheries

A background information document (Appendix 6) was forwarded (e-mail dated: 10 July 2012; Appendix 7) to the Department of Agriculture, Forestry and Fisheries in order to obtain the Department's concerns with regards to the proposed project. ***No comments were received.***

4.2.7 Department of Mineral Resources

A background information document (Appendix 6) was forwarded (e-mail dated: 10 July 2012; Appendix 7) to the Department of Mineral Resources in order to obtain the Department's concerns with regards to the proposed project. ***No comments were received.***

4.2.8 Department of Culture, Sports and Recreation (Provincial Heritage Resources Authority, Mpumalanga)

A background information document (Appendix 6) was forwarded (e-mail dated: 10 July 2012; Appendix 7) to the Department of Culture, Sports and Recreation (Director – Mr. S. Singh) in order to obtain the Department's concerns with regards to the proposed project. ***No comments were received.***

4.2.9 Department of Agriculture, Rural Development and Land Administration (housing)

A background information document (Appendix 6) was forwarded (facsimile dated: 10 July 2012; Appendix 7) to the Department of Housing (official – Ms. E. van Jaarsveld) in order to obtain the Department's concerns with regards to the proposed project. ***No comments were received.***

4.2.10 Department of Rural Development and Land Reform (Commission on Restitution of Land Rights)

The Department of Rural Development and Land Reform was contacted (e-mail dated: 10 July 2012; Appendix 7) with regards to the proposed project. ***No comments were received.***

4.2.11 Department of Public Works

A background information document (Appendix 6) was forwarded (facsimile dated: 10 July 2012; Appendix 7) to the Department of Public Works (official – M. Mokgohloa) in order to obtain the Department's concerns with regards to the proposed project. ***No comments were received.***

4.3 Consultation with other stakeholders

4.3.1 Mpumalanga Tourism and Parks Agency (MTPA)

A background information document (Appendix 6) was forwarded (e-mail dated: 10 July 2012; Appendix 7) to the following persons at the Mpumalanga Tourism and Parks Agency:

- Mr. A. Hoffman;
- Mr. F. Krige; and
- Mr. M. Lotter

No comments were received.

4.3.2 Mpumalanga Provincial Heritage Authority

A background information document (Appendix 6) was forwarded (e-mail dated: 10 July 2012; Appendix 7) to the Mpumalanga Provincial Heritage Authority in order to obtain their concerns with regards to the proposed project. ***No comments were received.***

4.3.3 South African Heritage Resources Agency (SAHRA)

A background information document (Appendix 6) was forwarded (e-mail dated: 12 July 2012; Appendix 7) to the South African Heritage Resources Agency (satellite and head offices) in order to obtain their concerns with regards to the proposed project. ***No comments were received.***

4.3.4 Mpumalanga Heritage Foundation

Mr. A. Barlow registered as an interested and affected party on 6 August 2012. Mr. Barlow indicated that he is the Curator of Fort Merensky and also represents the Mpumalanga Heritage Foundation and Heritage South Africa.

According to Mr. Barlow, the Botshabelo Nature Reserve, village and fort are classified by the South African Heritage Resources Agency as a Class 1 heritage site. Background information regarding Botshabelo was provided telephonically. In addition, a list of written resources that can be consulted regarding the history was provided.

Mr. Barlow expressed his concern about the proposed development.

4.3.5 Heritage South Africa

Fort Merensky (located within the Botshabelo Nature Reserve on Portion 3 of the farm Toevlugt 320 JS) is under the auspices of Heritage South Africa.

Mr. M. Kent, on behalf of Heritage South Africa, registered as an interested and affected party via e-mail on 2 August 2012 (Appendix 7). Table 4.2 provides an indication of the issues raised by Heritage South Africa while a response is provided in Table 4.14.

Table 4.2: Issues raised by Heritage South Africa

Comment
The impact assessment has to address matters concerning the fact that this property is within a Nature Reserve.
It is said that 1000 stands are provided. 930 beneficiaries are recorded. Does this mean that any further expansion would take place?
There is an airstrip close by. Will this be taken into consideration?
Will the 'Rural Village' accommodate rural and ethnic concerns?
Will road outlays be in line with traffic assessments?

4.3.6 Simon van der Stel Foundation

Portion 3 of the farm Toevlugt 269 JS is registered to the Simon van der Stel Foundation (Figure 6.2). Portion 3 is located within the Botshabelo Nature Reserve and comprises Fort Merensky.

A background information document (Appendix 6) was forwarded (e-mail dated: 12 July 2012; Appendix 7) to the Simon van der Stel Foundation in order to obtain their comment with regards to the proposed development.

Subsequently, an e-mail (dated: 25 July 2012; Appendix 7) was received from Ms. P. Benhow-Hebbert requesting that the Simon van der Stel Foundation be registered as an interested and affected party.

Table 4.3 provides an indication of the comment received from the Simon van der Stel Foundation while a response is provided in Table 4.14.

Table 4.3: Issues raised by the Simon van der Stel Foundation

Comment
It is called a 'rural' village but it is very close to the existing urban node of Middelburg AND adjacent to the Air Strip. Concern is voiced about the fact that urban development 'jumps' across undeveloped areas (leap frogging). The development of an individual free standing node like the one proposed will most probably in the long term stimulate infill resulting in urban sprawl. As this is not an ideal situation, the impact assessment has to address preventative measures.
Secondly: this proposed village is situated WITHIN the Nature Reserve which probably is in contradiction with the aim and purpose of the said Nature Reserve. The impact assessment must address issues such as the current state and future planning of the Nature Reserve, the importance of the natural vegetation, how endangered it is, impact of development on the Nature Reserve, etc.
Mention is made of 930 beneficiaries but 1000 stands are being provided for. How will future growth of this village be addressed? The street layout seems to 'invite' future expansion. These are crucial issues that must be addressed.
Proximity to the Air Strip – does it comply to all aviation regulations – safety, noise, future expansion of the facility, etc?
Sense of Place – the proposed layout is a very conventional and ordinary URBAN landscape. Concern is raised that this layout makes hardly any attempt in creating an unique African rural village with a special sense of place.

4.3.7 Wildlife and Environment Society of South Africa (WESSA)

A background information document (Appendix 6) was forwarded (e-mail dated: 10 July 2012; Appendix 7) to Mr. L. Betha of the Wildlife and Environment Society of South Africa (WESSA) for evaluation and comment. ***No comments were received.***

4.3.8 South African National Roads Agency (SANRAL)

The proposed development would obtain access from the N11 national road. A background information document (Appendix 6) was therefore forwarded (e-mail dated: 10 July 2012; Appendix 7) to the South African National Roads Agency for evaluation and comment. ***No comments were received.***

4.3.9 Mr. J. Dyason (Councillor - Ward 16)

A background information document (Appendix 6) was forwarded (e-mail dated: 10 July 2012; Appendix 7) to the councillor for the area (Mr. J. Dyason) in order to obtain his issues of concern and/or objections on behalf of the community. Telephonically, Mr. Dyason indicated that he would like to be involved in the process. ***No comments were received.***

4.3.10 Middelburg Chamber of Commerce and Industry

A background information document (Appendix 6) was forwarded (e-mail dated: 10 July 2012; Appendix 7) to Ms. A Ott of the Middelburg Chamber of Commerce and Industry for evaluation and comment. ***No comments were received.***

4.3.11 Birdlife South Africa

Birdlife South Africa was contacted (e-mail dated: 19 July 2012; Appendix 7) since the proposed development would be located within a nature reserve.

Subsequently, an e-mail was received (20 July 2012; Appendix 7) from Ms. C. Uys indicating that Birdlife South Africa will not register as an I&AP since the proposed development does not fall within or near a registered Important Bird Area.

Birdlife South Africa was therefore removed from the I&AP list.

4.3.12 Middelburg Birding Club

A background information document (Appendix 6) was forwarded (e-mail dated: 10 July 2012; Appendix 7) to Mr. H. Hoffman of the Middelburg Birding Club for comment. ***No comments were received.***

4.3.13 Endangered Wildlife Trust (EWT)

The Endangered Wildlife Trust (EWT) was contacted (e-mail dated: 10 July 2012; Appendix 7) since the proposed development would be located within a nature reserve. ***No comments were received.***

4.3.14 Mpumalanga Wetland Forum (MWF)

The background information document was forwarded (e-mail dated: 10 July 2012; Appendix 7) to Mr. G. Cowden of the Mpumalanga Wetland Forum since wetlands are present on site. Mr. Cowden was requested to forward the background information document to all persons on the MWF database. This was done on 20 August 2012 (Appendix 7). ***No comments were received.***

4.3.15 Middelburg Distriks Landbou Unie

A background information document (Appendix 6) was forwarded (e-mail dated: 10 July 2012; Appendix 7) to Mr. J. Schmahl of the Middelburg Distriks Landbou Unie for comment. ***No comments were received.***

4.3.16 Mpumalanga Agriculture

Mpumalanga Agriculture registered as an interested and affected party per letter (dated: 20 August 2012; Appendix 7). Table 4.4 provides an indication of the comment received while Table 4.14 provides a response.

Table 4.4: Issues raised by Mpumalanga Agriculture

Comment
It will be of great interest to find out how the boundaries of the proposed rural village will be managed to remain in the area declared as a rural village.
This is a recipe for the establishment of informal settlements next to/around the proposed rural village.
The proposed village is planned next to a Pan. How will this pan be protected against pollution?
How will all forms of wildlife on and in the pan be protected?
Figure 2 is supposed to indicate where sewerage and waste will be managed, but it is not on the map supplied.

4.3.17 Botlalo Mining and Energy Resources (Pty) Ltd.

Botlalo Mining and Energy Resources (Pty) Ltd. was informed (e-mail dated: 30 July 2012; Appendix 7) since they submitted a prospecting application in the area. ***No comments were received.***

4.3.18 Telkom

A background information document (Appendix 6) was forwarded (e-mail dated: 10 July 2012; Appendix 7) to Telkom in order to obtain their concerns with regards to the proposed project. ***No comments were received.***

4.3.19 Eskom

A background information document (Appendix 6) was forwarded (e-mail dated: 10 July 2012; Appendix 7) to Eskom Distribution and Eskom Transmission in order to obtain their concerns with regards to the proposed project.

Subsequently, an e-mail (dated: 25 July 2012; Appendix 7) was received from Eskom indicating that Eskom is not affected by the proposed development.

4.3.20 SA Civil Aviation Authority (SACAA)

A background information document was forwarded (e-mail dated: 10 July 2012; Appendix 7) to the SA Civil Aviation Authority since the proposed development would be located adjacent to the Middelburg Aeroclub.

Subsequently, an e-mail (dated: 11 July 2012) was received from Mr. C. Isherwood indicating that the proposed development has already received SACAA conditional approval. Urban Dynamics Town and Regional Planners contacted the SACAA at the start of the townplanning process and applied for the relevant approval.

The conditional approval letter (dated: 12 April 2012; Ref: CA8/8/Middleburg CAA-2012-04-DEV001; Appendix 7) indicates the following:

"As requested an assessment, utilising information supplied by your office (i.e. Urban Dynamics Town and Regional Planners), of the site on which the above mentioned development is proposed has been undertaken.

The assessment indicates that the developments on the site will encroach into protected areas of airspace relating to the Middelburg airfield and as such building height restrictions will be required.

The restrictions are stipulated as follows:

1) In the area designated as Botshabelo North (.jpg graphic of same name refers) and which comprises the area contained within the straight lines joining the positions Botshabelo Point, Botshabelo 2 and Botshabelo 6, buildings are to be restricted to no higher than an elevation (above mean sea level) of 1455 meters.

2) Buildings in the area contained within the straight lines joining Botshabelo 2, Botshabelo 3, Botshabelo 4, Botshabelo 5, Botshabelo 6 and then directly back to Botshabelo 2, are to be restricted to no higher than an elevation of 1510 meters. Graphic Botshabelo South (.jpg graphic of same name refers)."

The proposed development will have to comply with the requirements of the SA Civil Aviation Authority.

4.4 Adjacent landowners/users

Figure 4.2 provides an indication of the surrounding landowners/users in relation to the proposed site. During the scoping phase, the landowners/users within a 5 km radius were identified using a Deeds Search via the WinDeed system of the Deeds Office of South Africa. The Deeds Search Template provides information pertaining to land ownership, size and land value of each of the properties.

Contact details for the landowners were obtained from the townplanners (Urban Dynamics) where available as well as from the telephone directory and other interested and affected parties.

The surrounding landowners were informed of the proposed development through the advertising process as indicated in Section 4.1 and the distribution of background information documents (BID's). A copy of the background information document is provided in Appendix 6. In addition, individual meetings were held with a few of the landowners.

Contact details could however, not be obtained for all the landowners within the 5 km radius during the scoping phase. Subsequently, flyers containing information about the proposed project and public meeting were hand delivered to the various properties (i.e. given to owner, left in gate/front door, etc) during the EIA phase.

The comments received from the surrounding landowners in response to the advertising, distribution of the background information document/flyer and the meetings held are indicated below.

4.4.1 Middelburg Aeroclub – RE of Toevlugt 320 JS (Figure 4.2)

The Middelburg Aeroclub is located on the Remaining Extent of the farm Toevlugt 320 JS. The property is leased by the Steve Tshwete Local Municipality from the Botshabelo Community Development Trust. In turn, the Middelburg Aeroclub leases the airfield from the Steve Tshwete Local Municipality on a three (3) year contract basis.

The proposed development would be located on the western boundary of the Middelburg Aeroclub.

The chairman of the Middelburg Aeroclub (Mr. R. Lovett) was contacted (e-mail dated: 10 July 2012; Appendix 7) in order to obtain their concerns with regards to the proposed project.

Subsequently, an e-mail (dated: 11 July 2012; Appendix 7) was received from the Vice Chair of the Middelburg Aeroclub, Mr. B. van der Merwe, indicating that they strongly object to the proposed development. Table 4.5 lists the comments received. These written concerns were also raised in terms of the townplanning process. Table 4.14 provides a response to these comments.

Table 4.5: Issues raised by the Middelburg Aeroclub

Comment
The Middelburg Aeroclub is the Lessee of the airfield (Middelburg Airfield). The said airfield is leased by the Middelburg Aeroclub in terms of a written Lease Agreement of a period of 3 (three) years, affording it an option to renew the Lease Agreement for a further 3 (three) years. The Lease Agreement was renewed recently.
In terms of the said Lease Agreement the Middelburg Municipality has the obligation to maintain the airfield, its parameters and license with the Civil Aviation Authority of South Africa (CAA).
It is noted that the township is envisaged to be situated to the North West of the airfield.
The Middelburg Aeroclub's Members invested substantial amounts in the airfield. In recent times various electrical cables were installed by the Aeroclub to host air shows. The members also invested substantial amounts in the infrastructure of the airfield, being hangers, ablution facilities, offices, etc. The members also invested substantial amounts in aircraft that are being kept in the said hangers.
It is noted that the planned township would be established approximately 1 (one) kilometre or less from the runway and hangers. The aero club's members have serious concerns about the safety and security aspects at Middelburg aerodrome after the establishment of the rural village.
The Middelburg Aeroclub hereby formally objects strongly to the proposed site of the proposed development and it is evident that not enough attention was given to the safety, security and risk elements in the proposed establishment. Surely the safety and security of especially children had not been taken into account.
The Aeroclub base its objections and concerns on various other similar situations in towns where either formal or informal settlements have been established next to the towns airfields. Those airfields are non-existent today (Bethal and Bronkhorstspruit) and airfields like the Witbank and Newcastle Airfields are constantly battling with safety and security issues.
Burglaries, vandalism and runway intrusions are common at the Witbank airfield Newcastle airfield are constantly struggling with grazing animals on the airfield, so much so that a recent medical rescue flight were almost cancelled due to the safety risks involved. That despite the fact that contrary to Middelburg Airfield, those Airfield's Municipalities maintains the security fences around the airfield.
Currently, despite an obligation in terms of the Lease Agreement between the Middelburg Aeroclub and the Steve Tshwete Local Municipality (STLM) the fences on the parameters of the Middelburg airfield are in a state of dismal disrepair.
The fences on the Northern border of the airfield was vandalised, stolen and is actually non-existent. That allows intrusion of the airfield by animals and people which poses a serious threat to any aircraft utilizing the facility and the passengers using such aircraft. That is also contrary to the CAA requirements for a licensed airfield. It needs to be mentioned that STLM is the licensee of the airfield. It is a further concern that the unauthorised people entering the airfield are unaware of the deadly dangers they expose themselves and the general flying public to.
The Aeroclub members are aware of the fact that it cannot stop the legitimate owners of the farm Toevlugt to exercise their right to occupy their property. However, which is of utmost concern is the safety and security at the Middelburg aerodrome.
It is further proven by other similar situations that it will ultimately result in the Middelburg Aerodrome to become obsolete, unusable and lost for the Town of Middelburg.
Requirements:

Comment
Should the township be established it is and will be a requirement by the Aeroclub that: o Parameter fencing must be erected and maintained which would prevent animals, people and children in particular to enter the airfield area without proper authorisation. Wire fencing has proven not sufficient and safe and will not prevent such to enter the airfield. A concrete fence has proven its security qualities at the bigger Airports like ORT. o The parameter of the hangers at the facility should be fenced off properly by way of concrete security fencing with a proper large gate to the hangers to allow aircraft to enter and exit the hanger's spaces. o That the STLM accepts responsibility and liability for the security and safety of the aerodrome facilities as well as the safety and security of the aerodrome member's, the general flying public that makes use of the facility and hangers and investment into the airfield. o That access to the airfield by the inhabitants of the rural village, their children and animals be absolutely prevented and limited.
Various mining Companies use the airfield for their employees to have quick access to business opportunities and their businesses / mining activities in the vicinity. If security is not stepped up by visible Policing of the facility, the said facility would fall into disuse and discourage investment in the Middelburg economy.
It is thus the Middelburg Aero club's concern that the establishment of the rural village will pose a serious threat to the safety and security of the users of the facility and the Aeroclub members as well as the proposed inhabitants of the proposed village.
A precondition should be set to the establishment and the reality of a township next to the airfield should be dealt with. In terms of the license agreement between the STLM and the CAA, it is and remains the STLM's responsibility to ensure the safety of general aviation and the general public utilising the facility.
It is suggested that a meeting be scheduled between the responsible officials of the STLM, Urban Dynamics and the Management of the Middelburg Aeroclub to discuss and formalise conditions president to the establishment of the rural village and that such conditions form part of the conditions by the MEC for the establishment of the township.
As the STLM is aware of its obligations, responsibilities and liabilities towards the Middelburg Aeroclub and general aviation in particular, as the licensee of the facility, the STLM will have to accept responsibility and liability for the said security arrangements as well as any damages, losses or other suffered by the Middelburg Aero club's Members as a result of the establishment of the said village.

Clean Stream Environmental Services enquired from Mr. Van der Merwe whether any meetings were held between the Middelburg Aeroclub, Urban Dynamics and the Steve Tshwete Local Municipality. Mr. B. van der Merwe indicated (e-mail dated: 11 July 2012; Appendix 7) that several meetings were held, with no results. In addition, the Steve Tshwete Local Municipality indicated to the Middelburg Aeroclub that there is no money budgeted for the airfield and can thus not re-seal the runway or maintain the fences.

According to Mr. Van der Merwe, wild animals are encountered on the runway on a frequent basis and it is anticipated that with the establishment of a township, the airfield will be closed.

4.4.2 Toevlugt 269 JS (Figure 4.2)

Table 4.6 provides an indication of various landowners of the farm Toevlugt 269 JS according to the WinDeed system.

Table 4.6: Landowners of Toevlugt 269 JS

Toevlugt 269 JS			
Portion	**Registered landowner**	**Contact person**	**Comment received**
2	V.C. Fourie	V. Fourie	None. Flyer 3 May 2013
3	Stigting Simon van der Stel	M. Kent A. Barlow	Refer to Sections 4.3.4, 4.3.5 and 4.3.6
4	Middelburg Municipality	W. Fouche (Municipal Manager) M. Mahamba (Chief Townplanner)	None. Refer to Section 4.2.2.
6	Botshabelo Community Development Trust	M. Motsifane	None (the applicant)

4.4.3 Middelburg Town and Townlands 387 JS (Figure 4.2)

According to the WinDeed system, Portion 27 of the farm Middelburg Town and Townlands 387 JS is registered to the Steve Tshwete Local Municipality. The boundaries of the Botshabelo Nature Reserve (as indicated on the 1: 50 000 topographical map) extend onto this property.

4.4.4 Draaihoek 271 JS (Figure 4.2)

The entire farm Draaihoek 271 JS is registered to the Republic of South Africa. The property is located approximately 4 km south west of the proposed site (Figure 4.2). The Department of Public Works was informed of the proposed development (see Section 6.2.11). ***No comments were received.***

According to the Botshabelo Settlement and Business Plan (2004), Portions 1, 10 and the Remaining Extent of the farm Draaihoek 271 JS was awarded to the Botshabelo Community Development Trust as part of the land claim.

4.4.5 Noordhoek 333 JS (Figure 4.2)

The Botshabelo Community Development Trust indicated that the farm Noordhoek 333 JS also belong to them, even though it is still registered to the Republic of South Africa. The property is located approximately 3 km north east of the proposed site, adjacent to the N11 national road. This property was investigated as an alternative site for the proposed development (see Section 5).

The Department of Public Works was informed of the proposed development (see Section 6.2.11). ***No comments were received.***

4.4.6 Broodboomkrans 363 JS (Figure 4.2)

According to the WinDeed system, the entire farm Broodboomkrans 363 JS is registered to the Republic of South Africa. The property is located approximately 4 km west of the proposed development (Figure 4.2). The Department of Public Works was informed of the proposed development (see Section 6.2.11). ***No comments received.***

Mr. S. Mabena currently resides on Broodboomkrans. He was contacted telephonically on 13 August 2012 regarding the proposed development. Mr. Mabena indicated that although the farm Broodboomkrans is still registered

to the Republic of South Africa, the property was given to him through a land claim.

The background information document (Appendix 6) was forwarded to Mr. Mabena (facsimile dated: 13 August 2012; Appendix 7) in order to obtain his comments. ***No comments were received.***

According to the Botshabelo Settlement and Business Plan (2004), the farm Broodboomkrans 363 JS was awarded to the Botshabelo Community Development Trust as part of the land claim.

4.4.7 Doornkop 273 JS (Figure 4.2)

According to the WinDeed system, the entire farm Doornkop 273 JS is registered to the Republic of South Africa. The property is located approximately 4 km north west of the proposed development (Figure 4.2). The Department of Public Works was informed of the proposed development (see Section 6.2.11). ***No comments were received.***

The said property is utilized by 4 SAI for military training. A background information document (Appendix 6) was forwarded (facsimile dated: 13 August 2012; Appendix 7) to Major Gysman (and later Lt. Col. Madikoto) in order to obtain his comment with regards to the proposed development. ***No comments were received.***

4.4.8 Groenfontein 266 JS (Figure 4.2)

Table 4.7 provides an indication of various landowners of the farm Groenfontein 266 JS according to the WinDeed system.

Table 4.7: Landowners of Groenfontein 266 JS

Groenfontein 266 JS			
Portion	**Registered landowner**	**Contact person**	**Comment received**
1 & 2	Emarubini Communal Property Association	W. Mtsweni	None. Flyer and phone call – 3 May 2013.
3	Ramohlakane Groenfontein Community Trust	Contact details not known	-
3	Ramohlakane Groenfontein Community Trust	Leased by P. Steenkamp (SKS Boerdery) for agricultural purposes	Yes – refer to Table 4.8
4	N.J. Hesselman	K. Hesselman	Yes – refer to Table 4.9
5	R.W. Glintzer	R.W. Glintzer	Yes – refer to Table 4.10
8	R. Masondo	R. Masondo	None. Background information document (BID) e-mailed 11 July 2012 (Appendix 7).
11 & 12	LIJ Boerdery	S.J. Bester	None. BID e-mailed 13 August 2012 (Appendix 7)

4.4.8.1 P. Steenkamp (SKS Boerdery) (Figure 4.2)

Mr. P. Steenkamp leases the property (Portion 3 of Groenfontein 266 JS; Figure 6.2) on the northern boundary of the proposed development site from the Ramohlakane Groenfontein Community Trust for agricultural purposes.

A background information document was forwarded (e-mail dated: 13 August 2012; Appendix 7) to Mr. Steenkamp to obtain his issues of concern. Subsequently, a letter was received (dated: 16 August 2012; Appendix 7) indicating his concerns. Table 4.8 indicates the issues raised while Table 4.14 provides a response.

Table 4.8: Issues raised by Mr. P. Steenkamp (SKS Boerdery)

Comment
Water: It came to our attention that the local municipality plans to supply the whole village with water from boreholes sunk in and around the village. According to the National Water Act of 1999, each rural household is entitled to at least 6000 litres of water per month, which in this case, amounts to 6 000 000 litres per month, or, 196721 litres of water to be pumped from this boreholes per DAY. How sustainable can this be in the long term, especially in an area known for its poor groundwater availability? Furthermore, would the Local Authorities decide to supply the water via road, just imagine what the financial implications would be on the taxpayers' pockets of Middelburg.
Sewage: It is still unclear as to which sewerage system would be adapted, but I presume it will be the same system as found in the village of Doornkop. The 'long drop' system works well, however, if we have excessive rain during the rainy season, it has been known for these 'long drops' to overflow and that in turn results in the groundwater as well as the surface water being contaminated. With an average of 16 000 people dying from diarrheal diseases every year in South Africa, would this development be managed properly, and who would take responsibility if disaster strikes?
Vegetation: We have a thousand residential stands which will evidently result in no less than 4000 people residing in the village. The impact on the environment in terms of the availability of wood and grazing would be astronomical.
Air quality: Air pollution due to wooden fires would also be something to be taken into account.
Safety and Security: The Middelburg Aerodrome would be adjacent to the village and that poses a few threats to the residents of the village as well as to the airport users. Poor visibility due to air pollution, children playing on the landing strip and stray animals from the village can result in fatalities.
Safety and Security: Lessons learnt from the establishment of the Doornkop Village were that the residents need to fence off their stands, to either indicate their border or keep their livestock at bay during the evenings. Furthermore, these people must erect some kind of dwelling to live in at first. These materials (wire, droppers, corrugated iron, etc.) is rarely bought and is more often than not, taken from the adjacent farms and especially from the fences right next to the road (N11), hence, this results in stray animals ending up in the road and plenty of accidents happening. The close-by historical settlement of Botshabelo would also become a source of building materials for the new residents of the village.
Unemployment: The unemployment rate in Doornkop is also a factor to be reckoned with. If the same rate applies to the new village, it would become a market for stolen necessities like fuel, oil, wire, fertiliser, etc. which in turn makes life difficult for the people trying to make a living in the close vicinity of these villages.
Summary: The proposed layout is done correctly but situated wrongly. Resources such as pollution, availability of water, wood and public transport needs to be argued at length to find the best solution. Unemployment poses a real threat to the economically active people in and around these villages. If not properly managed and controlled, it will result in the whole area being negatively impacted on in terms of theft, pollution and property values going astray.

4.4.8.2 K. Hesselman (Figure 6.2)

A meeting was held with Mr. K. Hesselman on 18 July 2012 in order to obtain his issues of concern. Table 4.9 provides a summary of the issues raised during meeting while a response is provided in Table 4.14.

Table 4.9: Issues raised by Mr. K. Hesselman

Comment
Water: The three proposed boreholes will not be sufficient to provide everyone with water. In addition, the water abstraction may impact on his water supply downstream.
Wildlife: What will happen with the wildlife within the Botshabelo Nature Reserve?
Fences: Theft of fencing will increase
Agriculture: Intends to start cultivating maize. This will not be possible with the intended development since the maize will be stolen. Theft in general will most probably increase.
Fire: There is already a problem with fires in the area. A lot of damage is being caused.
Access road: The gravel access road is a private road, which is maintained by himself and Mr. Glintzer. The increased traffic will impact on this road. Who will be responsible for the maintenance of this road? Recommends that an alternative access road is constructed from the tar road, which will only be used by the new residents. Alternatively, the main Botshabelo entrance road must be used.
Safety: During protests, it would be easy to block off the gravel access road. The adjacent landowners would then not have access to their properties.

4.4.8.3 R.W. Glintzer (Figure 6.2)

A meeting was held with the Glintzer family on 18 July 2012 in order to obtain their issues of concern. Written as well as verbal comments were received and are indicated in Table 4.10. Table 4.14 provides a response.

Table 4.10: Issues raised by Mr. R.W. Glintzer

Comment
Wildlife: Botshabelo is a game farm and a township/rural village inside it is going to decimate the farm and its game. It is also a world heritage area. Indigenous to that area is scarce game like Oribi and Rooi Ribbok and a township is going to threaten its existence. Serval, genets, caracal, aardwolf, brown hyenas, ant bear, ietermago, suricate now back for the first time in many years, as well as springhaas. The bullfrog also occurs on site.
Birdlife: Blou ryer and wild makou breed next to the gravel road (DF) and will be driven out of the area by all the extra traffic. Fish eagle at the dam only here because of healthy area.
Water: The fountain on Groenfontein has its catchment area right there where this township is planned. Pollution is a great concern. A proper baseline before any development needs to be done. Lifelong tests are going to have to be done, on regular bases, to ensure that water quality stays the way it is now. The three proposed boreholes will not be sufficient to provide everybody with water. The abstraction of water from the boreholes could impact on their water supply.
Wetland: The township is planned on a wet area. In the summertime during the rainy season that area is a marshland.

Comment
Access road: The DF gravel road is a farm road for farmers and maintained privately. No entrance SHOULD be made to the planned township through this road. Dust from vehicles is going to increase drastically. The entrance road comes from the main road and goes directly through a pan. This pan during summers fills up over the road. Minor traffic will not cause the wet road to disintegrate but major traffic will be a problem. Entrance must be made from the main Botshabelo gate.
Services: Where is the water and sanitation coming from? Rural means extra costs. No pit toilets and boreholes are to be made here! Pipelines to Middelburg must be installed before any houses are set up here.
Site: Why behind the airfield? We request that the proposed town be located nearer to the middle of Botshabelo toward more open and flat area or nearer to town. Recommends that the development is placed adjacent to Mhluzi. Proper services can then be installed and the people will be closer to town and job opportunities.
Fire: Veldfires are going to be a big threat.
Pollution: All pollutions e.g. smoke, papers, dust, etc.
Apparently there are regulations stating that rural villages may not be located closer than 15 km from each other. Are there such regulations?
Safety: The farmers in the surrounding area would most probably have to stop farming and sell their properties due to an increase in theft and safety issues. Currently, the farmers in the area loose large portions of their harvest due to theft and cattle.
The Botshabelo Community may not sell or rent their stands to people not belonging to the community. In addition, the Botshabelo Community Trust must not sell the stands to the Botshabelo community members. The development is being paid for by the taxpayer. The development should not just be elaborate vacation homes.

4.4.9 Koelenhof 278 JS (Figure 4.2)

Table 6.11 provides an indication of various landowners of the farm Koelenhof 278 JS according to the WinDeed system.

Table 4.11: Landowners of Koelenhof 278 JS

Koelenhof 278 JS			
Portion	**Registered landowner**	**Contact person**	**Comment received**
0	E.J. de Meyer	F de Meyer	- (phone number incorrect)
1	B.J. Mayerhofer	B.J. Mayerhofer	None. Phone call 4 April 2013 and flyer 3 May 2013.
2	D.P.J. van den Bergh	Contact details not known	None. Flyer 3 May 2013.
3	N.J. Hesselman	K. Hesselman	Yes – see Section 4.4.8
4	G. van der Walt	N. van der Walt	None. BID e-mailed 11 July 2012 (Appendix 7)
5	D.B. Snyman	M.M. Snyman	None. BID e-mailed 11 July 2012 (Appendix 7)
6	A.R. Potgieter	P. Potgieter	None. BID faxed 11 July 2012 (Appendix 7)
7	M. Heyns	M. Heyns	None. BID e-mailed 13 August 2012 (Appendix 7)
9	Neels Moolman Familie Trust	F. Nel	None. Flyer 3 May 2013.

4.4.10 Leeuwpoortje 267 JS (Figure 4.2)

Table 4.12 provides an indication of various landowners of the farm Koelenhof 278 JS according to the WinDeed system.

Table 4.12: Landowners of Leeuwpoortje 267 JS

Leeuwpoortje 267 JS			
Portion	**Registered landowner**	**Contact person**	**Comment received**
1	M.T. Podges	M.T. Podges	None. Flyer 3 May 2013
1	M.T. Podges	K. Nell (business on site)	None. Flyer 3 May 2013
4	Botshabelo Community Development Trust	M. Motsifane	None (applicant)
4, 8, 9	Republic of South Africa	Department of Public Works	None. See Section 4.2.11
2	K. Erichsen	K. Erichsen	None. Phone call 4 April 2013 and flyer 3 May 2013.
10	N.J. Hesselman	K. Hesselman	Yes – see Section 4.4.8
12	S.D. Adams	S. Adams	BID e-mailed 11 July 2012 (Appendix 7). Requested a map of the area and wanted to know whether it has already been approved (e-mail dated: 18 July 2012; Appendix 7)
12	A. James (new owner of Portion 12)	A. James	None. Flyer 3 May 2013
13	J.J.M. Mthombeni	Contact details not known	None. Flyer 3 May 2013
14	L. van der Merwe	L. van der Merwe	None. BID e-mailed 11 July 2012 (Appendix 7)
15	T.J. Mahlangu	Contact details not known	-
16	P.R. Spies	B. Holder	None. Flyer 3 May 2013
17	T.E. van Niekerk	Contact details not known	-
18	E.I. Tosen	Contact details not known	None. Flyer 3 May 2013
19	V.O. Louw	V.O. Louw	None. BID e-mailed 13 August 2012 (Appendix 7)
20	P.J. Haarhoff	P.J. Haarhoff	None. BID e-mailed 11 July 2012 (Appendix 7)
21	Mid-Malanga X104 cc	R. van Zyl (Trinity Bedienings Sentrum)	None. Flyer 3 May 2013
23	Neels Moolman Familie Trust	J. Moolman	None. Flyer 3 May 2013
24	Harbou Boerdery	O. Hartman	None. Flyer 16 May 2013
25	H.M. van der Westhuizen	H.M. van der Westhuizen	None. Flyer 3 May 2013
26	J.M. Ruthven	Contact details not known	None. Flyer 3 May 2013
28	M.M. Herbst	Contact details not known	-
29	J.A.M. Pieterse	J.A.M. Pieterse	None. BID e-mailed 11 July 2012 (Appendix 7)
32	G.G. Gordon	G. Gordon	None. Flyer 3 May 2013

4.4.11 Keerom 374 JS (Figure 4.2)

Table 4.13 provides an indication of various landowners of the farm Keerom 374 JS according to the WinDeed system.

Table 4.13: Landowners of Keerom 374 JS

Keerom 374 JS			
Portion	**Registered landowner**	**Contact person**	**Comment received**
3	K. Erichsen	K. Erichsen	None. Phone call 4 April 2013 and flyer 3 May 2013
44	Pots Galore cc	Seymore	None. Flyer 3 May 2013
45	C.J. Hattingh	C.J. Hattingh	None. Flyer 3 May 2013
45	C.J. Hattingh	T. Viljoen	None. Flyer 3 May 2013
46	C.P. Nagel	C.P. Nagel	None. Flyer 3 May 2013
47	Philmar Trust	L. Roodman	None. Flyer 3 May 2013

4.5 Evaluation of the draft and final scoping reports

4.5.1 Availability of draft Scoping Report for review

The draft Scoping Report was submitted to the Department of Economic Development, Environment and Tourism on 19 September 2012 (letter dated: 10 September 2012; Appendix 8).

The draft Scoping Report was also provided to the following authorities for evaluation purposes:

- Department of Water Affairs – 2 October 2012 (letter dated: 10 September 2012; Appendix 8);
- Mpumalanga Tourism and Parks Agency – couriered 5 October 2012 (letter dated: 10 September 2012; Appendix 8);
- Steve Tshwete Local Municipality – 10 September 2012 (letter dated: 10 September 2012; Appendix 8).

The availability of the draft Scoping Report for review was advertised in the Middelburg Observer on 14 September 2012 (Appendix 8).

A hard copy of the Scoping Report was made available from 10 September 2012 to 22 October 2012 at the Gerard Sekoto Public Library and the Botshabelo Historical Village (letter dated: 10 September 2012; Appendix 8) for evaluation purposes. A copy of the notice displayed at the library and the register are provided in Appendix 8.

In addition, an electronic copy of the document was provided on the Clean Stream Environmental Services website (www.cleanstreamsa.co.za) for download and evaluation purposes. A copy of the webpage printouts is provided in Appendix 8.

Interested and Affected Parties and Stakeholders on the database were notified by means of facsimile, e-mail, etc. of the availability of the said report (an example of the e-mail forwarded is provided in Appendix 8).

4.5.2 Comments received on draft Scoping Report

The following section provides an overview of the comment received from interested and affected parties, stakeholders and government departments on the draft scoping report.

4.5.2.1 Department of Economic Development, Environment and Tourism

A letter was received from the Department of Economic Development, Environment and Tourism (dated: 23 October 2012; Ref: 17/2/3 N-167; Appendix 8) accepting the draft Scoping Report and Plan of Study for EIA.

The Department indicated that Clean Stream Environmental Services may proceed with the Environmental Impact Report.

4.5.2.2 Eskom Distribution

A letter was received from Ms. A. Pretorius (dated: 12 September 2012; Appendix 8) indicating that the application affects the existing Eskom Distribution Rockdale – Doornkop 11 kV powerline.

It was also indicated that Eskom Distribution has in principle no objection to the proposed development. However, a number of conditions must be adhered to and accepted in writing.

The conditions stipulated by Eskom are as follows:

1. *There is a 9 metres building and tree restriction either side of the centre lines of the 11kV powerlines, which must be adhered to in all future development and or construction. No construction work may be executed closer than 9 metres from any of Eskom's structures and or supporting mechanisms.*

2. *Eskom should receive an application for township development and or any other proposed activities near the powerlines, for which Eskom's will then comment accordingly.*

3. *All work within Eskom's servitude areas will have to comply with the relevant Eskom earthing standards at the time of construction.*

4. *All work within Eskom Distribution reserve area and servitudes must be done in accordance with the requirements of the Occupational Health and Safety Act No.85 of 1993 as amended. Special attention must be given to the clearances between Eskom's conductors, structures, cables and electrical apparatus and the proposed work as stipulated by Regulation R15 of the Electrical Installations Regulations of the aforementioned Act or any other legal requirements.*

5. *Eskom can't guarantee the exact position of the underground electrical cables and therefore the applicant's site representatives must expose the cables by hand, in order to establish their location.*

6. *The Applicants and Eskom's cables must be placed in sleeves encased in concrete across the width of the servitude, at the applicant's expense where frequent excavations occur in the cable area.*

7. *Eskom Distribution shall not be liable for the death of or injury to any person or for the loss of or damage to any property whether as a result of the encroachment or of the use of the area where Eskom Distribution has its services, by the applicant, his/her agent, contractors, employees, successors in title and assigns. The applicant indemnifies Eskom against loss, claims or damages including claims pertaining to consequential damages by third parties and whether as a result of damage to or interruption of or interference with Eskom Distribution services or apparatus or otherwise. The applicant's attention is drawn to section 27(3) of the Electricity Act 1987, (Act 41 of 1987, as amended in 1994), Section 27(3), which stipulates that the applicant can be fined and/or imprisoned as a result of damage to Eskom's apparatus.*

8. *No mechanical equipment, including mechanical excavators, high lifting machinery and drilling equipment, shall be used within Eskom's reserve area, or within close proximity of Eskom's services and equipment, without prior written permission having been granted by Eskom. If such permission is granted the applicant must give at least ten working days prior notice of the commencement of any work. This allows time for arrangements to be made for supervision and/or precautionary instructions to be issued.*

9. *Eskom Distribution shall at all times have unobstructed access to and egress from its services.*

10. *No work shall commence unless Eskom has received the applicant's written acceptance of the conditions specified in the final letter of consent.*

11. *Eskom's rights and duties in the servitude shall be accepted as having prior right at all times and shall not be obstructed or interfered with. Please note: Where an electrical outage is required, at least fourteen working days is required for arrangement.*

12. *Any third party servitudes encroaching on Eskom servitudes shall have to be registered against the property at the applicant's own cost.*

13. *Wherever any pipe crosses the Eskom services, the edge of the excavation shall not come within 10 meters of the Eskom services and structures. Any angles crossing should preferably be from 45º degrees to 90º.*

14. *Cathodic protection must be installed to prevent corrosion of the pipe.*

15. *Pipeline markers to be situated at 30 metre intervals and where the pipeline is crossing Eskom's servitude, the pipeline must be clearly marked.*

16. *The effective management and handling of waste is of crucial importance. No dumping shall be allowed within Eskom Distribution Servitudes. All unwanted waste (gaseous, liquid or solids) should be disposed of at a registered waste disposal site as stipulated under Section 20 of the Environmental Conservation Act (Act 73 of 1989). The applicant will adhere to all relevant environmental legislation. Any cost incurred by Eskom as a result of non-compliance will be charged to the applicant.*

17. *The use of explosives of any type within 500 metres of Eskom's services, shall only occur with Eskom's previous written permission. If such permission is granted the applicant must give at least fourteen working days prior notice of the commencement of blasting. This allows time for arrangements to be made for supervision and/or precautionary instructions to be issued in terms of the blasting process.*

18. *Any development, which necessitates the relocation of our services, will be to the account of the developer. If you decide on the option of relocation of the existing powerlines, the Customer Services, Regional Key Customer Executive (08600 37566) should be contacted in connection with costs.*

19. *Eskom will recover costs from the applicant where any damages of Eskom assets and or any penalties suffered by Eskom occur. The Applicant shall also accepts costs if:*

- *Eskom pylons subside or are damaged as a result of blasting activities.*
- *Eskom has to incur any costs to comply with statutory requirements because of the applicants or applicant's contractor work or the presence of the equipment or plant in the reserve area. Such proven costs shall be refunded on demand.*

It should be noted that the Rockdale-Doornkop powerline is located south of the site. The proposed development would not have a direct impact on the Eskom powerline.

4.5.2.3 Eskom Transmission

An e-mail was received from Eskom Transmission (dated: 14 September 2012; Appendix 8) indicating that they are not affected by the application.

4.5.2.4 Mpumalanga Agriculture

An e-mail was received from Mr. H. Laas (dated: 30 October 2012; Appendix 8) indicating that he was listed on pages 70 and 81 of the draft Scoping Report as from Middelburg Agriculture instead of Mpumalanga Agriculture.

The necessary corrections were made. See Page 50 of this report.

4.5.2.5 Department of Agriculture, Rural Development and Land Administration

A letter was received from the Department of Agriculture, Rural Development and Land Administration (dated: 10 October 2012; Appendix 8) regarding the proposed development. **The Department indicated that, from a natural resource viewpoint, the proposed development will not be supported on any of the proposed areas. The Department recommended that the development be moved to an existing urban area.**

The decision was based on the following findings:

AREA OF LOCALITY

The proposed area is situated outside the development area of the local municipality and zoned as a conservation area. Despite all efforts to minimise the impact of the proposed development, these activities will lead to additional impact on the area which needs to be preserved as a conservation area.

Secondary impact due to all the additional activities will impact negatively on the area resulting in an impacted area larger than the 130 ha which is envisaged.

LAND CAPABILITY AGRICULTURE

Land capability for the proposed area is indicated as moderate agriculture potential arable land, class III.
Land capability classes are interpretive groupings of land units with similar potentials and continuing limitations or hazards. Land capability is a more general term than land suitability and more conservation oriented. It involves consideration of:
(i) The risks of land damage from erosion and other causes and
(ii) The difficulties in land use owing to physical land characteristics, including climate.

SOIL POTENTIAL

The soil potential was compiled by overlaying 3 factors which consist of the soil form association, soil depth and clay contents which plays a major role in the assessment of the capability of the soils and impacts on the type of commodities and management that will be used in the optimum utilization of the soil. Whenever a soil is indicated as a low potential soil a general assumption can be made that one of the 3 factors consisting of soil form association, soil depth and clay contents is marginalized which will then be addressed by different management styles or alternatively utilized in a different manner such as natural grazing and not suitable to be cultivated. These factors will also impact on the profitability of the crop that will be planted on the specific area.

SOIL FORM ASSOCIATION

Soil Description of some of the majority soils in the area:
Soils of the Hutton form (Hu)
A medium to high potential soil dependant on soil depth. The soil suitability is usually a class 1 and/or class 2 and has a good to excellent yield potential as rain fed and/or irrigation soils.

Soils of the Clovelly form (Cv)
Irrigation scheduling is important on these soils as the clay percentages are usually below 32 % influencing its water holding capacity. Chisel ploughing and liming is important in order to enhance faunal activity and retain a good soil structure.

Soils of the Glenrosa form (Gs)
Irrigation scheduling is important on these soils as the clay percentages are usually below 32 % therefore influencing its water holding capacity. Chisel ploughing and liming is important in order to enhance faunal activity and retain a good soil structure. Knowing the percentage base - saturation will enhance choosing the best crop suited to the area. Dependant on the depth, it usually is a medium potential soil.

SOIL DEPTH

The soil depth is subject to natural restrictive horizons as found within the profile of the soil type determining the effective depth for root development. In some cases the effective depth according to the soil form association is suitable for cultivation purposes, but due to management methods and implements used previously a manmade restrictive layer such as a plough

layer is now present and must be eliminated by different management techniques.

RECOMMENDATION
It is therefore recommended that the proposed development be moved to existing urban area's which is situated nearby the Botshabelo Nature Reserve. Existing urban development's within the Steve Tshwete Local Municipality is situated approximately 4 kilometers from the reserve. The natural resources must be seen as scarce resources which cannot be renewed and must be preserved and nurtured for our descendents. Our natural resources are experiencing immense pressures from all sectors e.g. mining, urban development, pollution etc.

Table 4.14 provides a response in terms of the above-mentioned recommendation.

4.5.3 Availability of final Scoping Report for review

The final Scoping Report was submitted to the Department of Economic Development, Environment and Tourism on 29 October 2012 (letter dated: 29 October 2012; Appendix 8) after the document was revised as per the comments received (Section 4.5.2).

An electronic copy of the final Scoping Report (dated: October 2012) was available on the Clean Stream Environmental Services website (www.cleanstreamsa.co.za) for download and evaluation purposes from 29 October 2012 to 19 November 2012. A copy of the webpage printouts is provided in Appendix 8.

Interested and Affected Parties and Stakeholders on the database were notified by means of facsimile, e-mail, etc. of the availability of the said report (an example of the e-mail forwarded is provided in Appendix 8).

4.5.4 Comment received on the final Scoping Report

The following section provides an overview of the comment received from interested and affected parties, stakeholders and government departments on the final Scoping Report.

4.5.4.1 Department of Economic Development, Environment and Tourism

Clean Stream Environmental Services forwarded an e-mail to the Department (dated: 20 November 2012; Appendix 8) indicating that comment was received from the Department of Co-operative Governance and Traditional Affairs on the final Scoping Report. Subsequent to this e-mail, comment was also received from Eskom (see Section 4.5.4.3)

4.5.4.2 Steve Tshwete Local Municipality

The Steve Tshwete Local Municipality acknowledged receipt of the final Scoping Report on 6 November 2012 (Appendix 8). No comment was provided.

4.5.4.3 Eskom Transmission

A letter was received (dated: 19 November 2012; Appendix 8) indicating that Eskom Transmission's proposed Marble Hall-Rockdale B 400kV powerline is affected by the application. It was further indicated that Eskom Tx will raise no objection to the proposed development provided that Eskom Tx's rights and services are acknowledged and respected at all times.

Eskom Tx provided a number of conditions (in both letters) that must be adhered to by the developer (see Appendix 8).

Upon inspection of the map provided by Eskom (Appendix 8), it was established that the proposed rural village will not be located near the proposed Eskom line. The new powerline will be located east of the N11 national road and south of the proposed development.

4.5.4.4 Department of Co-operative Governance and Traditional Affairs

A letter (dated: 2 November 2012; Appendix 8) was received from the Department of Co-operative Governance and Traditional Affairs commenting on the Final Scoping Report. The following comments were raised:

1. The proposed development shows more characteristics of a conventional urban township than a rural village if one considers the number of erven, size of erven (500 m^2), proposed land uses and expected engineering services (water, electricity, sanitation) to be provided. It is suggested that rural characteristics be built into the rural village concept to include typical rural land uses such as grazing, cultivation, places where livestock can be slaughtered, places for religious gatherings, etc.

2. Furthermore, according to Table 3.1 on page 11 of the Scoping Report, the aim of the Development Facilitation Act is to provide for development and planning. This is correct, but not entirely as the act lays down specific principles that apply to all types of land planning and development. in this regard the proposed development contradicts the following DFA principles:

- Discourage the phenomenon of urban sprawl and contribute to the development of more compact towns and cities;

- Contribute to the correction of historically distorted spatial patterns of settlement in the Republic.

This means people have to spend a lot of time and money travelling long distances to work, shops, school and social facilities. It also means that local authorities must spend large amounts on providing and maintaining excessive amounts of infrastructure. Increasingly they cannot afford to do this. Urban sprawl does not use existing infrastructure efficiently.

The Steve Tshwete Local Municipality enforces the above-mentioned principles through their Spatial Development Framework by demarcating urban edges. However the proposed development is located outside the urban edge of Middelburg.

3. Page 28 of Scoping Report – in terms of the Mpumalanga Biodiversity Plan (2006) the terrestrial biodiversity of the site is categorized as highly Significant and Important and Necessary. The land uses permitted in terms of these two categories, as indicated in the MBCP, should be further investigated in the EIA as it is not reflected in the Final Scoping Report.

4. The compatibility of the proposed development with surrounding land uses should be further investigated i.e.:

- Compatibility of the proposed development with the Nature Reserve (what is the status of the reserve, how will the settlement impact on the reserve i.e.: wildlife and nature versus livestock and people).

- Compatibility of the proposed development with the Middelburg Aeroclub (compliance to aviation regulations, straying animals on the runway etc.

- Compatibility of the proposed development with Botshabelo historical village and Fort Merensky.

5. The EIA needs to proof the sustainability of the proposed development in terms of the provision of engineering and the economy.

Engineering services:
- *Option 1 as contained in the Scoping Report (pg 47) – Are the drilling of boreholes sustainable considering the quality and quantity of water.*
- *Option 2 – Is the installation of biological toilets sustainable considering the possibility of groundwater contamination.*
- *Option 2 as contained in the Scoping Report (pg 47) – Is the provision of municipal services sustainable considering the financial costs and possible recovery thereof through rates and taxes.*

Economy:
- *where will beneficiaries find employment, will the reserve with its tourism potential and wildlife sustain all beneficiaries.*

We would hereby like to recommend that the issues listed above need further investigation as part of the EIA process.

Table 4.14 provides a response in terms of the above-mentioned comments.

4.5.5 Other comment received

4.5.5.1 Steve Tshwete Local Municipality - Approval of township establishment

The town planners, Urban Dynamics Inc., informed Clean Stream Environmental Services on 17 October 2012 that the Steve Tshwete Local Municipality conditionally approved the proposed Botshabelo Rural Village in terms of the townplanning process.

The Council Resolution (dated: 12 October 2012; Appendix 8) was forwarded to Clean Stream Environmental Services and included in the final Scoping Report. The following is indicated in the resolution:

1. That an application to establish a township on a portion of the Remainder of the farm Toevlugt 320 JS to be known as Botshabelo Rural Village be approved by Council subject to the following:

1.1 That the proposed township be proclaimed only after a positive 'record of decision' has been issued by the Department of Economic Development, Environment and Tourism.
1.2 That the consultants be informed to submit a set of conditions of establishment for scrutiny and approval by Council.
1.3 That all the precautionary measures recommended in the geotechnical report be adhered to.
1.4 That the recommendations made by the respective government departments and relevant stakeholders be adhered to.

2. That concerns raised by the Department of Water Affairs be attended to.

3. That a traffic impact study be conducted and submitted to the South African Roads Agency.

4. *That the Developer apply to Eskom for the provision of electricity.*

5. *That a suitable area, measuring not less than 120 m X 90 m, be made available for a soccer field.*

6. *That areas created for storm water not be zoned as 'public open space' but rather 'institutional' or 'community facility'.*

7. *That all areas identified as 'public open space' be of a reasonable size and suitable to enable proper park development.*

8. *That a refuse disposal facility be incorporated in the layout of the township.*

9. *That waste removal services be introduced after the township has been developed and there is occupation of at least 50% of the houses.*

10. *That if possible an alternative solution for sewer reticulation be investigated to avoid the challenges encountered with biological toilets.*

The above-mentioned conditions are addressed in Table 4.14. In addition, Urban Dynamics Town and Regional Planners revised the layout plan in order to incorporate these conditions. The revised layout plan is provided and discussed in Section 6 (Alternatives) of this report.

4.5.5.2 Department of Mineral Resources

Comment on the townplanning process was received from the Department of Mineral Resources (letter dated: 19 July 2012; Appendix 8) and is deemed to be relevant to this EIA. The Department of Mineral Resources indicated the following:

"I refer to you abovementioned application, and have to advise you that it is considered unlikely that the proposed township will interfere with mining or activities incidental thereto and this Department therefore has no objection to raise against the matter. Should this project not materialize within five years of the date of this letter, the matter should be referred to this office again for review."

4.5.5.3 Department of Agriculture, Forestry and Fisheries

Comment on the townplanning process was received from the Department of Agriculture, Forestry and Fisheries (letter dated: 3 October 2011; Appendix 8) and is deemed to be relevant to this EIA. The Department indicated the following:

"With reference to the above-mentioned matter this Department wishes to inform you that there is no objection to the proposed township on 127 hectares of the total property and that the above-mentioned property is no longer subject to the Subdivision of Agricultural Land Act, Act 70 of 1970. Please note that this comment does not exempt any person from any provision of any other law, and does not purport to interfere with the rights of any person who may have an interest in the agricultural land. "

4.5.5.4 South African National Roads Agency Limited (SANRAL)

The traffic impact study was forwarded to the South African National Roads Agency Limited (SANRAL) by WSP SA Civil and Structural Engineers (Pty) Ltd. for comment. The following comment (letter dated: 24 May 2013; Appendix 8) was received from SANRAL:

> *"The South African National Roads Agency Limited (SANRAL) hereby accepts the contents and findings of the above mentioned traffic impact study and therefore approve the proposed access position to the N11 and the mentioned study in principle, subject to the following:*
>
> *The impact of traffic generated by this development on the road network must be adequately mitigated. The road upgrades as proposed in the mentioned report are deemed insufficient to fulfill this requirement, as the bulk of development traffic will make use of the N11.*
>
> *The proposed access to the N11 must be designed and constructed as a butterfly configuration access to SANRAL's satisfaction and all outstanding issues relating to the design must be agreed with SANRAL.*
>
> *Detail design drawings i.e. geometric design, pavement design etc. must be submitted for consideration before final approval and wayleave permission for the construction of this access will be granted.*
>
> *In addition to the upgrade of the proposed access the developer must prepare a road master plan for the section of road between Harry Kwala Street and the proposed access in order to define the latter in terms of the long term objective of a road of this nature (the N11)."*

Table 4.14 provides a response in terms of the comments received.

4.5.5.5 South African Heritage Resources Agency (SAHRA)

The South African Heritage Resources Agency requested Clean Stream Environmental Services (e-mail dated: 6 May 2013; Appendix 8) to load the proposed application onto the digital heritage management system for comment. The application was loaded as requested. See Appendix 8 for a printout of the webpage.

Subsequently, the following interim comment (letter dated: 14 August 2013; Appendix 8) was received from SAHRA:

> *"In terms of Section 38(8) of the National Heritage Resources Act, the relevant heritage resources authority must be satisfied that the heritage studies completed as part of the NEMA process are satisfactory. The submitted HIA does not comply with the Minimum Standards for Impact Assessments as published by SAHRA in 2006 and amended in 2013. The submitted HIA fails to provide track paths and does not assess impacts to all heritage resources, including palaeontology and visual impacts.*
>
> *In addition, the submitted HIA fails to identify the significance of the two known heritage sites located in the vicinity of the proposed development – Fort Merensky which is a Provincial Heritage Site and thus is afforded the highest level of protection available through the National Heritage Resources Act, and the Botshabelo Village, which was provisionally protected in 1989 for its heritage significance. Although this protection has lapsed, it indicates that this site is a heritage resource of some significance.*

In addition, the Botshabelo Mission Station is of heritage significance and is currently the subject of archaeological investigation.

In assessing the submitted scoping report, SAHRA concurs with the concerns raised by Heritage South Africa and by the Simon van der Stel Foundation. In addition, justifiable concerns have been raised regarding the legitimacy of this kind of extensive residential development within a Nature Reserve, and in an area identified as Nature Reserve in the relevant SDP. Development of this type that falls outside of the identified urban edge contradicts best-practice in terms of town planning.

According to the scoping report, the proposed development is underlain by the Dwyka and the older Wilgerivier Formations. The Dwyka Formation is known for trace fossils, organic-walled microfossils, rare marine invertebrates (e.g. mollusks), fish and vascular plants and as such, has some heritage significance.

Interim Comment:
The submitted HIA is not accepted as satisfying the requirements of SAHRA. As such, an integrated Heritage Impact Assessment is required that assesses the direct and indirect impacts of the proposed development on the identified heritage resources including but not limited to Fort Merensky, the Botshabelo Mission Station and Village, on palaeontological resources as well as the visual impact of the proposed development on the Nature Reserve. This report must be completed by suitably qualified professionals.

SAHRA looks forward to receiving the above report before issuing a Final Comment for this proposed development."

Table 4.14 provides a response in terms of the above-mentioned comments.

4.5.5.6 Eskom Transmission

A letter was received (dated: 26 April 2013; Appendix 8) from Eskom indicating that Eskom Transmission's proposed Marble Hall-Rockdale B 400kV powerline is affected by the application. This letter was previously forwarded to Clean Stream Environmental Services (see Section 4.5.4.3).

4.6 Public participation conducted during the EIA phase

4.6.1 Additional public participation

Contact details could not be obtained for all the landowners within the 5 km radius during the scoping phase. Subsequently, flyers containing information about the proposed project and public meeting were hand delivered to the various properties (i.e. given to owner, left in gate/front door, etc) during the EIA phase. Refer to Section 4.4 for the additional interested and affected parties consulted.

Clean Stream Environmental Services also forwarded an e-mail (dated: 12 April 2013; Appendix 8) to all I&APs on the database informing them that the EIA process is still ongoing and that a public meeting would be arranged. Comment received as a result of this e-mail is provided in Section 4.6.3.

4.6.2 Public meeting

A public meeting was held on Saturday, 18 May 2013, at the Botshabelo Historical Village in order to provide feedback to interested and affected parties regarding the proposed project.

A letter (dated: 26 April 2013; Appendix 16) was forwarded to committee members of the Botshabelo Community Development Trust to inform the applicant of the public meeting and to invite the committee members to attend the meeting on behalf of the 1000 claimants.

A letter (dated: 26 April 2013; Appendix 16) was also forwarded to the Steve Tshwete Local Municipality regarding the public meeting and requesting representation from the municipality. The Steve Tshwete Local Municipality acknowledged receipt of (letter dated: 2 May 2013; Appendix 16) of the invitation to the public meeting.

The invitations to interested and affected parties and other stakeholders were e-mailed on 2 May 2013 and a reminder was forwarded on 13 May 2013. Invitations were hand delivered to the people residing within a 5 km radius of the site on 3 May 2013. In addition, an invitation to the meeting was also placed in the Middelburg Observer on 17 May 2013. A copy of the newspaper notice is provided in Appendix 16.

Minutes were taken during the meeting. A copy of the minutes of the meeting, agenda and attendance register is provided in Appendix 16.

The minutes were e-mailed (4 June 2013; Appendix 16) to the I&APs for comment. In addition, a copy of the minutes (including a copy of the presentation) was made available on the company website www.cleanstreamsa.co.za (Appendix 16). To date, no corrections/ additions/etc. to the minutes have been received.

Table 4.14 provides a summary of the issues raised during the public meeting. It also provides an indication of whom raised the said issue and where the said issue is addressed in this EIA (i.e. a response).

In brief, the main issues raised were with regards to:

- Location of site within the nature reserve;
- Alternative locations closer to town;
- Location of development next to the airfield;
- Fencing of development;
- New claimants and pending High Court case;
- Potential water pollution;
- Presence of all Botshabelo claimants at the public meeting.

It should be noted that the public meeting was stopped before completion. The representative of the Botshabelo Community Development Trust (Ms. M. Motsifane), the Doornkop councilor (I. Motsepe) and a few other attendees felt that the meeting should not go ahead without the presence of the entire Botshabelo community.

Subsequently, Ms. M. Motsifane indicated that the community would decide on another date for a pubic meeting and inform Clean Stream Environmental Services accordingly. ***To date, a follow up meeting has not been scheduled since the Botshabelo Community Development Trust has not been able to indicate a suitable date for such a meeting.***

The proposed public meeting was discussed telephonically with Ms. M. Motsifane early in April 2013. It was indicated that a meeting with the Botshabelo beneficiaries was scheduled for Sunday, 28 April 2013.

An e-mail (dated: 25 April 2013) was received from Mr. T. Msiza indicating that an Interim Committee had been elected and that all correspondence should be forwarded to the said committee. A response (dated: 26 April 2013) to the said e-mail was forwarded to Mr. T. Msiza.

A letter from Clean Stream Environmental Services (dated: 26 April 2013) was e-mailed to Mr. L. Seloane (Chairperson) of the Interim Board with copies to Mr. B. Msiza (Secretary) and Mr. T. Msiza (Vice-chair) regarding the proposed public meeting.

The following was indicated in the said letter:
"Clean Stream Environmental Services intends to host a public meeting on 18 May 2013 in order to provide feedback to the interested and affected parties in terms of the issues raised and project progress.

As discussed with Ms. Motsifane, the meeting will be held in the hall at the Botshabelo Nature Reserve. The intended meeting will be advertised in the Middelburg Observer.

Unfortunately, it would logistically not be possible for all claimants to attend the meeting due to limited space available (the hall can only accommodate approximately 100 people). Please could this issue be discussed with the claimants during the AGM scheduled for Sunday, 28 April 2013.

It would be highly appreciated if you could indicate (at your earliest convenience) whether the committee members would be able to attend the meeting. Please provide us with the names and contact details of persons who will be present."

The said letter was subsequently also e-mailed to Ms. M. Motsifane (dated: 30 April 2013) after it was telephonically indicated that the Interim Board was not legitimate.

No comment or issues of concern regarding the proposed public meeting were received from the Botshabelo Community Development Trust Committee before the public meeting took place.

4.6.3 Comment received

Simon van der Stel Foundation
An e-mail (dated: 12 April 2013; Appendix 8) was received from the Simon van der Stel Foundation requesting to be removed from the I&APs list since the proposed development does not fall within the Simon van der Stel Foundation geographical area. Clean Stream Environmental Services was requested to consult Heritage SA.

It should be noted that Heritage SA is on the I&AP database.

Mr. R. Glintzer (Portion 5 of Groenfontein 266 JS)
Mr. R. Glintzer indicated in an e-mail (dated: 23 April 2013; Appendix 8) that he is concerned that their original comments (± 70) submitted to the Steve Tshwete Local Municipality were not included in the Scoping Report.

Clean Stream Environmental Services indicated (e-mail dated: 23 April 2013; Appendix 8) that all written and verbal comments received from Mr. Glintzer were included in the Scoping Report (Section 6.4.8.3). Any additional comments should be forwarded to Clean Stream Environmental Services for inclusion in the EIA Report. To date, no additional written comments have been received.

Middelburg Aeroclub

The Middelburg Aeroclub requested (e-mails dated: 20 and 22 May 2013; Appendix 8) that the following members also be added to the stakeholder database for future correspondence:

- S. Steenkamp; F. van der Merwe;
- W. Greyling; J. Nel; R. Lovett.

Mpumalanga Tourism and Parks Agency

After the pubic meeting, Clean Stream Environmental Services once again requested comment from the Mpumalanga Tourism and Parks Agency (e-mail dated: 22 May 2013).

Mr. B. Morris subsequently forwarded the gazette (Administrator's Notice 2757) indicating the proclamation of the Botshabelo Nature Reserve to Clean Stream Environmental Services. A copy of the notice is provided in Appendix 17.

In addition, Mr. B. Morris indicated the following (e-mail dated: 11 June 2013):

"We are busy negotiating with the community of Botshabelo to consider other options/sites for the location of the residential stands owing to the sensitivity of the site (MBCP value) as well as the location near to a pan and the fact that the site is located within a declared nature reserve.

MTPA does therefore not support the development of the current site as it is indicated on the map, however alternative land to the east of the tar road should be considered for the development."

The Mpumalanga Tourism and Parks Agency presented their proposal to the Botshabelo Community Development Trust on Sunday, 9 June 2013. The following feedback (e-mail dated: 12 June 2013) was received from Ms. N. Kunene:

"The MTPA's presentation on 9 June (Sunday) to the Botshabelo community was mainly to inform the community at large of the sensitivity of the chosen site (MBCP value) as well as the location near to a pan and the fact that the site is located within a declared nature reserve. We made it clear to them as one of their stakeholders that as MTPA does not support the development on the current site as it is indicated on the map, however alternative land to the east of the tar road should be considered for the development.

Our role was to paint the picture from the conservation perspective, it remains the community's prerogative to choose whether or not they take our advice. So yes, we presented and left. The interim committee promised to get back to us with the final decision of whether they are continuing with the proposed residential area in the chosen site or not. I have not heard a word since then, I am still waiting."

4.7 Evaluation of the draft Environmental Impact Report (EIR)

The draft Environmental Impact Report (dated: September 2013) will be submitted to the Department of Economic Development, Environment and Tourism for evaluation purposes. A hard copy of the document will also be forwarded to the following authorities for evaluation (40-day period):

- Department of Water Affairs;
- Mpumalanga Tourism and Parks Agency;
- Steve Tshwete Local Municipality.

A copy of the draft Environmental Impact Report will also be made available to the interested and affected parties and stakeholders consulted and/or registered as part of the process.

A hard copy of the draft EIR will be left at the Gerard Sekoto Public Library as well as the Botshabelo Historical Village offices. An electronic version will be made available on the company website (www.cleanstreamsa.co.za) and on cd (on request). The availability of the draft EIR for review will be advertised in the Middelburg Observer.

The various departments, stakeholders and interested and affected parties will be requested to forward any comments on the report to the consultant within the 40 day period provided. A register will be kept of all comments received in terms of the evaluation of the report. These comments will then be included and addressed in the final EIR.

The final EIR will once again be made available to interested and affected parties and stakeholders for comment (21-day period), whereafter it will be submitted to the Department of Economic Development, Environment and Tourism for decision making.

4.8 Informing Interested and Affected Parties of the Record of Decision

On receipt of the Environmental Authorisation and Record of Decision (positive or negative decision), all identified interested and affected parties will be informed by means of facsimile, e-mail or telephonically that the Environmental Authorisation and Record of Decision with regards to the project have been issued. Information w.r.t. the appeal procedure will also be provided.

An advertisement in this regard will also be placed in the Middelburg Observer, in order to inform I&APs of the decision.

A copy of the Environmental Authorisation and Record of Decision will be made available on the company website (www.cleanstreamsa.co.za).

4.9 List of Interested and Affected Parties

From the above public participation process (Scoping and EIA phases), the following list of Interested and Affected Parties was compiled:

INTERESTED AND AFFECTED PARTY LIST	
Organisation	**Name**
Government Departments	
Department of Agriculture, Forestry and Fisheries – Nelspruit	F. Mashabela
Department of Agriculture, Rural Development and Land Administration (agriculture)	J Venter
Department of Co-operative Governance and Traditional Affairs	M Loock
Department of Culture, Sports and Recreation	S Singh
Department of Economic Development, Environment and Tourism	M Sesweni
Department of Mineral Resources– eMalahleni	M Mokonyane
Department of Public Works	M Mokgohloa
Department of Rural Development and Land Reform	G Mathonsi
Department of Water Affairs – Bronkhorstspruit	P Monyela
Other Organisations	
Civil Aviation Authority	C Isherwood
Eskom	E Lennox, L Motsisi, M Moloko
Heritage South Africa/Simon van der Stel Stigting	M Kent
Middelburg Aeroclub	B van der Merwe, W Greyling, R Lovett, J Nel, S Steenkamp, F van der Merwe
Mpumalanga Agriculture	H Laas
Middelburg Bird Club	K Hattingh/B Smith
Middelburg Chamber of Commerce and Industry	A Ott
Middelburg Distriks Landbou Unie	J Schmahl
Mpumalanga Heritage Foundation	A Barlow
Mpumalanga Provincial Heritage Authority	B Moduka
Mpumalanga Tourism and Parks Agency	A Hoffman, F Krige, M Lotter, R Niemand, H Mare, B Morris
Mpumalanga Wetland Forum	G Cowden/A Beetge
South African Heritage Resources Agency	J Lavin
South African National Roads Agency	M Yorke-Hart
Telkom	J Kruger
Transvaal Agricultural Union	D du Plessis
Non-Governmental Organisations	
Endangered Wildlife Trust	U Franke
Wildlife and Environment Society of South Africa	L Betha

INTERESTED AND AFFECTED PARTY LIST	
Organisation	**Name**
Local Municipality and Municipal Councillor	
Ward Councillor – Steve Tshwete (Ward 16)	J Dyason
Ward Councillor – Steve Tshwete	I Motsepe
Steve Tshwete Local Municipality	M Mahamba, P Ndlovu, S Mtsweni
Nkangala District Municipality (Development and Planning)	G Mathalise
Surrounding landowners/users	
Botlalo Mining and Energy Resources (Pty) Ltd.	Mayerhofer, BJ
Adams, Susan	Mid-Malanga X104 cc.
Bester, Leon & Johan	Mthombeni, J
De Meyer, Flip	Nagel, CP
Emarubini Communal Property Association (W. Mtsweni)	Nell, Koos
Erichsen, K	Neels Moolman Familie Trust (Juan Moolman & Freek Nel)
Fourie, VC	Philmar Trust (Louw Roodman)
Glintzer, Rudiger	Pieterse, JAM
Glintzer, MJ	Podges, Michael
Gordon, Godfrey	Potgieter, P
Haarhoff, PJ	Pots Galore cc (Seymore)
Harbou Boerdery (Hartman, Org & Cilie)	Ramohlakane Groenfontein Community Trust
Hattingh, CJ	Ruthven, JM
Herbst, MM	Snyman, MM
Hesselman, K	Steenkamp, P (renting land)
Heyns, Mona	Tosen, EI
Holder, Bennie	Trinity Bedienings Sentrum (R van Zyl)
James, Ansie	Van den Bergh, D
Louw, Vic & Mari	Van der Merwe, L
Mabena, Samual	Van der Walt, N
Madikoto, WL (4 SAI)	Van der Westhuizen, HM
Mahlangu, TJ	Van Niekerk, TE
Masondo, Rhoda	Viljoen, T
Botshabelo community members who attended public meeting	
Motsifane, M	Mashilo, K
Ntsobe, KR	Sihlangu, B
Sihlangu, I	Malom, E
Ragamakane, J	
Other (I&APs who attended the public meeting)	
Mahlangu, L	Sonya
Patage, N	Mahubahe, D
Masibela, J	Mogatshe

4.10 Summary of issues

Table 4.14 provides a summary of all the objections and comments received during the Scoping and EIA phases of the project (including the public meeting) as well as a response to these comments.

Through the Scoping and EIA phases, it was determined that the main issues of concern are with regards to:

- The location of the proposed development;
- Potential impact on the natural environment (i.e. natural vegetation, animal life, surface water, groundwater, pans and wetlands, air quality, etc.);
- Status of the Botshabelo Nature Reserve;
- Sense of place;
- Service provision (water, sewage, electricity, waste removal);
- Management of the development;
- Potential impact on the Middelburg Aeroclub;
- Potential impact on the surrounding farms (agriculture, safety and security);
- Potential impact on traffic (including maintenance of access road);
- Potential impact on groundwater quality and quantity;
- Potential impact on the Botshabelo Historical Village and Fort Merensky (archaeological/cultural);
- Socio-economic impact on the beneficiaries (i.e. Botshabelo Community Development Trust).

From a conservation point of view, the Mpumalanga Tourism and Parks Agency indicated that they do not support the development of the current site and that alternative land to the east of the tar road should be considered for the development.

Table 4.14: Summary of issues of concern raised by interested and affected parties (I&AP's), stakeholders and authorities

	Issue	I&AP, Stakeholders, Authority	Response
	Development layout and location		
1.	Will the 'Rural Village' accommodate rural and ethnic concerns?	Heritage South Africa (4.3.5) Simon van der Stel Foundation (4.3.6) Department of Co-operative Governance and Traditional Affairs (4.5.4.4)	▪ Response from Urban Dynamics (19 November 2012): The fact that the town reflects the characteristics of a normal urban township is so. This is mainly due to the fact that the community expressed the need to obtain freehold title to the stands. The stands therefore will have to be surveyed and registered with the Surveyor-General and Deeds office. In terms of densification, the community requested that the development be contained to the site provided in order to reserve the majority of the area for open space or nature reserve, therefore leap frogging can be contained to the footprint of the development. Care has been taken not to interfere with the remainder of the farm. The layout makes provision for the African rural feel in the form of the mushroom concept, which is the modern version of the African way of living. Community erven have been provided in the layout which can be used where slaughtering of animal and religious activities can take place. ▪ In terms of character of the Rural Village, the following was indicated by Dr. J. Pistorius: The new residential development should perhaps consider historical events and architectural themes encapsulated in the Botshabelo cultural village such as the missionary station, colonial townscape and the indigenous architecture which may provide innovative and complimentary ideas to be incorporated in the new residential development.
2.	It is called a 'rural' village but it is very close to the existing urban node of Middelburg AND adjacent to the Air Strip. Concern is voiced about the fact that urban development 'jumps' across undeveloped areas (leap frogging). The development of an individual free standing node like the one proposed will most probably in the long term stimulate infill resulting in urban sprawl. As this is not an ideal situation, the impact assessment has to address preventative measures.		
3.	Sense of Place – the proposed layout is a very conventional and ordinary URBAN landscape. Concern is raised that this layout makes hardly any attempt in creating an unique African rural village with a special sense of place.		
4.	The proposed development shows more characteristics of a conventional urban township than a rural village if one considers the number of erven, size of erven (500 m^2), proposed land uses and expected engineering services (water, electricity, sanitation) to be provided. It is suggested that rural characteristics be built into the rural village concept to include typical rural land uses such as grazing, cultivation, places where livestock can be slaughtered, places for religious gatherings, etc.		
5.	The impact assessment has to address matters concerning the fact that this property is within a Nature Reserve.	Heritage South Africa (4.3.5)	See Section 7 of this report for the impact assessment.
6.	Furthermore, according to Table 3.1 on page 11 of the Scoping Report, the aim of the Development Facilitation Act is to provide for development and planning. This is correct, but not entirely as the act lays down specific principles that apply to all types of land planning and development. in this regard the proposed development contradicts the following DFA principles: ▪ Discourage the phenomenon of urban sprawl and contribute to the development of more compact towns and cities; ▪ Contribute to the correction of historically distorted spatial patterns of settlement in the Republic. This means people have to spend a lot of time and money travelling long distances to work, shops, school and social facilities. It also means that local authorities must spend large amounts on providing and maintaining excessive amounts of infrastructure. Increasingly they cannot afford to do this. Urban sprawl does not use existing infrastructure efficiently. The Steve Tshwete Local Municipality enforces the above-mentioned principles through their Spatial Development Framework by demarcating urban edges. However the proposed development is located outside the urban edge of Middelburg.	Department of Co-operative Governance and Traditional Affairs (4.5.4.4)	▪ Response from Urban Dynamics (19 November 2012): The proposed development is outside town and not urban sprawl per se. The proposed layout endeavours to densify the erven so as to create a compact residential area and not a sprawled out area, as the case is in many of the former homelands with vast tracts of undeveloped and un-used parcels of land. The Botshabelo settlement is based on a successful land claim and beneficiaries will be resettled on their ancestral land. This development can not be seen as a low cost township developed away from the work place as the case was with the majority of black townships in the past. Government has granted the claimants their ancestral land and the fact that they will have to travel to Middelburg and surrounding areas for work is a fact, and we as planners can do nothing about it, as the politicians have already granted the claim and created an expectation with the community that they may resettle on their land. The normal educational, social facilities and shops have been provided for in the layout. It must also be kept in mind that some of the claimants will continue with agricultural/subsistence farming on the remainder of the farm, whilst others might get involved with the tourism component of the cultural/historical Botshabelo museum. The fact that the development falls outside the urban edge of Middelburg cannot be denied, but again the politicians have raised an expectation with the community to re-settle on the land and we as planners merely tried to optimize the utilization of the land and limiting the impact of the development on the natural environment and the adjacent airfield, taking into account the aviation restrictions on the proposed development. Council was also put in the same situation so as to accept the political decision taken in terms of granting the land claim.
7.	It is said that 1000 stands are provided. 930 beneficiaries are recorded. Does this mean that any further expansion would take place? How will further growth of this village be addressed? The street layout seems to 'invite' future expansion. These are crucial issues that must be addressed. The proposed development will be too small for all the beneficiaries (± 2000).	Heritage South Africa (4.3.5) Simon van der Stel Foundation (4.3.6) A. Barlow (public meeting) R.W. Glintzer (public meeting)	Initially, the Botshabelo Community Development Trust indicated that they need 930 stands to accommodate the beneficiaries from the Trust. Urban Dynamics subsequently proposed to make provision for 1000 stands, which will accommodate the current need and potential future need of the community. However, during the public meeting Ms. M. Motsifane indicated that there were originally only 700 beneficiaries. The list has since grown to approximately 2000. The proposed development was designed in terms of the budget received from the Land Claims Commission. Currently, they can only accommodate 1000 households. As soon as they obtain more money, the necessary requests will be submitted to extend the village.
8.	Why behind the airfield? We request that the proposed town be located nearer to the middle of Botshabelo towards the more open and flat area or nearer to town. Recommends that the development is placed adjacent to Mhluzi. Proper services can then be installed and the people will be closer to town and job opportunities. The Steve Tshwete Local Municipality should make that property available to the community for relocation.	R.W. Glintzer (4.4.8 and public meeting)	The Botshabelo Community Development Trust want to relocate to their ancestral land and not other property. See Section 6 regarding alternatives investigated.
9.	Apparently there are regulations stating that rural villages may not be located closer than 15 km from each other. Are there such regulations?	R.W. Glintzer (4.4.8)	Neither Clean Stream Environmental Services or Urban Dynamics are aware of such a regulation.

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	Issue	I&AP, Stakeholders, Authority	Response
10.	A refuse disposal facility must be incorporated in the layout of the township.	Steve Tshwete Local Municipality (4.5.5.1)	The layout plan was amended by Urban Dynamics to include a refuse removal site that will be utilised as a transfer station. See Figure 6.6 in Section 6 of this report.
11.	The Botshabelo Community may not sell or rent their stands to people not belonging to the community. In addition, the Botshabelo Community Trust must not sell the stands to the Botshabelo community members. The development is being paid for by the taxpayer. The development should not just be elaborate vacation homes.	R.W. Glintzer (4.4.8)	Noted. According to Plan Associates (2013), the beneficiaries could take a resolution that only beneficiaries are allowed to initially own stands in the rural village. Furthermore, a condition can be included in the Conditions of Establishment of the township that approval from the beneficiaries should be obtained before a stand may be sold and that no backyard dwellings will be allowed. In addition, the Steve Tshwete Local Municipality promulgated the 'Municipal Management and Control of Informal Settlements By-Laws' in the Mpumalanga Provincial Gazette Extraordinary on 13 August 2010. The By-Laws make provision for the eviction of illegal informal settlements. It is proposed that the municipality monitor the proposed rural village on a weekly or monthly basis to ensure that no illegal structures are erected, and to evict those that spring up.
12.	The proposed development affects the existing Eskom Distribution Rockdale – Doornkop 11 kV powerline. A number of conditions must be adhered to (see Section 4.5.3.2).	Eskom (4.5.2.2)	The proposed development will not impact on the said powerlines or any other Eskom powerlines
13.	From a natural resource viewpoint, the proposed development will not be supported on any of the proposed areas. The Department recommended that the development be moved to an existing urban area situated near the Botshabelo Nature Reserve. Existing urban development's within the Steve Tshwete Local Municipality is situated approximately 4 kilometers from the reserve. The proposed area is situated outside the development area of the local municipality and zoned as a conservation area. Despite all efforts to minimise the impact of the proposed development, these activities will lead to additional impact on the area which needs to be preserved as a conservation area. The natural resources must be seen as scarce resources which cannot be renewed and must be preserved and nurtured for our descendents. The natural resources are experiencing immense pressures from all sectors e.g. mining, urban development, pollution, etc. Secondary impacts due to all the additional activities will impact negatively on the area resulting in an impacted area larger than the 130 ha which is envisaged.	Department of Agriculture, Rural Development and Land Administration (4.5.2.5)	Noted. See response from Urban Dynamics to Issue No. 6 above. The Botshabelo Community Development Trust want to relocate to their ancestral land and not other property. See Section 6 of this report regarding alternative investigated. ▪ In terms of the potential impact on an area larger than 130 ha, Plan Associates (2013) indicated the following: The beneficiaries should be capacitated to understand the importance of preserving the character and environment of the Nature Reserve. The development should be contained within the township boundary, including agricultural activities. Larger-scale activities (e.g. cattle farming) should be directed to the other farms owned by the Botshabelo Community Development Trust, outside of the Nature Reserve. In order to prevent the settlement from growing illegally through squatting, the Steve Tshwete Local Municipality Municipal Management and Control of Informal Settlements By-Laws need to be enforced. The By-Laws makes provision for the eviction and removal of informal dwellings. The municipality should thus monitor the settlement on a continuous basis to ensure that no illegal structures are established.
14.	Who decided on the location of the site? The adjacent landowners were not afforded the opportunity to provide input w.r.t. the location of the site.	R. Glintzer (public meeting)	According to Ms. M. Motsifane, the Botshabelo community identified the site currently on the table. The site was identified after many meetings and consultations with the municipality. The municipality has already approved the development (i.e. in terms of the town planning process). See Section 6 for alternatives investigated and included as part of this EIA.
15.	A suitable area, measuring not less than 120 m X 90 m, must be made available for a soccer field.	Steve Tshwete Local Municipality (4.5.5.1)	The layout plan was amended by Urban Dynamics to provide sufficient space for a soccer field. See Figure 6.6 in Section 6 of this report.
16.	Areas created for storm water must not be zoned as 'public open space' but rather 'institutional' or 'community facility'.	Steve Tshwete Local Municipality (4.5.5.1)	The layout plan was amended by Urban Dynamics. See Figure 6.6 in Section 6 of this report.
17.	All areas identified as 'public open space' must be of a reasonable size and suitable to enable proper park development.	Steve Tshwete Local Municipality (4.5.5.1)	The layout plan was amended by Urban Dynamics. See Figure 6.6 in Section 6 of this report.
	Services		
18.	Sewage: It is still unclear as to which sewerage system would be adapted, but I presume it will be the same system as found in the village of Doornkop. The 'long drop' system works well, however, if we have excessive rain during the rainy season, it has been known for these 'long drops' to overflow and that in turn results in the groundwater as well as the surface water being contaminated. With an average of 16 000 people dying from diarrheal diseases every year in South Africa, would this development be managed properly, and who would take responsibility if disaster strikes?	P. Steenkamp (4.4.8)	Due to budget constraints, biological toilets will be installed. Please refer to Section 2.6 for more information regarding proposed services.
19.	Where is the water and sanitation coming from? Rural means extra costs. No pit toilets and boreholes are to be made here! Pipelines to Middelburg must be installed before any houses are set up here.	R.W. Glintzer (4.4.8)	Due to budget constraints, biological toilets will be installed and water will be obtained from boreholes. Please refer to Section 2.6 for more information regarding service provision.
20.	Figure 2 is supposed to indicate where sewerage and waste will be managed, but it is not on the map supplied.	Mpumalanga Agriculture (4.3.16)	Please refer to Section 2.6 regarding services. Due to budget constraints, biological toilets will be installed. The proposed location of the waste transfer station is indicated in Figure 6.6.
21.	Will there be any sewage package plants on site?	B. Smith (public meeting)	No. Biological toilets will be used. See Section 2.6 regarding services.
22.	The development should be located next to Mhluzi since it is more suitable in terms of service provision. The closer the better since it is tax payers' money being wasted.	R. Glintzer (public meeting)	Agreed. The Botshabelo Community Development Trust want to relocate to ancestral land and not any other property.
23.	The Developer must apply to Eskom for the provision of electricity.	Steve Tshwete Local Municipality (4.5.5.1)	Noted. Developer to comply with this condition.
24.	Waste removal services must be introduced after the township has been developed and there is occupation of at least 50% of the houses.	Steve Tshwete Local Municipality (4.5.5.1)	Noted. Waste removal services should be introduced from the start of the development. ▪ Plan Associates (2013) recommended the following with regards to waste disposal: The community should be capacitated to understand the importance of a clean

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			environment especially in relation to the Nature Reserve. Illegal dumping should be firmly dealt with in the form of fines, etc. The community should be informed with regards to the approved refuse removal containers to be used and individual community members need to ensure that refuse is placed in the correct containers to comply with municipal procedures. In addition, the municipality must ensure that the refuse is collected on a weekly basis.
25.	If possible an alternative solution for sewer reticulation must be investigated to avoid the challenges encountered with biological toilets.	Steve Tshwete Local Municipality (4.5.5.1)	Noted. Developer to comply with this condition.
26.	The EIA needs to prove the sustainability of the proposed development in terms of the provision of engineering services and the economy. Engineering services: ▪ Option 1 as contained in the Scoping Report (pg 47) – Are the drilling of boreholes sustainable considering the quality and quantity of water. ▪ Option 2 – Is the installation of biological toilets sustainable considering the possibility of groundwater contamination. ▪ Option 2 as contained in the Scoping Report (pg 47) – Is the provision of municipal services sustainable considering the financial costs and possible recovery thereof through rates and taxes.	Department of Co-operative Governance and Traditional Affairs (4.5.4.4)	▪ Response from Urban Dynamics (19 November 2012): The community emphasized during various community participation meetings that they would like to have access to proper engineering services, as they currently have access to same in the former homeland areas to where they were resettled forcefully in the past. The funding of these services are currently being investigated by the claimants and politicians as the community do not want to accept the basic level of services e.g. pillar taps on RDP standards and biological toilets, but rather water per house and a waterborne sewer system. The sustainability of the services to be installed is debatable as the cost of the services have not yet been calculated or the monthly operational costs, as the current funds available does not make provision therefore. The provision of engineering services needs to be done in a cost effective way and therefore the need to concentrate the stands close to another so as to shorten the distance of pipes, roads, etc. ▪ Plan Associates (2013) indicated the following in terms of services: Given the financial constraints and the distance of the settlement from existing bulk services the following three options are available towards a higher level of services: 1. Locate the settlement closer to Middelburg town. 2. Beneficiaries to provide private funding for improved engineering services. 3. May be able to lower costs by pursuing more energy efficient energy sources (e.g. solar power). 4. Department of Human Settlements may provide funding for the installation of engineering services. ▪ Plan Associates (2013) indicated the following in terms of the general sustainability of the development: The Department of Rural Development and Land reform who is responsible for the monitoring of land obtained through the Restitution process should monitor whether the beneficiaries are utilising the land productively or not. Capacity building with regards to sustainable farming practices should be done by the Department. The Business Plan should be revisited to determine which agricultural activities can be pursued in the area sustainably.
Wetlands/pans			
27.	The 50-m buffer zone around the pans and wetlands will suffice.	DEDET (4.2.1)	Noted. The 50 m buffer zone is indicated on the layout plan. No development will take place within this buffer zone.
28.	The proposed village is planned next to a Pan. How will this pan be protected against pollution?	Mpumalanga Agriculture (4.3.16)	A 50 m buffer zone has been provided around both pans (Pan 1, Pan 2) and both wetlands (HSW1, HSW2). Mitigation measures to reduce the risk of polution will have to be provided in the Environmental Management Plan.
29.	The township is planned on a wet area. In the summertime during the rainy season that area is a marshland.	R.W. Glintzer (4.4.8)	The pans and wetlands on site were delineated by Wetland Consulting Services (see Section 5.9 of this EIA) and excluded from development.
30.	Will there be surface water runoff from the development into the pans? The current levels of pollution in the rivers and the potential additional pollution from the development is an issue of concern.	B. Smith (public meeting)	Surface water from the southern portion of the site drains towards HSW2, whilst surface water from the central and northern portions of the site drains towards Pan 1 and HSW1. Pan 2 receives runoff water from the Middelburg Aeroclub site. Mitigation and management measures (to be included in the Environmental Management Plan) would have to be implemented to ensure that the surface water environments are not polluted.
Groundwater			
31.	It must be ensured that there is sufficient groundwater available for the development.	DEDET (4.2.1)	According to Engeolab cc. (2011a), 3 boreholes should be able to provide the 96 m^3 of water required per day for the development. Further studies to confirm this would however, be required. ▪ Plan Associates (2013) indicated the following in terms of sustainable water supply: The municipality needs to weigh up the costs of providing a temporary solution (e.g. boreholes) vs. a permanent solution (viz piped water), noting that the geohydrological report indicated that the groundwater might become unusable after a time. The alternative is to establish the township closer to existing townships and services.
32.	Are the drilling of boreholes sustainable considering the financial costs and possible recovery thereof through rates and taxes?	Department of Co-operative Governance and Traditional Affairs (4.5.4.4)	
33.	It came to our attention that the local municipality plans to supply the whole village with water from boreholes sunk in and around the village. According to the National Water Act of 1999, each rural household is entitled to at least 6000 litres of water per month, which in this case, amounts to 6 000 000 litres per month, or, 196721 litres of water to be pumped from this boreholes per DAY. How sustainable can this be in the long term, especially in an area known for its poor groundwater	P. Steenkamp (4.4.8)	

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	Issue	I&AP, Stakeholders, Authority	Response
	availability? Furthermore, would the Local Authorities decide to supply the water via road, just imagine what the financial implications would be on the taxpayers pockets of Middelburg.		Once the boreholes have been drilled and equipped the water quality and supply should be monitored on a 6 monthly/bi-annual basis to ensure the water is suitable for human consumption and sufficient to meet the settlement's demands.
34.	The groundwater quality must be tested to ensure that it is suitable for domestic use.	DEDET (4.2.1)	Agreed. Once the boreholes have been drilled and equipped the water quality and supply should be monitored on a quarterly basis to ensure the water is suitable for human consumption and sufficient to meet the settlement's demands.
35.	The three proposed boreholes will not be sufficient to provide everyone with water. It must be ensured that water abstraction for the proposed development does not impact on the groundwater supply of the surrounding landowners.	DEDET (4.2.1) K. Hesselman (4.4.8) R.W. Glintzer (4.4.8)	Agreed. The monitoring of surrounding boreholes should be included as part of a groundwater monitoring programme. This would include the monitoring of the fountain on Groenfontein and nearby boreholes before any development takes place. Once the boreholes have been drilled and equipped the water quality and supply should be monitored on a quarterly basis to ensure the water is suitable for human consumption and sufficient to meet the settlement's demands.
36.	The fountain on Groenfontein has its catchment area right there where this township is planned. Pollution is a great concern. A proper baseline before any development needs to be done. Lifelong tests are going to have to be done, on regular bases, to ensure that water quality stays the way it is now.	R.W. Glintzer (4.4.8)	
	Archaeological sites		
37.	Impact of the development on the historical village and fort.	Mpumalanga Heritage Foundation (4.3.4)	The Heritage Impact Assessment indicated that the residential development occurs at a considerable distance from the Botshabelo cultural village and its associated infrastructure and should therefore not have a direct physical impact on this cultural landscape. The proposed development will be located approximately 1.2 km from Fort Merensky and 1.5 km from the Botshabelo historical village. ▪ Plan Associates (2013) indicated the following: The Botshabelo Settlement and Business Plan need to be revisited to evaluate the business proposals. The required funding should be sourced to upgrade and restore the village to have a marketable product. The Mpumalanga Provincial Heritage Authority must capacitate the beneficiaries on the importance of the historical town and the Ndebele heritage. The Department should further monitor that the buildings are kept in-tact and that none of the material is used for alternative purposes. The beneficiaries should actively pursue the feasible projects to create the necessary employment opportunities in order to uplift the community and protect the historical village.
38.	The compatibility of the proposed development with the Botshabelo historical village and Fort Merensky should be further investigated.	Department of Co-operative Governance and Traditional Affairs (4.5.4.4)	
39.	The close-by historical settlement of Botshabelo would become a source of building materials for the new residents of the village.	P. Steenkamp (4.4.8)	The beneficiaries should be educated on the importance of the Botshabelo Historical Village and Fort Merensky in terms of historical aspects. In addition, Plan Associates (2013) recommends that the historically important settlements be protected and utilized as assets. A number of potential projects were identified in the Business Plan (2004).
40.	In terms of Section 38(8) of the National Heritage Resources Act, the relevant heritage resources authority must be satisfied that the heritage studies completed as part of the NEMA process are satisfactory. The submitted HIA does not comply with the Minimum Standards for Impact Assessments as published by SAHRA in 2006 and amended in 2013. The submitted HIA fails to provide track paths and does not assess impacts to all heritage resources, including palaeontology and visual impacts. In addition, the submitted HIA fails to identify the significance of the two known heritage sites located in the vicinity of the proposed development – Fort Merensky which is a Provincial Heritage Site and thus is afforded the highest level of protection available through the National Heritage Resources Act, and the Botshabelo Village, which was provisionally protected in 1989 for its heritage significance. Although this protection has lapsed, it indicates that this site is a heritage resource of some significance. In addition, the Botshabelo Mission Station is of heritage significance and is currently the subject of archaeological investigation. In assessing the submitted scoping report, SAHRA concurs with the concerns raised by Heritage South Africa and by the Simon van der Stel Foundation. In addition, justifiable concerns have been raised regarding the legitimacy of this kind of extensive residential development within a Nature Reserve, and in an area identified as Nature Reserve in the relevant SDP. Development of this type that falls outside of the identified urban edge contradicts best-practice in terms of town planning. According to the scoping report, the proposed development is underlain by the Dwyka and the older Wilgerivier Formations. The Dwyka Formation is known for trace fossils, organic-walled microfossils, rare marine invertebrates (e.g. mollusks), fish and vascular plants and as such, has some heritage significance. **Interim Comment:** The submitted HIA is not accepted as satisfying the requirements of SAHRA. As such, an integrated Heritage Impact Assessment is required that assesses the direct and indirect impacts of the proposed development on the identified heritage resources including but not limited to Fort Merensky, the Botshabelo Mission Station and Village, on palaeontological resources as well as the visual impact of the proposed development on the Nature Reserve. This report must be completed by suitably qualified professionals. SAHRA looks forward to receiving the above report before issuing a Final Comment for this proposed development.	South African Heritage Resources Agency (4.5.5.5)	▪ **Response from specialist, Dr. J. Pistorius:** SAHRA's interim comments should be read against the fact that the Phase I HIA report was conducted in June 2011, two years in advance of receiving SAHRA's comments (August 2013) on the report. During the two years new information about the project was generated which was not available at the time when the report was done whilst changes occurred with regard to the guidelines that are set for heritage reports. SAHRA requires an integrated heritage impact assessment report for the proposed development. This requires that the following additional studies has to be done, namely: • A paleontological study (as fossil bearing rock may exist in the proposed developmental area). At the time when the Phase I HIA study was done (2011) SAHRA did not request paleontological studies. During the past two years (with no exact starting date?) paleontological studies have become a standard requirement for heritage studies. It is therefore recommended that Dr. Bruce Rubbidge (attached to the Department of Paleontology at Wits) be approached to do a paleontological study which mostly comprises a desk top study or a letter for exemption for a paleontological study to be conducted (Contact numbers: 0116465214 / 0725757752). • A visual impact assessment study as SAHRA is concerned about the impact of the residential development on the Nature Reserve. A visual impact assessment study may also help to establish whether the residential development may have an influence on the Botshabelo historical built environment and not only on the Nature Reserve. SAHRA also indicates that the Phase I HIA study does not comply to the guidelines for heritage reports as set out in 2006 and 2013. SAHRA does not outline the specific guidelines which are not fulfilled, except that track logs do not appear in the report. The use of track logs in heritage reports only became a requirement in guidelines which were published on 12 September 2012 (the latest guidelines for

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		heritage reports), fifteen months after the Botshabelo heritage report was completed. The absence of track logs as a requirement for heritage reports have become a standard request in all comments from SAHRA's Mpumalanga desk although this author (and other heritage specialists) have compiled heritage reports before these guidelines have been published. This issue was raised during a conversation with Mrs. Colette Scheermeyer (SAHRA) in June 2013 who remarked '…. that SAHRA officials surely must have an understanding of this issue'. SAHRA's comment that archaeological research is currently underway at Botshabelo has been confirmed by Dr Natalie Swanepoel from UNISA. Together with post graduate students from UNISA's Department of Anthropology and Archaeology the department has embarked on a research programme and field school which will stretch over three consecutive years (2013 to 2015). During this time period the department and the students will be involved in various research programmes. In Dr. Swanepoel's research proposal she indicates her willingness to assist in the 'development of a Heritage Management Plan' for the Botshabelo site based on the data that will be produced during the research programme. However, I fail to recognise any deterrent relationship between the research programme and the proposed residential development. Most of the concerns that were raised by Heritage South Africa (also representing the Mpumalanga Heritage Foundation) and the Simon van der Stel Foundation, which is supported by SAHRA, centre around issues of town development e.g.: the density of the rural village; future expansion of the village; its location within a Nature Reserve and outside the (more suitable) urban edge; proximity to the air field; lack of ethnic 'sense of place'; road outlays, etc. These issues have little direct bearing on Botshabelo's heritage and can only be addressed by means of a town development plan which integrates sensitive heritage issues. This was pointed out in the Phase I HIA report: 'The new residential development should perhaps consider historical events and architectural themes encapsulated in the Botshabelo cultural village such as the missionary station, colonial townscape and the indigenous architecture which may provide innovate and complimentary ideas to be incorporated in the new residential development'. **Recommendations**: In addition to the completion of paleontological and visual impact assessment studies it is recommended that the Phase I HIA report be revised and updated and that the following be indicated and included in the report: • A more detailed project description with an indication of the alternative sites which were considered for the proposed development (information which was not available when the Phase I HIA study was conducted). • Explicitly state that Fort Merensky is a declared Provincial Heritage Site (Grade 2) and that the Botshabelo Village (including the missionary station) is a historical significant landscape as this lacks in the heritage report although the historical significance of the Botshabelo complex was described in detail. • Indicate in a more explicit manner that the proposed development will have no direct physical impact on the Botshabelo cultural landscape which is supported with facts from the town development scheme which were not available at the time when the Phase I report was completed (e.g. access roads, security, etc. etc.). However, only a visual impact assessment will determine whether any indirect (non-physical) impact on the 'sense of place' or on any other tangible or intangible heritage attributes of the historical complex will occur. • That a track log be registered and included in the revised and updated report [although this request for 'older' heritage reports are contentious]. The revised Phase I HIA report in conjunction with the findings from the paleontological and visual impact assessment studies will provide a more comprehensive, integrated assessment of the possible impact of the residential development on the heritage of the Botshabelo built environment. **General remarks**: The project area comprising 130 hectare of land belonging to the Botshabelo Community Trust did not reveal any heritage resources of significance. The project area (and possibly its newly planned infrastructure) needs not to negatively influence the Botshabelo historical complex if the residential development is properly planned and executed. (This piece of land which is privately owned by the

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			Botshabelo Community Trust can probably be legally severed/separated from the Botshabelo Nature Reserve?). The residential development can provide an economic stimulus to the area and may have a positive impact on the historical complex which is currently an underachieving heritage resource with great potential. The sustainable conservation of the Botshabelo cultural landscape can only be guaranteed if the historical complex is utilized according to acceptable museological practices, standards and guidelines in fields such as education and tourism and only if and when these standards and guidelines are applied by suitably qualified personnel.
	Vegetation		
41.	This proposed village is situated WITHIN the Nature Reserve which probably is in contradiction with the aim and purpose of the said Nature Reserve. The impact assessment must address issues such as the current state and future planning of the Nature Reserve, the importance of the natural vegetation, how endangered it is, impact of development on the Nature Reserve, etc. The compatibility of the proposed development with the Nature Reserve (what is the status of the reserve, how will the settlement impact on the reserve i.e.: wildlife and nature versus livestock and people, etc.) should be further investigated.	Simon van der Stel Foundation (4.3.6) Department of Co-operative Governance and Traditional Affairs (4.5.4.4)	Agreed. Please refer to Section 5 of the EIA for background information regarding the natural environment. Section 7 provides an indication of the potential impacts identified. The Botshabelo settlement is based on a successful land claim and beneficiaries will be resettled on their ancestral land. ▪ Plan Associates (2013) indicated the following: The beneficiaries should be capacitated to understand the importance of preserving the character and environment of the Nature Reserve. The development should be contained within the township boundary, including agricultural activities. Larger-scale activities should be directed to the other farms owned by the Botshabelo Community Development Trust, outside of the Nature Reserve.
42.	We have a thousand residential stands which will evidently result in no less than 4000 people residing in the village. The impact on the environment in terms of the availability of wood and grazing would be astronomical.	P. Steenkamp (4.4.8)	Agreed. ▪ Plan Associates (2013) indicated the following: The beneficiaries should be capacitated to understand the importance of preserving the character and environment of the nature reserve. The development should be contained within the township boundary, including agricultural activities. Larger-scale activities should be directed to the other farms owned by the Botshabelo Community Development Trust, outside of the nature reserve. In addition, beneficiaries should be capacitated to understand that livestock cannot be kept in the nature reserve. Ample space is available on other portions of land which were obtained through the land restitution process. Livestock holding facilities should be developed on these adjacent farm portions where livestock can be safely kept overnight, with overnight accommodation for the livestock herders.
43.	Page 28 of Scoping Report – in terms of the Mpumalanga Biodiversity Plan (2006) the terrestrial biodiversity of the site is categorized as highly Significant and Important and Necessary. The land uses permitted in terms of these two categories, as indicated in the MBCP, should be further investigated in the EIA as it is not reflected in the Final Scoping Report.	Department of Co-operative Governance and Traditional Affairs (4.5.4.4)	De Castro & Brits (2012): The untransformed habitats within the study area have been ranked as Highly Significant within the Mpumalanga Biodiversity Conservation Plan (MBCP) (Ferrar and Lötter, 2007). Highly Significant areas have the second highest biodiversity status of land outside of the protected area network, and are regarded as being in need of "strict land-use controls". According to the MBCP land-use guidelines, Highly Significant areas should be maintained as natural vegetation cover and need to be managed for the conservation of biodiversity. This is indicated in Section 5.7 of this report.
	Animal life		
44.	The proposed development does not fall within or near a registered Important Bird Area.	Birdlife South Africa (4.3.11)	Noted.
45.	How will all forms of wildlife on and in the pan be protected?	Mpumalanga Agriculture (4.3.16)	The 50 m buffer zone is indicated on the layout plan, Figure 6.6. No development will take place within this buffer zone. Wetland Consulting Services (2011) recommended that the pan be fenced to keep vehicles and pedestrians away from these sensitive environments. In addition, the beneficiaries will have to be educated on the importance of the pans/wetlands and associated animal life.
46.	What will happen with the wildlife within the Botshabelo Nature Reserve?	K. Hesselman (4.4.8)	The Botshabelo Nature Reserve is a proclaimed nature reserve. However, it is not a world heritage site. The wildlife within the nature reserve belongs to the Steve Tshwete Local Municipality. 40% of the wildlife has already been sold and the remainder of the wildlife will most probably also be sold. Plan Associates (2013) recommended that the community be educated on the importance of wildlife management and the benefits which it could hold for the community. The beneficiaries should attempt to source the necessary funding to replace the wildlife which has been sold. A wildlife management plan can be developed for the active management and breeding of wildlife in the reserve. An annual game count should be undertaken to determine the number of wildlife species in the reserve. In addition, the beneficiaries should be capacitated to understand the importance of preserving the character and environment of the Nature Reserve. The development should be contained within the township boundary, including agricultural activities.
47.	Botshabelo is a game farm and a township/rural village inside it is going to decimate the farm and its game. It is also a world heritage area. Indigenous to that area is scarce game like Oribi and Rooi Ribbok and a township is going to threaten its existence. Serval, genets, caracal, aardwolf, brown hyenas, ant bear, ietermago, suricate now back for the first time in many years, as well as springhaas. The bullfrog also occurs on site.	R.W. Glintzer (4.4.8)	

Table 4.14: Summary of issues of concern raised by interested and affected parties (I&AP's), stakeholders and authorities

	Issue	I&AP, Stakeholders, Authority	Response
			Larger-scale activities (e.g. cattle farming) should be directed to the other farms owned by the Botshabelo Community Development Trust, outside of the Nature Reserve. In order to prevent the settlement from growing illegally through squatting, the Steve Tshwete Local Municipality Municipal Management and Control of Informal Settlements By-Laws need to be enforced. The By-Laws makes provision for the eviction and removal of informal dwellings. The municipality should thus monitor the settlement on a continuous basis to ensure that no illegal structures are established.
48.	Blou ryer and wild makou breed next to the gravel road (DF) and will be driven out of the area by all the extra traffic. Fish eagle at the dam only here because of healthy area.	R.W. Glintzer (4.4.8)	Noted. According to Birdlife South Africa, the site is not an identified priority bird area.
	Traffic		
49.	Will road outlays be in line with traffic assessments?	Heritage South Africa (4.3.5)	Yes, see Section 5.16 of this report.
50.	Where will the development be accessed from?	K. Hatting (public meeting)	The development will be accessed from the existing gravel road located on the northern boundary of the Botshabelo Nature Reserve. See Figure 2.1.
51.	The gravel access road is a private road, which is maintained by himself and Mr. Glintzer. The increased traffic will impact on this road. Who will be responsible for the maintenance of this road? Recommends that an alternative access road is constructed from the tar road, which will only be used by the new residents. Alternatively, the main Botshabelo entrance road must be used.	K. Hesselman (4.4.8)	A traffic impact study was done where recommendations with regards to the access road were made (see Section 5.16 of this report). It is recommended that stormwater pipes be installed at a few places along the gravel road to improve road drainage (including the pan area). The proposed development cannot utilize the main Botshabelo access road since it could interfere with the tourism aspect of the area. ▪ Plan Associated (2013) inidicated the following: The exact alignment of the road should be determined to identify the land owner. If it is found that the road traverses/is located on the farm Toevlugt it should be included in the township layout and the public roads transferred to the local authority, who will then be responsible for its maintenance. Otherwise, resources of all users should be pooled for its maintenance.
52.	The DF gravel road is a farm road for farmers and maintained privately. No entrance SHOULD be made to the planned township through this road. Dust from vehicles is going to increase drastically. The entrance road comes from the main road and goes directly through a pan. This pan during summers fills up over the road. Minor traffic will not cause the wet road to disintegrate but major traffic will be a problem. Entrance must be made from the main Botshabelo gate.	R.W. Glintzer (4.4.8)	
53.	The site is located 9 km from town and not 7.5 km as indicated in the scoping report. The distance is of importance since it will have an impact on transportation costs.	R. Glintzer (public meeting)	The impact of travel costs on the Botshabelo community was investigated as part of the socio-economic study (see Section 5.18.3.2). According to Plan Associates (2013), commuting to and from work can become a massive strain on the Botshabelo residents, especially in light of the fact that 58.49 % of the beneficiaries earn less than R 5 000 a month and 48% earn less than R3 500 per month. The cost of travel will have an impact on the available funds for other expenses i.e. food, rates and taxes, shelter, education etc. Prior to relocatioin, beneficiaries will have to be made aware of the implications. It will be every individual's responsibility to determine if employment is available locally at the study area, especially if the increased living costs could not be afforded.
54.	A traffic impact study must be conducted and submitted to the South African Roads Agency.	Steve Tshwete Local Municipality (4.5.5.1)	A traffic impact study was conducted by WSP SA Civil and Structural Engineers (Pty) Ltd. (see Section 5.16) and forwarded to the South African National Roads Agency Limited for input. Comment received from SANRAL is provided in Section 4.5.3.12.
55.	The impact of traffic generated by this development on the road network must be adequately mitigated. The road upgrades as proposed in the mentioned report are deemed insufficient to fulfill this requirement, as the bulk of development traffic will make use of the N11. The proposed access to the N11 must be designed and constructed as a butterfly configuration access to SANRAL's satisfaction and all outstanding issues relating to the design must be agreed with SANRAL. Detail design drawings i.e. geometric design, pavement design etc. must be submitted for consideration before final approval and wayleave permission for the construction of this access will be granted.	SANRAL (4.5.5.4)	The developer needs to comply with SANRAL's requirements.
56.	The developer must prepare a road master plan for the section of road between Harry Kwala Street and the proposed access in order to define the latter in terms of the long term objective of a road of this nature (the N11).	SANRAL (4.5.6.4)	
	Air quality		
57.	Air pollution due to wooden fires would also be something to be taken into account.	P. Steenkamp (4.4.8)	The proposed development will be provided with electricity (see Section 2.6). The proposed development will also have to be well managed to reduce potential pollution.
58.	All pollutions e.g. smoke, papers, dust, etc.	R.W. Glintzer (4.4.8)	
	Geology and soil		
59.	All the precautionary measures recommended in the geotechnical report must be adhered to.	Steve Tshwete Local Municipality (4.5.5.1)	Noted. The developer must comply with these requirements.
	Management of development		
60.	Will the development be manageable?	DEDET (4.2.1)	It is the intention of the Steve Tshwete Local Municipality to manage the development since it is located within their borders and they will get revenue from the development in the form of taxes.
61.	Require a letter from the Steve Tshwete Local Municipality indicating that they will be responsible for the management of the development, especially in terms of service provision and waste removal.	DEDET (4.2.1)	A letter in this regard was requested from the Steve Tshwete Local Municipality (23 April 2013), to which they agreed. To date, such a letter has not been provided.
62.	It will be of great interest to find out how the boundaries of the proposed rural village will be managed to remain in the area declared as a rural village.	Mpumalanga Agriculture (4.3.16)	According to the Steve Tshwete Local Municipality (23 April 2013), the proclaimed rural village will be fenced. A Clear View fence will be erected between the Middelburg Aeroclub and the village. However, activities (e.g. surface water

Table 4.14: Summary of issues of concern raised by interested and affected parties (I&AP's), stakeholders and authorities

	Issue	I&AP, Stakeholders, Authority	Response
63.	Would the village be fenced and separated from the nature reserve or will there be free access?	A. Barlow (public meeting)	pollution, wood cutting, air pollution, etc.) coud spill over into the adjacent areas. In order to contain the activities to the development, the beneficiaries should be capacitated to understand the importane of preserving the character and environment of the nature reserve.
64.	This is a recipe for the establishment of informal settlements next to/around the proposed rural village.	Mpumalanga Agriculture (4.3.16)	Noted and agreed. In order to prevent the settlement from growing illegally through squatting, the Steve Tshwete Local Municipality Municipal Management and Control of Informal Settlements By-Laws need to be enforced. The By-Laws makes provision for the eviction and removal of informal dwellings. The municipality should thus monitor the settlement on a continuous basis to ensure that no illegal structures are established
65.	The proposed layout is done correctly but situated wrongly. Resources such as pollution, availability of water, wood and public transport needs to be argued at length to find the best solution. Unemployment poses a real threat to the economically active people in and around these villages. If not properly managed and controlled, it will result in the whole area being negatively impacted on in terms of theft, pollution and property values going astray.	P. Steenkamp (4.4.8)	Noted and agreed. Plan Associates (2013) indicated that the beneficiaries will have to determine if employment is available prior to relocation. If beneficiaries relocate to the area prior to obtaining an indication of employment opportunities it will result in an increase in unemployment. It is recommended that a steering committee or board be established comprising of community members to manage the land and explore the proposals identified in the Business Plan. The community need to explore the possibility of appointing an implementing agent to explore the different projects to create the necessary employment opportunities. The agent can be appointed on an outcome based approach to ensure buy-in from the agent and to limit the costs that may be incurred by the beneficiaries. The different funding mechanisms need to be explored as outlined in the Business Plan.
66.	The concerns raised by the Department of Water Affairs must be attended to.	Steve Tshwete Local Municipality (4.5.5.1)	No comment was received from the Department of Water Affairs. However, the developer must comply with the requirements of the Department of Water Affairs.
67.	That the proposed township be proclaimed only after a positive 'record of decision' has been issued by the Department of Economic Development, Environment and Tourism	Steve Tshwete Local Municipality (4.5.5.1)	Noted. The developer will have to comply with this requirement.
68.	The recommendations made by the respective government departments and relevant stakeholders must be adhered to.	Steve Tshwete Local Municipality (4.5.5.1)	Noted. The developer must comply with the requirements of all departments.
	Middelburg Aeroclub		
69.	There is an airstrip close by. Will this be taken into consideration?	Heritage South Africa (4.3.5)	Yes. Conditional approval has already been obtained from the Civil Aviation Authority (CAA) along with height restrictions and other regulations that need to be followed. See Section 4.3.20.
70.	The compatibility of the proposed development with the Middelburg Aeroclub (compliance to aviation regulations, straying animals on the runway etc.) should be further investigated.	Department of Co-operative Governance and Traditional Affairs (4.5.4.4)	
71.	A residential development may not be located within 4 km of an airstrip according to building regulations.	A. Barlow (public meeting)	Conditional approval has already been obtained from the Civil Aviation Authority (CAA). See Section 4.3.20.
72.	The Middelburg Aerodrome would be adjacent to the village and that poses a few threats to the residents of the village as well as to the airport users. Poor visibility due to air pollution, children playing on the landing strip and stray animals from the village can result in fatalities.	P. Steenkamp (4.4.8)	Plan Associates (2013) indicated the following: The beneficiaries should be educated on the dangers of aeroplanes in order to avoid pedestrian and livestock-related incidents. The municipality who is the lessee of the airfield should budget for the upgrade of the fencing with concrete palisades. The concrete palisades cannot easily be used for the construction of border fencing for farms or residential stands and is more durable. The community should do their part in preserving the commodity. In addition, the beneficiaries should be capacitated to realise the value of having the airfield on their property in order to renew the lease with the Aeroclub when it lapses. If cleaner/alternative energy solutions are sought, the smoke would be avoided.
73.	Proximity to the Air Strip – does it comply to all aviation regulations – safety, noise, future expansion of the facility, etc?	Simon van der Stel Foundation (4.3.6)	Conditional approval has already been obtained from the Civil Aviation Authority (CAA). See Section 4.3.20 and Appendix 7.
74.	Was the reply from the Civil Aviation Authority included in the Scoping Report?	A. Barlow (public meeting)	Yes. See Section 4.3.20 and Appendix 7.

Table 4.14: Summary of issues of concern raised by interested and affected parties (I&AP's), stakeholders and authorities

	Issue	I&AP, Stakeholders, Authority	Response
75.	▪ The Middelburg Aeroclub is the Lessee of the airfield (Middelburg Airfield). The said airfield is leased by the Middelburg Aeroclub in terms of a written Lease Agreement of a period of 3 (three) years, affording it an option to renew the Lease Agreement for a further 3 (three) years. The Lease Agreement was renewed recently. ▪ In terms of the said Lease Agreement the Middelburg Municipality has the obligation to maintain the airfield, its parameters and license with the Civil Aviation Authority of South Africa (CAA). ▪ It is noted that the township is envisaged to be situated to the North West of the airfield. ▪ The Middelburg Aeroclub's Members invested substantial amounts in the airfield. In recent times various electrical cables were installed by the Aeroclub to host air shows. The members also invested substantial amounts in the infrastructure of the airfield, being hangers, ablution facilities, offices, etc. The members also invested substantial amounts in aircraft that are being kept in the said hangers. ▪ It is noted that the planned township would be established approximately 1 (one) kilometre or less from the runway and hangers. The aero club's members have serious concerns about the safety and security aspects at Middelburg aerodrome after the establishment of the rural village. ▪ The Middelburg Aeroclub hereby formally objects strongly to the proposed site of the proposed development and it is evident that not enough attention was given to the safety, security and risk elements in the proposed establishment. Surely the safety and security of especially children had not been taken into account. ▪ The Aeroclub base its objections and concerns on various other similar situations in towns where either formal or informal settlements have been established next to the towns airfields. Those airfields are non-existent today (Bethal and Bronkhorstspruit) and airfields like the Witbank and Newcastle Airfields are constantly battling with safety and security issues. ▪ Burglaries, vandalism and runway intrusions are common at the Witbank airfield Newcastle airfield are constantly struggling with grazing animals on the airfield, so much so that a recent medical rescue flight were almost cancelled due to the safety risks involved. That despite the fact that contrary to Middelburg Airfield, those Airfield's Municipalities maintains the security fences around the airfield. ▪ Currently, despite an obligation in terms of the Lease Agreement between the Middelburg Aeroclub and the Steve Tshwete Local Municipality (STLM) the fences on the parameters of the Middelburg airfield are in a state of dismal disrepair. ▪ The fences on the Northern border of the airfield was vandalised, stolen and is actually non-existent. That allows intrusion of the airfield by animals and people which poses a serious threat to any aircraft utilizing the facility and the passengers using such aircraft. That is also contrary to the CAA requirements for a licensed airfield. It needs to be mentioned that STLM is the licensee of the airfield. It is a further concern that the unauthorised people entering the airfield are unaware of the deadly dangers they expose themselves and the general flying public to. ▪ The Aeroclub members are aware of the fact that it cannot stop the legitimate owners of the farm Toevlugt to exercise their right to occupy their property. However, which is of utmost concern is the safety and security at the Middelburg aerodrome. ▪ It is further proven by other similar situations that it will ultimately result in the Middelburg Aerodrome to become obsolete, unusable and lost for the Town of Middelburg. ▪ Various mining Companies use the airfield for their employees to have quick access to business opportunities and their businesses / mining activities in the vicinity. If security is not stepped up by visible Policing of the facility, the said facility would fall into disuse and discourage investment in the Middelburg economy. ▪ It is thus the Middelburg Aero club's concern that the establishment of the rural village will pose a serious threat to the safety and security of the users of the facility and the Aeroclub members as well as the proposed inhabitants of the proposed village. ▪ A precondition should be set to the establishment and the reality of a township next to the airfield should be dealt with. In terms of the license agreement between the STLM and the CAA, it is and remains the STLM's responsibility to ensure the safety of general aviation and the general public utilising the facility. ▪ It is suggested that a meeting be scheduled between the responsible officials of the STLM, Urban Dynamics and the Management of the Middelburg Aeroclub to discuss and formalise conditions president to the establishment of the rural village and that such conditions form part of the conditions by the MEC for the establishment of the township. ▪ As the STLM is aware of its obligations, responsibilities and liabilities towards the Middelburg Aeroclub and general aviation in particular, as the licensee of the facility, the STLM will have to accept responsibility and liability for the said security arrangements as well as any damages, losses or other suffered by the Middelburg Aero club's Members as a result of the establishment of the said village. Requirements: Should the township be established it is and will be a requirement by the Aeroclub that: ○ Parameter fencing must be erected and maintained which would prevent animals, people and children in particular to enter the airfield area without proper authorisation. Wire fencing has proven not sufficient and safe and will not prevent such to enter the airfield. A concrete fence has proven its security qualities at the bigger Airports like ORT. ○ The parameter of the hangers at the facility should be fenced off properly by way of concrete security fencing with a proper large gate to the hangers to allow aircraft to enter and exit the hanger's spaces. ○ That the STLM accepts responsibility and liability for the security and safety of the aerodrome facilities as well as the safety and security of the aerodrome member's, the general flying public that makes use of the facility and hangers and investment into the airfield. ○ That access to the airfield by the inhabitants of the rural village, their children and animals be absolutely prevented and limited.	Middelburg Aeroclub (4.4.1)	Noted. Conditional approval has already been obtained from the Civil Aviation Authority (CAA) for the proposed development along with height restrictions and other regulations that need to be followed. See Section 4.3.20 and Appendix 7. Clean Stream Environmental Services enquired from Mr. Van der Merwe whether any meetings were held between the Middelburg Aeroclub, Urban Dynamics and the Steve Tshwete Local Municipality. Mr. B. van der Merwe indicated (e-mail dated: 11 July 2012; Appendix 7) that several meetings were held, with no results. In addition, the Steve Tshwete Local Municipality indicated to the Middelburg Aeroclub that there is no money budgeted for the airfield and can thus not re-seal the runway or maintain the fences. However, according to the Steve Tshwete Local Municipality (23 April 2013), a Clear View fence will be erected between the Middelburg Aeroclub and the village. ▪ Plan Associates (2013) indicated the following: The beneficiaries should be educated on the dangers of aeroplanes in order to avoid pedestrian and livestock-related incidents. The municipality who is the lessee of the airfield should budget for the upgrade of the fencing with concrete palisades. The concrete palisades cannot easily be used for the construction of border fencing for farms or residential stands and is more durable. The erection of the boundary fence of the airfield should be made a priority in the municipal IDP to ensure the required funds are made available. A dedicated pedestrian walkway should be provided around the airfield towards the N11 to encourage people not to walk across the airfield. In addition, the beneficiaries should be capacitated to realise the value of having the airfield on their property in order to renew the lease with the Aeroclub when it lapses. If cleaner/alternative energy solutions are sought, the smoke would be avoided.

Table 4.14: Summary of issues of concern raised by interested and affected parties (I&AP's), stakeholders and authorities

	Issue	I&AP, Stakeholders, Authority	Response
	Socio-economic		
76.	Lessons learnt from the establishment of the Doornkop Village were that the residents need to fence off their stands, to either indicate their border or keep their livestock at bay during the evenings. Furthermore, these people must erect some kind of dwelling to live in at first. These materials (wire, droppers, corrugated iron, etc.) is rarely bought and is more often than not, taken from the adjacent farms and especially from the fences right next to the road (N11), hence, this results in stray animals ending up in the road and plenty of accidents happening.	P. Steenkamp (4.4.8)	Plan Associates (2013) indicated the following: Livestock handling facilities need to be erected on the farm portions of the beneficiaries. Funding for the erection of the fencing should be sourced from the Department of Agriculture or the Land Claims Commission. The Botshabelo community is also inclined to undertake farming in the area. A working relationship should be developed with the community to ensure that unemployment is kept low to prevent the possibility of crime increasing. The housing should be in line with the National Building Code. Beneficiaries will have access to various housing subsidy options, which should be actively pursued. The correlation between unemployment and the increase of crime has been proven in various studies. To create local employment opportunities, the Botshabelo community will have to implement the various projects identified in the Business Plan. The LED unit of the Steve Tshwete Local Municipality and other knowledgeable people should be approached to play a key role in the implementation of various projects and capacity building. Proper policing and monitoring should be employed to curb any form of crime throughout the municipal area.
77.	The unemployment rate in Doornkop is also a factor to be reckoned with. If the same rate applies to the new village, it would become a market for stolen necessities like fuel, oil, wire, fertiliser, etc. which in turn makes life difficult for the people trying to make a living in the close vicinity of these villages.	P. Steenkamp (4.4.8)	
78.	Theft of fencing will increase. Intends to start cultivating maize. This will not be possible with the intended development since the maize will be stolen. Theft in general will most probably increase.	K. Hesselman (4.4.8)	
79.	The farmers in the surrounding area would most probably have to stop farming and sell their properties due to an increase in theft and safety issues. Currently, the farmers in the area loose large portions of their harvest due to theft and cattle.	R.W. Glintzer (4.4.8)	
80.	There is already a problem with fires in the area. A lot of damage is being caused. Veldfires are going to be a big threat.	K. Hesselman (4.4.8) R.W. Glintzer (4.4.8)	A buffer zone around the proposed village has been incorporated in the layout plan to act as a fire break (see Figure 6.6). According to Plan Associates (2013), the Botshabelo community should be educated on the National Veld and Forest Fire Act No. 101 of 1998 and the liability that can be faced for non-compliance. The Department of Agriculture must ensure that the beneficiaries comply with this act. The steering committee/board should oversee the task of making and maintaining the necessary firebreaks every year. If the community lacks the necessary skills or equipment, a contractor can be appointed to undertake the task, or a working relationship could be established with adjacent land owners to guide and assist with the process, thus empowering the beneficiaries.
81.	During protests, it would be easy to block off the gravel access road. The adjacent landowners would then not have access to their properties.	K. Hesselman (4.4.8)	Plan Associates (2013) indicated the following: The possibility of protest cannot be excluded. However, if it is found that the access road is indeed situated on the Remaining Extent of the farm Toevlugt 320 JS that belongs to the beneficiaries, it is proposed that the road forms part of the township layout and the public roads transferred to the local authority. The local authority will thus have jurisdiction and be responsible to resolve any conflict that arises between the adjacent land owners and the Botshabelo community.
82.	Where will beneficiaries find employment, will the reserve with its tourism potential and wildlife sustain all beneficiaries?	Department of Co-operative Governance and Traditional Affairs (4.5.4.4)	Plan Associates (2013) indicated the following: The proposals that emanated from the Botshabelo Business Plan for 400+ employment opportunities should be revisited. The employment opportunities however, require funding in excess of R 31 million. If the necessary funds cannot be accessed, the beneficiaries will have to find employment in towns in the vicinity. Migrant labour will have social implications such as workers only returning home over weekends, combined with increased transport costs. Beneficiaries should be able to prove that they are currently employed and intend to commute to work from the new settlement or have found alternative work in or near the study area.
83	Has the issues regarding the second group of people claiming the Botshabelo property and the pending high court case been investigated and resolved? The Botshabelo community would be negatively affected if the case turns out in favour of the new claimants. All the expenditure for the proposed development would have been wasted.	J. Dyasson (public meeting)	Clean Stream Environmental Services is aware of the fact that the property is also claimed by the Bapedi Batubatse Corporative Society. However, we were appointed by the Botshabelo Community Development Trust. M. Motsifane indicated during the public meeting held on 18 May 2013 that the additional claimants are in actual fact part and parcel of the existing Botshabelo beneficiaries. It is not a different group. Even though the legal process has not been resolved, they were listed as beneficiaries.
84.	The development will be too small if the additional beneficiaries are added.	A. Barlow and R. Glintzer (public meeting)	M. Motsifane indicated that there were originally only 700 beneficiaries. The list has since grown to approximately 2000. The proposed development was designed in terms of the budget received from the Land Claims Commission. Currently, they can only accommodate 1000 households. As soon as they obtain more money, the necessary requests will be submitted to extend the village.

5. BIOPHYSICAL DESCRIPTION OF THE PROPOSED SITE

This section provides:
- Background information with regards to the environmental features of the proposed site;
- Findings of the various specialist studies.

5.1 Location of the site

The proposed development would be located on the Remaining Extent of the farm Toevlugt 320 JS, Middelburg. The site is located within the Botshabelo Nature Reserve, approximately 9 km north of Middelburg along the N11 national road. The boundaries of the Botshabelo Nature Reserve are indicated in green in Figure 5.1. The site is indicated in red and the Remaining Extent of the farm Toevlugt 320 JS is indicated in yellow.

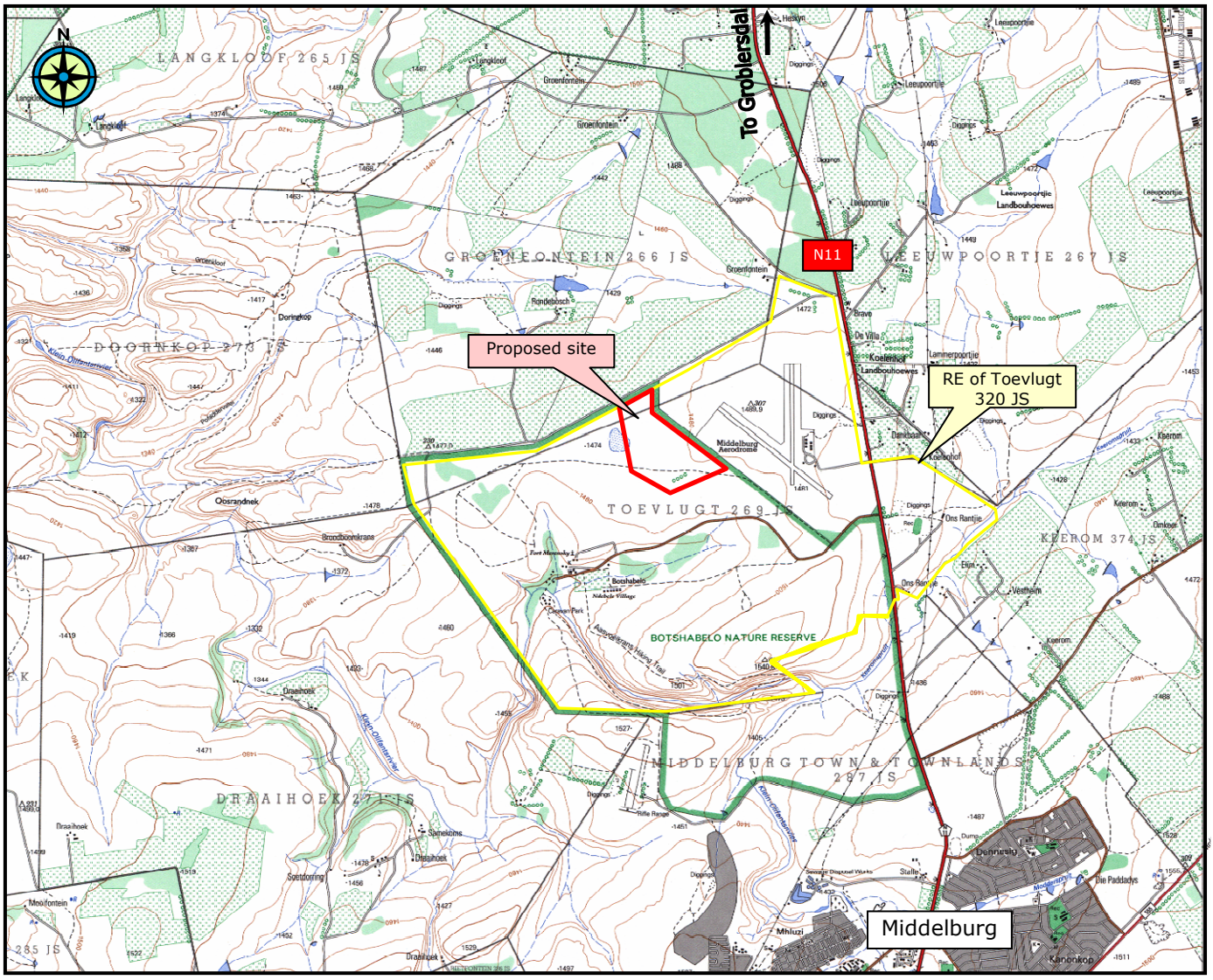


Figure 5.1: Location of site *(taken from 1: 50 000 2529 CB and 2529 CD-not to scale)*

The centre co-ordinates of the site are as follows:

- 25° 41' 09.07'' S;
- 29° 25' 17.99" E.

The Surveyor-General 21 digit site reference number for the proposed project is:

T	O	J	S	0	0	0	0	0	0	0	0	0	3	2	0	0	0	0	0

The said property falls under the jurisdiction of the Steve Tshwete Local Municipality and the Nkangala District Municipality.

5.2 Climate

The South African Weather Bureau has partitioned the country into 15 climatic regions. This division is based on:

- geographic considerations, more specifically the prominent mountain ranges (great escarpment) which constitute the main climatic divides (in addition to other features such as rivers and political boundaries);
- the interior plateau – use has been made of the change from BW (desert climate) to BS (steppe climate) and from BS (steppe climate) to C (temperate/mesothermal climates) climates according to the Köppen classification.

The proposed site falls within Climatic Region H – The Highveld.

5.2.1 Temperature

The climate is typically "Highveld", with summer temperatures ranging from 9°C to 32°C and winter temperatures from -6°C to 22°C. The mean monthly maximum and minimum temperatures recorded are given in Table 5.1.

Table 5.1: Mean, maximum and minimum temperature

Mean Monthly Maximum and Minimum Temperatures (°C)				
Month	**Daily Maximum**	**Daily Minimum**	**Highest Temp.**	**Lowest Temp**
January	27,2	13,7	32,0	9,1
February	26,8	13,4	30,8	9,0
March	26,8	11,4	30,2	6,4
April	23,9	7,4	27,9	1,4
May	21,3	2,2	26,1	-2,9
June	18,5	-1,8	22,4	-6,0
July	18,4	-1,7	23,0	-5,8
August	21,4	0,8	26,0	-4.1
September	24,0	5,3	29,2	-1,3
October	26,0	10,1	31,2	4,4
November	26,2	11,8	31,8	5,9
December	27,1	13,2	31,2	7,8
Yearly Average	**23.9**	**7.2**	**28.4**	**2.0**

5.2.2 Rainfall

The site occurs in Mpumalanga and falls in the summer rainfall region, which is characterized by thunderstorm activity and relatively low average rainfall. The mean annual rainfall is 735 mm compared to the mean annual potential evaporation of 1500 mm. Pertinent climate data was obtained from the Middelburg (No. 0515/826) and Belfast (No. 0517/0109) weather stations.

The average number of days per month having rainfall depths in excess of 0.1 mm, together with the maximum and minimum number of rainfall days are given in Table 5.2 while the 24 hour rainfall depths for different recurrence intervals are given in Table 5.3.

Table 5.2: Monthly rainfall data

Average Monthly Rainfall Depths (mm) and Days Having a Rainfall of >0,1 mm		
Month	**Ave Depths**	**Ave Days**
January	132	13,8
February	103	11,2
March	88	9,5
April	42	6,5
May	19	2,9
June	7	1,5
July	9	1,7
August	8	0,9
September	22	3,7
October	63	8,3
November	124	13,0
December	118	13,1
Total	**735**	**86.1**

Table 5.3: Rainfall intensities

24 Hour Rainfall Depths (mm)			
Maximum Depth	**50 Year Storm Event**	**100 Year Storm Event**	**200 Year Storm Event**
117	104	118	134

5.2.3 Prevailing wind direction

The prevailing wind direction data for the Middelburg station is provided in Table 5.4.

Table 5.4: Mean monthly wind speed and direction

Month	N		NE		E		SE		S		SW		W		NW	
	n	V	n	V	n	V	n	V	n	V	n	v	n	v	N	v
January	161	3.0	287	3.2	44	3.1	92	3.3	122	3.6	96	3.3	109	3.7	48	4.5
February	142	2.9	295	3.2	44	3.1	74	3.4	112	3.4	101	2.9	141	3.9	60	4.2
March	152	2.8	304	3.3	36	3.1	54	3.1	100	3.4	104	2.9	139	3.4	63	3.5
April	170	2.7	211	3.3	47	3.2	95	3.4	149	3.6	146	2.8	87	3.4	39	3.0
May	172	2.6	166	2.9	59	3.4	89	3.7	162	3.9	167	2.9	67	3.0	51	3.3
June	146	2.5	149	3.0	54	3.6	117	3.0	157	3.8	166	2.7	86	3.2	43	3.2
July	162	2.5	184	2.9	51	3.9	99	3.9	142	3.6	143	2.8	79	3.4	53	4.2
August	174	5.4	180	3.4	40	3.5	86	4.1	141	4.1	182	3.0	83	3.2	40	4.4
September	197	3.2	223	3.8	27	3.5	70	3.9	131	4.3	171	3.3	84	4.0	41	3.9
October	190	3.4	243	3.7	33	3.6	71	3.6	142	4.0	160	3.8	83	4.3	42	3.6
November	174	3.2	225	3.6	28	3.1	68	3.1	185	3.8	154	3.5	92	4.1	40	3.9
December	180	3.1	254	3.4	34	3.0	69	3.3	154	3.5	135	3.3	95	4.0	40	4.0
Average	**188**	**2.0**	**227**	**3.3**	**41**	**3.3**	**82**	**3.8**	**141**	**3.8**	**146**	**3.1**	**95**	**3.7**	**47**	**3.8**

n = average direction frequency per 1000 readings; v = velocity (m/s)

5.2.4 Evaporation

The mean monthly evaporation data recorded at the relevant weather station are given in Table 5.5. The data in the table was obtained using an 'A' Pan.

Table 5.5: Mean monthly evaporation

Month	Evaporation (mm)	Rainfall (mm)	Monthly deficit (mm)
January	160	132	28
February	140	103	37
March	110	88	22
April	110	42	68
May	85	19	66
June	70	7	63
July	75	9	66
August	110	8	102
September	140	22	118
October	160	63	97
November	160	124	36
December	180	118	62
Total	**1500**	**735**	**765**

5.2.5 The incidence of extreme weather conditions

Being located on the Highveld, the area is prone to extreme weather conditions on a regular basis. These weather conditions include droughts, floods and strong gusty winds prior to and during thunderstorms. Frost also occurs on an average of 120 to 150 days between April and September.

5.3 Geology

According to Engeolab cc (2011b), the site is underlain by the following geologies (Figure 5.2):

- Northern portion of the site - Transported and residual soils derived from the in-situ decomposition of tillite and sandstone of the **Dwyka Formation**, Karoo Sequence. It is presumed that the tillite was deposited on the sandstone of the older Wilgerivier Formation.
- Central and southern portion of the site - Sandstone (quartzitic in places) and conglomerate of the older **Wilgerivier Formation** of the Waterberg Group. Regional dip varying between 3° and 6° towards the northwest. Widely scattered sandstone outcrops.
- Towards the south of the site - Intrusive **diabase** occurring as a prominent and undulating east-west trending ridge. The diabase is concealed by a transported layer of silty sand in places, with some boulder outcrops.

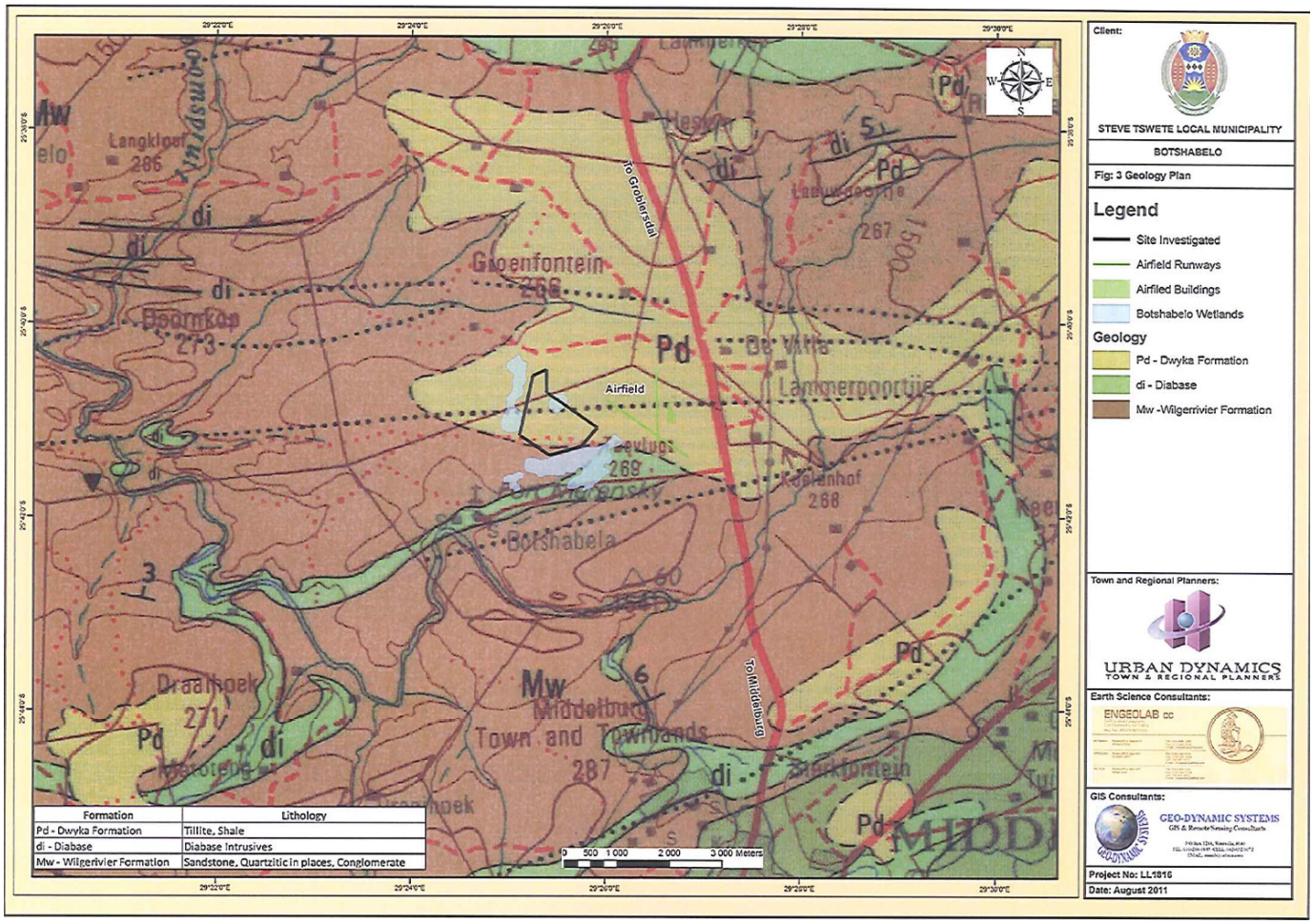


Figure 5.2: Geology of the site (taken from Engeolab cc., 2011b)

5.4 Topography

The proposed site lies between 1486 - 1470 meters above mean sea level (mamsl). According to Engeolab cc (2011b), the site is relatively flat and slopes slightly at approximately 1: 10 to 1: 20 towards the southwest (i.e. towards the pan, drainage area and tributary of the Klein Olifants River; Figure 5.1).

The topography towards the south of the site (i.e. where the Botshabelo Historical Village is located) is much steeper. Figure 5.3 indicates the 5 m contours of the site and surrounding area.

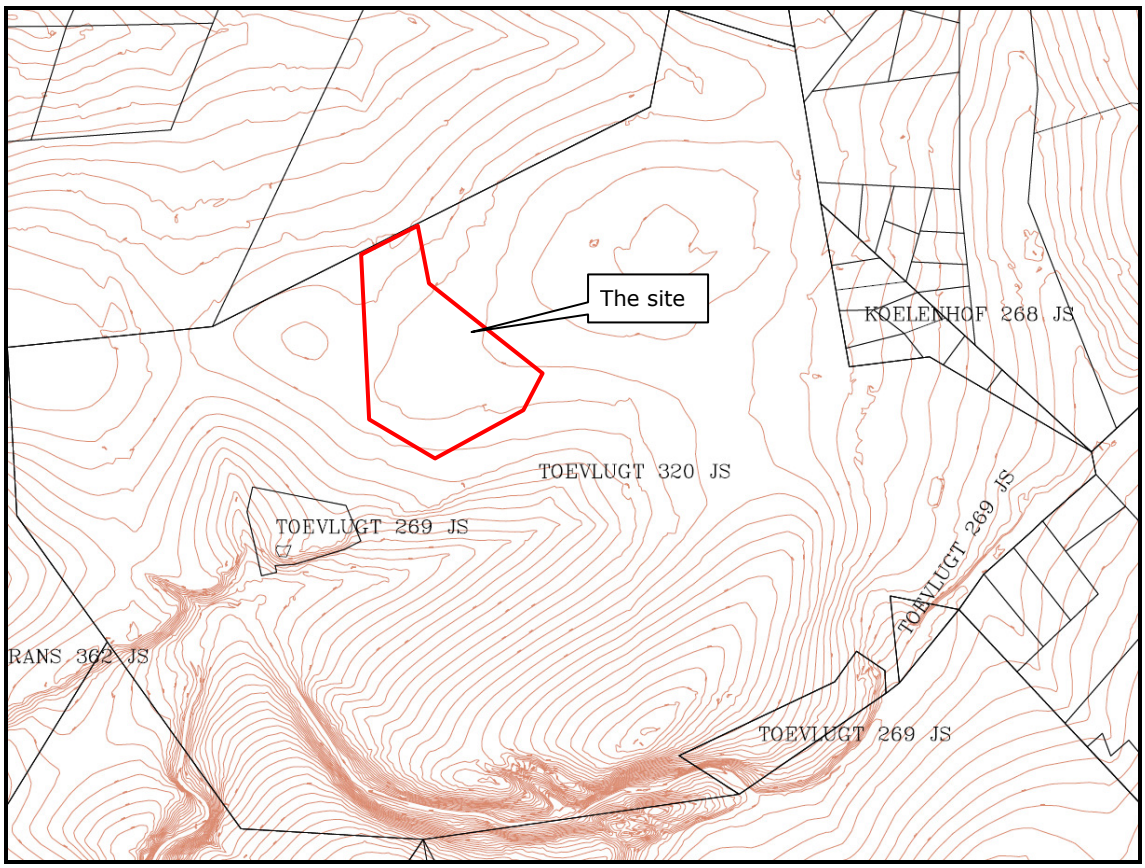


Figure 5.3: Contour plan

There has been little impact on the topography of the site since it forms part of the Botshabelo Nature Reserve. Impacts on the topography include the erection of fences, grading of gravel roads and the construction of a boma.

The terrain type of the proposed site is indicated as plains with open low hills or ridges as indicated in Figure 5.4.

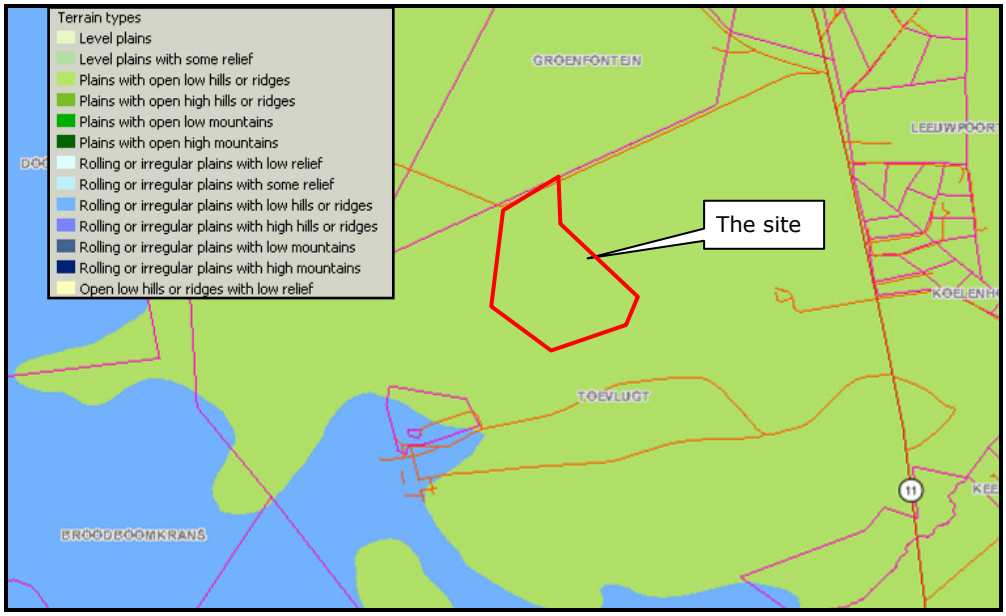


Figure 5.4 – Terrain type of the proposed site (taken from Department of Agriculture, Forestry and Fisheries)

5.5 Soil/land capability/agricultural potential

According to the AGIS Comprehensive Atlas of the Department of Agriculture, Forestry and Fisheries, the soils of the area are generally red, yellow and/or greyish with low to medium base status (PT1) as indicated in Figure 5.5.

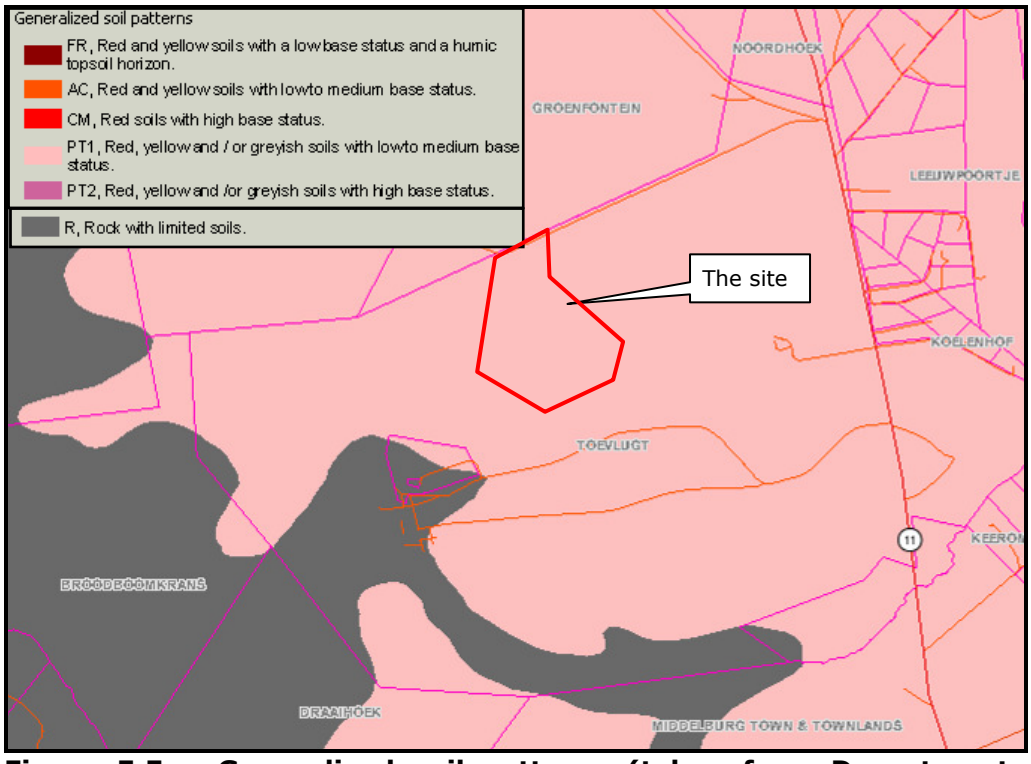


Figure 5.5 – Generalized soil patterns (taken from Department of Agriculture, Forestry and Fisheries)

The Department of Agriculture, Rural Development and Land Administration (letter dated: 10 October 2012; Appendix 8) provided the following general information regarding the agricultural potential of the soils found in the area:

SOIL FORM ASSOCIATION
Soil Description of some of the majority soils in the area:

Soils of the Hutton form (Hu)
A medium to high potential soil dependant on soil depth. The soil suitability is usually a class 1 and/or class 2 and has a good to excellent yield potential as rain fed and/or irrigation soils.

Soils of the Clovelly form (Cv)
Irrigation scheduling is important on these soils as the clay percentages are usually below 32 % influencing its water holding capacity. Chisel ploughing and liming is important in order to enhance faunal activity and retain a good soil structure.

Soils of the Glenrosa form (Gs)
Irrigation scheduling is important on these soils as the clay percentages are usually below 32 % therefore influencing its water holding capacity. Chisel ploughing and liming is important in order to enhance faunal activity and retain a good soil structure. Knowing the percentage base - saturation will enhance choosing the best crop suited to the area. Dependant on the depth, it usually is a medium potential soil.

SOIL DEPTH
The soil depth is subject to natural restrictive horizons as found within the profile of the soil type determining the effective depth for root development. In some cases the effective depth according to the soil form association is suitable for cultivation purposes, but due to management methods and implements used previously a manmade restrictive layer such as a plough layer is now present and must be eliminated by different management techniques.

5.5.1 Soil properties

A geotechnical study (Appendix 4) was undertaken by Engeolab cc. to determine the suitability of the site for the proposed development.

As indicated in Section 5.3, the site is underlain by tillite of the Dwyka Formation as well as sandstone and conglomerate of the older Wilgerivier Formation.

In general, the average soil profile on site consists of a relatively thin (<500mm) topsoil layer, which is sequentially underlain by a sandy residuum, ferruginised residuum, some pedocrete and bedrock (Engeolab cc, 2011b). The residual soils are generally loose to medium dense silty sands and silty gravels, overlain by loose colluvial soils.

In the north eastern portion of the site, gravel and dropstones of various origins are present in a powdery matrix of brown silty sand. The reddish brown, occasionally mottled yellow, silty gravel layer originates from the in-situ decomposition of Dwyka tillite. It generally extends to depths in excess of 1.5 m below surface (Engeolab cc, 2011b).

In the south easterly portion of the site, the diabase is deeply weathered, comprising characteristically maroon-brown active clays with corestones and boulders.

According to Engeolab cc (2011b), a medium dense, generally thick, erratically developed, partially ferruginized pedocrete layer (colluvium and residuum) was recorded in a number of test pits (i.e. mostly around the wetland area). In addition, well cemented, dense honeycomb hardpan ferricrete was also noted.

The site soils and bedrock are summarised in Table 5.6. Table 5.7 presents the estimated compressibility of the soils on site.

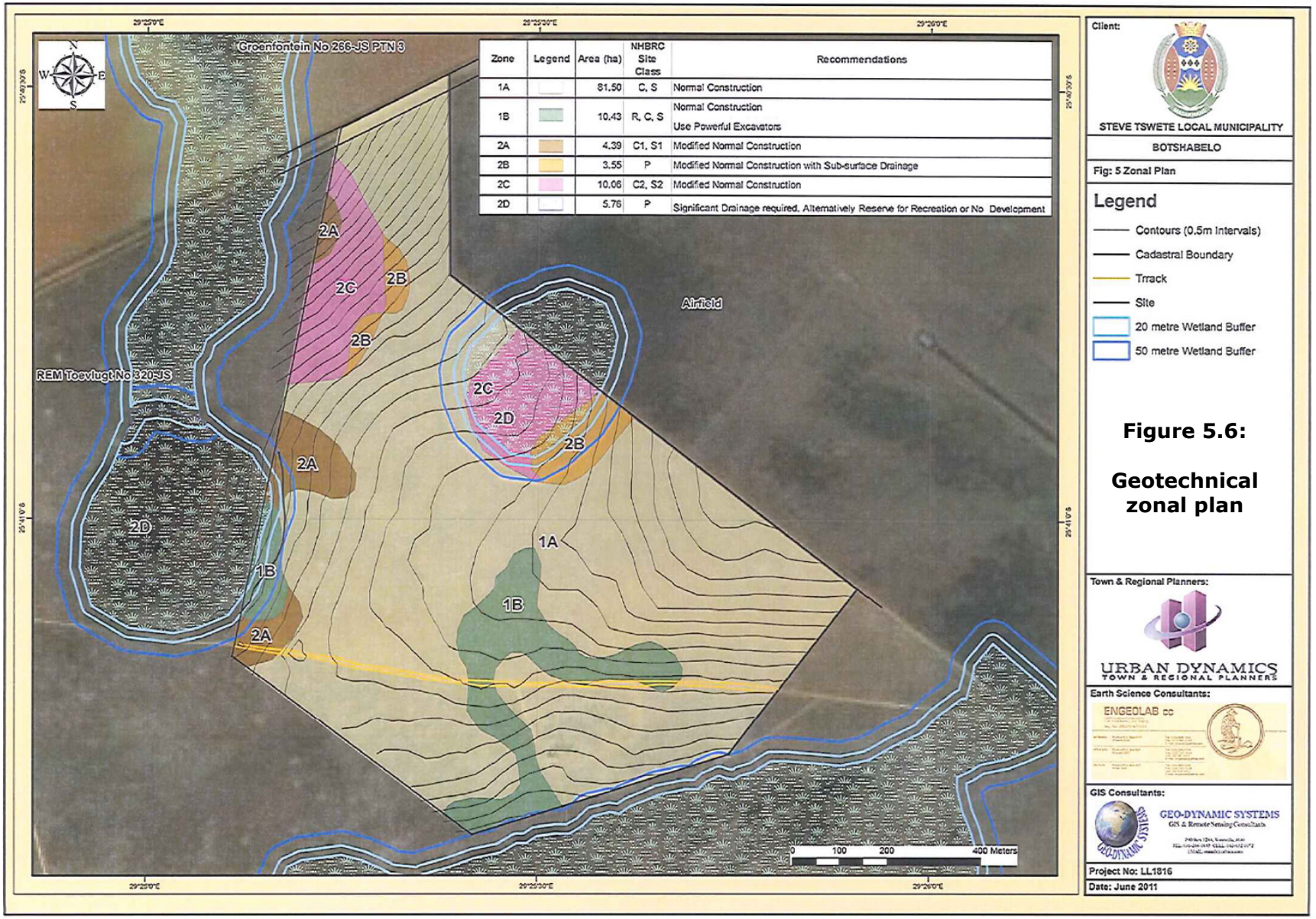
Table 5.6: Summary of site soils and bedrock (taken from Engeolab cc., 2011b)

Material type	Origin	Average thickness (m)	Depth range (m)
Cover soils	Various Origins	0.47	Surface to 2.5
Partially ferruginised residuum	Pedocrete	0.47 – 1.34	0.1 - >2.0
Well cemented hardpan ferricrete	Pedocrete	1.23 – unknown	0.5 – 1.8
Tillite	Dwyka Formation	> 2.0 – depth	>2.0
Quartzitic sandstone	Wilgerivier Formation	1.25 – depth	0.7 - >2.0

Table 5.7: Estimated compressibility (taken from Engeolab cc., 2011b)

Material Description	Consistency	Deformation Modulus (MPa)	Foundation Rating
Topsoil/hillwash/colluvium	Very loose – Loose	< 5	Very poor
Colluvium/loose/pedocrete	Loose – Medium Dense	10 – 20	Fair - Erratic
Upper residuum/pedocrete	Loose to Medium Dense	10 – 30	Fair - Good
Lower residuum	Medium Dense to Dense	30 – 60	Good – Very Good
Decomposed bedrock	Very dense to soft rock	60 – 120	Very Good

Figure 5.6 provides an indication of the geotechnical zones identified on site.


Groenfontein No 266-JS PTN 3
REM Toevlugt No 320-JS
Airfield
2A
2B
2C
2D
1A
1B
0 100 200 400 Meters
Zone | Legend | Area (ha) | NHBRC Site Class | Recommendations
1A | 81.50 | C, S | Normal Construction
1B | 10.43 | R, C, S | Normal Construction; Use Powerful Excavators
2A | 4.39 | C1, S1 | Modified Normal Construction
2B | 3.55 | P | Modified Normal Construction with Sub-surface Drainage
2C | 10.06 | C2, S2 | Modified Normal Construction
2D | 5.76 | P | Significant Drainage required. Alternatively Reserve for Recreation or No Development
Client:
STEVE TSWETE LOCAL MUNICIPALITY
BOTSHABELO
Fig: 5 Zonal Plan
Legend
Contours (0.5m Intervals)
Cadastral Boundary
Trrack
Site
20 metre Wetland Buffer
50 metre Wetland Buffer
Figure 5.6:
Geotechnical zonal plan
Town & Regional Planners:
URBAN DYNAMICS
TOWN & REGIONAL PLANNERS
Earth Science Consultants:
ENGEOLAB cc
GIS Consultants:
GEO-DYNAMIC SYSTEMS
GIS & Remote Sensing Consultants
Project No: LL1816
Date: June 2011

Engeolab cc. (2011b) demarcated the site into six (6) geotechnical zones as defined by the NHBRC and indicated in Table 5.8.

Table 5.8: Geotechnical zones (taken from Engeolab cc, 2011b)

Zone	Area (ha)	NHBRC Class	Geotechnical Aspects
1A	81.50	C, S	*Normal construction*. Thin layer of compressible soils followed by medium dense gravely soils. Foundation settlement not expected to exceed 7.5 mm. Normal precautions include: adequate drainage away from building, flexible water connections, grass or concrete aprons around the buildings and moderate compaction in the base of foundation excavations.
1B	10.43	R, C, S	*Normal construction. Excavatability constraints.* Area is characterised by a generally thin layer of colluvium underlain by shallow soft to medium hard sandstone bedrock. Around the fringes of this zone, a layer of residuum is present between the layers. Soil movements under load are expected to be ≤7.5 mm. Refusal of TLB was experienced at shallow depths, generally on soft rock sandstone. The excavators should be able to excavate to depths of 1.5m.
2A	4.39	C1, S1	*Modified normal construction.* This zone comprises moderately compressible soils and collapsing sands >750 mm thick. Loose to medium dense soil with a moderate compressibility may cause settlements of between 5 – 15 mm if construction is not modified. Erratically developed ferricrete (from loose nodules to hardpan ferricrete) is present. Well cemented ferricrete may cause excavatability problems. Precautions include: compaction to at least 93% Mod. AASTHO density at optimum moisture content to a depth of 1.5 times the foundation width; light reinforcement in foundations and masonry; articulated joint at doors and lintels; additional drainage; service and plumbing precautions.
2B	3.55	P	*Modified normal construction with sub-surface drainage.* A perched water table is expected during the rainy season due to the close proximity to the wetland area and a shallow hardpan ferricrete layer.
2C	10.05	C2, S2	*Modified normal construction.* This zone comprises moderately compressible soils and collapsing sands up to 2 m thick. Loose soil with a low to moderate compressibility may cause settlements of > 15 mm if construction is not modified to accommodate the differential movements. Precautions include: compaction to at least 93% Mod. ASSTHO density at optimum moisture content to a depth of 1.5 times the foundation width; light reinforcement in foundation and masonry; articulated joint at doors and lintels; additional drainage; service and plumbing precautions.
2D	5.75	P	*Significant drainage required. Alternatively reserve for recreation or No Development.* This zone comprises areas susceptible to inundation from rising water tables during the wet, rainy season. The area requires either significant drainage works or should be set aside as a no development area.

5.5.2 Agricultural potential/land capability

The site forms part of the overall Botshabelo Nature Reserve and is subsequently used by wildlife for grazing purposes. No cultivation has recently taken place on site. However, the site could have been utilized for agricultural purposes (grazing or cultivated lands) in the past as part of the old Mission Station.

In terms of land capability, the proposed site is indicated according to the Department of Agriculture, Fisheries and Forestry as comprising moderate potential arable land (Figure 5.7).

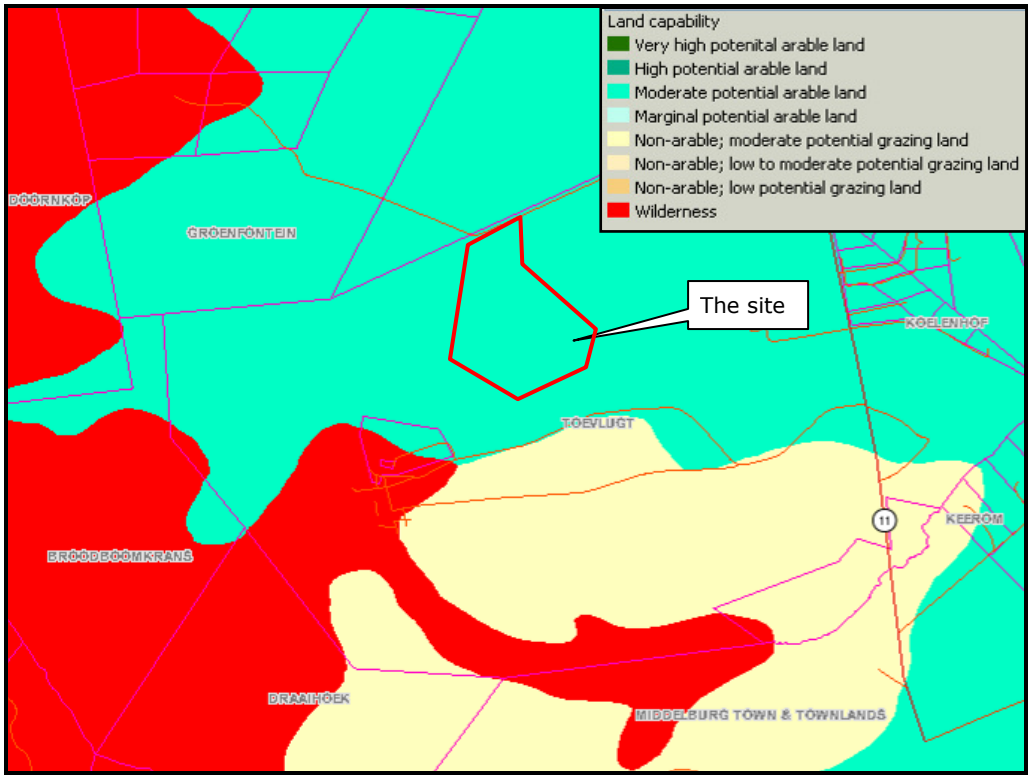


Figure 5.7 – Land capability of the proposed site (taken from Department of Agriculture, Forestry and Fisheries)

The Mpumalanga Biodiversity Conservation Plan indicates a score of 6 (which is medium, grazing) for the site in terms of land capability.

The Department of Agriculture, Forestry and Fisheries classified the land type of the site as Ba (Figure 5.8). The Ba land type comprises of plinthic soils (with subsurface accumulation of iron and manganese oxides due to fluctuating water table) with low to intermediate base status. Red soils are widespread. Upland duplex and black clay soils are rare.

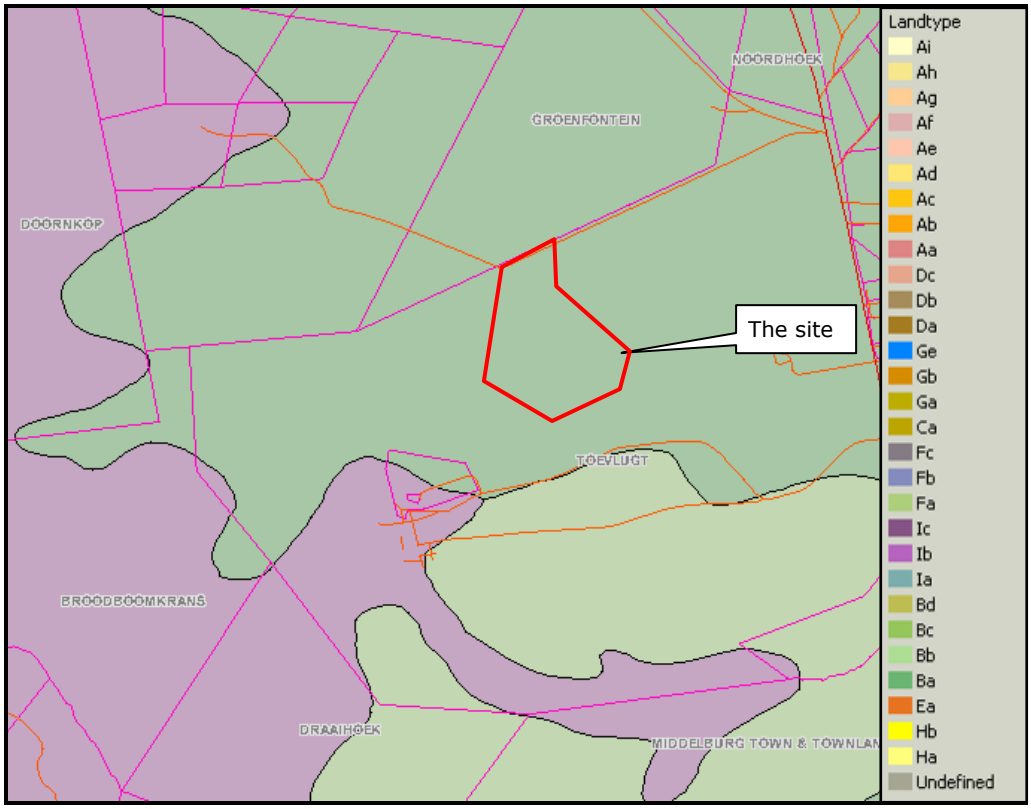


Figure 5.8 – Land type (taken from Department of Agriculture, Forestry and Fisheries)

Looking at grazing capacity, Figure 5.9 (Department of Agriculture, Forestry and Fisheries) indicates that the proposed site has a below average grazing capacity of 11 – 13 ha required per livestock unit. A livestock unit consists of 1 head of cattle or 6 head of sheep.

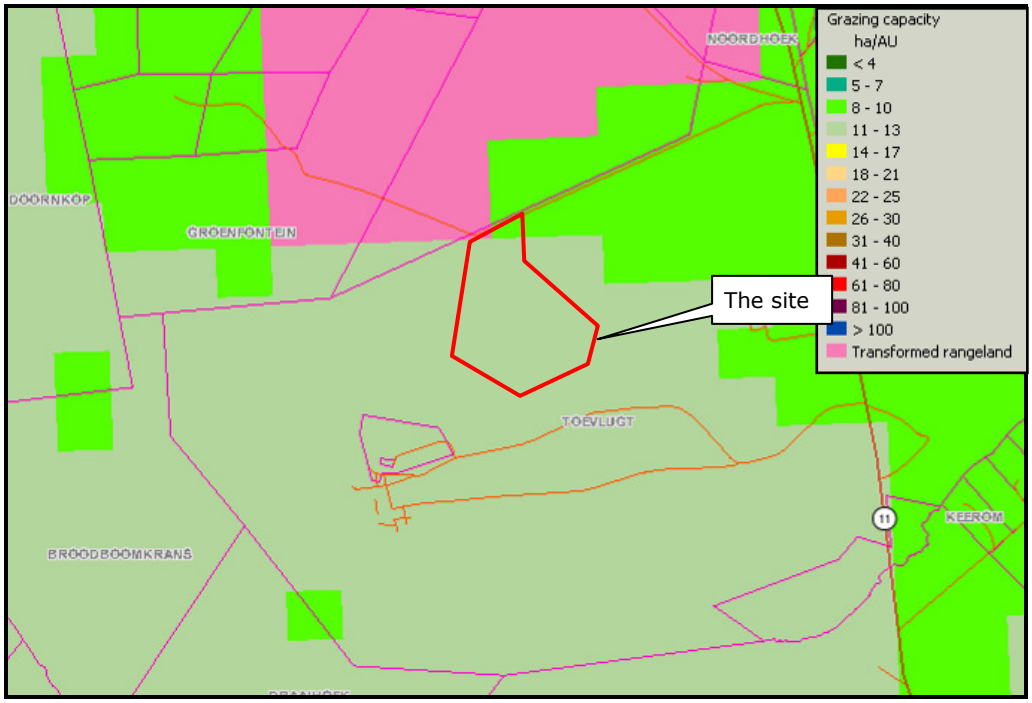


Figure 5.9 – Grazing capacity of the proposed site (taken from Department of Agriculture, Forestry and Fisheries)

5.5.3 Impacts on soil

The proposed site forms part of the greater Botshabelo Nature Reserve. Impacts on the environmental features of the site are therefore limited, since the site is conserved and only used for wildlife grazing and tourism.

Impacts on the soil include the construction and maintenance of the gravel roads on site as well as the construction of the boma (now dilapidated) in the southern portion of the site. Some soil erosion was noted along the gravel roads.

5.6 Land use

Figure 5.10 provides an aerial view of the site as well as an indication of the surrounding land uses and environmental features of the site.

5.6.1 Land ownership

The said site is registered to the Botshabelo Community Development Trust (title deed number: T113237/2005). The Remaining Extent of the farm Toevlugt 320 JS and Portion 6 of the farm Toevlugt 269 JS were awarded to the Botshabelo Community Development Trust in 2005 as part of a Land Claim. A copy of the Title Deed is provided in Appendix 3.

There is a lease registered against the property in favour of the Steve Tshwete Local Municipality (lease no. K4075/2006L). The lease area covers the Middelburg Aerodrome, which is in turn leased to the Middelburg Aeroclub.

According to the Botshabelo Settlement and Business Plan (2004) the following properties were awarded to the Botshabelo Community Development Trust as part of the land claim:

Farm	Portion	Size (ha)
Noordhoek 333 JS	0	449.96
Toevlugt 269 JS	6	35.17
Toevlugt 320 JS	RE	2755.10
Draaihoek 271 JS	RE, 1, 10	1459.92
Broodboomkrans 362 JS	0	780.10
Leeuwpoortjie 267 Js	4	428.26
	Total	**5908.5**

5.6.2 Zoning of the site

The property is zoned for agriculture but indicated as Nature Reserve in the latest Spatial Development Framework (2010) of the Steve Tshwete Local Municipality. It is also indicated as Nature Reserve on the 1: 50 000 topographical map (Figure 5.1).

The Botshabelo Nature Reserve was proclaimed on 11 December 1985 in terms of the Nature Conservation Ordinance, 1983 (Ordinance 12 of 1983). The following properties were included in the nature reserve:

- The Remainder of the farm Leeuwpoortjie 267 JS;
- The Remainder of the farm Groenfontein 266 JS;
- The Remainder of the farm Toevlugt 269 JS.

A copy of the Administrator's Notice 2757 is provided in Appendix 17.

5.6.3 Size of the site

The entire property (i.e. Remaining Extent of the farm Toevlugt 320 JS) is 2755,0952 ha in extent. However, only approximately 130 ha will be utilized for the rural village. This equates to approximately 4.6% of the total area. The Botshabelo Nature Reserve, which overlaps the Remaining Extent of the farm Toevlugt 320 JS, is approximately 2 300 ha in extent.

5.6.4 Servitudes

There are two servitudes registered against the said property (i.e. Remaining Extent of Toevlugt 320 JS) in favour of Eskom (Notarial Deed of Servitude K1078/1960-S and K853/1972-S). The proposed development will however, not be affected by these servitudes due to its location.

5.6.5 Land use

The site forms part of the greater Botshabelo Nature Reserve. It is thus currently utilized for tourism, game keeping, bird watching and other recreational activities. Gravel roads are present on site for game viewing purposes.

The proposed development site is vacant except for a dilapidated game boma near the southern boundary.

5.6.6 Major existing infrastructure

The proposed development site is located within the Botshabelo Nature Reserve and is currently vacant. An old game boma (animal/game enclosure) is located near the southern boundary of the site. The boma is surrounded by Blue Gum trees (Figure 5.10).

The site is fenced along the eastern and northern boundaries. However, the fence between the site and the Middelburg Aeroclub (eastern boundary) is in disrepair.

Narrow gravel roads extend along the eastern boundary of the site and past the boma (Figure 5.10). The gravel road on the northern boundary of the site, which provides access to the adjacent agricultural properties, is located outside of the site boundaries.

A number of game and off-road pathways also crisscross the site as indicated in Figure 5.10.

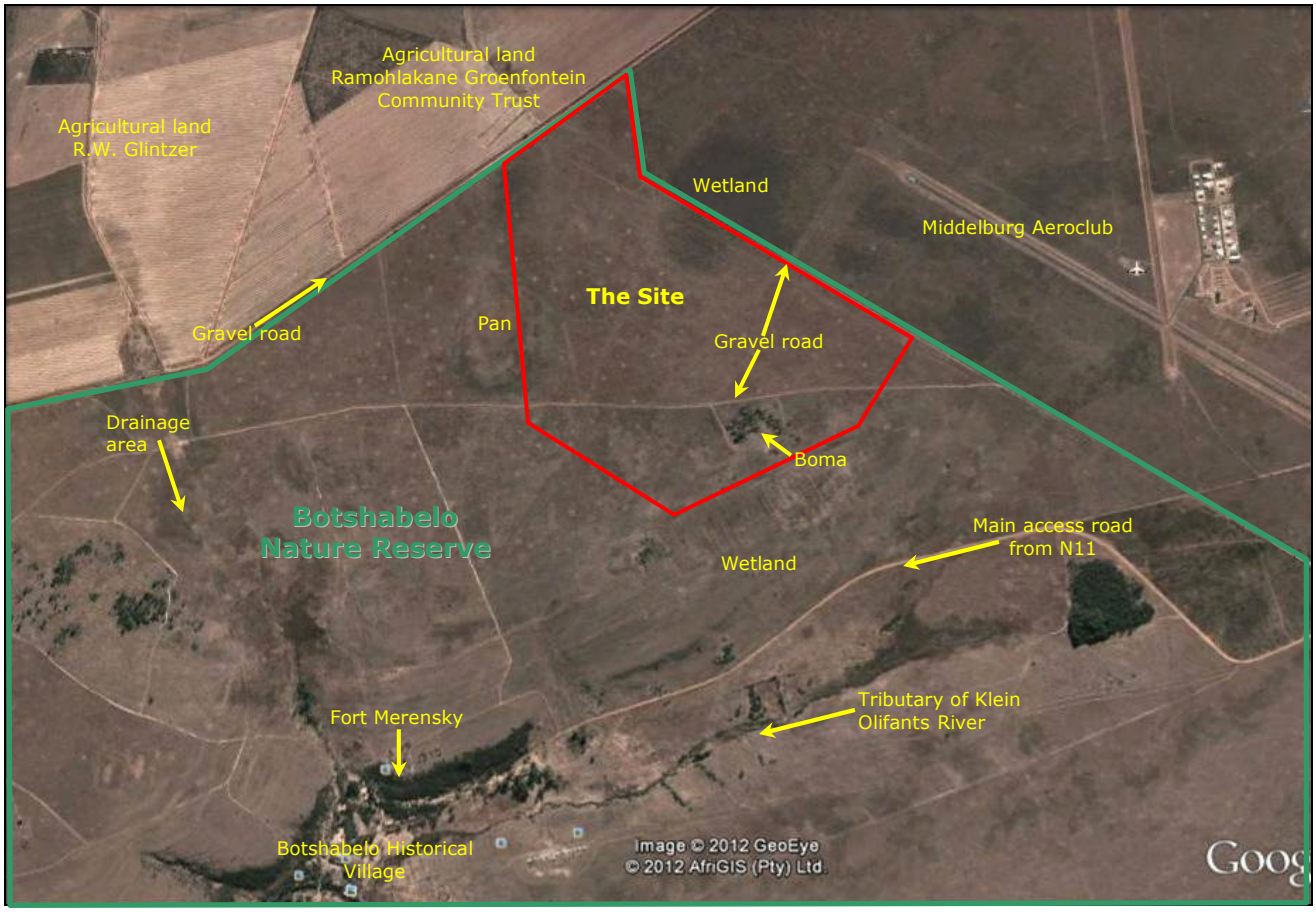


Figure 5.10: Aerial view of the site and surroundings

5.6.7 Adjacent land uses

The proposed site forms part of the greater Botshabelo Nature Reserve. The site is located in the north eastern corner of the nature reserve and is bordered by agricultural land towards the north and the Middelburg Aeroclub towards the east (Figure 5.10).

Although the Middelburg Aeroclub is also located on the Remaining Extent of Toevlugt 320 JS, it does not form part of the nature reserve and is fenced off (Figure 5.1). The Middelburg Aeroclub is currently leased by the Steve Tshwete Local Municipality from the Botshabelo Community Development Trust.

5.7 Natural vegetation

5.7.1 General vegetation description

According to the 'The vegetation of South Africa, Lesotho and Swaziland', the study area falls within the Mesic Highveld Grassland Bioregion, specifically the Rand Highveld Grassland (veld type Gm11; Figure 5.11) (Mucina & Rutherford, 2006). The vegetation type was previously referred to by Low and Rebelo (1998) as Moist Sandy Highveld Grassland (38) and Rocky Highveld Grassland (34) and by Acocks (1953) as Bankenveld (61).

This grassland is found at an altitude of 1 300 metres above mean sea level (mamsl) to 1 635 mamsl in areas between rocky ridges from Pretoria to eMalahleni (Witbank). It also extends onto ridges in the Stoffberg and

Roossenekal regions as well as west of Krugersdorp.

This vegetation type is species-rich and comprises wiry, sour grassland alternating with low, sour shrubland on rocky outcrops and steeper slopes. The most common grasses on the plains belong to the genera *Themeda, Eragrostis, Heteropogon* and *Elionurus*. A high diversity of herbs, many of which belong to the *Asteraceae* family, is also a typical feature. Rocky hills and ridges carry sparse woodlands with *Protea caffra* subsp. *caffra, Acacia caffra* and *Celtis africana*, accompanied by a rich suite of shrubs among which the genus *Rhus* is most prominent.

Almost half of the Rand Highveld Grassland has already been transformed by cultivation, urbanisation, plantations and dams. This vegetation type has been afforded the status of **Endangered** with a conservation target of 24%. Only approximately 1% of this vegetation type is currently conserved.

The National List of Ecosystems that are Threatened and in need of protection (GN1002 of 2011), published under the National Environmental Management: Biodiversity Act (Act No. 10, 2004), lists this vegetation type as **Vulnerable**.

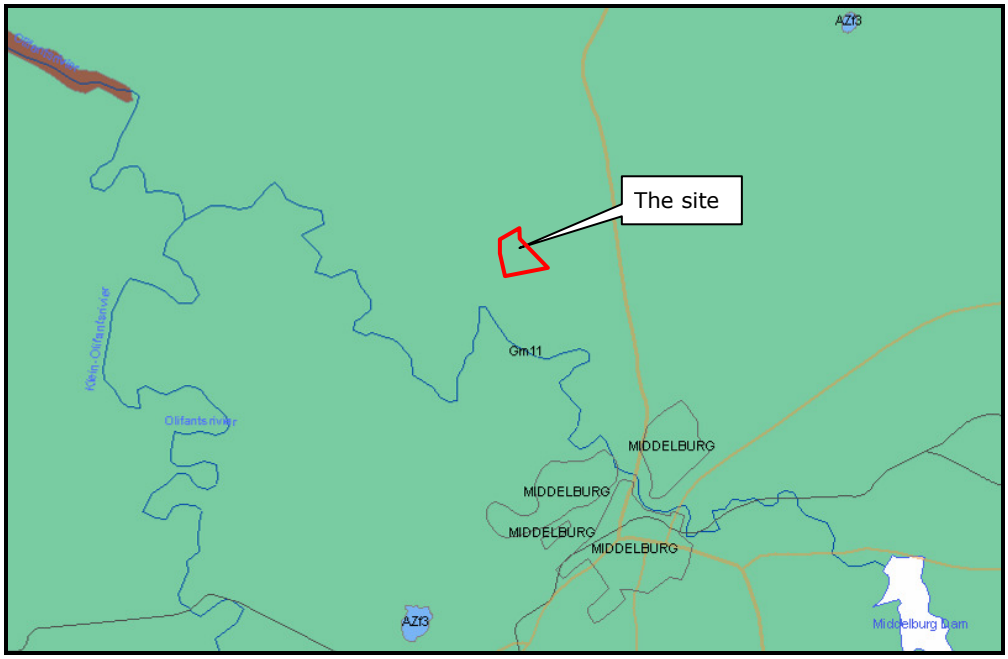


Figure 5.11 – Vegetation type (taken from Mucina and Rutherford, 2006)

The site and surrounding area is indicated as 'Highly Significant' and 'Important and Necessary' in terms of the terrestrial biodiversity assessment of the Mpumalanga Biodiversity Conservation Plan (2006) (Figure 5.12). Highly Significant areas have the second highest biodiversity status of land outside of the protected area network, and are regarded as being in need of "strict land-use controls". According to the MBCP land-use guidelines, Highly Significant areas should be maintained as natural vegetation cover and need to be managed for the conservation of biodiversity. Cultivation-based agriculture and urban/industrial development should not be permitted.

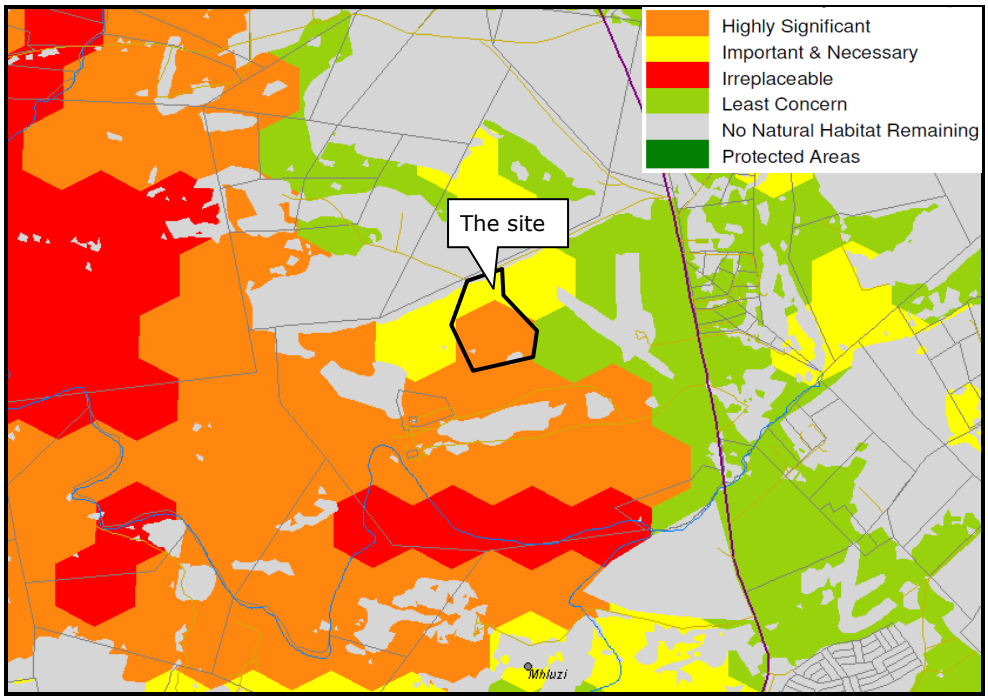


Figure 5.12 – Terrestrial biodiversity assessment (taken from the Mpumalanga Biodiversity Conservation Plan)

The site is not close to any of the Centres of Plant Endemism (Van Wyk and Smith 2001).

5.7.2 Vegetation found on site

The proposed site is located in the north eastern corner of the Botshabelo Nature Reserve, adjacent to the Middelburg Aeroclub. The Botshabelo Nature Reserve is fenced and has been managed as a conservation and historical area for many years.

De Castro & Brits cc. was commissioned to conduct a baseline vegetation survey of the proposed development site. A copy of this report is provided in Appendix 9. This report should be consulted with regards to the methodology used. The vegetation survey was conducted during the growing season (February 2012).

During the survey, a total of 167 species (14 of which are alien) in 41 families was recorded. A comprehensive list of all the plant species noted on site is provided in Appendix 1 of Appendix 9.

De Castro & Brits cc (2012) identified the following vegetation units on site (Figure 5.13):

- Untransformed Grassland;
- Wetlands;
- Transformed (alien trees).

The majority of the site comprises untransformed grassland on gentle slopes and plateau (91.3%), followed by wetlands (7.2%). A very small percentage (1.5%) of the study area has been transformed through planting of alien trees. Table 5.9 provides an indication of the proportions of the vegetation units on site.

Table 5.9: Proportions of different vegetation units within the Study Area (taken from De Castro & Brits cc., 2012)

Vegetation Units	Hectares	Percentage
Untransformed Grassland	120	91.3
Wetlands	9.5	7.2
Transformed - Alien Trees, Homestead	1.9	1.5
	131.4	**100.0**

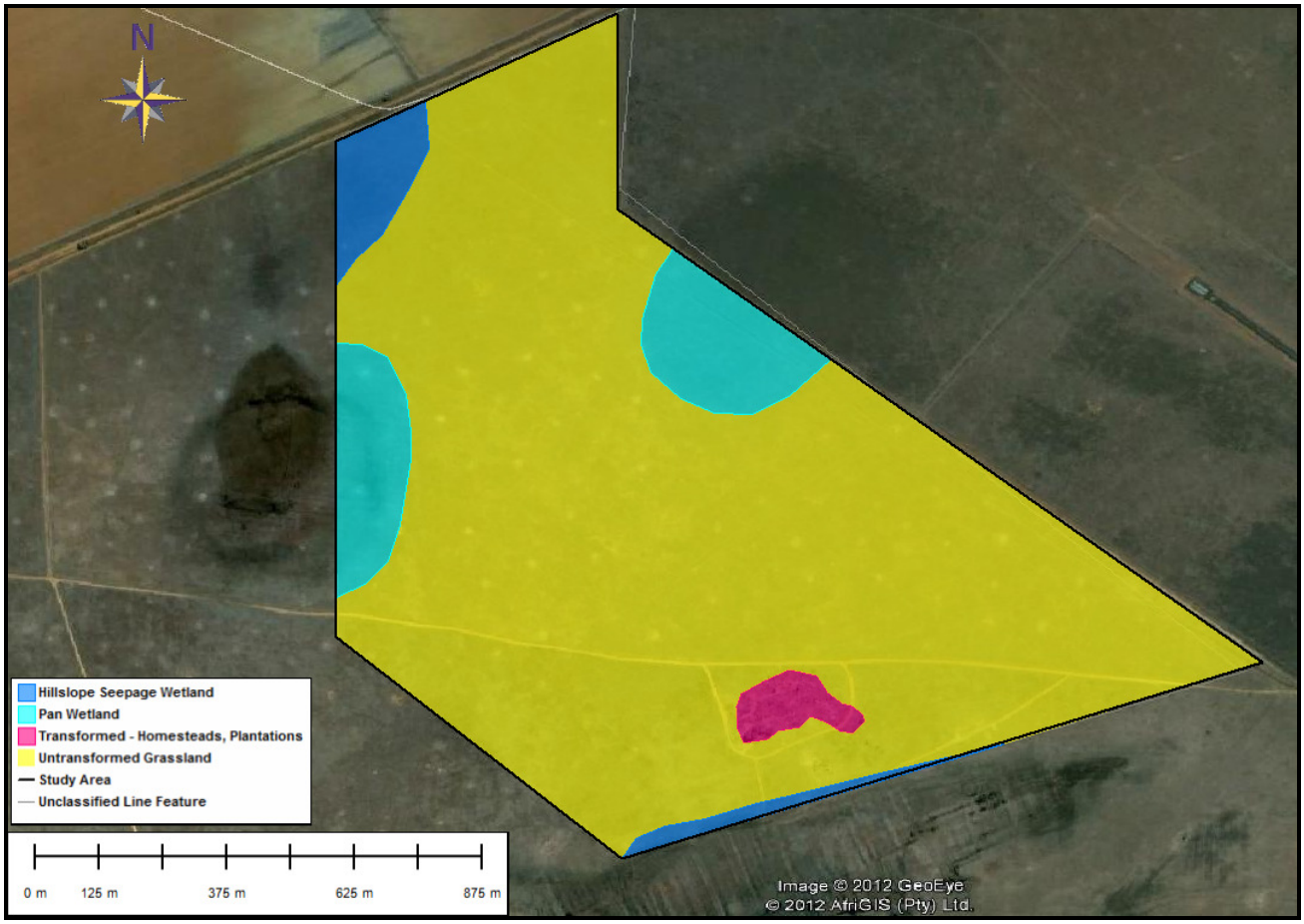


Figure 5.13: Vegetation units within the study area (taken from De Castro & Brits cc, 2012)

5.7.2.1 Untransformed Grassland (Figure 5.13)

According to De Castro & Brits cc (2012), the predominant vegetation unit within the study area is untransformed grassland (Photo 5.1). It covers approximately 120 ha or 91.3% of the site and is located on the central plateau and gentle slopes. Structurally, it can be described as Short Closed Grassland, which is grassland that is less than 0.5 m in height and has a grass canopy cover of more than 10%.

In the past, the grassland was most probably used for cattle grazing and subsequently overgrazed. However, in recent years the grassland has only been utilized by wildlife and the grazing pressure has been low.

The species composition of the untransformed grassland vegetation unit is representative of typical Rand Highveld Grassland. A total of 142 species were recorded and the species richness varied from 33 – 59 species per 100m^2. A feature of this vegetation unit is the presence of geoxylic suffrutices, a particular life-form of plants that characterise fire-evolved grasslands (De Castro & Brits cc., 2012).

The two dominant grass species noted on site are *Tristachya rehmannii* and *Diheteropogon amplectens. Tristachya rehmannii* is noticeably dominant on the plateau, while *Diheteropogon amplectens* is more evenly distributed throughout.

Other common grass species include *Hyparrhenia hirta*, *Eragrostis racemosa, Elionurus muticus, Loudetia simplex, Melinis nerviglumis* and *Schizachyrium sanguineum.* Three species show significant cover-abundance, namely *Dichapetalum cymosum, Fadogia homblei* and *Parinari capensis*.

A wide variety of herbaceous plant species (mainly from the Asteraceae and Fabaceae families) are also present within the grassland. Common herbaceous plant species include *Euryops peduncularis, Felicia muricata, Geigeria burkei, Helichrysum aureonitens, Chamaecrista comosa, Elephantorrhiza obliqua* var. *glabra*, *Eriosema lucipetum, Indigofera daleoides, Crabbea angustifolia, Justicia anagalloides, Commelina* cf. *subulata* and *Cyanotis speciosa* to name but a few.

Common geophytes are *Hypoxis obtusa* and *Ledebouria ovatifolia*.

Photo 5.1: Untransformed grassland

5.7.2.2 Wetlands (Figure 5.13)

Two seasonal pans and associated hillslope seepage wetlands are located on the eastern and western boundaries of the site (Figure 5.13). A wetland is also present on the southern boundary of the site. The wetlands and pans are located mostly off-site, covering an area of only approximately 9.5 ha on site.

De Castro & Brits cc (2012) recorded a total of 34 species in the wetlands vegetation unit, with a species richness of 12-13 species per 100 m^2. Each wetland type is characterised by a unique species composition associated with the dominant physical and hydro-geomorphic characteristics of the site.

Pans:

Three major plant communities can be distinguished in the pans, based on floristic composition. The distribution of the plant communities is mostly influence by the frequency and duration of inundation and/or elevated soil

moisture levels. In terms of aquatic vegetation, rooted emerging, rooted submerged and floating vegetation are present.

The riparian vegetation consisted mainly of grasses. *Imperata cylindrica* and *Leersia hexandra* were noted to be dominant and common hygrophilous grasses included *Agrostis eriantha, Andropogon eucomus, Pennisetum sphacelatum* and *Paspalum dilatatum**.

Sedges, namely *Cyperus* cf. *sphaerospermus*, *Cyperus tenax, Eleocharis acutangula, Fuirena pubescens, Isolepis* sp. and *Kyllinga erecta* are common around the fringes of the pans (Photo 5.2).

The permanently waterlogged conditions provide habitat for hydrophytes found nowhere else in the study area, namely *Aponogeton stuhlmannii* and *Ornithogalum paludosum* (De Castro & Brits cc., 2012).

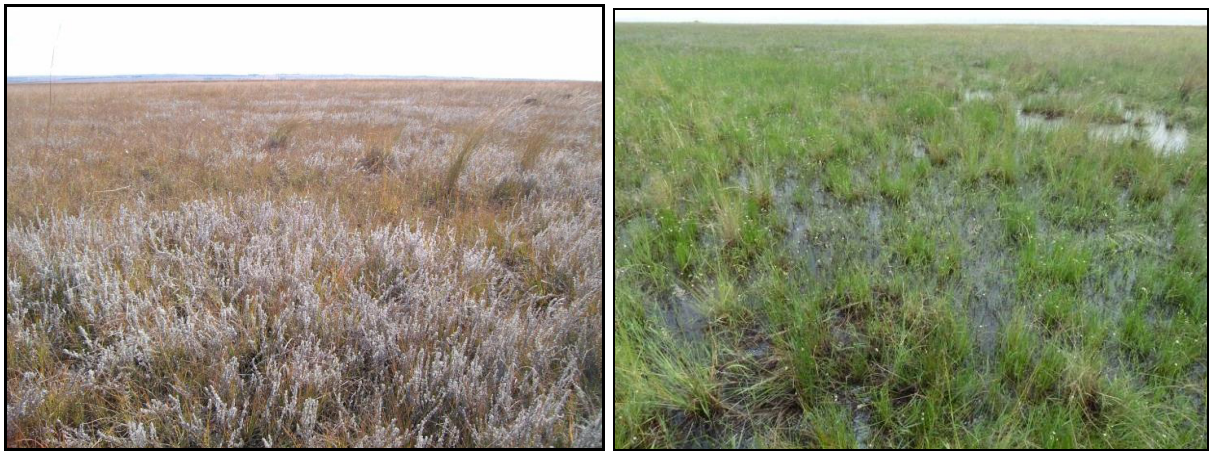


Photo 5.2: Wetland vegetation within the western pan

Hillslope seepage wetlands:
Two hillslope seepage wetlands are present on site. The larger hillslope seepage wetland is located on the southern boundary of the site (Figure 5.13). The smaller wetland is located in the northwestern corner of the site and associated with one of the pans (Figure 5.13).

Since the hillslope seepage wetlands are not permanently water logged, the species composition differs from that within the pans, although the floristic composition is similar. For example, *Leersia hexandra* is less dominant and the two hydrophytes noted in the pans are absent.

According to De Castro & Brits cc. (2012), the diversity of sedges is lower in the hillslope seepage wetlands than in the pans, whereas the diversity of herbaceous species seems to be higher. *Helichrysum aureo-nitens* is particularly abundant in places. Grasses not found within the pans but present in the hillslope seepage wetlands are *Aristida* sp. aff. *junciformis*, *Eragrostis gummiflua, Eragrostis racemosa* and an unidentified *Eragrostis* species. Other species include *Conyza podocephala, Nidorella anomala, Hypericum lalandii, Monopsis decipiens* and *Cycnium tubulosum*.

5.7.2.3 Transformed (Figure 5.13)

An area of 1.9 ha (1.5% of the site) in the southern portion of the site has been transformed by the planting of alien trees (*Eucalyptus sideroxylon, Acacia dealbata*) (Photo 5.3 and Figure 5.13). A dilapidated boma and

associated infrastructure is present amongst the alien trees. There is evidence that *Acacia dealbata* is spreading into the adjacent grassland, which could have a negative impact on the large hillslope seepage wetland situated immediately to the south.

Photo 5.3: Alien vegetation

5.7.3 Sensitivity Assessment

Figure 5.14 indicates the sensitivity and conservation importance of the vegetation on site.

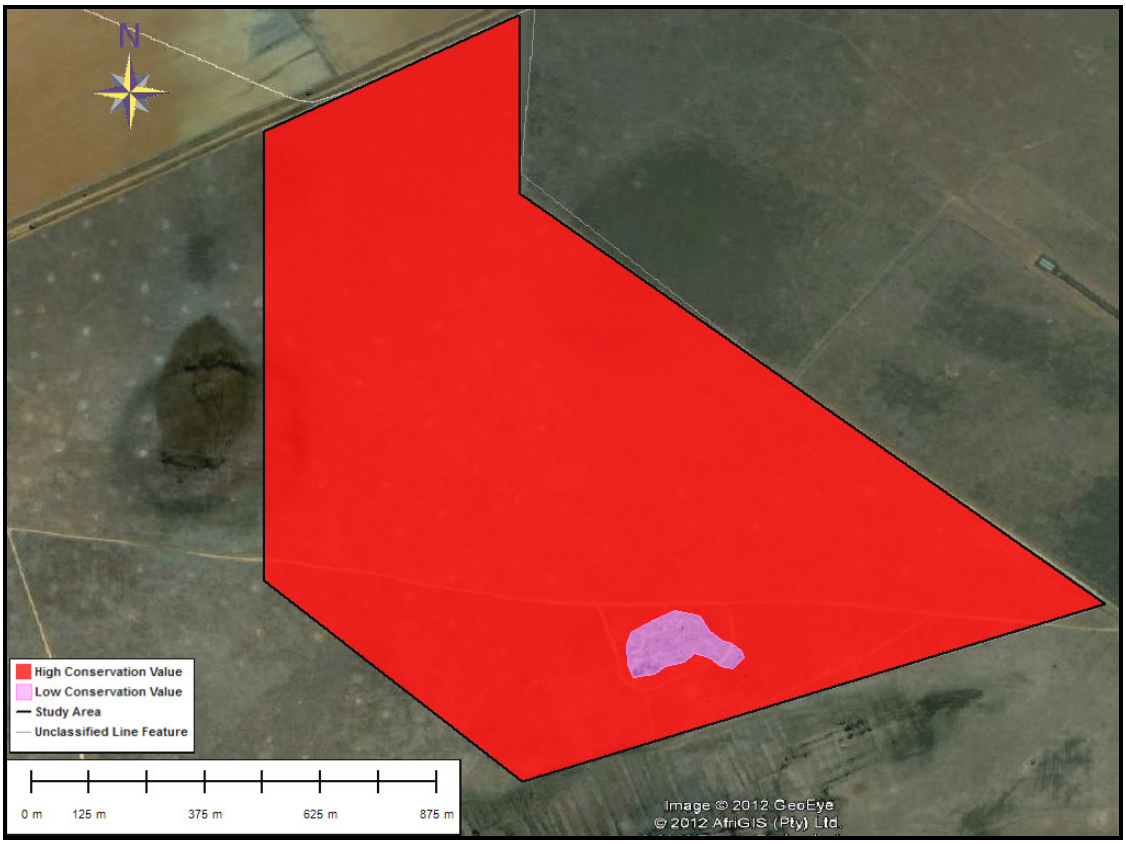


Figure 5.14: Sensitivity map (taken from De Castro & Brits, 2012)

Untransformed grassland (Figures 5.13 and 5.14)
According to De Castro & Brits cc. (2012), the untransformed grassland vegetation is considered to be of **high conservation importance**. It is regarded as sensitive for the following reasons:

- It is representative of Rand Highveld Grassland, an Endangered vegetation type. Few unfragmented areas of this vegetation type remain within the region of the highveld within which the study area is situated. Rand Highveld Grassland is poorly protected in Mpumalanga, and almost 50% has been transformed.
- Species richness is very high and includes many species that will be absent from disturbed areas.
- One species of conservation concern was confirmed to occur, namely *Crinum* cf. *macowanii*, which is classified as Declining.
- There are at least four plant species of conservation concern that have a moderate or high likelihood of occurring within this vegetation unit in the study area. There are also a number of protected and medicinally important plant species that occur in the grassland.

Wetland (Figures 5.13 and 5.14)
According to De Castro & Brits (2012), the wetland vegetation unit was assessed based on the functional value and perceived condition of the wetlands. No comprehensive regional conservation assessment has been undertaken for the Highveld region.

Since the wetlands on site are in general relatively healthy and largely natural, this vegetation type is considered to have **elevated conservation importance and a high sensitivity**. De Castro & Brits (2012) provided the following reasons for assigning this status:

- They perform an important ecological function, e.g. maintaining water purity and supply and reducing soil erosion;
- They provide habitats for various wild animal and bird populations and contain many plant species that are restricted to this habitat;
- There are two Declining plant species that have a moderate likelihood of occurring within this habitat type;
- They are systems situated in the catchment of tributaries that feed the Klein Olifants River, and thus any disturbance will affect the quality of systems further downstream;
- They have been transformed or are under threat by various factors in many parts of the country.

Transformed (Figures 5.13 and 5.14)
De Castro & Brits (2012) classified the transformed vegetation unit as having **low conservation importance and sensitivity**.

5.7.4 Endangered, threatened or rare species

The said site is located within the following quarter degree square: 2529CB.

De Castro & Brits (2012) obtained a list of plant species of conservation concern, which historically occurred in the area (quarter degree squares 2529CB, 2529AD, 2529CA, 2529CD and 2529DA) from the PRECIS Database (South African National Biodiversity Institute) and PlantDat database (Mpumalanga Tourism & Parks Agency). The list contains 27 species together with their conservation status categories (Appendix 3 of Appendix 9).

None of the threatened species classified as Critically Endangered, Endangered or Vulnerable are likely to occur in the study area because of lack of suitable habitat and / or incorrect altitude.

The following plant species were noted on site or could occur on site:

Latin Name	Description/habitat	Status	Occurrence on site
Boophone disticha	Bulbous plant, occurs in grassland.	Declining	Confirmed in the untransformed grassland
Crinum cf. macowanii	Grassland, rocky areas and near rivers	Declining	Noted but could not be confirmed beyond doubt since it was not flowering
Callilepis leptophylla	Daisy, occurs sporadically in grassland on the Mpumalanga Highveld and Escarpment. Flowers from August to January.	Declining	High likelihood of occurring on site
Eucomis autumnalis subsp. *clavata*	Geophyte, occurs in both untransformed grassland and at wetland edges.	Declining	High likelihood of occurring on site
Crinum bulbispermum	Large bulb, found in grassland at the edges and in wetlands. Flowers in the spring.	Declining	Moderate chance of occurring on site
Hypoxis hemerocallidea	Bulbous plant harvested for medicinal purposes. Flowers anytime from early spring to late summer.	Declining	Moderate chance of occurring on site

5.7.5 Protected plant species

According to Provincial Ordinances (specifically Schedule 11 of the Mpumalanga Nature Conservation Act (No. 10 of 1998)), a number of plant species are protected in the Mpumalanga Province, whether they are considered to be threatened or not. This includes, but is not limited to, the following common names: ferns, flame lilies, christmas bells, pineapple flowers, clivia, nerine, crinum, ground lily, fire lily, irises, all orchids.

De Castro & Brits (2012) confirmed the presence of five (5) protected plant species on site, namely:

- *Boophone disticha;*
- *Crinum* cf. *macowanii;*
- *Gladiolus ecklonii;*
- *Habenaria epipactidea;* and
- A sterile, unidentified orchid species.

Other protected species may be present on site, although they were not detected during the survey.

5.7.6 Medicinal plants

According to De Castro & Brits (2012), only the most important medicinal plants as listed by Lotter and Krynauw (2002) were considered during this survey.

The only species confirmed on site is *Boophone disticha*.

5.7.7 Invader or exotic species

De Castro & Brits (2012) noted 14 alien species (Appendix 1 of Appendix 9) on site. Of the 14 alien species, only 3 are declared invader species, namely:

Latin name	Common name	Category
Acacia dealbata	Silver Wattle	Category 2
Eucalyptus sideroxylon	Black Ironbark	Category 2
Solanum sisymbriifolium	Wild Tomato	Category 1

- ***Category 1:*** *Prohibited and must be controlled.*
- ***Category 2:*** *(commercially used plants) – May be grown in demarcated areas provided that there is a permit and that steps are taken to prevent their spread.*

Acacia dealbata poses the most serious threat, since it is currently invading adjacent grassland and may have a negative impact on the hillslope seepage wetland located to the south.

5.8 Animal life

5.8.1 General

The site is indicated as 'Highly Significant' and 'Important and Necessary' (Figure 5.12) in terms of the terrestrial biodiversity assessment of the Mpumalanga Biodiversity Conservation Plan (2006).

In terms of aquatic biodiversity, the proposed site is indicated in the Mpumalanga Biodiversity Conservation Plan (2006) as occurring within an area where the conservation of aquatic biodiversity is 'Not Required' (Figure 5.15).

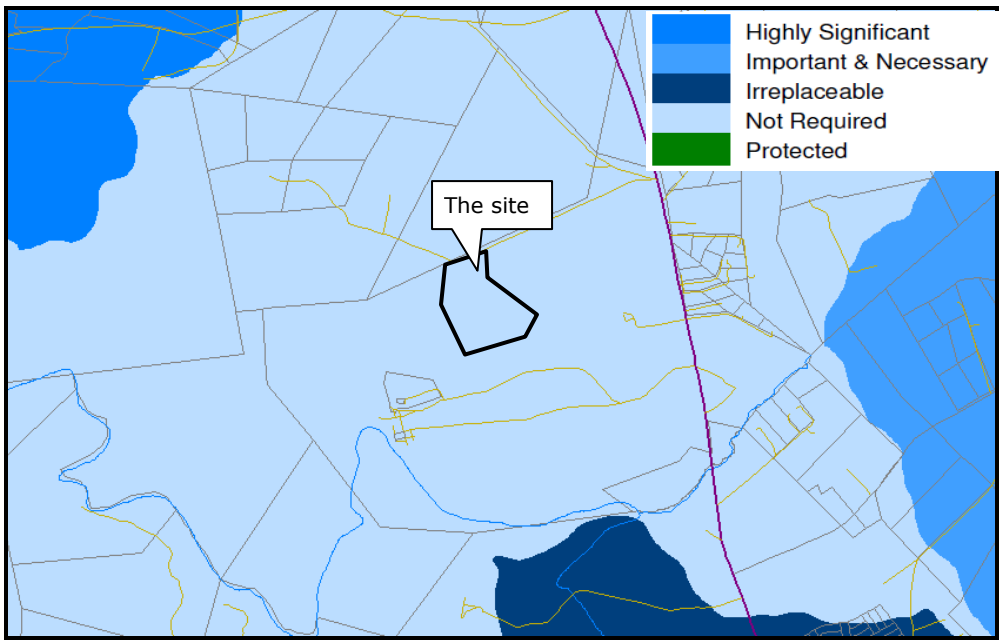


Figure 5.15 – Aquatic biodiversity subcatchments of the area (taken from the Mpumalanga Biodiversity Conservation Plan)

The Klein Olifants River, which is located south west of the proposed site, is identified in the Mpumalanga Biodiversity Conservation Plan (2006) as an important aquatic corridor in terms of fish movements (Figure 5.16).

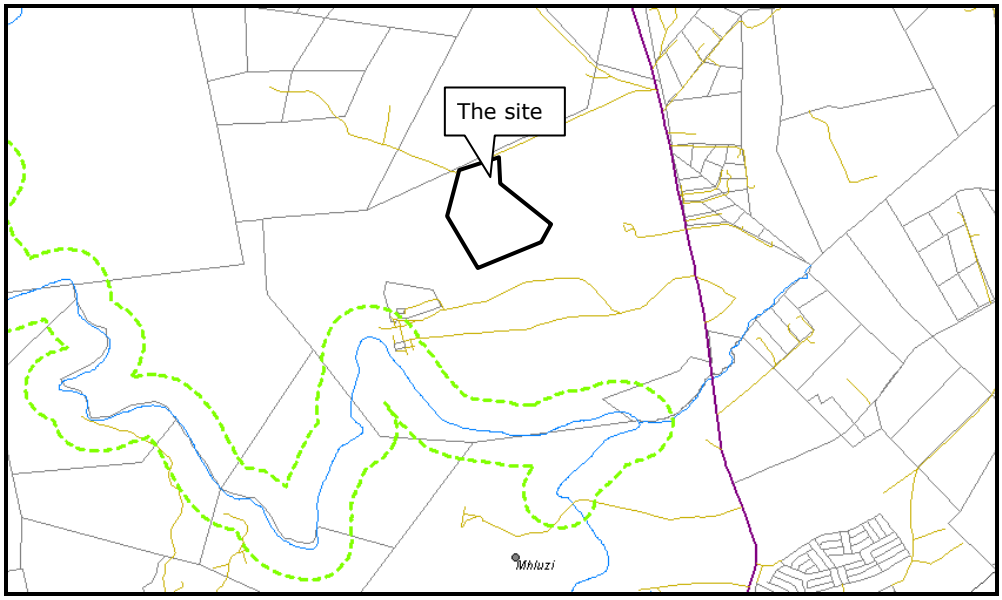


Figure 5.16 - Aquatic Corridor (taken from the Mpumalanga biodiversity Conservation Plan)

The proposed site is located within the Botshabelo Nature Reserve. A number of mammal species were thus introduced to the area. In general, the purpose of the nature reserve is to protect the natural environment, which would allow for the sustainable use of the area for e.g. tourism, hunting, game farming, etc.

The Steve Tshwete Local Municipality indicated that the game within the Botshabelo Nature Reserve belongs to the municipality. Approximately 40% of the game was recently sold and there are plans in place to sell more of the animals. The most recent game count took place in 2011 and the game count figures are provided in Table 5.10. Game count figures after the last sale are not available.

According to Mr. Glintzer (nearby landowner), large scale hunting and capturing of game recently took place within the nature reserve. Game numbers are therefore very low. In addition, local community members are using dogs for hunting purposes.

Table 5.10: Most recent game count figures (Steve Tshwete Local Municipality, 2013)

	Average count (1999 to 2006)	2011 Count
Aardwolf		
Blesbok	81	23
Duiker	2	1
Eland	58	15
Jackal	2	5
Klipspringer	9	4
Kudu	2	
Oribi	2	
Grey Rhebok	7	2
Red Hartebeest	134	101
Impala	1	
Mountain Reedbuck	20	3
Springbok	81	66
Steenbok	2	1
Black Wildebeest	44	7
Warthog	25	35
Ostrich	1	
Zebra	63	46

5.8.2 Specialist study

Dr. Andrew Deacon conducted a faunal survey of the said site. A copy of the report is provided in Appendix 10. This report should be consulted with regards to methodology used.

According to Deacon (2012), the Botshabelo Nature Reserve is situated in an area with a wide variety of biotopes ranging from undulating grass covered hill crests to drainage lines, rocky ridges, a river valley, deep gorge, bushveld and riparian woodland. The fact that all of these biotopes occur in a relative small area of 2 300 ha, surrounded by mostly homogenous landscape of Highveld Grassland, renders this area diverse in habitat and associated wildlife.

Although the proposed site mainly comprises grassland and wetlands, it forms an essential part of the overall Botshabelo Nature Reserve ecosystem. Animals that are mostly woodland and riverine dependent may periodically visit the site, bats living in the cliffs may visit the grassland to feed, birds may fly over or perch, etc.

Using the geomorphology and vegetation types of the site, Deacon (2012) identified two main faunal biotopes on site, namely:

- Primary Grassland; and
- Pan Wetlands.

Each biotope has the potential to harbour a number of structural components that serve as shelter and habitat for faunal species that reside in the area. By allocating only one habitat per species, the importance of the different habitats can easily be rated. However, although most animals have a preferred habitat type, they do move around and can make use of more than one biotope/habitat.

5.8.2.1 Local Biotopes

The *Primary Grassland biotope* may seem rather monotonous, but the dense growths of grass and other aspects such as stones, rocks, forbs, shrubs and termite mounds create a favourable biotope for local fauna. It provides habitat for smaller species that tunnel and move underneath the overhead shelter. According to Deacon (2012), these aspects of habitat were however, not common within the study area.

The grassland provides food for a number of herbivorous animals and seed-eaters (birds). Frogs will utilize the grasslands when temporary pools develop after heavy rainfall events. Snakes, nocturnal predators (cats, mongoose, jackal, etc.) and raptors could also be found in the grassland looking for prey.

According to Deacon (2012), the *Pan Wetlands* are biodiversity hotspots and have a high sensitivity and conservation value. They are extremely rich in diversity and provide habitat for various animals and birds. Wetland habitats range from open water spaces to inundated aquatic vegetation, emergent macrophytes and marginal mud flats. They provide permanent or temporary watering points for game and birds, breeding habitats for frogs and nesting habitat for wetland bird species.

The pans located within the central Highveld region comprise a unique and restricted habitat. However, most of these pans have already been severely impacted upon by agriculture, eutrophication, mining and development.

5.8.2.2 Botshabelo ecology

According to Deacon (2012), the said site could potentially provide habitat to 255 different species (15 frog species, 40 reptile species, 145 bird species and 55 mammal species).

Frogs:

According to Deacon (2012), most frogs can live away from water but need water for egg laying and the larval stage. Frogs will thus be absent if no standing water is available in the area.

Table 5.11 provides an indication of the 15 frog species most likely to occur in the study area. *Four (4) species were observed during the survey.*

Table 5.11: Frog species that may occur on site (taken from Deacon, 2012)

Biotope / Probability of occurrence	Primary grassland and hill-slope seepage	Pan wetlands
Definite (observed)	**Giant bullfrog (*Pyxicephalus adspersus*)**	**Bubbling kassina (*Kassina senegalensis*)**
		Boettger's caco (*Cacosternum boettgeri*)
		Giant bullfrog (*Pyxicephalus adspersus*)
		Plain grass frog (*Ptychadena anchietae*)
High		Guttural toad (*Amietophrynus gutturalis*)
		Striped grass frog (*Ptychadena porosissima*)
		Clicking stream frog (*Strongylopus grayii*)
Medium		Rattling frog (*Semnodactylus wealii*)
		Snoring puddle frog (*Phrynobatrachus natalensis*)
		Common river frog (*Amietia angolensis*)
		Tremolo sand frog (*Tomopterna cryptotis*)
		Natal sand frog (*Tomopterna natalensis*)
Low		Raucous toad (*Amietophrynus rangeri*)
		Striped stream frog (*Strongylopus fasciatus*)
		Tandy's sand frog (*Tomopterna tandyi*)

Biotope Probability of occurrence	Primary grassland and hill-slope seepage	Pan wetlands
Number of Species	1	15
% of overall total	6	100
Threatened species	1	1

*Red: Threatened species *Purple: Endemic species

As indicated in Table 5.11, the giant bullfrog (*Pyxicephalus adspersus*) was found in the Pan Wetland in the Botshabelo study area just after a good rainfall event. This species is considered a Protected species in terms of the National Environmental Management: Biodiversity Act. A Protected species is an indigenous species of high conservation value or national importance that requires national protection.

The Giant Bullfrog is listed as "Least Concern" globally and "Near-Threatened" (NT) in South Africa (SA).

The "Near-Threatened" status means that a provincial permit is required to:

- catch, handle, collect, transport and/or relocate the species;
- maintain the species in captivity;
- conduct hands-on research and/or conservation work on the species.

According to Deacon (2012), the giant bullfrog is especially vulnerable when areas are being developed due to its habitat restrictions and lack of mobility. The fact that it has been recorded in the study site makes this an important and key species to consider in developing the area. Detailed information about the distribution, habitat, breeding habits, etc. of the giant bullfrog is provided in Appendix 10.

It is evident from the summary in Table 5.11, that most of the frog species are expected to occur in the Pan Wetland biotope. However, during the rainy season, temporary pools and pans might form in the grassland biotope, which will also be utilized by the frogs. During the dry cold winter months, most of the frogs aestivate in sheltering places and burrow into the soil, which means that the frogs may be found quite a distance from the wetlands in the grassland biotope.

Reptiles:

The presence of reptiles on site is a good indication of the habitat integrity of an area since they form an important link in the food chain.

Reptiles are not as mobile as birds or most mammals and are therefore more or less restricted to the microhabitat of choice. The following microhabitats were considered during the field survey:

- Rupicolous surroundings – loose boulders or koppies and rocky outcrops.
- The presence of disused and even active termitaria
- The presence of hollow tree trunks or stumps or dead trees with loose bark
- The presence of sandy substratum or other suitable medium for burrowing
- The presence of trees and shrubs

Table 5.12 provides an indication of the 40 reptile assemblages most likely to occur in the study area. *Two (2) reptile species were observed on site.*

Table 5.12: Reptile species that may occur on site (taken from Deacon, 2012)

Biotope / Probability of occurrence	Primary grassland and hillslope seepage wetland	Pan wetlands
Definite (observed)	**Variable skink (*Trachylepis varia)***	
	Yellow-throated plated lizard *(Gerrhosaurus flavigularis)*	
High	Brown house snake *(Lamprophis capensis)*	Red-lipped snake *(Crotaphopeltis hotamboeia)*
	Mole snake *(Pseudaspis cana)*	
	Spotted grass snake *(Psammophylax rhombeatus rhombeatus)*	
	Striped grass snake *(Psammophylax tritaeniatus)*	
	Black-headed centipede-eater *(Aparallactus capensis)*	
	Red-lipped snake *(Crotaphopeltis hotamboeia)*	
	Cape skink *(Trachylepis capensis)*	
Medium	Aurora house snake *(Lamprophis aurora)*	Brown water snake *(Lycodonomorphus rufulus)*
	Cape wolf snake *(Lycophidion capense capense)*	Aurora house snake *(Lamprophis aurora)*
	South African slug-eater *(Duberria lutrix)*	Cape wolf snake *(Lycophidion capense capense)*
	Fork-marked sand snake *(Psammophis trinasalis)*	Rinkhals *(Hemachatus haemachatus)*
	Short-snouted grass snake *(Psammophis brevirostris brevirostris)*	
	Cross-marked grass snake *(Psammophis crucifer)*	
	Rhombic egg-eater *(Dasypeltis scabra)*	
	Rinkhals *(Hemachatus haemachatus)*	
	Puff adder *(Bitis arietans arietans)*	
	Wahlberg's snake-eyed skink *(Afroblepharus wahlbergii)*	
	Breyer's long-tailed seps *(Tetradactylus breyeri)*	
	Distant's ground agama (*Agama aculeata distanti*)	
	Cape thicktoed gecko *(Pachydactylus capensis)*	
Low	Lobatse hinged tortoise (*Kinixys lobatsiana*)	Western Natal green snake *(Philothamnus natalensis occidentalis)*
	Bibron's blind snake *(Afrotyphlops bibronii)*	
	Eastern Cape thread snake *(Leptotyphlops scutifrons conjunctus)*	
	Western yellow-bellied sand snake (*Psammophis subtaeniatus*)	
	Bibron's stiletto snake (*Atractaspis bibronii*)	
	Eastern tiger snake (*Telescopus semiannulatus semiannulatus*)	
	Highveld garter snake *(Elapsoidea sundervallii media)*	
	Speckled Shield Cobra (*Aspidelaps scutatus scutatus*)	
	Snouted night adder (*Causus defilippii*)	
	Rhombic night adder *(Causus rhombeatus)*	
	Dusky spade-snouted worm lizard (*Monopeltis infuscata*)	
	Western Legless Skink *(Acontias occidentalis)*	
	Sundevall's writhing skink (*Mochlus sundevallii sundevallii*)	
	Ornate scrub lizard *(Nucras ornata)*	
	Coppery Grass Lizard *(Chamaesaura aenea)*	
	Large-scaled grass lizard *(Chamaesaura macrolepis)*	
Number of Species	**38**	**6**
% of overall total	**95**	**15**
Threatened species	**0**	**0**

*Purple: Endemic species

It is evident from Table 5.12 that reptiles would mainly (95%) be found in the Primary Grassland biotope.

No endemic or threatened reptile species were noted on site. The probability of endemic reptiles occurring on site ranges from medium to low, whereas no threatened species are expected to occur in the area.

Birds:

According to Deacon (2012), many studies have shown that counts of birds accurately reflect environmental changes. A decline in species richness and

diversity, as determined by routine monitoring, may serve as an early warning of environmental degradation.

The birds that could potentially occur in the area were categorized into one of the following groups:

a. Resident: Feeding, breeding and residing in the immediate vicinity of the study area.
b. Visitor (Nomadic): Foraging in the immediate vicinity of the study area, but nesting in a distant area (large wetlands, rocky cliffs, etc).
c. Migrant: Migrating birds feeding and residing (sometimes breeding) only for a part of the year in the immediate vicinity of the study area.

These three groups will be affected directly or indirectly by any development in the immediate vicinity of the study area. Although vagrants and birds passing through add to the biodiversity, they will not be influenced as directly as the resident populations when development occurs in the area.

Table 5.13 provides an indication of the 145 bird assemblages that may occur in the area. *Of the 145 species, 31 species were observed on site.*

Table 5.13: Bird species that may be present on site (taken from Deacon, 2012)

Biotope / **Probability of occurrence**	**Primary grassland and hillslope seepage wetland**	**Pan wetlands**
Birds resident to the area		
Definite (observed)	**Blackheaded heron (*Ardea melanocephala*)**	**Blackheaded heron (*Ardea melanocephala*)**
	Laughing dove (*Streptopelia senegalensis*)	**Yellowbilled duck (*Anas undulata*)**
	Cape turtle-dove (*Streptopelia capicola*)	
	White-fronted bee-eater *(Merops bullockoides)*	
	Rufousnaped Lark (*Mirafra africana*)	
	Cape Clapper Lark *(Mirafra apiata)*	
	Anteating Chat *(Myrmecocichla formicivora)*	
	Fan-tailed Cisticola *(Cisticola juncidis)*	
	Desert Cisticola *(Cisticola aridulus)*	
	Cloud Cisticola *(Cisticola textrix)*	
	Ayre's Cloud Cisticola (*Cisticola ayresii)*	
	Cape Longclaw *(Macronyx capensis)*	
	African Pipit *(Anthus cinnamomeus)*	
	Common Fiscal *(Lanius collaris)*	
	Southern Masked weaver (*Ploceus velatus*)	
High	Cattle egret (*Bubulcus ibis*)	Marsh owl (*Asio capensis*)
	Swainson's Spurfowl *(Pternistes swainsonii)*	Levaillant's cisticola (*Cisticola tinniens*)
	Marsh owl (*Asio capensis*)	Common Waxbill (*Estrilda astrild*)
	Neddicky (*Cisticola fulvicapilla*)	
	Common Waxbill (*Estrilda astrild*)	
	Black-throated Canary *(Serinus atrogularis)*	
Medium	Hadeda Ibis (*Bostrychia hagedash*)	Little egret (*Egretta garzetta*)
	Secretary bird (*Sagittarius serpentarius*)	Hadeda Ibis (*Bostrychia hagedash*)
	Rock Kestrel *(Falco tinnunculus)*	Hamerkop (*Scopus umbretta*)
	Greater Kestrel *(Falco rupicoloides)*	Hottentot teal (*Anas hottentota*)
	Red-winged Francolin *(Scleroptila levaillantii)*	Southern pochard (*Netta erythrophthalma*)
	Spotted Thick-knee *(Burhinus capensis)*	African Snipe (*Gallinago nigripennis*)
	African Hoopoe *(Upupa africana)*	Brown-throated Martin *(Riparia paludicola)*
	Pied Crow (*Corvus albus*)	Tawny-flanked prinia (*Prinia subflava*)
	Black-chested Prinia *(Prinia flavicans)*	Cape wagtail *(Motacilla capensis)*
	Pied Starling *(Spreo bicolor)*	Great Egret (*Egretta alba*)
Low	Southern Bald Ibis *(Geronticus calvus)*	Reed cormorant (*Phalacrocorax africanus*)
	Ovambo Sparrowhawk *(Accipiter ovampensis)*	Grey heron (*Ardea cinerea*)
	Jackal Buzzard *(Buteo rufofuscus)*	Black Heron (*Egretta ardesiaca*)
	Lanner Falcon *(Falco biarmicus)*	Purple heron (*Ardea purperea*)
	Helmeted Guineafowl (*Numida meleagris*)	Squacco heron (*Ardeola ralloides*)
	Kurrichane Buttonquail *(Turnix sylvatica)*	Sacred ibis (*Threskiornis aethiopicus*)

Biotope Probability of occurrence	Primary grassland and hillslope seepage wetland	Pan wetlands
	Whitebellied korhaan (*Eupodotis senegalensis*)	Cape shoveller (*Anas smithii*)
	Northern Black Korhaan (*Afrotis afraoides*)	Black crake (*Amaurornis flavirostris*)
	African Grass owl *(Tyto capensis)*	Redchested flufftail (*Sarothrura rufa)*
	Spotted eagle owl (Bubo africanus)	Common Moorhen (*Gallinula chloropus*)
	Eastern Clapper Lark *(Mirafra fasciolata)*	Plainbacked Pipit (*Anthus leucophrys*)
	Cape Long-billed Lark *(Certhilauda [c.] curvirostris)*	African marsh harrier (*Circus ranivorus*)
	Eastern Long-billed Lark *(Certhilauda [c.] semitorquata)*	
	Cape Crow *(Corvus capensis)*	
	Cape Grassbird *(Sphenoeacus afer)*	
	Wailing Cisticola *(Cisticola lais)*	
	Plainbacked Pipit (*Anthus leucophrys*)	
	Buffy Pipit *(Anthus vaalensis)*	
	Northern Grey-headed Sparrow *(Passer griseus)*	
	Red-headed Finch *(Amadina erythrocephala)*	
	Martial Eagle *(Polemaetus bellicosus)*	
	Cape Sparrow *(Passer melanurus)*	
Number of Species	**53**	**27**
% of overall total	**36%**	**19%**
Threatened species	**6**	**1**
Nomadic birds		
Definite (observed)	**Spike-heeled Lark *(Chersomanes albofasciata)***	**Redbilled teal (*Anas erythrorhyncha*)**
	African Stonechat *(Saxicola torquata)*	**Redbilled Quelea (*Quelea quelea*)**
	Redbilled Quelea (*Quelea quelea*)	**Long-tailed Widowbird *(Euplectes progne)***
	Long-tailed Widowbird *(Euplectes progne)*	
	Yellow-crowned bishop (*Euplectes afer*)	
	Southern red bishop (*Euplectes orix*)	
	African Quailfinch *(Ortygospiza atricollis)*	
	Pintailed Whydah (*Vidua macroura*)	
High	Crowned Lapwing *(Vanellus coronatus)*	African Wattled plover (*Vanellus senegallus*)
	Little Swift *(Apus affinis)*	Little Swift *(Apus affinis)*
	Orange-breasted Waxbill *(Amandava subflava)*	Orange-breasted Waxbill *(Amandava subflava)*
Medium	Black-shouldered Kite *(Elanus caeruleus)*	Black stork *(Ciconia nigra)*
	Common Quail *(Coturnix coturnix)*	African spoonbill (*Platalea alba*)
	Blacksmith plover (*Vanellus armatus*)	Fulvous duck (*Dendrocygna bicolor*)
	Alpine Swift *(Apus melba)*	Whitefaced duck (*Dendrocygna viduata*)
	Red-capped Lark *(Calandrella cinerea)*	Whitebacked duck (*Thalassornis leuconotus*)
	Common Ostrich *(Struthio camelus)*	Comb Duck (*Sarkidiornis melanotos)*
		Kittlitz's plover (*Charadrius pecuarius*)
		Blacksmith plover (*Vanellus armatus*)
		White-winged Widowbird *(Euplectes albonotatus)*
Low	Blue Crane *(Grus paradisea)*	Yellowbilled egret (*Egretta intermedia*)
	Harlequin Quail *(Coturnix delegorguei)*	Cape teal (*Anas capensis*)
	Denham's Bustard *(Neotis denhami)*	Greyheaded gull (*Larus cirrocephalus*)
	Temminck's Courser *(Cursorius temminckii)*	Red-collared Widowbird *(Euplectes ardens)*
	Speckled Pigeon (*Columba guinea)*	
	Namaqua Dove *(Oena capensis)*	
	Little Rush-Warbler *(Bradypterus baboecala)*	
	Wattled Starling *(Creatophora cinerea)*	
	Red-collared Widowbird *(Euplectes ardens)*	
	Cape Canary *(Serinus canicollis)*	
Number of Species	**27**	**19**
% of overall total	**18%**	**13%**
Threatened species	**2**	**1**
Intra African migrants		
Definite (observed)	**Banded Martin *(Riparia cincta)***	**Banded Martin *(Riparia cincta)***
	Greater Striped Swallow *(Hirundo cucullata)*	**Greater Striped Swallow *(Hirundo cucullata)***
High	White-rumped Swift (*Apus caffer*)	White-rumped Swift (*Apus caffer*)
		White-throated Swallow *(Hirundo albigularis*)
Medium	Abdim's stork (*Ciconia abdimii*)	Horus Swift *(Apus horus)*
	Horus Swift *(Apus horus)*	
	Red-breasted Swallow *(Hirundo semirufa)*	
Low	Diederik Cuckoo (*Chrysococcyx caprius*)	Little bittern (*Ixobrychus minutus*)
	South African Cliff-Swallow *(Hirundo spilodera)*	Pearl-breasted Swallow *(Hirundo dimidiata)*
		African reed-warbler (*Acrocephalus baeticatus*)
Number of Species	**8**	**8**
% of overall total	**5%**	**5%**

Biotope / Probability of occurrence	Primary grassland and hillslope seepage wetland	Pan wetlands
Threatened species	**0**	**0**
Palaearctic migrants		
Definite (observed)	**Steppe Buzzard *(Buteo vulpinus)***	**Barn Swallow (*Hirundo rustica*)**
	Lesser Kestrel *(Falco naumanni)*	
	Amur Falcon *(Falco amurensis)*	
	Barn Swallow (*Hirundo rustica*)	
High	White stork (*Ciconia ciconia*)	
Medium	Common House-Martin *(Delichon urbicum)*	Marsh sandpiper (*Tringa stagnatilis*)
		Common Greenshank (*Tringa nebularia*)
		Wood sandpiper (*Tringa glareola*)
		Little stint (*Calidris minuta*)
		Whitewinged tern (*Chlidonias leucopterus*)
		Great reed warbler (*Acrocephalus arundinaceus*)
Low	Yellowbilled Kite (*Milvus migrans parasitus*)	Common sandpiper (*Actitis hypoleucos*)
	European Bee-eater (*Merops apiaster*)	Curlew sandpiper (*Calidris ferruginea*)
	European Roller (*Coracias garrulus*)	Ruff (*Philomachus pugnax*)
		Marsh Warbler *(Acrocephalus palustris)*
Number of Species	**9**	**11**
% of overall total	**6%**	**7%**
Threatened species	**2**	**0**

*Red: Threatened species
*Purple: Endemic species

As can be seen from Table 5.13, the Primary Grassland is relatively rich in bird diversity, attracting 97 species, while, due to their seasonality, the pan wetlands are home to 65 resident and visiting bird species.

According to Deacon (2012), 12 out of the 145 bird species that might frequent the site are listed in the IUCN Red List of Threatened Species (IUCN, 2008) and the National Environmental Management: Biodiversity Act (see Table 5.13). However, only one (Lesser Kestrel) was noted on site.

Five (5) out of the 145 bird species are endemic to South Africa.

Mammals:
The larger mammals are usually the first animals to disappear when man moves into an area. This is mainly due to loss of natural habitat and hunting. On the other hand, smaller mammal species such as rodents and small carnivores can adapt and even thrive in the presence of humans.

A number of large mammal species are present within the Botshabelo Nature Reserve. According to Deacon (2012), all the mammals were reviewed in this report in order to provide background of the fauna that occurred here historically, which is useful information when considering the ongoing protection of the area.

Table 5.14 provides a summary of the mammals that are present on site and could potentially occur in the area. *Of the 55 mammal species that could frequent the site, 11 species were observed.*

Table 5.14: Mammal species that may be present on site (taken from Deacon, 2012)

Biotope / Probability of occurrence	Primary grassland and hillslope seepage wetland	Pan wetlands
Definite (observed)	**Black-backed jackal (*Canis mesomelas*)**	Yellow mongoose *(Cynictis penicullata)*
	Yellow mongoose *(Cynictis penicullata)*	

Biotope Probability of occurrence	Primary grassland and hillslope seepage wetland	Pan wetlands
	Blue wildebeest (*Connochaetes taurinus*)	
	Black wildebeest (*Connochaetes gnou*)	
	Red hartebeest (*Alcelaphus buselaphus*)	
	Blesbok (*Damaliscus dorcas phillipsi*)	
	Springbok (*Antidorcas marsupialis*)	
	Eland (*Taurotragus oryx*)	
	Cape Porcupine *(Hystrix africaeaustralis)*	
	Common Molerat *(Cryptomys hottentotus)*	
	Cape hare (*Lepus capensis*)	
High	Caracal (*Felis caracal*)	Caracal (*Felis caracal*)
	Slender mongoose (*Galerella sanguinea*)	Pouched mouse (*Saccostomus campestris*)
	Steenbok (*Raphicerus campestris)*	
	Bushveld gerbil (*Tatera leucogaster*)	
	Brants' (Highveld) Gerbil *(Tatera brantsii)*	
	Striped mouse (*Rhabdomys pumilio*)	
	Pouched mouse (*Saccostomus campestris*)	
	Fat mouse (*Steatomys pratensis*)	
	Kreb's fat mouse (*Steatomys krebsii*)	
	Single-striped Mouse *(Lemniscomys rosalia)*	
Medium	Least dwarf shrew (*Suncus infinitesimus*)	Reddish-grey musk shrew (*Crocidura cyanea*)
	Lesser dwarf shrew (*Suncus varilla*)	Greater red musk shrew (*Crocidura flavescens*)
	Tiny musk shrew (*Crocidura fuscomurina)*	Lesser grey-brown musk shrew (*Crocidura silacea*)
	Reddish-grey musk shrew (*Crocidura cyanea*)	Pygmy Mouse *(Mus minutoides)*
	Lesser grey-brown musk shrew (*Crocidura silacea*)	
	Cape fox *(Vulpes chama)*	
	African weasel (*Poecilogale albinucha*)	
	Striped polecat (*Ictonyx striatus*)	
	Burchell's zebra (*Equus burchellii*)	
	Aardvark (*Orycteropus afer*)	
	Warthog (*Phacochoerus aethiopicus*)	
	Grey climbing mouse (*Dendromus melanotis*)	
	Chestnut climbing mouse (*Dendromus mystacalis*)	
	White-tailed mouse (*Mystromys albicaudatus*)	
	Multimammate mouse (*Mastomys coucha*)	
	Pygmy Mouse *(Mus minutoides)*	
Low	South African hedgehog (*Atelerix frontalis*)	Swamp musk shrew (*Crocidura mariquensis)*
	Egyptian free-tailed bat (*Tadarida aegyptiaca*)	Serval (*Felis serval*)
	Chacma baboon (*Papio ursinus*)	Honey badger (*Mellivora capensis*)
	Aardwolf (*Proteles cristatus*)	Oribi (*Ourebia ourebi*)
	Brown hyaena (*Hyaena brunnea*)	Reedbuck (*Redunca arundinum*)
	African wild cat (*Felis lybica*)	Vlei Rat *(Otomys irroratus)*
	Honey badger (*Mellivora capensis*)	Water Rat *(Dasymys incomtus)*
	Dwarf mongoose (*Helogale parvula*)	
	Oribi (*Ourebia ourebi*)	
	Reedbuck (*Redunca arundinum*)	
	Mountain reedbuck (*Redunca fulvorufula*)	
	Springhare **(***Pedetes capensis***)**	
	Short-snouted elephant-shrew (*Elephantulus brachyrhynchus*)	
Number of Species	**50**	**14**
% of overall total	**91%**	**25%**
Threatened species	**7**	**4**

*Red: Threatened species

It is evident from Table 5.14 that the Primary Grassland biotope has the highest mammal diversity (91%) with fewer species potentially occurring in the Pan Wetlands (25%).

Nine (9) out of the 55 species that may frequent the site are considered as threatened in terms of the IUCN and National Environmental Management: Biodiversity Act. One of these species (Black wildebeest) was noted within the Botshabelo Nature Reserve. The other 54 species have a medium to low probability of occurring on site.

Summary:
Table 5.15 provides a summary of the number of species that could occur in each of the faunal biotopes. Seeing as some species were noted in both biotopes, the total number of species recorded in Table 5.15 is higher than the 255 indicated to potentially occur on site.

Table 5.15: Faunal biotopes and associated fauna (taken from Deacon, 2012)

Status	Primary Grassland	Pan Wetlands
Frogs	1	15
Reptiles	38	6
Birds	97	65
Mammals	50	14
Total	**186**	**100**
% of total	73%	39%
Threatened spp	18	7

The untransformed Primary Grassland presents the most diverse biotope with a total of 186 species, which is 73% of the total species assemblage in the study area, while the untransformed Pan Wetland has 100 species (39%).

There are 22 threatened faunal species that can be expected to occur, visit or have the potential to occur in the project area. ***Threatened fauna observed during the current survey were Giant bullfrog (Pyxicephalus adspersus), Lesser kestrel (Falco naumanni) and Black wildebeest (Connochaetes gnou).*** The potential presence of the other expected threatened fauna can however, not be disregarded. A list of the potential threatened species and their habitat preferences are provided in Appendix 10.

5.9 Surface water

5.9.1 Catchment description

The said site is situated within the Olifants River Catchment, more specifically the quaternary catchment B12E (Figure 5.17).

Table 5.16 provides more details regarding the B12E quaternary catchment.

Table 5.16: Quaternary catchment characteristics (Wetland Consulting Services, 2011)

Area (Ha)	Mean Annual Precipitation (mm)	Mean Annual Runoff (mm)	MAR as a % of MAP	Mean Annual Evaporation (mm)
39190	696.76	52.5	7.54	1600-1700

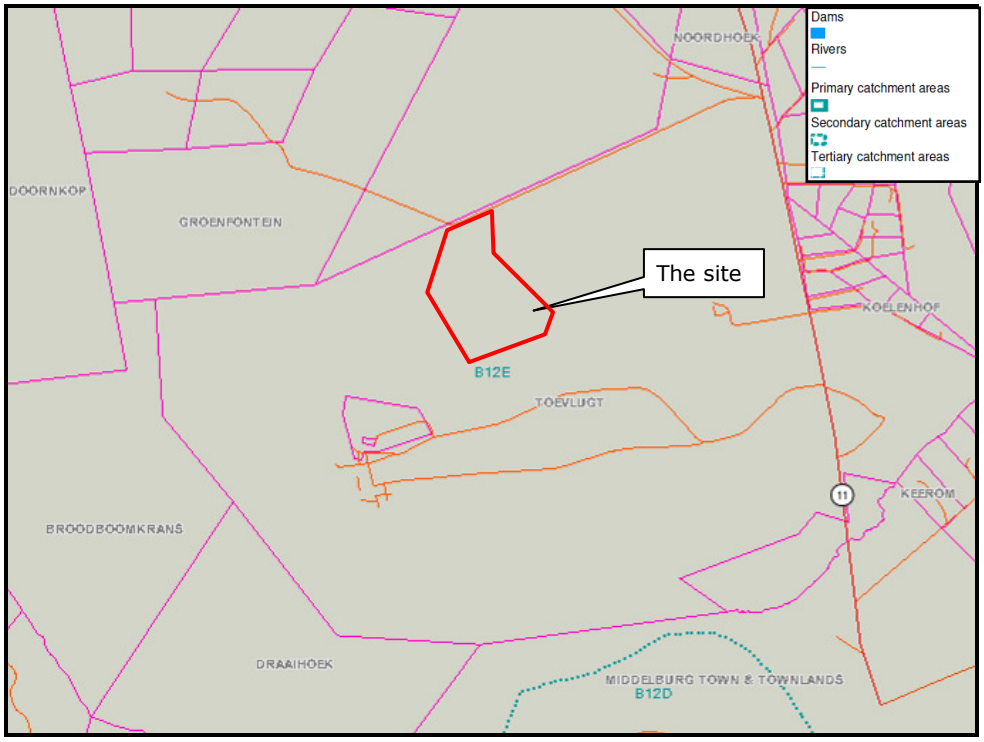


Figure 5.17 – Tertiary Catchment (taken from Department of Agriculture, Forestry and Fisheries)

5.9.2 Site drainage

The site is located on a high point in the landscape and drains in both a northerly and a south westerly direction towards tributaries of the Klein Olifants River.

Two perennial pans are present in the almost level, higher lying eastern and western boundaries of the site (Figure 5.18). The pan on the western boundary of the site is fed by surface water runoff and shallow groundwater from the central and northern portions of the site. The pan then drains towards the north, feeding a hillslope seepage wetland (Figure 5.18).

The pan on the eastern boundary of the site is fed from the Middelburg Aeroclub side (i.e. east of the site). It drains onto the site and subsequently feeds the larger pan and hillslope seepage wetland (Figure 5.18).

Surface water runoff and groundwater from the southern portion of the site feeds a hillslope seepage wetland located on the southern boundary (Figure 5.18).

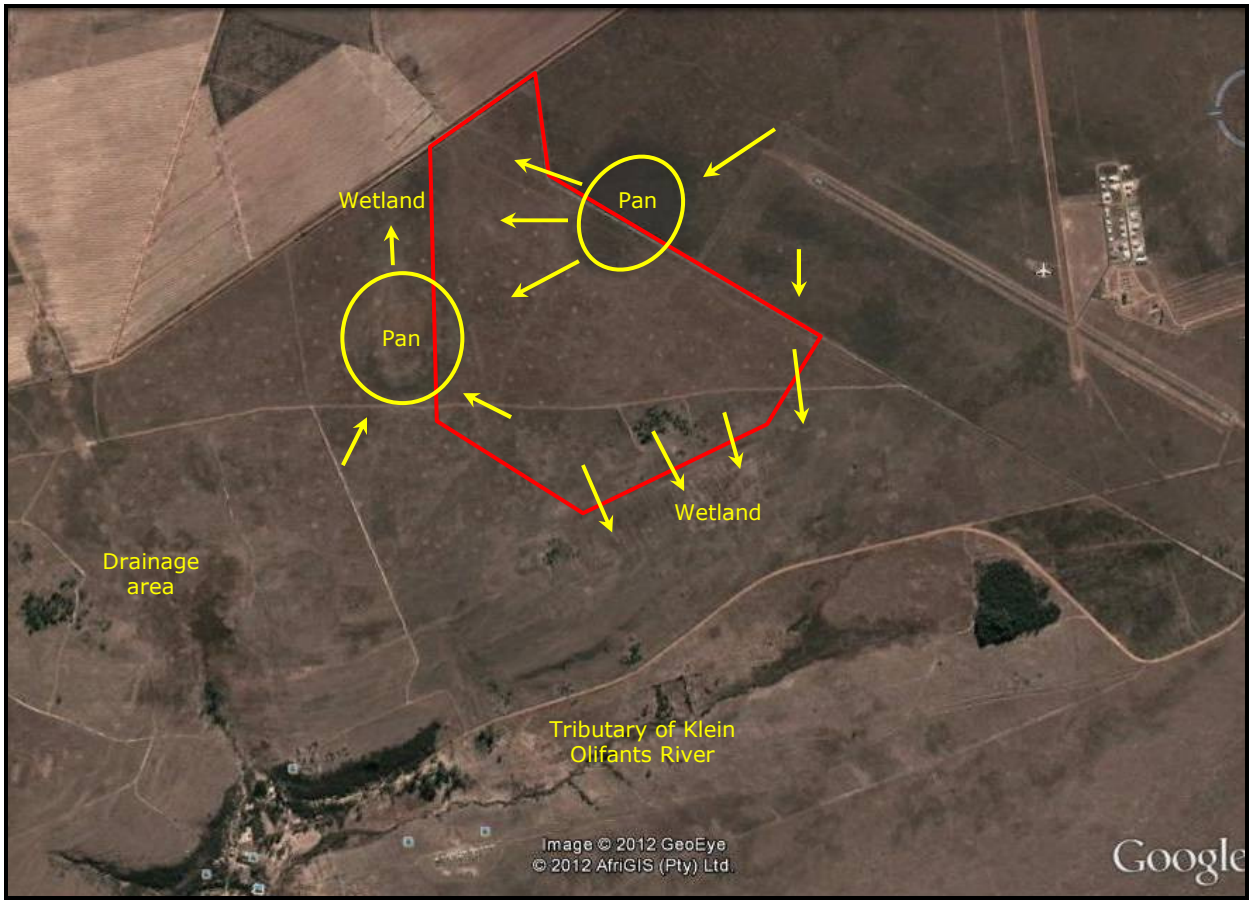


Figure 5.18: Surface water environments on site

5.9.3 Wetlands and pans

Wetland Consulting Services (Pty) Ltd. were appointed to undertake a wetland delineation and classification of the proposed development area. A copy of the report is provided in Appendix 11. This report should be consulted with regards to the methodology used.

5.9.3.1 Wetland types

According to Wetland Consulting Services (Pty) Ltd. (2011), wetlands occupy approximately 7.7 % or 9.5 ha of the total study area.

On the said site, two (2) hydrogeomorphic (HGM) wetland types were identified namely:

- Pan/Depression Wetlands;
- Isolated Hillslope Seepage Wetlands.

Figure 5.19 provides an indication of the location of the identified wetland types.

As indicated in Figures 5.18 and 5.19, the wetlands/pans extend across the site boundaries onto the adjacent area. In total, the wetlands cover 93.29 ha.

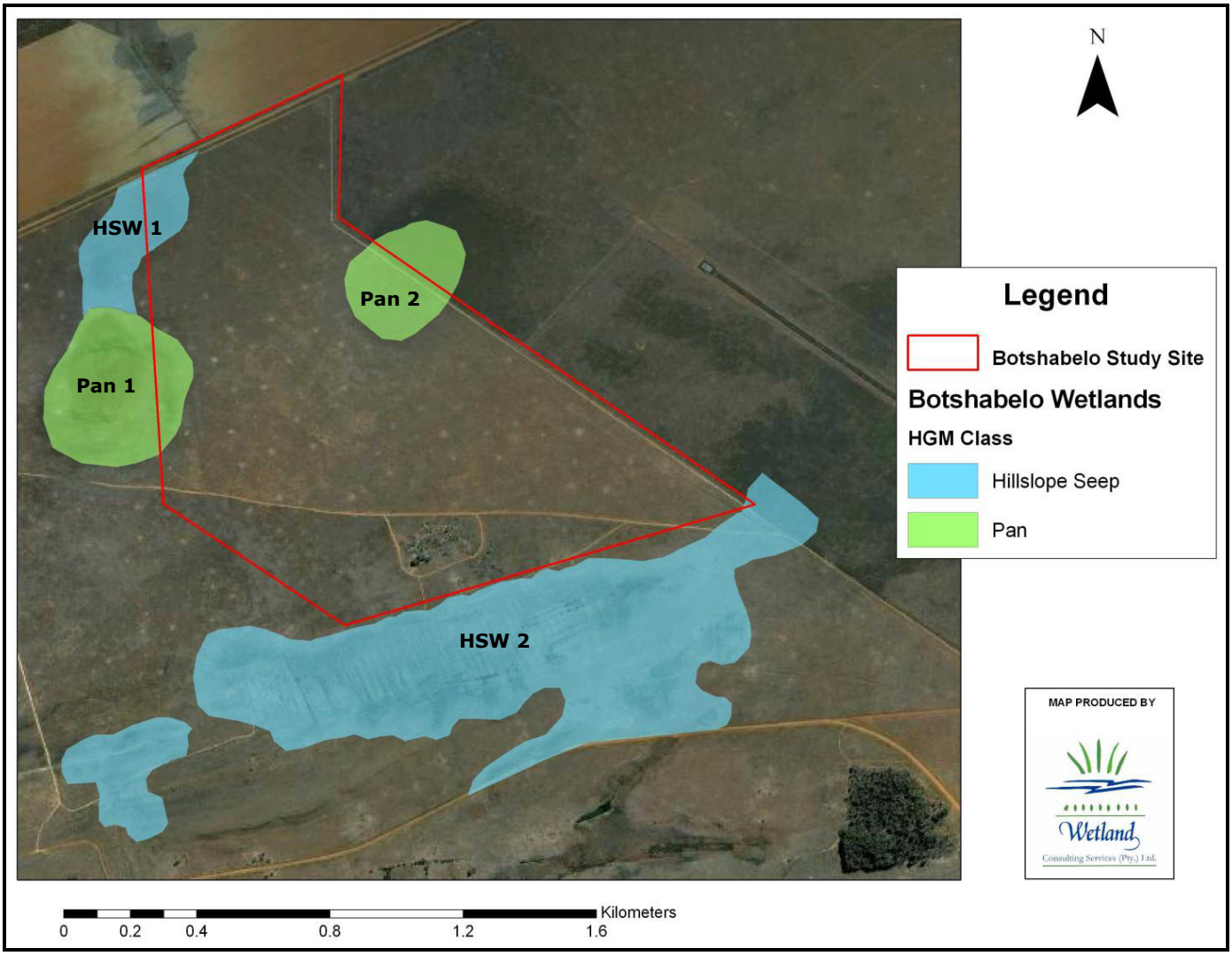


Figure 5.19: Wetlands located on and adjacent to the site (taken from Wetland Consulting Services (Pty) Ltd., 2011)

Pan/Depression Wetlands (Figure 5.19)
According to Wetland Consulting Services (Pty) Ltd. (2011), the pan/depression wetlands cover 7.11 ha on site and 20.77 ha in total.

The pan/depression wetland comprise two pans (Pan 1 and Pan 2), both of which drain to the north and northwest (Figure 5.15). Pan 1 feeds a hillslope seepage wetland draining to the north whereas Pan 2 is fed by a hillslope seepage wetland located off site.

According to Wetland Consulting Services (Pty) Ltd. (2011), Pan 1 appears to be seasonally inundated, whilst Pan 2 is inundated less frequently or for shorter periods of time. Both pans are fed primarily through shallow groundwater driven by precipitation and interflow within the catchments as well as surface runoff.

Water is prevented from infiltrating deeper within the pans due to a shallow plinthic horizon, which forms an impermeable layer. Water movement is maintained within 1.5 – 2 m of the surface across much of the site.

Soils associated with the pans were sandy, shallow and underlain by a hardpan ferricrete layer.

The vegetation within and along the margins of the pans is dominated by graminoids and low profile shrubs, such as *Stoebe vulgaris*, *Heliochrysum* sp., *Monocymbium ceresiiforme*, *Hyparrhenia hirta*, *Eragrostis gummiflua*, *Agrostis lachnantha*, *Verbena* sp., *Imperata cylindrica*, *Themeda triandra*, *Cymbopogon* sp.

According to Wetland Consulting Services (Pty) Ltd. (2011), the pan wetlands perform a number of functions such as:

- Improving water quality by allowing for the precipitation of minerals. Accumulated salts and nutrients can however, be released back into the system during dry periods.
- In the case of Pan 1, stored water may be released into the downstream systems via the hillslope seepage wetland, thereby contributing to flow augmentation.
- Support of faunal and floral biodiversity.
- Educational and tourism resource.

Although the pans do store runoff water, they have a limited ability in terms of flood attenuation due to the isolation of the pans within the landscape. In addition, the pans are not important in terms of sediment trapping.

Isolated Hillslope Seepage Wetlands (Figure 5.19)

According to Wetland Consulting Services (Pty) Ltd. (2011), hillslope seepage wetlands occur on sloping terrain and are mainly supported by diffuse, sub-surface flows maintained at or near the soil surface. Usually, an impermeable layer prevents or limits the vertical infiltration of water into the deeper soil horizons. The main source of flow is groundwater, with contributions from surface runoff and precipitation. Flow outputs may either feed the surface water resource directly or contribute to groundwater recharge.

Two hillslope seepage wetlands were identified by Wetland Consulting Services (Pty) Ltd., covering an area of 2.39 ha on site and 72.52 ha off site.

The geotechnical investigation (Engeolab 2011b) identified several areas that may support a perched water table during the rainy season due to underlying ferricrete (Figure 5.6 – Zone 2B). These areas fall outside of the delineated wetlands since the extent and duration of saturation is not sufficient to influence the vegetation or result in active redoxymorphic features (i.e. mottling).

The hillslope seepage wetland located in the north western corner of the site (HSW 1; Figure 5.19) is fed by Pan 1 and drains in a northerly direction across the gravel access road and adjacent cultivated land. Pan 2 and HSW 1 are most probably linked through subsurface flows. The soils within this system are relatively shallow and sandy with a matrix of gravel and iron/manganese concretions. Iron mottling in the soil suggests only temporary to seasonal wetness.

A large hillslope seepage wetland lies towards the south of the site (HSW 2; Figure 5.19). This wetland drains towards the south and southwest. Some flows are impounded in a small earthen dam located within a non-perennial tributary of the Klein Olifants River (Figure 5.18).

According to Wetland Consulting Services (Pty) Ltd. (2011), the soils of the wetland located south of the site (HSW 2; Figure 5.19) are shallow and sandy with bedrock exposed at the soil surface in some areas. The soils are saturated with a high organic content. The presence of saturated soils (even during the dry season) suggests that this wetland receives groundwater flows which maintain areas of permanent saturation throughout the year. This is supported by the geohydrological report (Engeolab, 2011a) where it is indicated that links between the surface and groundwater are most likely to occur at the saturated contact zones with intrusive diabase and decomposed (weathered) rock). This wetland lies across the interface of three geological formations. The exposed rock outcrop also plays an important role by forcing subsurface flows close to the soil surface.

The vegetation community within the hillslope seepage wetlands was similar to that encountered in the pans, with species such as *E. gummiflua*, *Aristida junciformis*, *A. lachnantha, T. triandra, Cymbopogon* sp., *I. cylindrica*, *Verbena* sp., *Heliochrysum* sp. and *Stuba vulgaris* and several species of sedge present. A few stands of exotic *Acacia mearnsii* (Black wattle) were observed within HSW2 and its catchment.

The hillslope seepage wetlands perform a number of beneficial functions, namely:

- Provide a measure of erosion control by slowing down surface flows through the wetland, thereby reducing the risk of erosion and preventing excess sedimentation of downstream aquatic systems.
- Slower flows through the wetlands encourage the deposition of sediments, an ecosystem service important in maintaining the ecological integrity of downstream aquatic ecosystems.
- The slow movement of water through the organically rich wetland soils facilitates the reduction of sulphates and nitrates. Shallow surface flows promote sunlight penetration which allows for the photo-degradation of certain toxicants (Wetland Consulting Services (Pty) Ltd, 2011).

5.9.3.2 Present Ecological State (Figure 5.20)

According to Wetland Consulting Services (Pty) Ltd. (2011), the results of the Present Ecological State (PES) assessment indicate that all the wetlands are relatively healthy and largely natural. Figure 5.20 provides an indication of the PES of the wetlands.

Due to the site being located within a nature reserve, there has been limited disturbance within the wetland catchments and only minor impacts within the wetlands themselves. Impacts on the wetlands include fence lines, dirt roads, a shallow trench, possibly past cultivation and the presence of the airstrip within the catchment. The influence of these impacts on the wetland hydrology, geomorphology and vegetation is however, limited with little impact on the condition or functionality of these systems.

Both of the hillslope seepage wetlands (HSW 1 and HSW 2; Figure 5.19) and Pan 1 were given a PES rating of B (Largely Natural).

Pan 2 is in a slightly poorer condition and was classified as a B/C (Largely Natural/Moderately Modified) (Figure 5.20).

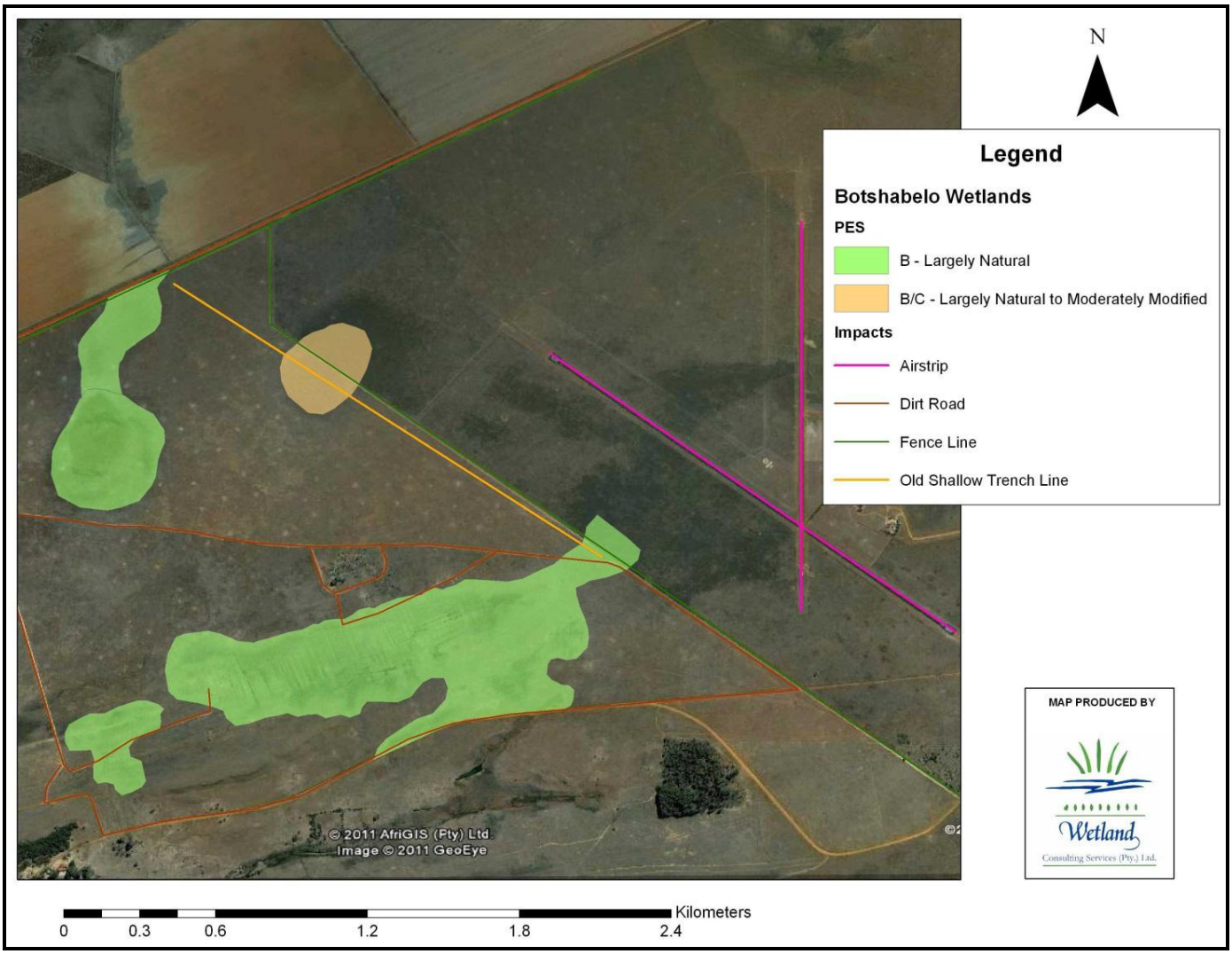


Figure 5.20: Present Ecological State (PES) of wetlands (taken from Wetland Consulting Services (Pty) Ltd., 2011)

5.9.3.3 Ecological Importance and Sensitivity (Figure 5.21)

According to the Mpumalanga Biodiversity Conservation Plan (Ferrar & Lotter, 2006), wetlands are considered to be sensitive habitats and all wetlands should be treated as "irreplaceable" habitats. This is due to the extent of wetland loss within the Mpumalanga Highveld as a consequence of open cast mining, agricultural activities and other changes in land use.

According to Wetland Consulting Services (Pty) Ltd. (2011), the ecological importance of the wetlands on site is further raised by the fact that the wetlands are in a largely natural condition with few anthropogenic influences affecting the hydrology, geomorphology or wetland vegetation. The wetlands also represent the movement of water through the landscape. In a water scarce country like South Africa, the water itself, independent of the wetland, is also considered important.

Wetland Consulting Services (Pty) Ltd. (2011) indicated that all the wetlands in the study area are considered of Moderate importance and sensitivity (i.e. C rating), except for the southern hillslope seepage wetland (HSW2; Figure 5.19) which, due to its larger size and greater levels of saturation, is considered to be of High importance and sensitivity (i.e. B rating).

Figure 5.21 provides an indication of the ecological importance and sensitivity of the identified wetlands.

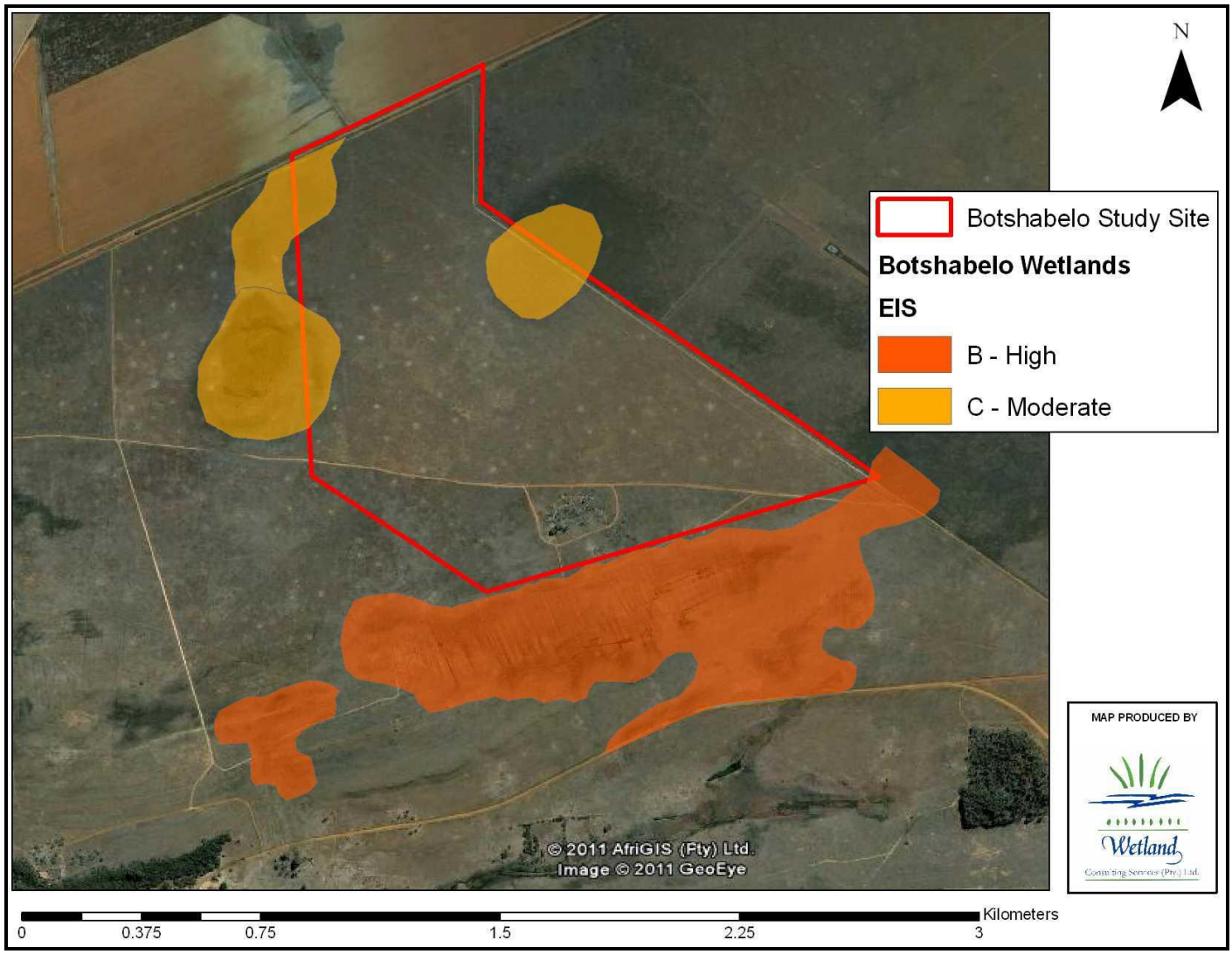


Figure 5.21: Ecological Importance and Sensitivity (EIS) of the wetlands (taken from Wetland Consulting Services (Pty) Ltd., 2011)

5.9.3.4 Sensitivity mapping and buffer zone

The Mpumalanga Conservation Plan (C-Plan) recommends that all wetland areas and an associated 20 m buffer zone be classified as sensitive and should be excluded from development.

However, Wetland Consulting Services (Pty) Ltd. (2011) advised that a more extensive buffer zone of natural vegetation should be maintained given the healthy condition of the existing wetlands and their rural setting.

A 50 m buffer zone is recommended in accordance with the Gauteng guidelines. Both the wetland and the buffer area should remain undisturbed by adjacent development activities.

Figure 5.22a provides an indication of the wetlands on site with the recommended 50 m buffer zone. Figure 5.22b indicates the wetlands and buffer zone in relation to the conceptual layout plan.

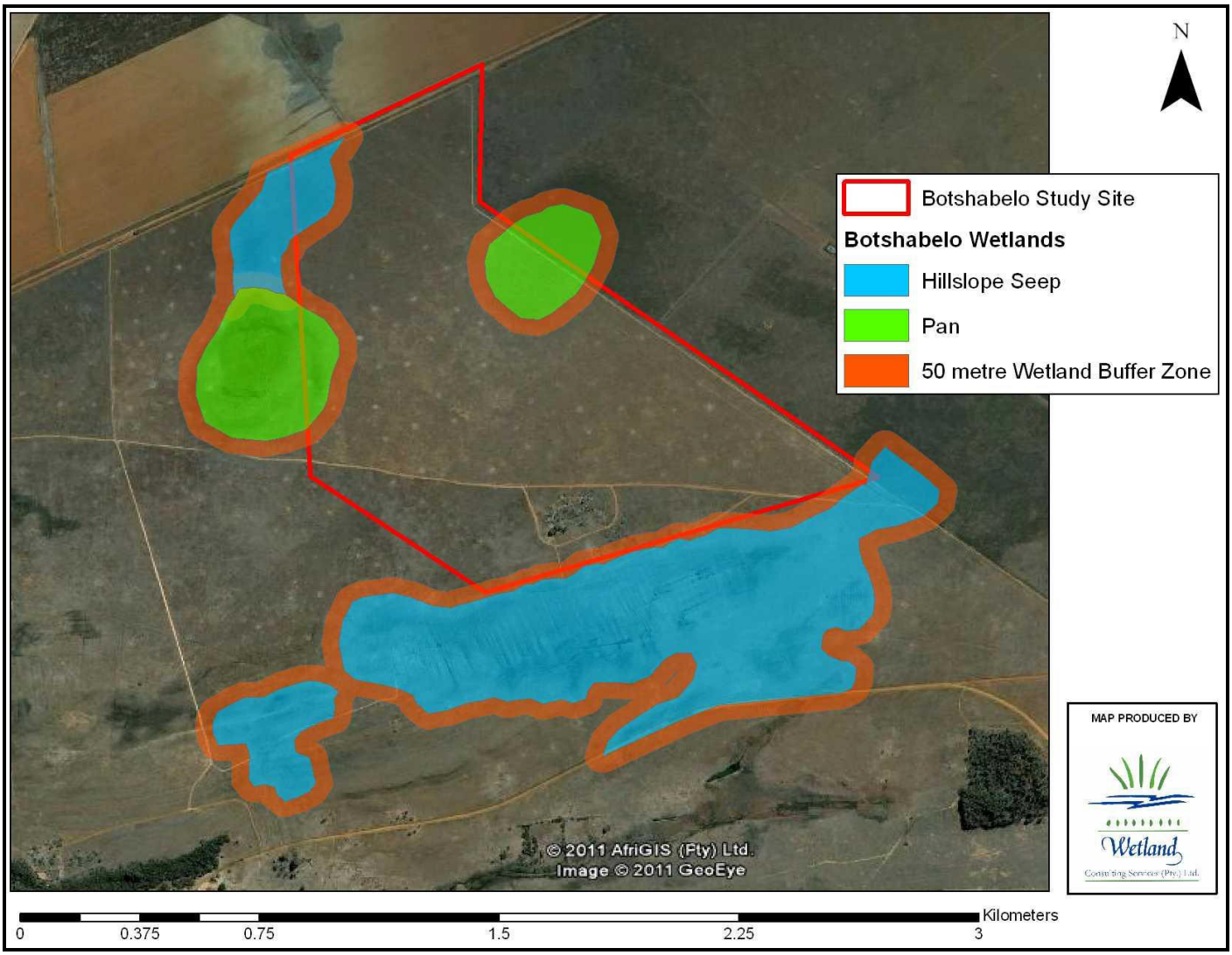


Figure 5.22a: Sensitivity map indicating the wetlands on site and the minimum recommended 50 m buffer zone (taken from Wetland Consulting Services (Pty) Ltd., 2011)

Although the 50 m buffer zone is expected to limit a number of impacts on the wetlands and pans (e.g. erosion control and protection of biodiversity), Wetland Consulting Services (Pty) Ltd. (2011) is of the opinion that it is ***unlikely to compensate for the loss of storage capacity within the catchment soils and a shift in the balance of flows in the catchment from diffuse, subsurface drainage to surface runoff.*** In light of this, it cannot be guaranteed that the inclusion of a buffer zone will completely prevent a change in the hydrology and condition of the wetlands.

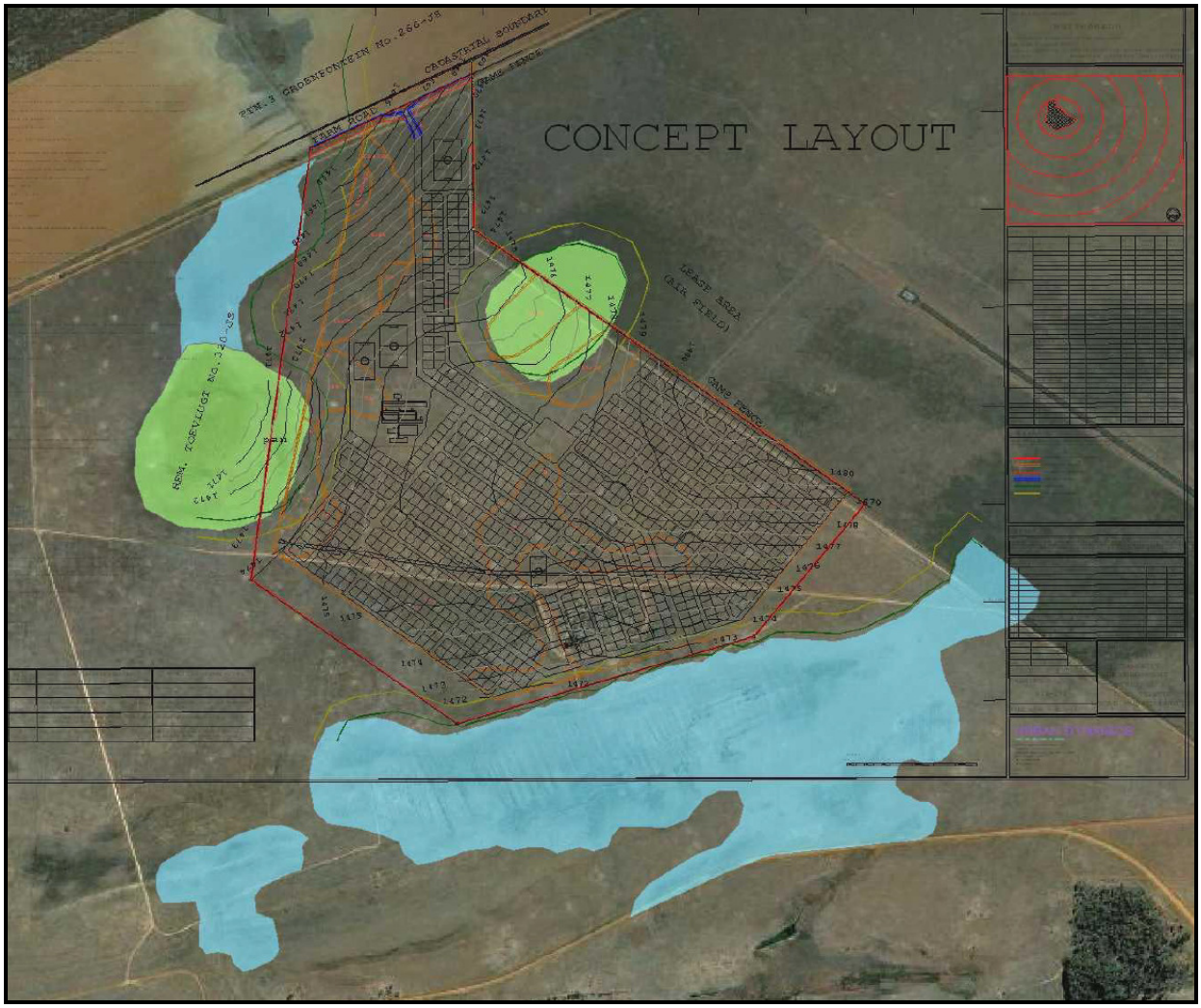


Figure 5.22b: Location of the delineated wetlands in relation to the layout plan (taken from Wetland Consulting Services Pty (Ltd.), 2011)

5.10 Groundwater

Engeolab cc. (2011a) indicated that the presence of hardpan ferricrete on site is a good indication that a seasonally perched water table can be expected. However, no groundwater was noted in any of the geotechnical test pits.

The presence of the pans and hillslope seepage wetlands on site is also an indication that a shallow perched groundwater table can be expected on site.

A Phase 1 geohydrological study was commissioned to obtain more information regarding the groundwater situation on site and to determine whether sufficient water can be obtained from boreholes for the proposed development. A copy of the report prepared by Engeolab cc. is provided in Appendix 12. This report should be consulted with regards to methodology used.

5.10.1 Geohydrological setting

According to Engeolab cc (2011a), the secondary openings of the Dwyka tillite and Wilgerivier sediments originate through tectonic deformation,

weathering and unloading by erosion. Geological formations capable of yielding water to boreholes through these openings are termed secondary aquifers.

Two types of secondary porosities can be distinguished on the bedrock that underlies the site. The one type of porosity is produced by deep weathering and the second type produced by fracturing, jointing and diabase intrusions. Accordingly, all exploitable groundwater sources occur in saturated contact zones with intrusive rock (diabase) and decomposed rock.

A number of east-west trending concealed geological lineaments (effectively compartmentalizing the site) was observed from aerial photographic interpretation. According to Engeolab cc (2011a), these compartments are prone to dewatering under severe pumping conditions due to the influence of the intrusive diabase dykes on the movement and storage of groundwater.

The regional geohydrological trends indicate average borehole yields ranging from 0.1*l/s* to 0.5*l/s* and the water quality is generally suitable for long term human consumption.

5.10.2 Presence of boreholes/springs/fountains

Engeolab cc (2011a) conducted a hydrocensus on the site and the immediate surroundings to verify the status of the groundwater infrastructure. Two boreholes and one spring were recorded in the immediate surrounding area. The one borehole is located at the Middelburg Aeroclub east of the site. The other borehole and associated windmill is located south east of the site and the spring is located west of the site. The location of the boreholes and spring are indicated in Figure 5.23.

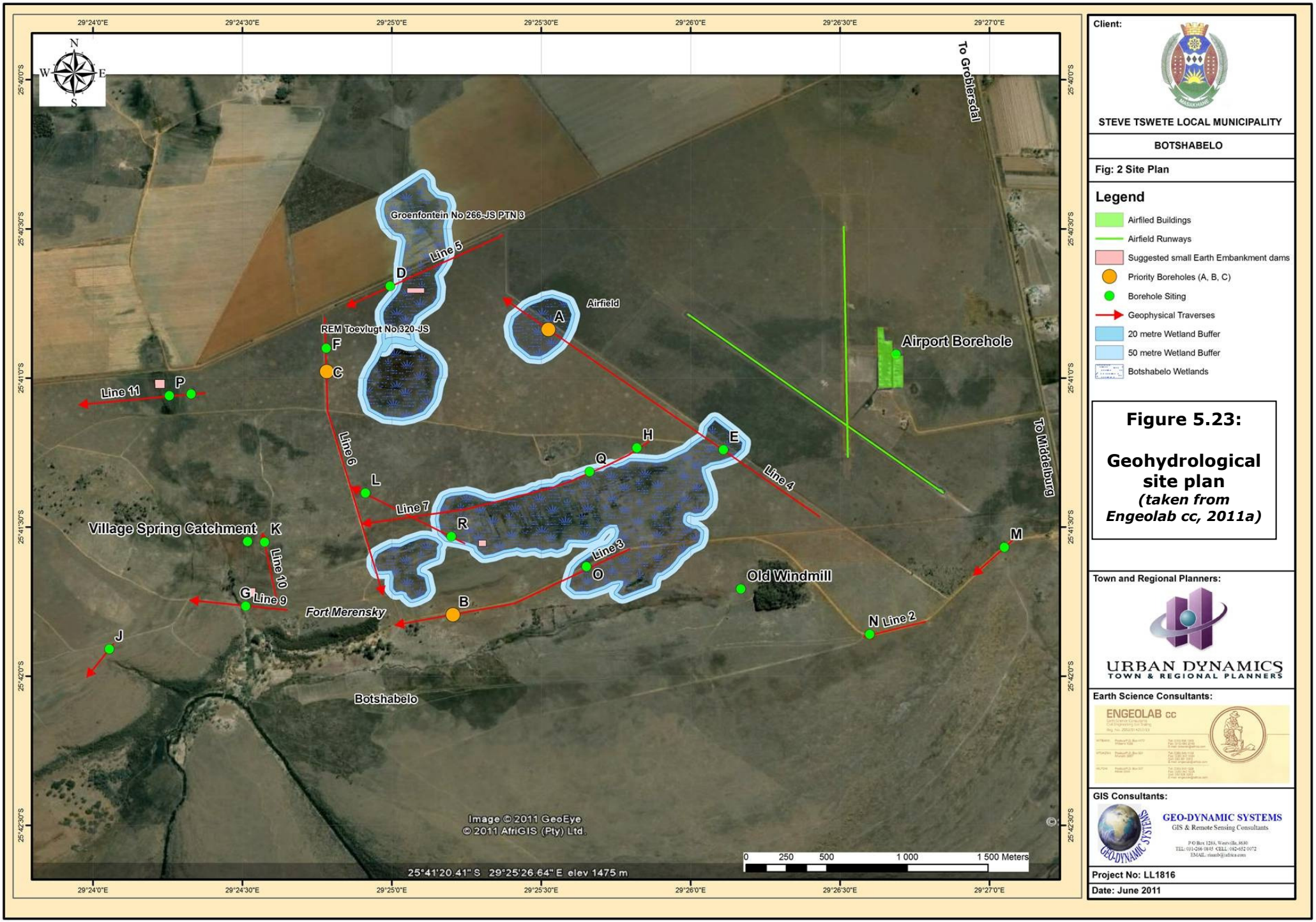
The highest borehole yield (2m³/h) was recorded at the Middelburg Aeroclub. No information could be obtained regarding the water strike depths and other hydrochemical characteristics of the groundwater.

5.10.3 Geophysical Traversing and Proposed Drilling Sites

Engeolab cc (2011a) undertook a geophysical investigation of the proposed site. Twelve (12) geophysical traverses (totaling 11 180 m) were conducted (Figure 5.23). Based on the results of the geophysical investigation, seventeen (17) potential drilling sites were identified. The potential borehole sites are indicated in Figure 5.23.

Based on the hydrocensus and geophysical data, Engeolab cc (2011a) believes that the three priority boreholes (A, B and C; Figure 5.23) should suffice and the target of 96 m³ per day should be achieved.

Development of the groundwater sources will require drilling, yield testing and chemical analyses of the groundwater samples.



Client:

STEVE TSWETE LOCAL MUNICIPALITY

BOTSHABELO

Fig: 2 Site Plan

Legend

- Airfiled Buildings
- Airfield Runways
- Suggested small Earth Embankment dams
- Priority Boreholes (A, B, C)
- Borehole Siting
- Geophysical Traverses
- 20 metre Wetland Buffer
- 50 metre Wetland Buffer
- Botshabelo Wetlands

Figure 5.23:

Geohydrological site plan
(taken from Engeolab cc, 2011a)

Town and Regional Planners:

URBAN DYNAMICS
TOWN & REGIONAL PLANNERS

Earth Science Consultants:

ENGEOLAB cc

GIS Consultants:

GEO-DYNAMIC SYSTEMS
GIS & Remote Sensing Consultants

Project No: LL1816

Date: June 2011

5.11 Air quality

The air quality of the site is predominantly governed by the following:

- Various industrial (e.g. power stations, etc.) and opencast mining activities in the Steve Tshwete Local Municipal area.
- Emissions from vehicles utilizing the surrounding roads (e.g. N11 national road and nearby gravel road);
- Dust from traffic utilizing the internal Botshabelo gravel roads and nearby gravel road;
- Dust from agricultural activities in the surrounding area;
- Smoke emitted from veld fires.

5.12 Noise

In general, the area is relatively quiet since it is located within a rural area. The major contributing factor to the ambient noise level of the site would be as a result of:

- Limited traffic along the gravel access road on the northern boundary of the site and within the Botshabelo Nature Reserve;
- Activities at the adjacent Middelburg Aeroclub and aircraft flying overhead;
- Agricultural activities in the surrounding area.

5.13 Sites of archaeological and cultural interest

A Phase I Heritage Impact Assessment was undertaken by Dr. Julius Pistorius, an accredited archaeologist. A copy of this report is provided in Appendix 13. This report should be consulted with regards to the methodology used.

According to Dr. J. Pistorius (2011), pre-historical and historical information helps to determine the significance of any heritage resources that may occur in the project area. Evidence that serves as background to the proposed development includes the following:

- The stone age;
- The earliest farmers and stone builders;
- The arrival of the colonists;
- Early coal mining; and
- Farm homesteads with graveyards.

A general overview of the stone ages, iron age remains, the coal mining heritage and vernacular stone architectural heritage is provided in Appendix 13. Only a brief history of the project area (Botshabelo) is deemed pertinent to this EIA.

Brief history of Botshabelo:
Between 1860 and 1865, two missionaries (Alexander Merensky and Heinrich Gruntzner) from the Berlin Mission Society decided to extend their missionary work to the Swazi and Pedi people. The ruler of the area, Chief Sekhukune, suppressed Christianity and ordered Merensky to leave his country. Merensky and his followers (including remnants of the Kopa tribe) subsequently moved and started the Botshabelo Mission Station.

The Botshabelo Nature Reserve forms part of the farm that was purchased in 1865 by Alexander Merensky for the Mission station. The mission station was called Botshabelo, meaning 'Place of Refuge'.

The Mission Station eventually developed into a small town, where the gospel was proclaimed, people received education and where commerce and industry were practiced. A fort (Fort Wilhelm; Photo 5.6) was also constructed to protect the Mission Station against any possible attacks by Chief Sekhukune. The fort was constructed of flat sandstone rocks and had a number of rooms, including a high round tower.

By 1873, there were 1315 people living at Botshabelo and by 1898 the population had risen to approximately 4000 people.

The second church constructed on the property and consecrated in 1873, was for many years the largest church building in the Transvaal. Both the original place of worship and new church still stand.
The following developments also took place:

- School for children of converts – 1871;
- Training school for catechists and evangelists – 1878;
- Teacher training college – 1906;
- Secondary school and hostel – 1940.

Work ceased on the missionary when the Anglo-Boer War broke out. Conditions deteriorated further with the outbreak of World War 1 when funds were no longer forthcoming from Germany. During a service in 1950, the church bell cracked and the people saw this as a divine sign of Botshabelo's end.

The fort also fell into disrepair by 1960 and was presented to the Simon van der Stel Foundation for restoration. Most of the funds for the restoration works were provided by Hans Merensky. The fort was thus renamed Merensky and proclaimed a National Monument in 1962 (Gazette Number 1042).

The schools and training facilities were closed down in 1969 in terms of the Nationalist Party's apartheid policy.

A Ndebele village is situated on the south side of the Keeromspruit and is called Botshabelo Historical Village.

In 1972, the city council of Middelburg purchased Botshabelo, which is now a historical town surrounded by a nature reserve. Renovations of the mission station started in the 1980's when sufficient funds were available. The Botshabelo Nature Reserve was developed to promote tourism and includes various hiking trails, accommodation and the Ndebele village. The Pakendorf House (constructed in 1882) was changed into a Trading Post where local crafts were sold. The Seminary was used as a museum for the display of old photographs and artifacts. The old high school was used as an information centre and agricultural museum.

A number of the original inhabitants and founders of Botshabelo were buried on the property, south of the Mission Station (Photo 5.7).

Figure 5.24 provides an indication of the Botshabelo heritage sites as taken from the Steve Tshwete Local Municipality Spatial Development Framework, 2010.

Fort Merensky is a declared Provincial Heritage Site (Grade 2) and the Botshabelo Village (including the missionary station) is a historical significant landscape. The Botshabelo Mission Station is currently the subject of an archaeological investigation.

Photos 5.4 and 5.5 indicate some of the buildings (e.g. the church) within the historical town.

Photo 5.4: Seminary

Photo 5.5: Church

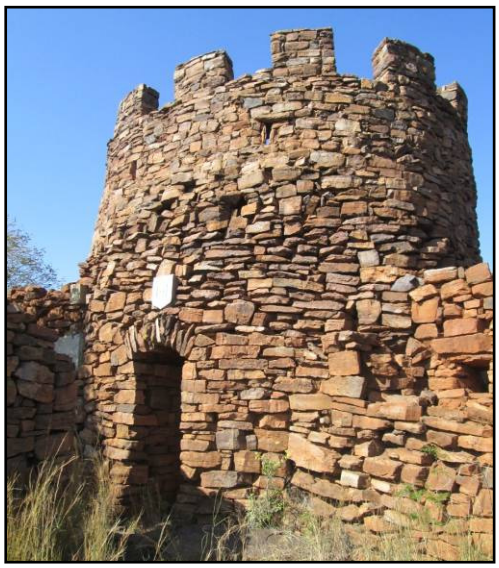


Photo 5.6: Fort Merensky

Photo 5.7: Cemetery

In 2005, the Remaining Extent of the farm Toevlugt 320 JS, which forms part of the Botshabelo Nature Reserve, was awarded to the Botshabelo Community Development Trust as part of a Land Claim.

After the land claim was awarded, Botshabelo was no longer maintained and fell into total disrepair. Many of the buildings were vandalized, the museum artifacts are strewn across the floors, the old agricultural implements and wagon are broken, the walls of the wagon house are covered in graffiti, the fences around the property were stolen and broken, etc. Currently, many

discussions are taking place regarding the restoration and protection of this historical site, to no avail.

The community (930 beneficiaries) indicated that they intend to resettle on the said property. The proposed development will be located approximately 1.2 km from Fort Merensky and 1.5 km from the historical village.

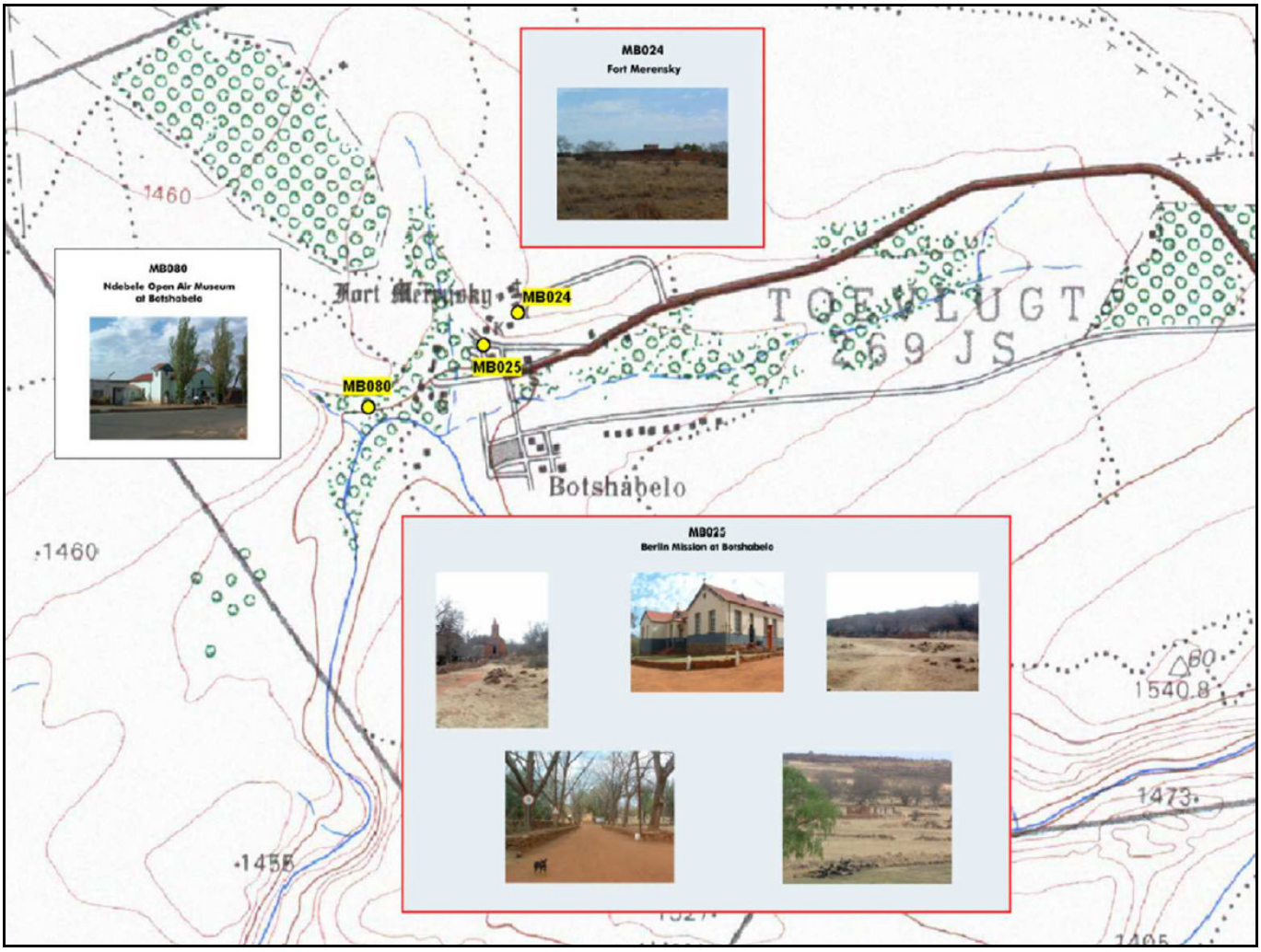


Figure 5.24: Heritage sites within Botshabelo Nature Reserve (taken from the Steve Tshwete Local Municipality Spatial Development Framework, 2010)

Heritage Impact Assessment:
According to Dr. J. Pistorius (2011), the Phase 1 Heritage Impact Assessment revealed **no** types and ranges of heritage resources as outlined in Section 3 of the National Heritage Resources Act (No. 25 of 1999) on the development site. No heritage resources of significance were observed.

A single stone tool (manufactured from quartzite) was noticed on site (Photo 5.8). The stone tool occurs out of context and may have been brought into the area by hunter-gatherers, probably during the Middle Stone Age (200 000 years to 22 000 years ago).

Photo 5.8: Stone tool

5.14 Sensitive landscapes

Surface water environments
Two pans and hillslope seepage wetlands are present on site. A specialist wetland study was commissioned to delineate the wetlands and recommend mitigation measures. More information is provided in Section 5.9 and Appendix 11 of this report.

Vegetation
According to the 'The vegetation of South Africa, Lesotho and Swaziland', the study area falls within the Mesic Highveld Grassland Bioregion, specifically the Rand Highveld Grassland (veld type Gm11; Figure 4.11) (Mucina & Rutherford, 2006). Almost half of the Rand Highveld Grassland has already been transformed by cultivation, urbanisation, plantations and dams.

This vegetation type has been afforded the status of **Endangered** with a conservation target of 24%. The National List of Ecosystems that are Threatened and in need of protection (GN1002 of 2011), published under the National Environmental Management: Biodiversity Act (Act No. 10, 2004), lists this vegetation type as **Vulnerable**.

A specialist vegetation study was commissioned for the site. Details of the findings of the vegetation study are provided in Section 5.7 and Appendix 9 of this report.

Animal life
The site is located within the Botshabelo Nature Reserve and as such provides habitat to a number of animal species.

A specialist animal study was commissioned for the said site. More information is provided in Section 5.8 and Appendix 10 of this report. Threatened species such as the Giant Bullfrog, Lesser Kestrel and Black Wildebeest were observed in the area.

Sites of archaeological and cultural interest
According to Dr. J. Pistorius (2012), the Phase 1 Heritage Impact Assessment revealed **no** types and ranges of heritage resources as outlined in Section 3 of the National Heritage Resources Act (No. 25 of 1999) on the proposed development site.

In addition, the residential development occurs at a considerable distance from the Botshabelo historical village and its associated infrastructure and

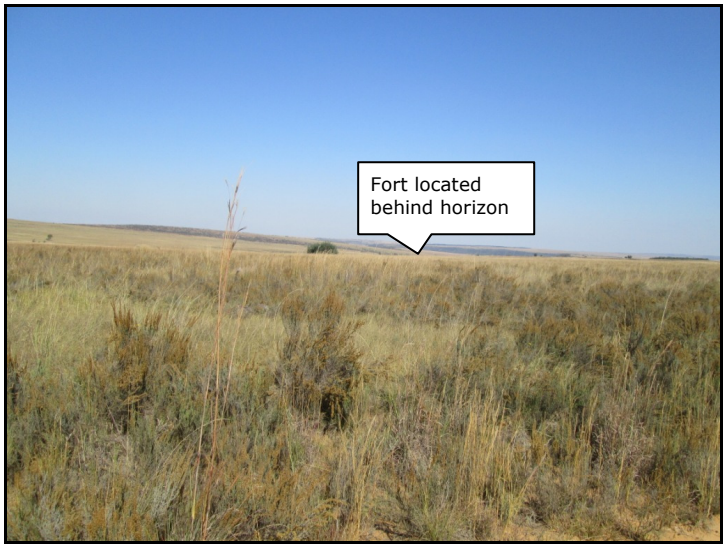
therefore does not have a direct physical impact on this cultural landscape. The proposed development will be located approximately 1.2 km from Fort Merensky and 1.5 km from the Botshabelo historical village.

Details of the archaeological study are provided in Section 5.13 and Appendix 13 of this report.

5.15 Visual aspects

The topography of the proposed site is relatively flat. The site is visible from the Middelburg Aeroclub property, the gravel road along the northern boundary of the site as well as the immediate surrounding area.

The site is not visible from the southern and western portions of the Botshabelo Nature Reserve or from the historical village and fort as is evident from the photograph below.



View of the site looking towards the historical village and the fort

5.16 Traffic

A traffic impact assessment was conducted by WSP SA Civil and Structural Engineers (Pty) Ltd. (hereafter referred to as WSP) for the proposed development. A copy of the traffic impact assessment is provided in Appendix 14.

The objective of the traffic impact assessment was to:

- identify the impact of the traffic generated by the proposed development on the immediate surrounding road network;
- to determine access requirements;
- to determine the necessity to implement any road and/or intersection improvements to mitigate the anticipated traffic impact.

5.16.1 Existing road network (Figure 5.25)

Figure 5.25 provides an indication of the existing road network and proposed access roads to the development.

The N11 national road is located on the eastern boundary of the Botshabelo Nature Reserve (Figure 5.25). The N11 national road (Walter Sisulu Street near town) is a class 2 rural arterial road, which connects Middelburg and Loskop Dam. Speed limits on the road vary between 60 and 100 km/h. Generally, the N11 has one through lane, with passing lanes in certain inclined areas. Traffic volumes in the vicinity of Botshabelo vary between 110 and 250 vehicles per hour (vph) per direction during the weekday AM, Lunch and PM peak hours.

The Dennesig residential area (northern outskirts of Middelburg) is connected to the N11 national road via Harry Kwala Street (Figure 5.25). This road is classified as a class 4 collector street with one through lane in each direction. The road is approximately 11 m wide and carries peak hour traffic volumes of between 70 and 220 vph per direction during the weekday AM, Lunch and PM peak hours.
The main access to the Botshabelo Nature Reserve is from the N11 national road (Figure 5.25). The main gravel access road winds through the nature reserve towards the historical village. There are numerous smaller gravel roads that branch off from the main gravel road to provide access to the rest of the Botshabelo Nature Reserve.

The Botshabelo access road functions as a class 5 access road. According to WSP (2012) this gravel access road carries less than 10 vph per direction during the weekday AM, Lunch and PM peak hours.

According to Urban Dynamics (2011), access to the proposed development will be obtained from the existing gravel road located on the northern boundary of the site (Figure 2.1b). This road connects to the N11 national road and provides access to the farms located north and northwest of the proposed site. The road functions as a class 5 access road and carries less than 10 vph per direction during the weekday AM, Lunch and PM peak hours.

5.16.2 Proposed site access

Access to the proposed development will be obtained from the existing gravel road located on the northern boundary of the Botshabelo Nature Reserve (Figure 2.1b and Figure 5.25). According to WSP (2012), it is envisaged that this road will remain a gravel road at this stage. However, the South African National Roads Agency (SANRAL) is currently upgrading the N11 national road. As part of the process, the T-intersection between the gravel access road and the N11 will be upgraded. This will entail the widening of the N11 with short separate turning lanes and the surfacing of the first section of the gravel road (Figure 5.25).

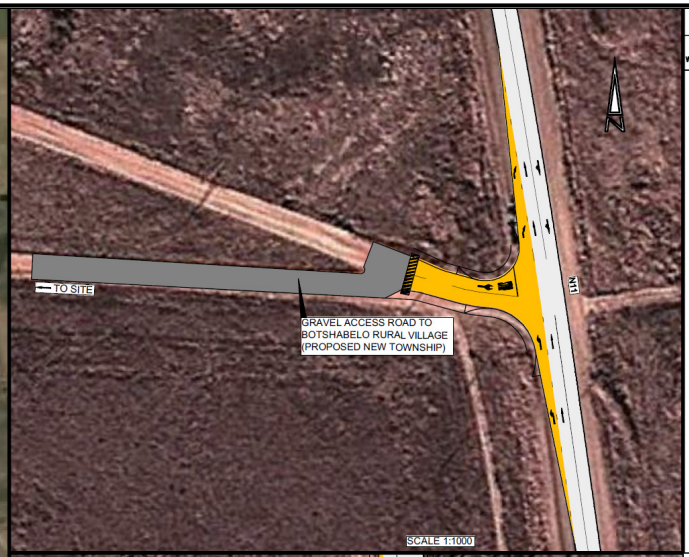


Figure 5.25

Key intersections
(taken from WSP, 2012)

REV	DATE	BY	DESCRIPTION	CHK	API
A	11/26/2012	BB	ISSUED FOR INFORMATION	EDK	-

DRAWING STATUS: FOR INFORMATION

WSP
34 Bouvardia Avenue
Lynnwood Ridge Pretoria
0081
PostNet Suite 113
Private Bag X844
Silverton 0127
Tel (012) 361-4141, Fax (012) 361-4142

CLIENT: CLEAN STREAM ENVIRONMENTAL SERVICES COALFIELDS cc

ARCHITECT: -

PROJECT: BOTSHABELO RURAL VILLAGE MIDDELBURG

TITLE: SITE AERIAL VIEW & KEY INTERSECTIONS

SCALE :	CHECKED:	APPROVED:
AS SHOWN	E.D. KOTZE	-
DESIGN:	DRAWN:	DATE:
-	B. BLOXHAM	2012-11-26

PROJECT No:	DRAWING No:	REV:
15281.R	15281.R/AL/01	A

5.16.3 Traffic impact

The expected trip generation for the proposed development is summarized in Table 5.17.

Table 5.17: Estimated development trips (taken from WSP, 2012)

Land Use	Assigned Trip Rate	Adj Factor	Split %	Weekday AM Peak			Weekday PM Peak		
				In	Out	Tot	In	Out	Tot
Residential	0.5 Trips/erf (1000 erven)	N/A	65/35	175	325	500	325	175	500
Total Trip (AM & PM)				175	325	500	325	175	500
				Weekday AM Peak			Weekday Lunch Peak		
				In	Out	Tot	In	Out	Tot
School	0.85 Trips/pupil (Max 500 pupils)	0.4 (40%)	55/56	94	76	170	76	94	170
Total Trips (AM & Lunch)				94	76	170	76	94	170

According to WSP (2012), the proposed development (residential and school) would generate the following combined total vehicles per hour:

- Weekday AM peak hour: 670 vph
- Lunch peak hour: 170 vph
- Weekday PM peak hour: 500 vph

No allowance was made for external traffic generated by the business stand or community facilities, since the likelihood of external traffic entering the development from the N11 to visit the shops and community facilities is very low.

WSP (2012) analyzed future traffic flows with a growth rate of 3% per annum over the next 5 years (2012 – 2017). Figures 2 – 6 of Appendix 14 provides an indication of the background plus estimated total development traffic.

The expected traffic impact of the development on the following nearby key intersections (Figure 5.25) was also analyzed:

- N11 Walter Sisulu Street / Harry Kwala Street;
- N11 Walter Sisulu Street / Botshabelo Rural Village access;
- N11 Walter Sisulu Street / Access Road.

According to WSP (2012), all three (3) intersections operate within acceptable limits during the weekday peak hours.
The methods used for the above-mentioned analysis as well as the detailed results obtained are provided in the traffic impact assessment in Appendix 14.

5.16.4 Proposed road/intersection improvements

According to WSP (2012), the expected peak hour development traffic will not have a major impact on the critical key intersections on the N11 and therefore no upgrades (in addition to those currently undertaken by SANRAL) are required.

Currently, it is not seen as necessary to surface the gravel access road located on the northern boundary of the site. The road can be upgraded in future when the peak hour traffic increases beyond what is now expected. However, stormwater pipes may have to be installed at a few places along the gravel road to improve road drainage.

5.16.5 Public transport

In terms of Section 29 of the National Land Transport Transition Act (NLTTA) 22 of 2000, a public transport assessment must be included as part of the traffic impact assessment.

There are currently no formal public transport facilities near the proposed site. According to WSP (2012), it is expected that a large percentage of the residents will need to use public transport services such as minibus taxis on a daily basis.

Since the N11 national road and Middelburg are located far from the proposed development site, public transport loading / off-loading facilities would have to be provided within the planned Botshabelo Rural Village. WSP (2012) recommended that at least four (4) areas be provided, which should be evenly distributed throughout the site. Additional public transport facilities should also be provided at the school and business area.

According to WSP (2012), pedestrian sidewalks would not be required due to the nature of the development.

5.17 Sense of place

The proposed site is identified in the Spatial Development Framework of the Steve Tshwete Local Municipality (2010) as a nature reserve (Figure 5.26). It is also located outside of the Middelburg urban edge.

Another rural village (Doornkop) is located north of the site (Figure 5.26).

In terms of land capability, the proposed site is indicated according to the Department of Agriculture, Fisheries and Forestry as comprising moderate potential arable land. However, no cultivation has recently taken place on site. The site forms part of the overall Botshabelo Nature Reserve and is subsequently used by wildlife for grazing purposes and for tourism purposes.

The surrounding area (north and east) is used for agricultural purposes. The Middelburg Aeroclub is located on the eastern boundary. The area towards the west is identified for eco-tourism in the Spatial Development Framework of the Steve Tshwete Local Municipality (2010) due to the area being largely natural with a steep topography.

It should be noted that the proposed development is as a result of a land claim that was awarded to the Botshabelo community. The land claims process disregards any regulations in terms of urban sprawl, spatial development frameworks, etc. and creates an expectation within the community that they will be resettled at that location (*pers. comm.* Urban Dynamics, 2013)

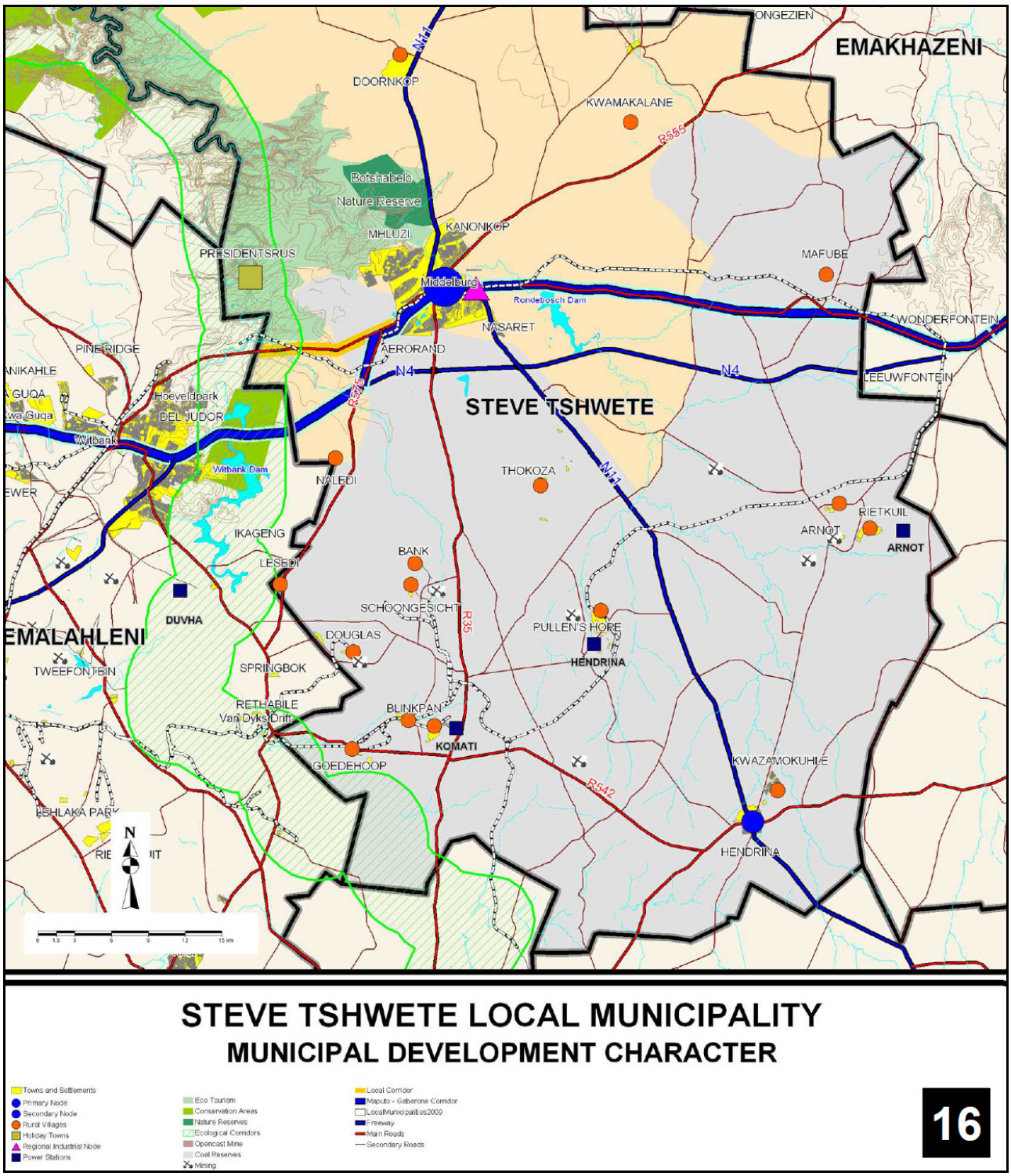


Figure 5.26: Municipal development character of the Steve Tshwete Local Municipality (taken from the Spatial Development Framework, 2010)

5.18 Socio-economic

Plan Associates Town and Regional Planners Inc. (hereafter referred to as Plan Associates) was appointed to conduct a socio-economic impact assessment for the proposed development. A copy of the report is provided in Appendix 15.

The methodology used and constraints pertaining to the socio-economic assessment are indicated in Appendix 15.

The impact assessment was mainly based on information obtained from the environmental scoping report as well as the Botshabelo Settlement and Business Plan (compiled in 2004 by Izwe-Libanzi Development Consultants).

The socio-economic impact assessment investigated the locality of the proposed development, layout plan, access to the site, service provision, issues raised by interested and affected parties and the socio-economic profile of the Botshabelo community. Potential impacts and mitigation/management measures were subsequently identified and a number of recommendations made.

The information in this section of the EIA report was taken directly from the Plan Associates (2013) document.

5.18.1 Land use budget

Plan Associates compiled a land use budget based on the number of proposed stands in the rural village and the estimated density, in order to determine the land uses that are needed to support the local community, and conversely whether the resident community 'warrant'/would be able to support the proposed land uses. The parameters of the land use budget are based on guidelines obtained from the RED Book: Guidelines for Human Settlement Planning and Design. The parameters have been further refined by Plan Associates, based on the latest Census 2011 data.

As can be seen in Table 5.18 the estimated population in the proposed rural village could support retail to the extent of 700m² and office space of 100m^2. The retail component is equivalent to a neighbourhood store and will thus only cater for the local community. Furthermore, the development qualifies for one primary school and one religious facility. The proposed rural village thus allows a sufficient number of institutional stands. The business stands are however much larger than what the local community could support/ will require. The proposed layout makes provision for 2 large "Municipal" zoned stands of which one will be used for refuse collection.

Table 5.18: Rural village land use budget

Land use	Rural village	
	No	ha
Base data		
Dwelling Units	1000	
Population	4890	
Education	1	2.4
Primary	1	2.4
Secondary	0	0.0
Retail	1956	0.7
Small, local retail centre (floor area in m^2)	1956	0.7

Land use	Rural village	
	No	ha
Offices (floor area in m^2)	196	0.1
Community facilities		0.2
Religious places	1	0.2
Clinic	0	0.0
Hospital	0	0.0
Post office	0	0.0
Police	0	0.0
Community centre/library/pay point	0	0.0
Municipal office	0	0.0

5.18.2 Socio-economic profile

This section comprises a summary of the socio-economic profile/ baseline conditions of the beneficiaries of the Botshabelo Community Development Trust. The information was mostly sourced from the Household Survey report in the Botshabelo Settlement and Business Plan conducted by Izwe-Libanzi Development Consultants in 2004.

Population and Household Size

The proposed development will have to accommodate a total population 4891, based on the number of beneficiaries and their families, namely 930 beneficiaries. The average household size of the beneficiaries was given as 5.26 people.

Dwelling Type

The type of dwelling occupied by the Botshabelo community at the time of the survey is set out in Table 5.19. It is evident that the majority (94%) of the beneficiaries live in houses.

Table 5.19: Botshabelo community: Type of dwelling

Total responses	105
Flat	1.9%
House	94.29%
Outbuilding	1.9%
Shack	1.9%

It is however not known how relevant the above data is to the beneficiaries seeing as some of them may have received RDP houses in the meantime (at their current residence). They would thus not be eligible to receive a second house by means of government subsidy, but would be able to construct their own houses.

Place of Birth

Table 5.20 below provides an outline of the place of birth of the beneficiaries. A total of 90% of the beneficiaries who participated in the survey indicated that Botshabelo and Middelburg were their place of birth, with the majority (77.3%) indicating Botshabelo.

Table 5.20: Botshabelo community: Place of birth

Total responses	97
Botshabelo	77.32%
Middelburg	13.40%
Mokwete	2.06%
No answer	3.09%
Springs	2.06%
Witbank	2.06%

Need to resettle in Botshabelo

According to the survey, 96% of community indicated that they wish to resettle in the Botshabelo area; the desire to resettle in the study area is thus very strong. The majority (46.2%) of the population stated that the reason for the desire for resettlement is because they were born in Botshabelo (see **Table 5.21**). The second greatest motivation for resettlement is the agriculture opportunities offered in the area.

Table 5.21: Botshabelo community: Reason for resettlement

Total responses	78
Agriculture opportunities	30.8%
Climate	5.1%
Development opportunities	10.3%
Job opportunities	2.6%
Nearer to livestock	2.6%
Place of birth	46.2%
Stock farming	2.6%
No answer	10.3%

Age Distribution

Table 5.22 provides an outline of the age distribution of the Botshabelo community.

Table 5.22: Botshabelo community: Age distribution

Total responses	431
1-6	9.7%
7-12	8.6%
13-18	9.0%
19-24	14.4%
25-44	32.3%
45-59	14.2%
60+	11.8%

The age category 1 to 6 represents pre-school children, 7 to 12 primary school children, 13 to 18 secondary school children. The age category 19 to 24 represents persons who are just entering the economy as labourers as well as students, category 25 to 59 the potential labour force, and finally ages 60 and over represent retired people.

The average age among the residents at the time of the survey was 32. The youth under 18 years of age makes up a total of 27% of the population, while the greatest segment of the residents is of working age, and specifically in

the group 25-44. In total, the adults aged 19 to 60 years of age comprise 61% of the population. Residents of 60 and over are only 11.8%.

Income Distribution
The income distribution of the Botshabelo community is set out is **Table 5.23**. The average monthly household income is namely R 6100. Note that approximately 48% of households earn R 3500 and less per month and 36.79% earn less than R1500. Note that R3500 is the maximum income to qualify for subsidised housing, thus 48% of the community qualify. The majority of households earn between R3500 and R7500 per month. Very few households earn above R15 000.

Table 5.23: Botshabelo community: Income distribution

Total responses	106
>1 500	36.79%
1 500 – 2 500	5.66%
2 500 – 3 500	5.66%
3 500 – 5 000	10.38%
5 000 – 7 500	15.09%
7 500 – 10 000	8.49%
10 000 – 15 000	7.55%
15 000 – 20 000	6.60%
25 000 – 30 000	1.89%
30 000+	1.89%

According to **Table 5.24**, at the time of the survey, approximately 70% of household income in Botshabelo was derived from salaries and wages (take-home pay), whilst 15.5% comes from pensions and 14.6% from self-employment.

Table 5.24: Botshabelo community: Sources of income

Take home pay	69.60%
Self-employment	14.60%
Pensions/grants	15.50%
Other	0.20%

Agriculture Activities
Approximately 54% of the Botshabelo community is involved with crop or vegetable farming, while 19% is involved with livestock farming of which the majority are chickens.

Education and Skills
Table 5.25 indicates that a very small percentage of the population have no education whatsoever. The majority of residents have some level of secondary school education, while a very high percentage (36%) has post matric qualifications.

Table 5.25: Botshabelo community: Education level

Total responses	242
None	3.7%
Grade 1 to 4	8.3%
Grade 5 to 7	7.0%

Grade 8 to 9	17.8%
Grade 10 to 11	16.9%
Grade 12/Matric	10.3%
Post matric	36.0%

The post matric qualifications of Botshabelo residents include Bachelor degrees, higher education diplomas, teaching diplomas, nursing qualifications and N4 qualifications.

In addition to formal education noted above, the survey also captured additional skills that the population may have (outlined in **Table 5.26**). The skills found most often were namely sewing and needlework (18%), gardening (15%) and baking, cooking and catering (19%). The community is thus relatively well-educated and has some skills with potential to generate income.

Table 5.26: Botshabelo community: Additional skills

Total responses	68
Agriculture	2.9%
Baking	8.8%
Bricklayer	2.9%
Catering	4.4%
Computer	4.4%
Cooking	5.9%
Disabled	2.9%
Driver	5.9%
Farming	11.8%
Gardening	14.7%
Needlework	2.9%
Painting	4.4%
Poultry farming	2.9%
Selling	2.9%
Sewing	14.7%
Sport	2.9%
Teaching	4.4%

Employment
Only 26% of the Botshabelo community are employed (see **Table 5.27**); 3.9% are self employed/informally employed, and 25.3% are at school or students. The rest can either not work, are looking for work, or are retired. This means that a small portion of the population actively earn income through employment. However, the official unemployment rate as a percentage of the total labour force is 25%, which is lower than the 2004 unemployment rate of Steve Tshwete Municipality (35%). Note that the current unemployment rate in Steve Tshwete Municipality (according to Census 2011) is 20%.

Table 5.27: Botshabelo community: Activity

Total responses	285
Employed	26.0%
Self/informally employed	3.9%
Stay at home by choice/disabled	4.2%

Unemployed looking for work	12.6%
Work when you can get it	4.2%
Too young for school	7.7%
Attending school/university/crèche	25.3%
Retired/pension	16.1%

Employment Industry
In terms of employment industry, the Botshabelo community works mostly in public sector roles (62%) and is also significantly involved in the trade industry.

Table 5.28: Botshabelo community: Industry

Total responses	50
Domestic	4.0%
Trade	16.0%
Government	62.0%
Manufacturing	8.0%
Mining	4.0%
Service	6.0%

It was indicated that 36.2% of the community are employed by the Department of Education and 18.8% by National Government. A further 4.3% are employed by Eskom, and 2.9% by Quasi State organisations.

5.18.3 Access to Job Opportunities
The residents indicated that the majority of them commute to nearby activity nodes e.g. 27.5% of the beneficiaries work in eMalahleni Local Municipality. The potential of Steve Tshwete and Emalahleni Municipalities to absorb workers was thus assessed.

In terms of Census 2011 the unemployment rate in Steve Tshwete Local Municipality is 20% (lower than the national figure of 29.8%), while the eMalahleni Local Municipality, located to the west of the study area, has an unemployment rate of 27%. Although the unemployment rate in Steve Tshwete drastically declined from 35% in 2004, it cannot be guaranteed that the economy would be able to absorb the additional influx of workers should the beneficiaries settle in Botshabelo.

The population growth of Steve Tshwete Municipality from 1996-2001 was 1.07% and 2001-2011 was 4.79%. The drastic increase in population can be attributed to the economic activities taking place in the area and the fact that Middelburg is one of the primary economic nodes in the province.

As indicated in Table 5.29 a large portion of the economic active population (48%) lives and works in proximity of Botshabelo in Emalahleni.

Table 5.29: Steve Tshwete Municipality: Labour force

	Employed	Unemployed	Labour force	Unemployment rate (%)
Ward 1	1 090	548	1 638	33%
Ward 2	3 172	1 631	4 803	34%
Ward 3	2 525	851	3 376	25%
Ward 4	2 253	584	2 837	21%

	Employed	Unemployed	Labour force	Unemployment rate (%)
Ward 5	1 848	328	2 176	15%
Ward 6	3 009	596	3 605	17%
Ward 7	2 368	292	2 660	11%
Ward 8	3 958	1 444	5 402	27%
Ward 9	2 351	559	2 910	19%
Ward 10	7 061	827	7 888	10%
Ward 11	5 399	671	6 070	11%
Ward 12	7 147	383	7 530	5%
Ward 13	2 853	322	3 175	10%
Ward 14	3 203	136	3 339	4%
Ward 15	3 575	229	3 804	6%
Ward 16	3 596	297	3 893	8%
Ward 17	2 329	1 011	3 340	30%
Ward 18	1 406	416	1 822	23%
Ward 19	2 274	637	2 911	22%
Ward 20	1 288	590	1 878	31%
Ward 21	1 921	448	2 369	19%
Ward 22	874	334	1 208	28%
Ward 23	4 525	1 547	6 072	25%
Ward 24	708	230	938	25%
Ward 25	4 389	1 631	6 020	27%
Ward 26	556	282	838	34%
Ward 27	1 841	1 254	3 095	41%
Ward 28	6 999	2 186	9 185	24%
Ward 29	1 449	836	2 285	37%
Total	**85 968**	**21 101**	**107 069**	**20%**

In terms of the Demarcation Board the study area is located in Ward 16 of the Steve Tshwete Local Municipality, where the unemployment figure is 8%. The Doornkop settlement is the only major settlement in Ward 29 to the north of the study area, and represents a development similar to the one proposed at Botshabelo. The unemployment figure is however very high at 37% - the second highest in the Municipality.

Proper mitigation measures will need to be put in place should the community be settled in the study area in order to prevent the Ward 16 unemployment rate from rising.

5.18.3.1 Botshabelo potential business opportunities

Part of the appointment of Izwe–Libanzi Development Consultants CC in 2004 was to compile a detailed land use plan of Botshabelo, together with detailed information regarding current business operations as well as a fundable plan detailing potential business opportunities in the area. The study area included all the farm portions which the Botshabelo beneficiaries successfully obtained with the land restitution process.

For the purpose of this socio-economic assessment, the proposals emanating from the Business Plan have been extracted and are reflected in **Table 5.30** below, together with their ability to create employment and the funding required for each respective project. Note that some of the proposals are site specific while others are not.

Table 5.30: Identified projects

Proposed project	Permanent no of employment opportunities	Funding required
Hotel and Accommodation Development – project entails the restoration of the existing resort accommodation and construction of 20 room hotel. A detailed marketing plan is also part of the project.	38	R 21.25 mil
Training Centre – convert and refurbish the former German School and training schools to a modern training facility.	5	R 2.87 mil
Museum and Ndebele Village Development – development of a museum and workshop for curio manufacturing	50	R 539 661.00
Agriculture Activities: Hydroponic Vegetable tunnels for the production of tomatoes, cucumbers and other crops pending on the market	24	R 1.03 mil
Agriculture Activities: Chicken Farming – broilers hand fed – develop a cluster of 12 smaller chicken houses that can each house 2500 chickens and a chicken abattoir	37	R 1.8mil
Agriculture Activities: Chicken Layers – develop poultry house proving 3000 laying hens	14	
Agriculture Activities: Dairy farming – procure dairy cows and equip milking parlour	8	R 921 000.00
Administrative unit – administrative unit to manage all activities above agriculture activities	21	R 358 000.00
Intensive Agriculture: Livestock farming- farming with beef, sheep and cattle	5	R 471 642.60
Intensive Agriculture: Open land vegetable production – production of various vegetables based on demand	20 casual and 30 permanent	R 2.5 mil
Intensive Agriculture: Crop Farming – sunflower, maize, green maize and sorghum	30	R 1.48 mil
Administrative unit – administrative unit to manage all activities above intensive agriculture	15	R 260 000.00
Infrastructure for Agriculture Activities		R 1.028 mil
Total	**438**	**R 31.63 mil**

Comment cannot be given on the feasibility of the projects contained in Table 5.30 seeing as the data is too old (nine years). New data will have to be collected in order to determine the feasibility of the above mentioned projects.

The Botshabelo Settlement and Business Plan provided a wide range of funding opportunities. The full number of employment opportunities will however only materialise if the beneficiaries manage to access the necessary funds to implement the above projects seeing as the projects are subject to obtaining grants and loans for funding.

Based on the information discussed at the socio-economic profile, it can be deduced that the number of unemployed people in the population were 611 in 2004. The above projects, if implemented successfully, could potentially provide 438 employment opportunities which are not quite enough for the

population. But also note that the funding required for the above projects is almost R 32 million. The cost per work opportunity is thus calculated at R72,214.

5.18.3.2 Travel Costs

Place of Work

In the 2004 survey by Izwe Libanzi it was found that the majority of the Botshabelo workers work in Witbank (27.5%), Groblersdal (17.4%), as well as Middelburg and Mhluzi (total 20.3%) (see Table 5.31). Thus they commute long distances which have other social implications (see next paragraph).

Table 5.31: Botshabelo community: Place of work

Total responses	69
Ekangala	2.9%
Gauteng	4.3%
Groblersdal	17.4%
Mhluzi	5.8%
Middelburg	14.5%
Motetema	4.3%
Polokwane	2.9%
Pretoria	10.1%
Tafelkop	10.1%
Witbank	27.5%

The vast majority of workers (83%) return to their homes every night. However, there is a significant proportion of migratory labour returning home only weekends (9%) or only 3 to 4 times per year (9%).

Taxi Fare

In an effort to calculate the related travel costs it was assumed that the predominant number of the Botshabelo beneficiaries currently utilises public transport in the form of mini bus taxi. The current costs for public transport with mini bus taxi are reflected in **Table 5.32**.

Table 5.32: Short and long distance taxi fares

Long distance Destination	Costs	Short distance Destination	Costs
Polokwane – Middelburg	R 150	Arnot – Middelburg	R 30
Jane Furne – Middelburg	R 100	Komati Power Station – Middelburg	R 30
Valsfontein – Middelburg	R 80	Pullenshope – Middelburg	R 30
Groblersdal – Middelburg	R 80	Witbank – Middelburg	R 20
Dennilton – Middelburg	R 80	Vaalbank – Middelburg	R 10
Pretoria – Middelburg	R 90	Doornkop – Middelburg	R 14
Johannesburg – Middelburg	R 80	Eikeboom – Middelburg	R 20
Leporogong – Middelburg	R 90	Alzu Garage – Middelburg	R 25
Burgersfort – Middelburg	R 110	Wonderhoek – Middelburg	R 30
Verena – Middelburg	R 70	Lichtelm - Middelburg	R 20
Nelspruit – Middelburg	R 120		
Mosteri – Middelburg	R 80		
Bronkhorstspruit – Middelburg	R 70		

Long distance Destination	Costs	Short distance Destination	Costs
Acorn Hoek – Middelburg	R 150		
Nhlazatshe – Middelburg	R 70		
Carolina – Middelburg	R 45		
Belfast – Middelburg	R 35		
Machadodorp – Middelburg	R 45		
Stofberg – Middelburg	R 50		
Hendrina –Middelburg	R 40		
Bethal – Middelburg	R 70		

The study area falls under the Doornkop area. In other words a commuter will need to take a taxi from Botshabelo to Middelburg, then obtain a connecting taxi to his/her final destination. **Table 5.33** provides an indication of the costs a commuter would incur working in the various towns, based on a 22 work day month.

Table 5.33: Taxi fare for a 22-day work month

Destination from	Destination to	Cost
Botshabelo (Doornkop)	Ekangala	R 3 696
Botshabelo (Doornkop)	Gauteng	R 4 136
Botshabelo (Doornkop)	Groblersdal	R 4 136
Botshabelo (Doornkop)	Mhluzi	R 616
Botshabelo (Doornkop)	Middelburg	R 616
Botshabelo (Doornkop)	Motetema	R 4 136
Botshabelo (Doornkop)	Polokwane	R 7 216
Botshabelo (Doornkop)	Pretoria	R 4 136
Botshabelo (Doornkop)	Witbank	R 1 496

It is evident that commuting to and from work can easily become a massive strain on the Botshabelo residents, especially in light of the fact that 58.49 % of the beneficiaries earn less than R 5 000 a month and 48% earn less than R3 500 per month. The cost of travel will have an impact on the available funds for other expenses i.e. food, rates and taxes, shelter, education etc.

5.18.4 Access to Social Facilities

The proposed layout of the site makes provision for a combined school site and an institutional site that could be utilised for various social facilities. It is however not clear if the Department of Education has committed to the development of a combined school, nor if any other social facilities will be constructed in the near future.

If the Botshabelo beneficiaries do settle on the study area prior to the development of any social facilities the beneficiaries will have to travel to the closest town namely Middelburg/Mhluzi to access social facilities such as schools, medical facilities, etc. The extra travelling will add to households' monthly transport expenses.

5.18.5 Agriculture potential and biodiversity

Although the agriculture potential of these land parcels do not form part of this study, a quick summary is given due to the fact that 30.8% of the Botshabelo Development Trust beneficiaries indicated that their reason for wanting to resettle is the agriculture opportunities offered by the study area.

In terms of the Department of Agriculture, Fisheries and Forestry the land capability of the study area was indicated as 'moderate potential arable land'. The Mpumalanga Biodiversity Conservation Plan scores the site as a 6 in terms of land capability – which is 'medium, grazing'.

The grazing capacity of the area is below average with a capacity of 11-13 ha required per livestock unit. The area east of the study area (where the airfield is located) has an even lower grazing capacity of 8-10 ha per livestock unit.

The study area has further been indicated as "Highly Significant" and "Important and Necessary" in terms of the terrestrial biodiversity assessment of the Mpumalanga Biodiversity Conservation Plan (2006). The Plan does not support agricultural activities in areas with the above rating.

Based on the soil potential and grazing capacity the study area does not lend itself to high intensity agricultural activities such as intensive cattle farming or large-scale crop production. Apparently, the beneficiaries do however have access to alternative land parcels for agriculture activities.

6. DESCRIPTION OF ALTERNATIVES IDENTIFIED

This section provides an overview of the alternatives investigated in terms of:

- The location of the site;
- The proposed layout plan;
- Services.

6.1 Alternative sites

In 2004, the company Izwe-Libanzi Development Consultants cc. (hereafter referred to as Izwe-Libanzi) was appointed to compile a development and business plan for the resettlement of the Botshabelo community onto their restituted land. The main aim of the development plan was to provide guidelines, actions and projects for the future development of the land in order to ensure the sustainable development thereof. The development plan also included an environmental scoping report (compiled by Wandima Environmental Services), which investigated a number of alternative sites for the resettlement of the community.

Over and above the investigation of alternative sites as part of the Botshabelo Settlement and Business Plan (2004), alternative sites were also considered by Urban Dynamics Town and Regional Planners (2011) (hereafter referred to as Urban Dynamics) as part of the township establishment process.

It should also be noted that the Botshabelo community formed part and parcel of discussions regarding the location of the proposed village.

Figure 6.1 provides an indication of the alternative sites considered by Izwe-Libanzi and Urban Dynamics for the development of a residential area.

The following alternative sites were investigated:

Alternative	Property	Investigated by	Year investigated
Site 1	Noordhoek 333 JS	Izwe-Libanzi Urban Dynamics	2004 2011
Site 2	Toevlugt 320 JS	Urban Dynamics	2011
Site 3	Toevlugt 320 JS	Izwe-Libanzi Urban Dynamics	2004 2011
Site 4	Toevlugt 320 JS	Izwe-Libanzi	2004
Site 5	Toevlugt 320 JS	Urban Dynamics	2011

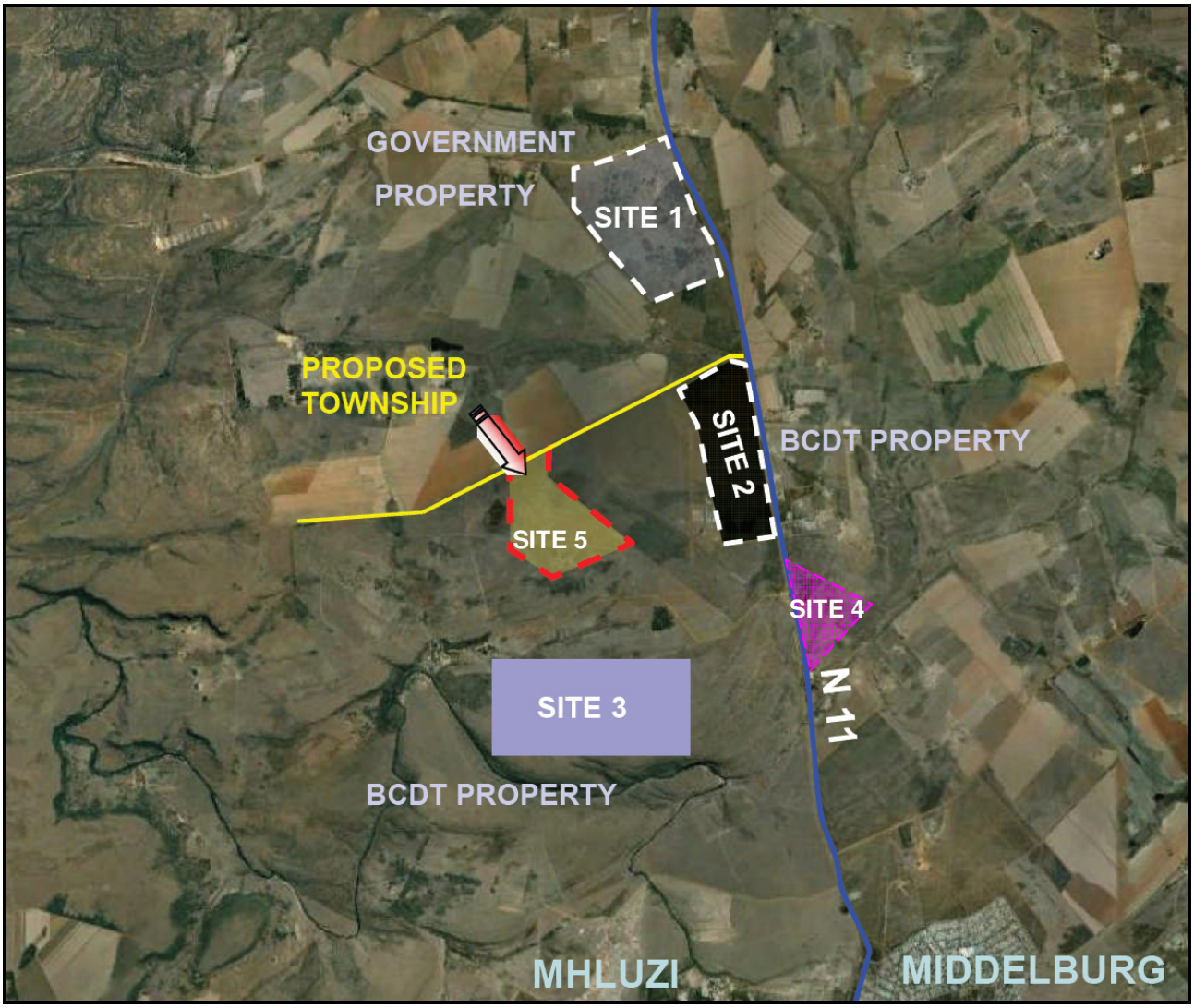


Figure 6.1: Alternative sites (taken from Urban Dynamics, 2011)

6.1.1 Site 1 – Noordhoek 333 JS (Figure 6.1)

The farm Noordhoek 333 JS is located just south of the existing Doornkop rural development, adjacent to the N11 national road (Figure 6.1). The said property is 449.95 ha in extent.

Izwe-Libanzi identified the following positive and negative aspects with regards to Site 1:

SITE 1 – NOORDHOEK 333 JS	
Positive (advantages)	**Negative (disadvantages)**
Safe access can be provided from the N11 national road.	The site is registered in the name of the Republic of South Africa.
The site is not located near any areas of archaeological or cultural importance.	No main source of water is available.
The slope of the site is suitable for development.	
The use of Improved Ventilated Pit (VIP) latrines should not cause down-slope pollution.	
The site is geotechnically suitable for development.	
The site can be developed in a cost effective way in terms of geotechnical factors.	

As indicated in the Botshabelo Settlement and Business Plan (Izwe-Libanzi Development Consultants cc, 2004), ***Site 1 was recommended as the preferred site for development*** by the environmental consultants (Wandima) as well as the geotechnical engineer (De Villiers).

However, through further discussions held with the Botshabelo community during the townplanning process, Urban Dynamics decided against developing the rural village on Noordhoek due to the following:

- The Botshabelo community members indicated that they want to reside within the Botshabelo Nature Reserve (i.e. on their forefathers land).
- A black wattle forest is present on the said site. It would be very costly to remove all the trees and tree stumps and to compact the site as required for building purposes.
- The site is located directly adjacent to the N11 national road. The establishment of yet another township adjacent to this road could lead to more accidents.

Site 1 was thus excluded as a potential development site by Urban Dynamics and *therefore not investigated as part of the EIA process.*

6.1.2 Site 2 – Toevlugt 320 JS (Figure 6.1):

Site 2 is located on the Remaining Extent of the farm Toevlugt 320 JS within the Middelburg Aeroclub lease area (Figure 6.1). The said site is registered in the name of the Botshabelo Community Development Trust.

Site 2 was investigated by Urban Dynamics and excluded from development due to the following:

- The site is located directly adjacent to the N11 national road. The establishment of yet another township adjacent to this road could lead to more accidents.
- The development would definitely impact on the Middelburg Aeroclub. The Middelburg Aeroclub would have to close down and the lease agreement terminated. The Botshabelo Community Development Trust would also lose a regular source of income.

In view of the above-mentioned, *this site was not investigated as part of the EIA process.*

6.1.3 Site 3 – Toevlugt 320 JS (Figure 6.1):

The proposed site is located south east of the Botshabelo Historical Village, approximately 1 km from the main access road and south of the Klein Olifants River (Figure 6.1). According to Izwe-Libanzi, this site was identified by the Botshabelo community as the priority area for settlement.

Izwe-Libanzi and Urban Dynamics identified the following positive and negative aspects with regards to Site 3:

SITE 3- TOEVLUGT 320 JS	
Positive (advantages)	**Negative (disadvantages)**
The site is very accessible from the Botshabelo Historical Village, which could provide potential job opportunities.	The development would be located close to the Botshabelo Historical Village and Fort Merensky, increasing the potential impact on these historical sites.
The site is located near an existing water source (i.e. existing boreholes at village).	A bridge would have to be constructed across the stream in order to obtain access to the site.

SITE 3- TOEVLUGT 320 JS	
Positive (advantages)	**Negative (disadvantages)**
The site belongs to the Botshabelo Community Development Trust.	The potential impact on the Klein Olifants River in terms of pollution would be high due to the close proximity of the development to the river.
	The site is geotechnically NOT suitable for development e.g. hard excavation in places, soil erosion potential, settlement problems, etc.
	The utilization of pit latrines could lead to pollution of the nearby wetland system and stream.
	Geotechnically, the development of the site would be costly.
	Potential for game poaching by residents and visitors since the site is located well within the nature reserve.
	Tourists and residents would have to utilize the same access road.
	The development would definitely impact on tourism since it would be very visual.
	A graveyard is located near the site.
	Steep slopes are present on site.

Based on the above-mentioned, ***Site 3 was thus excluded*** as a potential development site by both Izwe-Libanzi and Urban Dynamics as a result of the numerous potential negative aspects. *This site was therefore not investigated as part of the EIA process.*

6.1.4 Site 4 – Toevlugt 320 JS (Figure 6.1)

This site comprises an area east of the N11 national road opposite the main gate to Botshabelo. The site is located near the Keeromspruit (Figure 6.1).

Izwe-Libanzi identified the following positive and negative aspects with regards to Site 4:

SITE 4 – TOEVLUGT 320 JS	
Positive (advantages)	**Negative (disadvantages)**
Safe access can be provided from the N11 national road.	The site is located directly adjacent to the N11 national road. The establishment of yet another township adjacent to this road could lead to more accidents.
The slope of the site is suitable for development.	The site is located adjacent to a stream, which could lead to potential water pollution.
The site is not located near any areas of archaeological or cultural importance.	No source of water available.
The site belongs to the Botshabelo Community Development Trust.	The site is geotechnically NOT suitable for development e.g. settlement problems, high perched water table and wet conditions for most of the year, soil erosion, borrow pits, etc.
	A large portion of the site comprises a wetland.
	The utilization of pit latrines could lead to pollution of the nearby wetland system and stream.
	The development of the site will be costly.

Based on the above-mentioned, ***Site 4 was excluded*** by Izwe-Libanzi as a potential development site as a result of the numerous potential negative aspects. The said site was therefore not investigated as part of the EIA process.

6.1.5 Site 5 – Toevlugt 320 JS (the proposed site; Figure 6.1):

Site 5 is located on the western boundary of the Remaining Extent of the farm Toevlugt 320 JS, west of the Middelburg Aeroclub (Figure 6.1).

During the Annual General meeting held by the Botshabelo community on 12 September 2004 (taken from the Botshabelo Settlement and Business Plan, 2004), Site 5 was identified as a possible site for development and that future investigation of the site was required.

In 2011, the Steve Tshwete Local Municipality managed to secure the required funding and agreed to assist the community to establish a township on their land.

Subsequently, Site 5 was investigated for development purposes as part of the townplanning process. After a number of meetings between the Steve Tshwete Local Municipality, Urban Dynamics and the Botshabelo community, ***Site 5 was decided upon*** in view of the following:

- The said site belongs to the applicant and is registered in their name.
- The intention is to relocate to their ancestral home/forefather's land.
- The development will not be visible from the N11 national road.
- The development will not be visible from the Botshabelo Historical Village. This would minimize the impact on tourism.
- Easy access to the development could be obtained from the existing gravel road along the northern boundary of the site. The residents would not have to use the roads within the Botshabelo Nature Reserve. This would minimize the impact on tourism.
- The slope of the site is relatively flat, reducing the cost of the development.

This site was thus investigated as part of the EIA in order to determine the viability of the site for development purposes from an environmental point of view.

6.1.6 Other sites

During the public participation process, the question was asked why the development could not take place closer to Middelburg since the land (i.e. the farm Middelburg Town and Townlands 287 JS) belongs to the municipality. In addition, services would be easier to provide closer to Middelburg.

It should be noted that this option was not investigated since the Botshabelo community insisted on resettling on their newly awarded property (i.e. the farm Toevlugt 320 JS).

This site was therefore also not investigated as part of the EIA process.

6.2 Alternative layouts

6.2.1 Stand sizes

During the initial discussions between Urban Dynamics and the Botshabelo Community Development Trust committee, the issue of stand sizes and possible layouts were discussed. Initially, the committee indicated that they want large stands (up to 4000 m^2) to give the residents a sense of space and to allow for vegetable/maize gardens and livestock.

Urban Dynamics indicated that large stands would take up a large portion of the Botshabelo Nature Reserve. This would affect the income generated from tourism. It would also impact on the amount of game they would be able to keep on site.

Subsequently, Urban Dynamics presented two options to the community, namely a 1000 m^2 and 500 m^2 stand with various house placements. Table 6.1 provides the advantages and disadvantages of the two stand sizes.

Table 6.1: Advantages and disadvantages of the 500 m^2 and 1000 m^2 stand sizes (taken from Urban Dynamics)

500 m^2 Stand	1000 m^2 Stand
Provision of 30 stands in street block.	Provision of 24 stands in street block.
Shorter water line to be installed (715 m).	Longer water line to be installed (776 m).
Total area that can be utilized due to building line is 304 m^2.	Total area that can be utilized due to building line is 714 m^2.
Coverage of 50% only allows maximum of 250 m^2 for house.	Coverage of 50% only allows maximum of 500 m^2 for house.
Municipal tax is lower due to the smaller size.	Due to the bigger size the municipal tax is higher.
Extended family will be able to have a stand of their own, right of tenure.	Extended families all on one property, not enough space.
Street block width is only 50 m.	Street block width is 80 m.
Perimeter fence is less expensive due to shorter length.	Perimeter fence is more expensive due to longer length.
Smaller stand to maintain.	Bigger stand to maintain.
Smaller area that will be taken from the reserve.	Bigger area that will be taken from the reserve.
Stand utilized to full extent.	Stand not utilized to full extent (Maximum house footprint is 500 m^2).
Area of road around block is less (0.585 ha). Cost of road is less.	Area of road around block is longer (0.633 ha). Cost of road is higher.

Figures 6.2 and 6.3 provide an indication of the two stand sizes and house footprints.

Based on the above-mentioned, the Botshabelo Community Development Trust committee members agreed that the 500m^2 stand sizes would be more viable. The layout plan was thus designed accordingly.

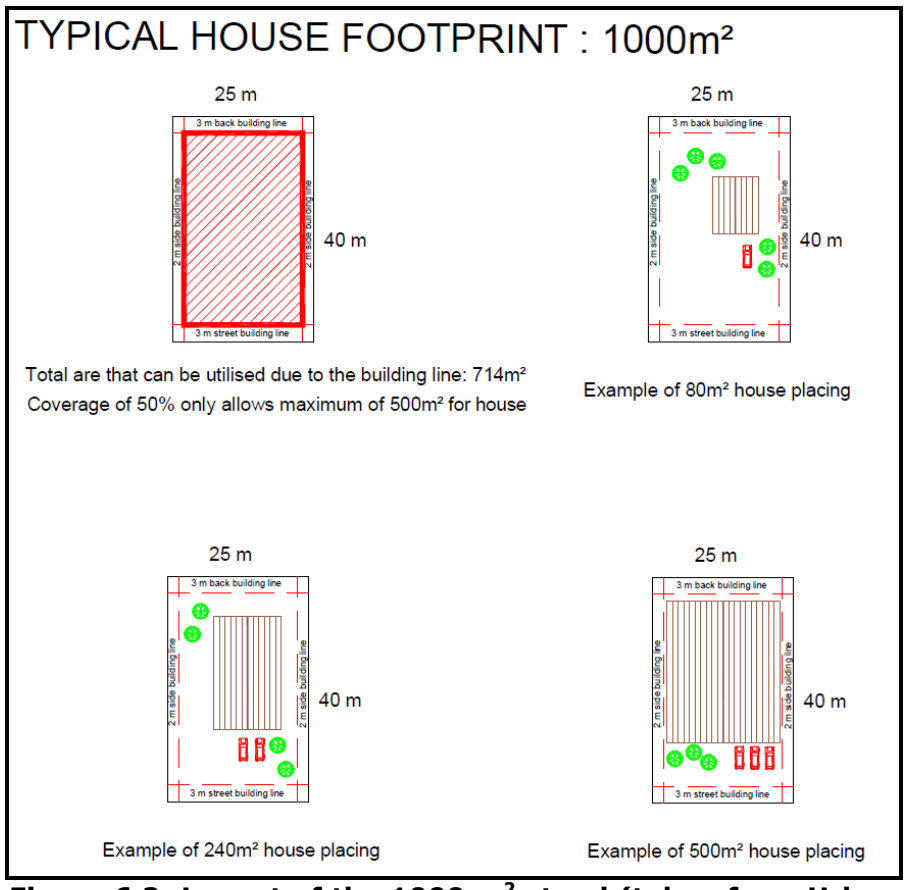


Figure 6.2: Layout of the 1000 m² stand (taken from Urban Dynamics, 2011)

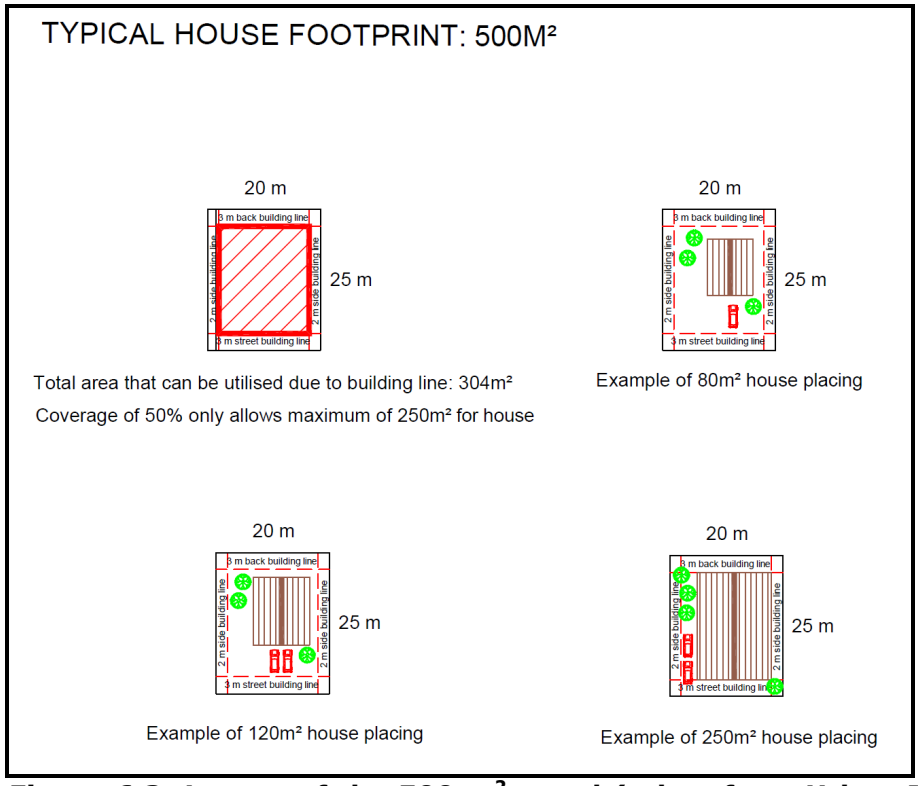


Figure 6.3: Layout of the 500 m² stand (taken from Urban Dynamics, 2011)

6.2.2 Concept layouts

Urban Dynamics (2011) investigated two concept design layouts, namely the typical block layout and an alternative layout for the extended family tradition.

Typical block layout:

Figure 6.4 provides the typical block layout that does not make provision for the extended family.

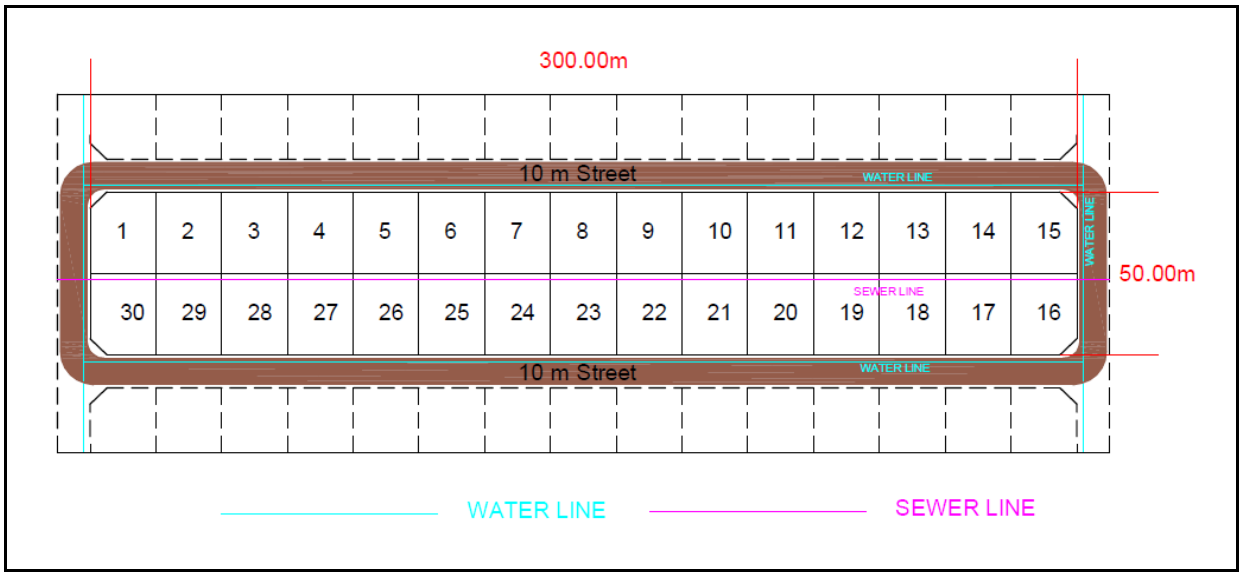


Figure 6.4: Typical block layout (taken from Urban Dynamics, 2011)

Extended family layout:

The alternative concept design for the extended family makes provision for five (5) separate stands, which allows different members of the family to own their own properties (Figure 6.5). The street layout is such that it forms a cul-de-sac that can also be utilized as a playground or shared central space for the family.

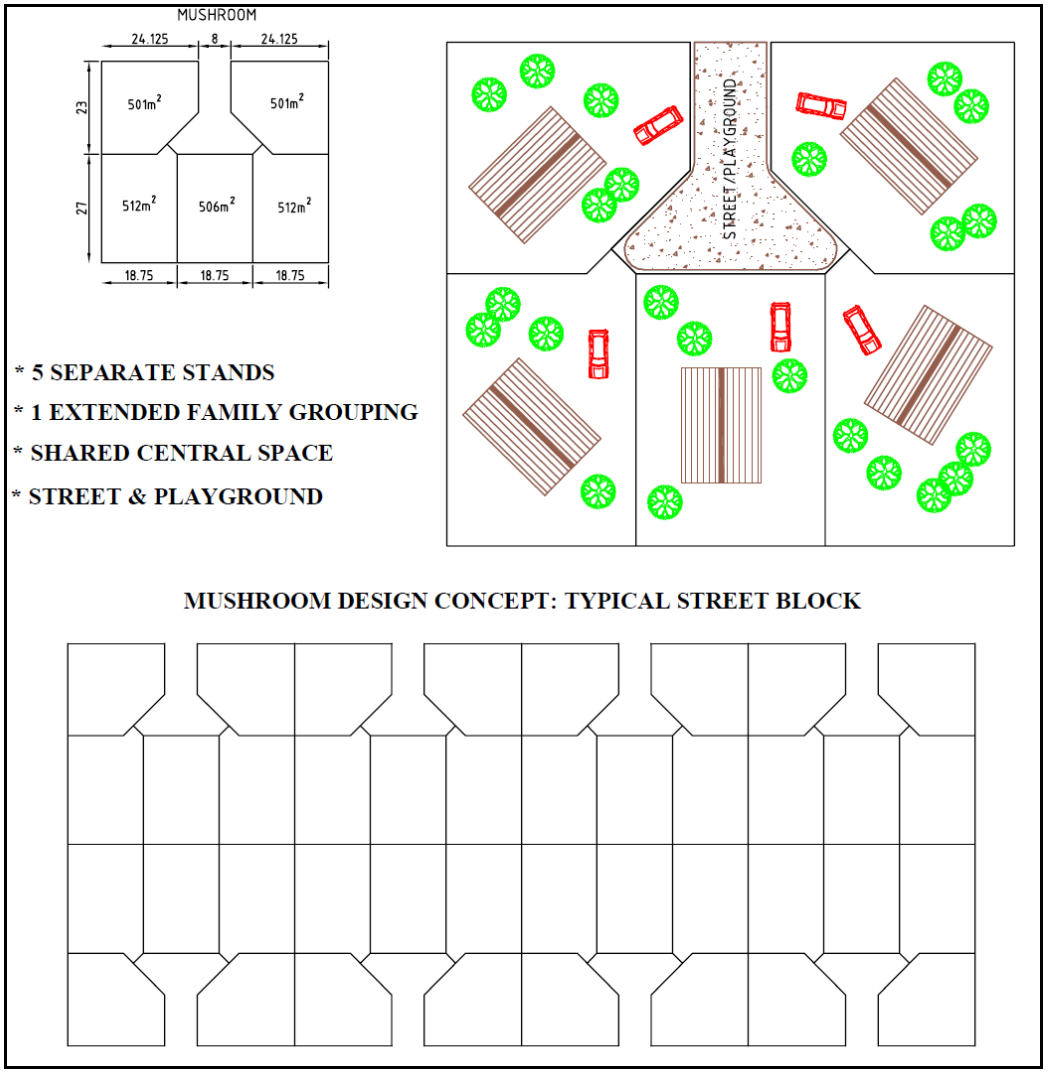


Figure 6.5: Alternative design for the extended family (taken from Urban Dynamics, 2011)

The layout plan provided by Urban Dynamics (Figures 2.1 and 6.6) is based on the typical block design concept. Provision was however, made for extended families in the eastern portion of the site.

6.2.3 Layout plans

6.2.3.1 Layout Plan No. 1 (Figure 2.1)

Layout Plan No. 1 (Figure 2.1) is the original layout plan, which was presented in the Scoping Report. A description of the components of this layout plan is presented in Section 2 of this report.

6.2.3.2 Layout Plan No. 2 – preferred layout (Figure 6.6)

Layout Plan No. 1 was revised by the townplanners in order to address the following comment received from the Steve Tshwete Local Municipality:

- *That a suitable area, measuring not less than 120 m X 90 m, be made available for a soccer field.*
- *That areas created for storm water not be zoned as 'public open space' but rather 'institutional' or 'community facility'.*

- *That all areas identified as 'public open space' be of a reasonable size and suitable to enable proper park development.*
- *That a refuse disposal facility be incorporated in the layout of the township.*

Layout Plan No. 2 is the preferred layout plan and is presented in Figure 6.6.

Number of stands
According to Urban Dynamics (2012), the proposed rural village would comprise of the following:

Zoning	Land use	No. of Stands	Average Size	% of Area	Area of Stands
Residential	Residential	1000	518.97 m^2	40.58%	51.90 ha
Business	Business	1	8994.80 m^2	0.69%	0.89 ha
Institutional	Community facility	3	4569.92 m^2	1.07%	1.37 ha
	Combined school	1	61862.96 m^2	4.84%	6.19 ha
Municipal	Municipal	20	637.51 m^2	1.00%	1.28 ha
Public Open Space	Park	8	61678.75 m^2	38.55%	49.34 ha
Street	Internal			13.27%	16.98 ha
Total		**1033**		**100%**	**127.95 ha**

Residential:
The number of residential stands (1000) and average stand size were not changed. For both Layout Plan No. 1 (Figure 2.1) and Layout Plan No. 2 (Figure 6.6), the average residential stand size was indicated as 518.97 m^2 as agreed with the community during a community meeting at the start of the planning process. Approximately 41 % of the total area will thus comprise residential land uses.

The Steve Tshwete Local Municipality had no special requirements regarding the residential stands.

Business:
The size of the business stand was increased from 0.76 ha to 0.89 ha in Layout Plan No. 2. However, the business stand will still be located in approximately the centre of the development, making it accessible to all residents. The business stand could be used for a number of business activities including a small shopping area and taxi rank.

The Steve Tshwete Local Municipality had no special requirements regarding the business stand.

Institutional land use:
The institutional land use includes the 3 community facilities and 1 combined school. The 3 community facilities will cater for uses such as churches, crèches, community halls, old age homes, clinics, etc. depending on the needs of the community.

The community facilities are spaced further apart in Layout Plan No. 2 to make it more accessible to all residents. In addition, the overall size was increased from 1.08 ha to 1.37 ha.

The size and location of the combined school did not change. The combined school will cover an area of 6.19 ha according to the Guidelines for Human Settlement Planning and Design.

RESIDENTIAL SITES

THE AVERAGE SIZE OF RESIDENTIAL SITES ARE 518,97m²
THE MINIMUM STAND SIZE IS 500m²
THE RULING SIZE OF RESIDENTIAL SITES ARE 25m x 20m
THE MINIMUM WIDTH OF REGULAR RESIDENTIAL SITES ARE 20m
MINIMUM WIDTH OF PANHANDLE ACCESSES ARE 4m

ROADS

RESERVE WIDTHS OF ALL INTERNAL STREETS ARE 10m UNLESS OTHERWISE INDICATED ON THE PLAN
SPLAYS ON ALL STREETS ARE 5m x 5m UNLESS OTHERWISE INDICATED ON THE PLAN
THE WIDTH OF ALL TURNING CIRCLES SHOULD NOT BE LESS THAN 16m IN DIAMETER
MAXIMUM SLOPE ON ROADS 1 : 65
MINIMUM SLOPE ON ROADS 1 : 220

CONTOURS / CO-ORDINATES

CONTOURS ARE BASED ON STANDARDS LAID DOWN IN REGULATION 21(2) OF THE TOWN PLANNING AND TOWNSHIPS ORDINANCE (TVL) 25 OF 1965 AS AMENDED.
GEODETICAL SYSTEM : WGS 84
CONSTANTS Y : N.A. X : N.A.
DATE PLANE : SEA LEVEL

DIMENSIONS AND SIZES

ALL DIMENSIONS SHOWN ON THE PLAN ARE APPROXIMATE AND SCALE IN METRES

LAND SURVEYOR

BASE PLAN MAPPING WAS DONE BY THE FIRM JOHAN MEIRING LAND SURVEYOR AND I, THE UNDERSIGNED, HEREBY CERTIFY THE BASE PLAN INFORMATION

LAND SURVEYOR (PRINT): J.J MEIRING REG.No.PLS 0394

(SIGN): ..... DATE :20-11-2012

FLOODWATER

IT IS CERTIFIED THAT THE PROJECT AREA IS NOT AFFECTED BY FLOODWATERS IN TERMS OF THE SPECIFICATIONS LAID DOWN BY CLAUSE 144 OF THE WATERACT (ACT 36 OF 1998)

CIVIL ENGINEER (PRINT): P.J. STRYDOM PR.ENG PR.ENG. REG.No.860571

(SIGN): .....

FIRM : STRYDOM & MALAN

DATE 20-11-2012

CIVIL ENGINEER'S CONSENT

IT IS HEREBY CERTIFIED THAT THE LAYOUT HAS BEEN CONSIDERED ACCEPTABLE BY STRYDOM & MALAN BEING THE CONSULTING ENGINEER APPOINTED BY THE CLIENT.

(PRINT): P.J. STRYDOM PR.ENG. REG.No.860571

(SIGN): .....

FIRM : STRYDOM & MALAN

DATE :20-11-2012

GEOLOGICAL

THIS IS TO CERTIFY THAT THE TOWNSHIP LAYOUT ON THIS PLAN IS IN ACCORDANCE WITH THE PROVISIONS AND RECOMMENDATIONS AS SET OUT IN THE ENGINEERING GEOLOGICAL REPORT.

ENGINEERING GEOLOGIST (PRINT): P.G..HANSMEYER REG.NO.400012191

(SIGN): .....

FIRM : ENGEOLAB CC

DATE :20-11-2012

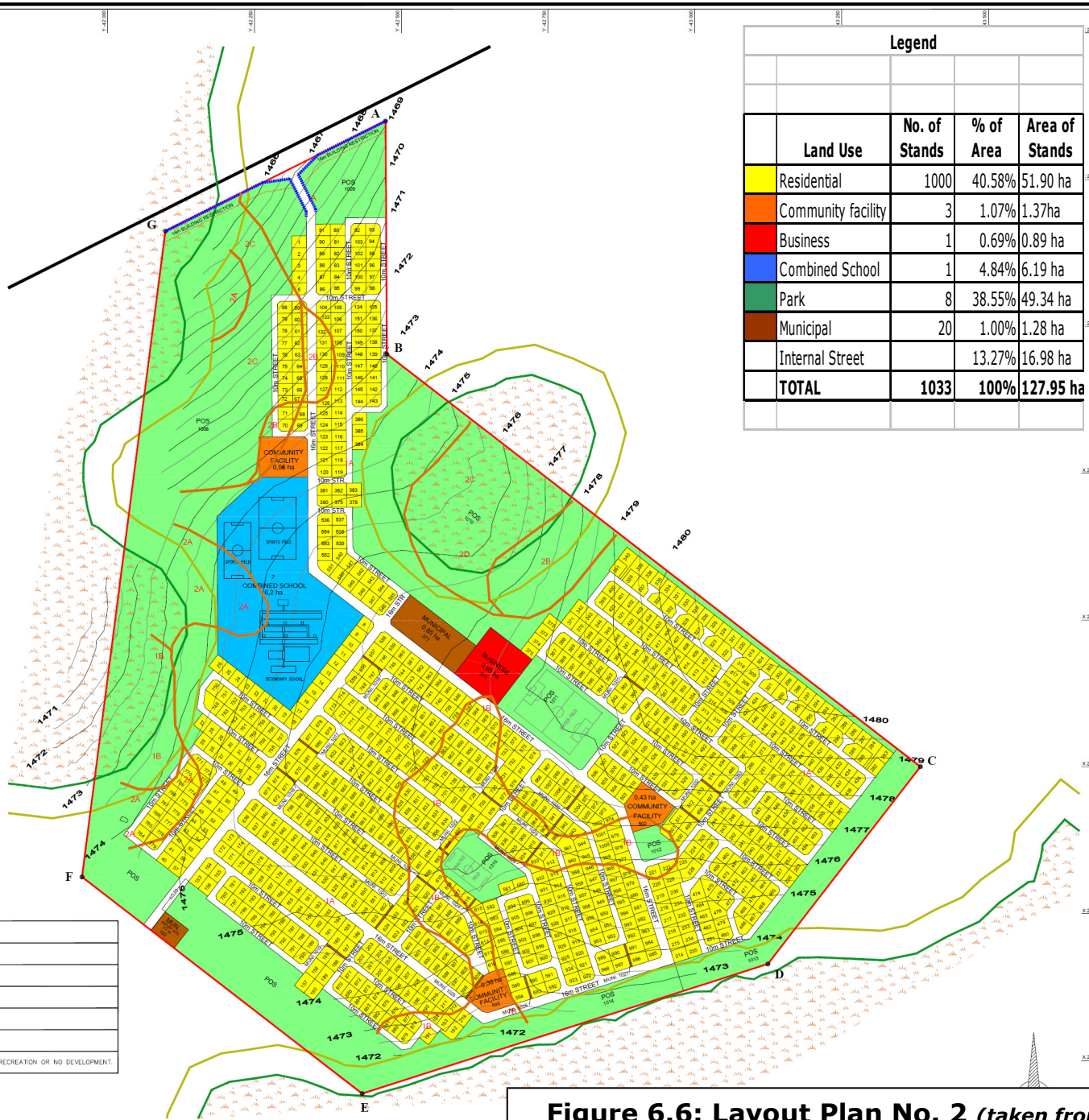
ZONE	NHBRC CLASS	RECOMMENDATIONS
1A	C,S	NORMAL CONSTRUCTION
1B	R,C,S	NORMAL CONSTRUCTION. USE POWERFUL EXCAVATORS
2A	C1,S1	MODIFIED NORMAL CONSTRUCTION
2B	P	MODIFIED NORMAL CONSTRUCTION WITH SUB-SURFACE DRAINAGE
2C	C2,S2	MODIFIED NORMAL CONSTRUCTION
2D	P	SIGNIFICANT DRAINAGE REQUIRED. ALTERNATIVELY RESERVE FOR RECREATION OR NO DEVELOPMENT.

TOWN PLANNER

NAME: JN HAMMAN
TOWN PLANNER TRP (SA) REG. NO:A/525/1987

SIGNATURE:

DATE: 31/08/2011



Legend

	Land Use	No. of Stands	% of Area	Area of Stands
	Residential	1000	40.58%	51.90 ha
	Community facility	3	1.07%	1.37ha
	Business	1	0.69%	0.89 ha
	Combined School	1	4.84%	6.19 ha
	Park	8	38.55%	49.34 ha
	Municipal	20	1.00%	1.28 ha
	Internal Street		13.27%	16.98 ha
	TOTAL	**1033**	**100%**	**127.95 ha**

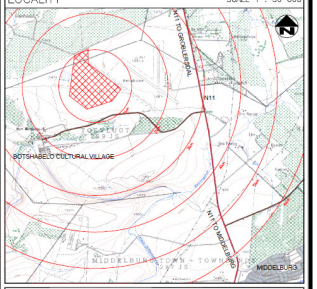
PROJECT

PROPOSED TOWNSHIP

BOTSHABELO RURAL VILLAGE

SITUATED ON A PORTION OF THE REMAINDER OF THE FARM TOEVLUGT 320-JS
LOCAL AUTHORITY : STEVE TSHWETE LOCAL MUNICIPALITY
DISTRICT : NKANGALA DISTRICT MUNICIPALITY

LOCALITY SCALE 1 : 50 000



LAND USE

ZONING	LAND USE	NOTATION	ERF NUMBERS	NO. OF STANDS	AVERAGE SIZE	% OF AREA	AREA OF STANDS
RESIDENTIAL	RESIDENTIAL		1–5, 8–151, 153–375, 378–501, 503–594, 596–1007	1000	518,97m²	40,58%	51,90ha
BUSINESS	BUSINESS MIXED LAND USES TAXI / PARKING MARKET		376	1	± 994,80m²	0,69%	0,89ha
INSTITUTIONAL	COMMUNITY FACILITY		6, 500, 595	3	± 569,63m²	1,07%	1,37ha
	COMBINED SCHOOL		?	1	61662,96m²	4,84%	6,19ha
	PRIMARY SCHOOL CRECHE CHURCH						
MUNICIPAL	MUNICIPAL		152, 377, 1016–1033	20	637,51m²	1,00%	1,28ha
	OFFICES DEPOT CEMETERY SUBSTATION RESERVOIRS						
INDUSTRIAL	INDUSTRIAL RAILWAY LINE ESKOM PURPOSES						
P.O.S	PARK		1008–1015	8	61678,75m²	38,55%	49,34ha
	URBAN AGRICULTURE						
UNDETERMINED	UNDETERMINED						
STREET	INTERNAL					13,27%	16,98ha
	EXTERNAL (LINK)						
TOTAL				1033		100%	127,95ha

GENERAL NOTES

THE FIGURE A,B,C,D,E,F,G & A REPRESENTS THE OUTSIDE BOUNDARY OF THE PROPOSED TOWNSHIP BEING APPROXIMATELY 127,95ha IN EXTENT.

- OUTSIDE BOUNDARY OF TOWNSHIP
- GEOTECHNICAL ZONES
- 16m BUILDING RETRICTION
- LINE OF NO ACCESS
- WETLAND AREA
- 50m WETLAND BUFFER

INDEMNITY

URBAN DYNAMICS MAKES NO WARRANTY OF ANY KIND, EXPRESSED OR IMPLIED, WITH REGARD TO THE DATA AND SHALL NOT BE HELD LIABLE IN ANY EVENT FOR ANY INCIDENTAL OR CONSEQUENTIAL DAMAGES IN CONNECTION WITH OR ARISING OUT OF THE USE OF THIS DATA. THE DATA REMAINS THE SOLE PROPERTY OF THE CLIENT AND MAY ONLY BE USED FOR THE PURPOSES OF A PROJECT WITH THE PRIOR WRITTEN APPROVAL OF THE CLIENT.

AMENDMENTS

No.	DESCRIPTION	DATE	BY
1	COMMUNITY FACILITIES ADDED	31/08/2011	MZB
2	ZONES AMENDED AS PER GEOTECHNICAL REPORT	30/03/2012	MZB
3	AMENDED AS PER COUNCIL RESOLUTION	15/11/2012	JPC
4	FINAL ERF NUMBERS ADDED	20/11/2012	MZB

DESIGNED	J.N. HAMMAN	COPYRIGHT RESERVED
DRAWN	M.Z. BOTHA	
APPROVED		
DATE	02-08-2011	

SCALE 1 : 2 500

DRAWING No. MID-293_4

FILE NAME : MID-293

CLIENT

BOTSHABELO COMMUNITY DEVELOPMENT TRUST / STEVE TSHWETE LOCAL MUNICIPALITY

URBAN DYNAMICS
AND REGIONAL PLANNERS
DYNAMICS MPUMALANGA INC.
O. 95/10010/21)
DERITE, SUITE 12, DOLERITE CRESENT,
ND, MIDDELBURG 1050
13) 244 1598 / 244 1599
3) 244 1560

Figure 6.6: Layout Plan No. 2 ***(taken from Urban Dynamics, 2012)***

Municipal:
No provision was made for municipal stands in Layout Plan No. 1.

As requested by the Steve Tshwete Local Municipality, the zoning of the areas created for storm water was changed from Public Open Space to Municipal in Layout Plan No. 2 (Figure 6.6). Eighteen (18) municipal stands will thus be provided for storm water management as indicated in Figure 6.6.

The Steve Tshwete Local Municipality also requested that the layout plan make provision for a refuse disposal facility. The one municipal stand on the south western boundary of the site would be utilized as a refuse transfer station (Figure 6.6). The site would be approximately 0.2 ha in extent. The Botshabelo community will temporarily store their waste in this designated area. The waste would then be collected by the municipality on a weekly basis.

Another municipal site is provided in the centre of the site to cater for a possible pension pay point, mobile clinic, etc. in Layout Plan No. 2.

Public Open Space:
A total of 8 public open spaces will be provided (Figure 6.6). The public open spaces make provision for fire breaks, buffer zones, soccer fields and wetlands present on site. Approximately 38% of the layout consists of public open spaces.

In terms of fire breaks, a park strip is provided around the entire development to safeguard the residents from veld fires during the dry season and to prevent fires from spreading from the development onto the surrounding land.

A 10 metre park strip will also be provided along the eastern boundary of the site to try and limit any potential impact from the development on the adjoining airfield.

As requested by the Steve Tshwete Local Municipality, Layout Plan No. 2 makes provision for a soccer field in approximately the centre of the site adjacent to the business stand (Figure 6.6).

Access road alternatives
Access to the site will be obtained from the existing gravel road located on the northern boundary of the site (Figure 6.6). The gravel road connects with the N11 national road.

An alternative access road would be the existing access road to the Botshabelo Nature Reserve. However, this road is used by tourists who visit the historical site and cultural village. According to Urban Dynamics (2011), the intention is to keep residents and tourists separate.

One of the interested and affected parties suggested that a separate access road be constructed across the Middelburg Aeroclub area. The development would then have direct access to the N11 national road and residents would not have to utilize the same road as the adjacent land owners.

This alternative was however, excluded since a new access road would have a direct impact on the Middelburg Aeroclub. In addition, it is doubtful that the

South African National Road Agency would approve another access point in close proximity to the existing one.

6.3 Alternative service provision

The Steve Tshwete Local Municipality proposes to install services (i.e. water, sewage, roads, electricity, etc.) in accordance with the minimum standard for rural villages as indicated in the Steve Tshwete Local Municipality policy. The Botshabelo Community Development Trust will be responsible for the initial costs of the services. After installation, the services will be handed over to the Steve Tshwete Local Municipality who will be responsible for the maintenance of the services. This is also indicated in Section 2.6 of this report.

According to Urban Dynamics (2011), early discussions with the community revealed that the level of services proposed by the municipality is not acceptable to the Botshabelo Community Development Trust.

It should be noted that limited funds are available for the proposed development. Funding for the installation of the preferred level of services (i.e. waterborne sewage and bulk water supply) is currently not available. The preferred level of services will only be installed once the required funding can be secured from government.

Urban Dynamics (2011) therefore investigated two options, namely:

- Option 1-preferred level of services: This option is based on the demands of the community and includes water provision at each stand as well as water borne sewage.
- Option 2-current option: This option is based on the minimum essential standards for low cost township establishment. It would include the provision of boreholes, pillar taps at regular intervals and a biological toilet system.

Herewith a brief overview of what services would be provided in terms of each option investigated.

6.3.1 Water

Option 1-preferred level of services:

For Option 1, water would be provided to each stand via an internal water reticulation network and uPVC pipe with a minimum of 75 mm diameter. Water meters would also be installed to allow the Steve Tshwete Local Municipality to carry out readings.

The following table provides the proposed standards for the infrastructure (i.e. Option 1) as based on the 'Human Settlement Planning and Design' guidelines under the patronage of the Department of Housing:

Average demand	800 l/day
Peak Factor	4
Fire Risk	Low risk Group 3
Minimum flow at fire hydrants	350 l/day
Absolute minimum water pressure	12 m and 7 m with fire flow
Fire hydrant spacing	240 m maximum
Minimum pipe size	75 mm outside diameter uPVC for main lines

	20 and 25 mm outside diameter HDPE for single and double house connections
Pipe material	uPVC (main line) and HDPE house connections
Cover to pipe	800 mm minimum
Hydrant valves	Screw type
Valves	Right hand (clockwise) closing
Water meters	As per municipal regulation

According to Urban Dynamics (2011), the water demand of ± 35 l/s (peak flow) would have to be supplied for the proposed development. Treated water would have to be obtained from the Middelburg water supply network.

Providing bulk water to the proposed development would entail the following:
- A bulk water pipeline from the existing Dennesig reservoir to the proposed development.
- The pipeline would potentially be a pump line of approximately 10 km in distance and the existing reservoir might need to be enlarged to supply the mentioned demand.
- Installation of a water pump station situated at the Dennesig Reservoir.
- Installation of a high-level water tank at the development to ensure minimum water pressure to the stands in the proposed development.

Funding for the installation of the bulk water supply is currently not available. Bulk water will thus only be supplied once the required funding can be secured from government.

Option 2-current option:
Water would be obtained from boreholes, which would be supplied by the Steve Tshwete Local Municipality. Three (3) potential borehole sites were identified by Engeolab cc. (see Figure 5.23). The boreholes would be operated either by windmills and/or hand pumps.

Water would be pumped to high level water tanks and then distributed to pillar taps, which would be placed within a 100 m walking distance from all stands.

The following table provides the proposed standards for the Option 2 infrastructure as based on the 'Human Settlement Planning and Design' guidelines under the patronage of the Department of Housing:

Average demand	20 l/capita/day
Pipe material	uPVC (main line) and HDPE house connections
Cover to pipe	800 mm minimum
Pillar taps	20 mm diameter

As indicated in Section 3.5, this option would be implemented.

Engeolab cc (2011a) recommended the following alternative water sources to augment the groundwater supply:
- construction of a number of small earth embankment dams to the west and to the south of the proposed site (Figure 5.23);
- construction of a weir in the Klein Olifants River and pumping the water to the site.

Although the alternative water sources will be of a more sustainable nature than boreholes, it would require additional funding. In addition, the small earth embankment dams would be located within the identified wetland areas.

6.3.2 Sewage

Option 1-preferred level of services:
This option would involve the construction of two new biological reclaiming sewage plants in the north western and south western corners of the site. A complete waterborne sewerage system would be installed with a connection point at each stand. Sewage from the various stands and combined school would gravitate into the sewage plant and would be treated on site. Treated water would be discharged into the nearby stream.

The following table provides an indication of the proposed standards for the infrastructure for Option 1 as based on the 'Human Settlement Planning and Design' guidelines under the patronage of the Department of Housing:

Average daily flow	700 l/day
Minimum pipe size for house connections	110 mm
Minimum pipe size in network	160 mm
Pipe material	Structured wall uPVC
Maximum manhole spacing	90 m
Peak factor	2.25
Minimum flow speed	0.7 m/s
Minimum slope	1: 120 for 110 mm diameter 1: 200 for 160 mm diameter
Minimum cover to pipes in servitudes	800 mm
Minimum cover to pipes in sidewalks	1000 mm
Manholes	1000 mm inside diameter with step iron if deeper than 1.2 m
Rodding eye	Positioned at the beginning of a line if there are 4 house connections or less before the next manhole. Rodding eyes to be installed with its won chamber and cover.

This option is currently not viable due to the lack of water on site. In addition, funding for the installation of a waterborne sewage system is currently not available.

Option 2-current option:
Option 2 would involve the provision of biological toilets for each stand. The biological toilets would be provided outside the houses and would have to be maintained by the Steve Tshwete Local Municipality. No details regarding the type of biological toilets to be installed are currently available.

As indicated in Section 3.5, this system will be implemented.

6.3.3 Waste

Option 1 – waste removal by Steve Tshwete Local Municipality:
In Section 2.6.4 of this report, it is indicated that refuse will be collected by the Steve Tshwete Local Municipality's refuse removal unit and disposed of at the Middelburg (Rietfontein) Waste Disposal Site.

The Steve Tshwete Local Municipality indicated (Council Resolution: 12 October 2012; Appendix 8) that waste removal services will only be introduced after the township has been developed and at least 50% of the houses have been occupied.

During a meeting (23 April 2013) with the Steve Tshwete Local Municipality it was indicated that waste is currently collected from the Doornkop area on a weekly basis. Since the Botshabelo Rural Village is located en-route to Doornkop, refuse removal from the Botshabelo Rural Village should not pose a problem.

Option 2 – waste disposal site:
The Steve Tshwete Local Municipality requested that the layout plan make provision for a refuse/waste disposal facility (Council Resolution: 12 October 2012; Appendix 8). This could be interpreted as a waste disposal site, which would require a separate EIA and waste license application.

Option 3 – waste transfer station:
In response to the request from the Municipality to provide a refuse disposal facility on site, Urban Dynamics included a municipal stand in the layout plan to be used as a refuse/waste transfer station (Figure 6.6). The site would be approximately 0.2 ha in extent.

The Botshabelo community would thus temporarily store their waste in this designated area until such time as it is collected by the Steve Tshwete Local Municipality.

During a meeting (23 April 2013) with the Steve Tshwete Local Municipality it was indicated that waste is currently collected from the Doornkop area on a weekly basis. Since the Botshabelo Rural Village is located en-route to Doornkop, refuse removal from the Botshabelo Rural Village should not pose a problem.

6.3.4 Electricity

Electricity for the proposed development will be obtained from either the Steve Tshwete Local Municipality or Eskom. The choice of supplier will be determined during a later stage of the development and will depend on the costs involved.

6.4 The 'No Project Option'

The 'no project option' is the alternative of not going ahead with the proposed development. The 'no project option' is only considered if it is found that the development will have significant negative impacts on the environment, which cannot be mitigated or managed.

If the 'no project option' in terms of the proposed development was exercised, it could mean that:

- The land use of the Botshabelo Nature Reserve would remain the same.
- The Botshabelo community would not be able to resettle on their property.
- The Botshabelo committee and the Steve Tshwete Local Municipality would have to obtain more financing for the development and investigate an alternative site.
- The Botshabelo community may decide to relocate to the site without any of the relevant approvals.

7. ENVIRONMENTAL IMPACT DESCRIPTION AND EVALUATION

7.1 Introduction

This section of the report describes and evaluates the potential impact of the proposed development on the environment. The impact of the development has to be assessed in terms of the following development phases:

- **Construction phase**
- **Operational phase**
- **Decommissioning phase**

7.2 Evaluation of impacts

The evaluation of impacts will be conducted in terms of the following criteria:

- **Nature of impact** e.g. impact on surface water; groundwater; natural vegetation; etc.

- **Extent of impact**

Site	Effect limited to the site and its immediate surroundings
Local	Effect limited to within 3-5 km of the site
Regional	Effect will have an impact on a regional scale

- **Duration of impact**

Short	Effect lasts for a period 0 to 5 years
Medium	Effect continues for a period between 5 and 10 years
Long	Effect will cease after the operational life of the activity either because of natural process or by human intervention
Permanent	Where mitigation either by natural process or by human intervention will not occur in such a way or in such a time span that the impact can be considered transient

- **Intensity of impact**

Low	The impact affects the environment in such a way that natural, cultural and social functions and processes are not affected
Medium	Where the affected environment is altered but natural, cultural and social functions and processes continue albeit in a modified way
High	Where natural, cultural or social functions or processes are altered to the extent that it will temporarily or permanently cease

- **Probability**

Improbable	Less than 33% chance of occurrence
Probable	Between 33 and 66% chance of occurrence
Highly probable	Greater than 66% chance of occurrence
Definite	Will occur regardless of any prevention measures

- **Significance of impact**

Low	Where the impact will have a relatively small effect on the environment and will not have an influence on the decision
Medium	Where the impact can have an influence on the

	environment and the decision and should be mitigated
High	Where the impact definitely has an impact on the environment an the decision regardless of any possible mitigation

- **Status**

Positive	Impact will be beneficial to the environment
Negative	Impact will not be beneficial to the environment
Neutral	Positive and negative impact

- **Confidence**

Low	It is uncertain whether the impact will occur
Medium	It is likely that the impact will occur
High	It is relatively certain that the impact will occur

It must be noted that many of the potential negative consequences can be mitigated successfully. It will however, be necessary to make a thorough assessment of all possible impacts in order to ensure that environmental considerations are taken into account, in a balanced way, as far as possible, supporting the aim of creating a healthy and pleasant environment.

7.3 Planning and design phase

The planning and design phase involved office work and site surveys with regards to the design of the layout plan, the Environmental Impact Report and the various specialist studies (e.g. geotechnical, fauna and flora, wetland study, etc.). It also involves obtaining the necessary authorisations for the said development.

No actual work (construction) took place on site. Therefore, no impacts are expected.

7.4 Environmental aspects

Prior to describing and evaluating the environmental impact, the different environmental aspects, which will have potential environmental consequences for the different phases, must be listed.

7.4.1 Construction phase

The construction phase would involve the following:

- The installation of services;
- Construction of the internal roads;
- Construction of the buildings and associated infrastructure.

- The **installation of services** would involve the removal of vegetation, excavation of the trenches/holes, the laying of the pipelines and the covering and rehabilitation of the trenches/holes on site.
- **The construction of the internal roads** would involve the removal of vegetation and the preparation of the road surfaces.
- **The construction of the buildings and associated infrastructure** would involve the removal of vegetation and topsoil, leveling of the site, the installation of the required piling, laying of the required foundations,

the building of the outer structure and the installation of the required internal fittings.

7.4.2 Operational phase

The operational phase would thus involve:

- Utilization of the services and internal roads;
- Utilization of the buildings and associated infrastructure.

7.4.3 Decommissioning phase

This phase would involve the decommissioning of the facilities already constructed on site at that particular date, if ever required. This would depend on whether the entire project would be decommissioned or only parts thereof.

This phase will not be discussed in detail. It is recommended that at the time of decommissioning, a specific Environmental Management Plan (EMP) be compiled which specifically addresses this phase. This EMP would have to address issues such as the removal of building rubble, ripping of the soil, the sowing of seed and the maintenance of the vegetation until it is established. Soil conservation measures would also have to be implemented.

The following tables provide an indication of the environmental features that will be impacted (directly and indirectly) during the construction, operational and decommissioning phases of the proposed project as indicated above.

ENVIRONMENTAL FEATURE(S)	PREDICTED IMPACT CONSTRUCTION PHASE AREA: ± 80 ha	EXTENT	DURATION	PROBABILITY	SIGNIFICANCE (PRE-MITIGATION)	SIGNIFICANCE (POST MITIGATION)	PREDICTED IMPACT OPERATIONAL PHASE AREA: ± 80 ha	EXTENT	DURATION	PROBABILITY	SIGNIFICANCE (PRE-MITIGATION)	SIGNIFICANCE (POST MITIGATION)	PREDICTED IMPACT PHASE: DECOMMISSIONING PHASE AREA: ± 80 ha	EXTENT	DURATION	PROBABILITY	SIGNIFICANCE (PRE-MITIGATION)	SIGNIFICANCE (POST MITIGATION)
	The following impact assessment was done based on Layout Plan No. 2 (Figure 6.6), in which the pans (Pan 1 and Pan 2) and the hillslope seepage wetlands (HSW1 and HSW2) (Figure 5.19) were identified as NO-GO areas. The proposed development will thus not have a direct impact on the topography, geology, soil, vegetation, animal life, surface water or groundwater of these sensitive natural environments. Based on Layout Plan No. 2, only approximately 80 ha of the proposed site (130 ha in total) would be directly impacted upon.																	
TOPOGRAPHY	**Installation of services, construction of roads and buildings:** ▪ The site is relatively flat with a slight slope of approximately 1: 10 to 1: 20. The southern portion of the site slopes in a southerly direction towards a hillslope seepage wetland (HSW2; Figure 5.19). The central and northern portions of the site slopes in a westerly and north westerly direction towards Pan 1 and HSW1 (Figure 5.19). ▪ Due to the slope of the site in a southerly, westerly and northwesterly direction, Pan 2 should not be impacted upon in terms of erosion and sediment transport since no drainage is expected from the construction site towards the pan. ▪ As per Layout Plan No. 2, the pans (Pan 1 and Pan 2) on site and the wetlands (HSW1 and HSW2) adjacent to the site will be excluded from development. Other areas (e.g. buffer zone around pans, fire break, etc.) were also excluded from development (Figure 6.6). The topography of these environments would thus not be directly impacted upon. ▪ However, the proposed development will impact directly on the topography of approximately 80 ha of the site (i.e. 130 ha minus 50 ha public open space). In general, the removal of vegetation, sloping of the site and the formation of voids and topographical highs would result in changed runoff patterns and an increased risk of soil erosion. The risk is however, expected to be low due to the relatively flat nature of the site. ▪ Disturbance in the southern portion of the site could impact indirectly on HSW2, whereas disturbance in the central and northern portions of the site could have an indirect impact on Pan 1 and HSW1 in terms of erosion and sedimentation. ▪ The construction activities could also impact on the existing topography i.t.o. the construction of the various structures (topographical highs). No high rise buildings would however, be constructed.	SITE SITE SITE SITE	LONG LONG LONG LONG	PROBABLE HIGHLY PROBABLE PROBABLE DEFINITE	MEDIUM NEGATIVE LOW NEGATIVE MEDIUM NEGATIVE LOW NEGATIVE	LOW NEGATIVE LOW NEGATIVE LOW NEGATIVE LOW NEGATIVE	**Utilization of services, roads and buildings:** ▪ During the operational phase, the direct impact on the topography of 80ha of the site will continue in terms of slope, changed runoff patterns and an increased risk of soil erosion. ▪ The presence of buildings and roads in the southern portion of the site will continue to impact on HSW2 in terms of runoff and an increased risk of erosion. ▪ The presence of buildings and roads in the central and northern portions of the site will continue to impact on Pan 1 and HSW1 in terms of runoff and an increased risk of erosion. ▪ The presence of buildings (topographical highs) will continue to impact on the general topography of the area. ▪ Due to the slope of the site in a southerly, westerly and northwesterly direction, Pan 2 should not be impacted upon in terms of erosion and sediment transport since no drainage is expected from the site towards the pan.	SITE SITE SITE SITE	LONG LONG LONG LONG	PROBABLE PROBABLE PROBABLE DEFINITE	LOW NEGATIVE MEDIUM NEGATIVE LOW NEGATIVE LOW NEGATIVE	LOW NEGATIVE LOW NEGATIVE LOW NEGATIVE LOW NEGATIVE	**Decommissioning of the services, roads and buildings:** ▪ The decommissioning and rehabilitation of the site would have a positive impact on the topography since the infrastructure will be removed and the site will be top soiled and shaped to the original slope of the area.	SITE	LONG	DEFINITE	LOW POSITIVE	MEDIUM POSITIVE

ENVIRONMENTAL FEATURE(S)	PREDICTED IMPACT CONSTRUCTION PHASE AREA: ± 80 ha	EXTENT	DURATION	PROBABILITY	SIGNIFICANCE (PRE-MITIGATION)	SIGNIFICANCE (POST MITIGATION)	PREDICTED IMPACT OPERATIONAL PHASE AREA: ± 80 ha	EXTENT	DURATION	PROBABILITY	SIGNIFICANCE (PRE-MITIGATION)	SIGNIFICANCE (POST MITIGATION)	PREDICTED IMPACT PHASE: DECOMMISSIONING PHASE AREA: ± 80 ha	EXTENT	DURATION	PROBABILITY	SIGNIFICANCE (PRE-MITIGATION)	SIGNIFICANCE (POST MITIGATION)
GEOLOGY /GEOTECHNICAL	**Installation of services, construction of roads and buildings:** ▪ The site is underlain by tillite and sandstone of the Dwyka Formation in the north and sandstone of the Wilgerivier Formation in the central and southern portions. Approximately 80 ha of the underlying geology will be directly impacted by the proposed development, depending on the depth of the trenches required for the installation of infrastructure and construction of foundations. The possible impact on the underlying geology cannot be mitigated. ▪ The majority of the site is located within Geotechnical Zone 1A, where normal construction would apply (Figure 5.6). In general, the installation of services and construction of roads and buildings should not be problematic. ▪ No development is recommended for Geotechnical Zone 2D (i.e. Pan 1, Pan 2, HSW1 and HSW2). As per Layout Plan No. 2, the pans (Pan 1 and Pan 2) on site and the wetlands (HSW1 and HSW2) adjacent to the site will be excluded from development. Other areas (e.g. buffer zone around pans, fire break, etc.) were also excluded from development (Figure 6.6). The geology associated with these environments as well as Geotechnical Zone 2D will thus not be directly impacted upon. ▪ Approximately 70 stands in the centre and southern portion of the site are located in Geotechnical Zone 1B (Figure 5.6). Excavatability constraints may be experienced at depths >1.5m (Figure 5.6). The geology could thus impact on the installation of services, and construction of buildings depending on the required depths of the trenches/foundations. ▪ A portion of the school and 14 residential stands are located in Geotechnical Zone 2A (Figure 5.6), which is present in the western and northern portions of the site. Zone 2A comprises compressible soils and would require compaction and modified construction. In addition, excavatability problems may occur in some areas where ferricrete is present. The geology could thus impact on the installation of services and construction of buildings if mitigation measures were not implemented. ▪ Geotechnical Zone 2B is underlain by a shallow hardpan ferricrete layer and is present adjacent to Pan 2 (excluded from development) and in the northern portion of the site (Figure 5.6). A perched water table is expected during the rainy season. The installation of services during the rainy season could be problematic if the trenches fill up with water. The buildings could be impacted upon if mitigation measures were not implemented (i.e. sub-surface drainage). 8 residential stands and a community facility are located in Zone 2B. ▪ Geotechnical Zone 2C (Figure 5.6) is present in the northern portion of the site and within Pan 2 (which was excluded from development). This zone comprises compressible soil, which would require compaction and modified construction. The services and buildings could be impacted upon if mitigation measures were not implemented to accommodate the differential soil movements. 18 residential stands will be located within this zone.	SITE SITE SITE SITE SITE	PERMANENT LONG LONG LONG LONG	HIGHLY PROBABLE PROBABLE PROBABLE PROBABLE PROBABLE	LOW NEGATIVE LOW NEGATIVE MEDIUM NEGATIVE MEDIUM NEGATIVE MEDIUM NEGATIVE	LOW NEGATIVE LOW NEGATIVE LOW NEGATIVE LOW NEGATIVE LOW NEGATIVE	**Utilization of services, roads and buildings:** ▪ No further impact on geology expected since no further construction will take place. ▪ However, the structures located in Geotechnical Zones 2A, 2B and 2C will continue to be impacted upon if mitigation measures were not implemented as part of the construction phase.	SITE	LONG	PROBABLE	MEDIUM NEGATIVE	LOW NEGATIVE	**Decommissioning of the services, roads and buildings:** ▪ None.					

ENVIRONMENTAL FEATURE(S)	PREDICTED IMPACT CONSTRUCTION PHASE AREA: ± 80 ha	EXTENT	DURATION	PROBABILITY	SIGNIFICANCE (PRE-MITIGATION)	SIGNIFICANCE (POST MITIGATION)	PREDICTED IMPACT OPERATIONAL PHASE AREA: ± 80 ha	EXTENT	DURATION	PROBABILITY	SIGNIFICANCE (PRE-MITIGATION)	SIGNIFICANCE (POST MITIGATION)	PREDICTED IMPACT PHASE: DECOMMISSIONING PHASE AREA: ± 80 ha	EXTENT	DURATION	PROBABILITY	SIGNIFICANCE (PRE-MITIGATION)	SIGNIFICANCE (POST MITIGATION)
SOILS	**Installation of services, construction of roads and buildings:** ▪ In general, the average soil profile on site consists of a relatively thin (<500 mm) topsoil layer, which is sequentially underlain by a sandy residuum, ferruginised residuum, some pedocrete and bedrock. ▪ As per Layout Plan No. 2, the pans (Pan 1 and Pan 2) on site and the wetlands (HSW1 and HSW2) adjacent to the site will be excluded from development. Other areas (e.g. buffer zone around pans, fire break, etc.) were also excluded from development (Figure 6.6). The soils associated with these environments will thus not be directly impacted upon. ▪ However, the soil on the remaining 80 ha of the site, will be directly impacted upon by the construction activities. During the installation of services and construction of the buildings and roads, the soil will be directly impacted when the vegetation and topsoil are removed, the site is sloped and the buildings are constructed. The construction activities will impact on the soils i.t.o. soil structure, nutritional and chemical values and soil compaction. The impact cannot be mitigated. ▪ Sediment transport and erosion may occur following the clearing of the site in preparation of construction. The clearing of vegetation in the southern portion of the site may indirectly impact on HSW2, whereas the clearing of vegetation in the central and northern portions of the site may indirectly impact on Pan 1 and HSW1. Mitigation measures would have to be implemented. ▪ Due to the slope of the site in a southerly, westerly and northwesterly direction, Pan 2 should not be impacted upon in terms of erosion and sediment transport since no drainage is expected from the construction site towards the pan.	SITE SITE SITE SITE	LONG LONG LONG LONG	DEFINITE PROBABLE PROBABLE HIGHLY PROBABLE	MEDIUM NEGATIVE MEDIUM NEGATIVE MEDIUM NEGATIVE MEDIUM NEGATIVE	MEDIUM NEGATIVE LOW NEGATIVE LOW NEGATIVE LOW NEGATIVE	**Utilization of services, roads and buildings:** ▪ Direct impact on soil within the 80 ha development footprint will continue i.t.o. soil structure, nutritional and chemical values and soil compaction as a result of the presence of the infrastructure. ▪ Due to the slope of the site, HSW2 could be impacted upon in terms of increased runoff and soil erosion if proper storm water control measures are not implemented in the southern portion of the site. ▪ Due to the slope of the site, Pan 1 and HSW1 could be impacted upon in terms of increased runoff and soil erosion if proper storm water control measures are not implemented in the central and northern portions of the site. ▪ Soil pollution would occur if proper waste management does not take place, especially since domestic waste would be stored on site temporarily until collected by the Steve Tshwete Local Municipality. ▪ Soil pollution would occur if the biological toilets are not properly installed and maintained. ▪ The wetland soils associated with Pan 1, Pan 2, HSW1 and HSW2 could be directly impacted upon if these sensitive environments were not demarcated as No-Go Areas (e.g. fenced, sign boards erected, etc.).	SITE SITE SITE SITE SITE SITE	LONG LONG LONG LONG LONG LONG	DEFINITE PROBABLE PROBABLE HIGHLY PROBABLE HIGHLY PROBABLE HIGHLY PROBABLE	MEDIUM NEGATIVE MEDIUM NEGATIVE MEDIUM NEGATIVE MEDIUM NEGATIVE MEDIUM NEGATIVE MEDIUM NEGATIVE	MEDIUM NEGATIVE LOW NEGATIVE LOW NEGATIVE LOW NEGATIVE LOW NEGATIVE LOW NEGATIVE	**Decommissioning of the services, roads and buildings:** ▪ In general, the decommissioning and rehabilitation of the site would have a positive impact on the soil of the site since the infrastructure will be removed and the site will be top soiled and shaped to conform to the original slope of the area. ▪ Any polluted soil would be removed from site. ▪ The revegetation of the site would lead to a decrease in surface water runoff velocity and a smaller risk of soil erosion and sedimentation of the surface water environments.	SITE SITE SITE	LONG LONG LONG	HIGHLY PROBABLE PROBABLE PROBABLE	LOW POSITIVE LOW POSITIVE LOW POSITIVE	MEDIUM POSITIVE MEDIUM POSITIVE MEDIUM POSITIVE

ENVIRONMENTAL FEATURE(S)	PREDICTED IMPACT CONSTRUCTION PHASE AREA: ± 80 ha	EXTENT	DURATION	PROBABILITY	SIGNIFICANCE (PRE-MITIGATION)	SIGNIFICANCE (POST MITIGATION)	PREDICTED IMPACT OPERATIONAL PHASE AREA: ± 80 ha	EXTENT	DURATION	PROBABILITY	SIGNIFICANCE (PRE-MITIGATION)	SIGNIFICANCE (POST MITIGATION)	PREDICTED IMPACT PHASE: DECOMMISSIONING PHASE AREA: ± 80 ha	EXTENT	DURATION	PROBABILITY	SIGNIFICANCE (PRE-MITIGATION)	SIGNIFICANCE (POST MITIGATION)
LAND USE / AGRICULTURAL POTENTIAL / LAND CAPABILITY	**Installation of services, construction of roads and buildings:** <u>Land use</u> ▪ The site is located within the proclaimed Botshabelo Nature Reserve and is currently used for conservation and recreational purposes. The development of the site will thus have a direct negative impact on the existing land use. An area of ± 80 ha of the 2 300 ha nature reserve would be directly impacted (this equates to 3.4% of the reserve) with an indirect impact possibly extending beyond the development boundaries. Mitigation measures would have to be implemented to keep the indirect impacts as small as possible. ▪ In addition, the proposed development is in conflict with the land-use guidelines of the Mpumalanga Biodiversity Conservation Plan (MBCP) over much of the site. The untransformed habitats within the study area have been ranked as Highly Significant by the Mpumalanga Biodiversity Conservation Plan (MBCP) and are regarded as being in need of 'strict land-use controls'. According to the MBCP land-use guidelines, the site should be maintained as natural vegetation cover and need to be managed for the conservation of biodiversity. <u>Agricultural potential</u> ▪ No cultivation has recently taken place on site. However, the site could have been utilized for agricultural purposes (grazing or cultivated lands) in the past as part of the old Mission Station. According to the Department of Agriculture, Fisheries and Forestry the site comprises moderate potential arable land and a below average grazing capacity. Even though the site is not currently used for agricultural purposes (i.e. cultivation and grazing), the development will have a direct impact on the agricultural potential of the 80 ha area.	REGIONAL LOCAL	PERMANENT LONG	DEFINITE DEFINITE	HIGH NEGATIVE LOW NEGATIVE	MEDIUM NEGATIVE LOW NEGATIVE	**Utilization of services, roads and buildings:** <u>Land use</u> ▪ The site is located within the proclaimed Botshabelo Nature Reserve and is currently used for conservation and recreational purposes. The development of the site will thus continue to have a direct negative impact on the existing land use. An area of ± 80 ha of the 2 300 ha nature reserve would be directly impacted (this equates to 3.4% of the reserve) with an indirect impact possibly extending beyond the development boundaries. Mitigation measures would have to be implemented to keep the indirect impacts as small as possible. ▪ In addition, the proposed development would continue to be in conflict with the land-use guidelines of the Mpumalanga Biodiversity Conservation Plan (MBCP) over much of the site, which requires 'strict land-use controls'. According to the MBCP land-use guidelines, the site should be maintained as natural vegetation cover and need to be managed for the conservation of biodiversity. <u>Agricultural potential</u> ▪ The development will continue to have a direct impact on the agricultural potential (moderate potential arable land and a below average grazing capacity) of the 80 ha area.	REGIONAL LOCAL	PERMANENT LONG	DEFINITE DEFINITE	HIGH NEGATIVE LOW NEGATIVE	MEDIUM NEGATIVE LOW NEGATIVE	**Decommissioning of the services, roads and buildings:** ▪ The decommissioning and rehabilitation of the site would allow for a different land use on site. The impact will depend on the intended land use and the existing land uses in the surrounding area.	SITE	LONG	HIGHLY PROBABLE	MEDIUM NEUTRAL	MEDIUM NEUTRAL

ENVIRONMENTAL FEATURE(S)	PREDICTED IMPACT CONSTRUCTION PHASE AREA: ± 80 ha	EXTENT	DURATION	PROBABILITY	SIGNIFICANCE (PRE-MITIGATION)	SIGNIFICANCE (POST MITIGATION)	PREDICTED IMPACT OPERATIONAL PHASE AREA: ± 80 ha	EXTENT	DURATION	PROBABILITY	SIGNIFICANCE (PRE-MITIGATION)	SIGNIFICANCE (POST MITIGATION)	PREDICTED IMPACT PHASE: DECOMMISSIONING PHASE AREA: ± 80 ha	EXTENT	DURATION	PROBABILITY	SIGNIFICANCE (PRE-MITIGATION)	SIGNIFICANCE (POST MITIGATION)
NATURAL VEGETATION	**Installation of services, construction of roads and buildings:** ▪ Section 5.7 of this report provides an indication of the vegetation present on site. The site is located in the Rand Highveld Grassland, which has been classified as Endangered in Mucina et. al. (2006) and Vulnerable in the National List of Ecosystems that are threatened and in need of protection (GN 1002 of 2011). The development of the site will impact directly on 80 ha (i.e. 130 ha minus 50 ha public open space area) of Rand Highveld Grassland. ▪ 91.3 % of the site comprises untransformed grassland, with only 1.5% being transformed (Figure 5.13). The natural grasslands on site were classified as being of high conservation importance by De Castro & Brits (2010). In addition, the untransformed habitats within the study area have been ranked as Highly Significant by the Mpumalanga Biodiversity Conservation Plan (MBCP) and are regarded as being in need of 'strict land-use controls'. According to the MBCP land-use guidelines, Highly Significant areas should be maintained as natural vegetation cover and need to be managed for the conservation of biodiversity. The proposed development would result in the loss of most of the natural vegetation cover and would thus not result in the conservation of biodiversity. The development of the site could lead to the potential elevation of adjacent Highly Significant areas to Irreplaceable status. ▪ 7.2 % of the site comprises pans and wetlands of High Sensitivity and Conservation Importance (Figure 5.13). As per Layout Plan No. 2, the pans (Pan 1 and Pan 2) on site and the wetlands (HSW1 and HSW2) adjacent to the site will be excluded from development. ▪ Even though provision was made for a buffer around these pans and wetlands, these sensitive landscapes could be indirectly impacted due to a change in runoff patterns, erosion and possible pollution as a result of the development. In addition, construction workers could impact on the wetland/pan vegetation (e.g. driving vehicles through these areas, dumping waste, etc.) if these areas are not demarcated as a NO-GO AREA. Mitigation measures would have to be implemented. ▪ One plant species classified as Declining (*Crinum cf. macowanii*) and a number of protected and medicinally important plants were noted in the untransformed grassland on site. In addition, there are at least four other species of conservation concern that have a moderate or high likelihood of occurring on site. The construction activities (i.e. removal of vegetation) would impact on these plant species if they are not identified, protected and/or relocated before any construction commences. ▪ The removal of vegetation and use of heavy machinery during the construction phase could lead to dust creation on site and the surrounding area. The dust could impact on the grassland and wetland vegetation as it settles on the leaves, in turn making the vegetation unpalatable to animal life.	REGIONAL REGIONAL LOCAL LOCAL LOCAL	PERMANENT PERMANENT LONG PERMANENT SHORT	DEFINITE DEFINITE HIGHLY PROBABLE HIGHLY PROBABLE PROBABLE	HIGH NEGATIVE HIGH NEGATIVE MEDIUM NEGATIVE HIGH NEGATIVE MEDIUM NEGATIVE	HIGH NEGATIVE HIGH NEGATIVE LOW NEGATIVE LOW NEGATIVE LOW NEGATIVE	**Utilization of services, roads and buildings:** ▪ No further direct impact on vegetation or animal life expected since no further construction activities will take place. ▪ The declining plant species (*Crinum cf. macowanii*) and other protected and medicinally important plants noted on site could be impacted upon if the necessary measures were not implemented to protect/relocate these plants during the construction phase. ▪ Any operational activities (e.g. cattle grazing, human activities, footpaths) that are not restricted to the physical footprint of the development could impact on the areas of high sensitivity (i.e. Pan 1, Pan 2, HSW1 and HSW2) as well as the adjacent Botshabelo Nature Reserve. ▪ The vegetation of the Botshabelo Nature Reserve could be degraded if livestock are kept within the nature reserve and allowed to graze anywhere. ▪ The vegetation of the Botshabelo Nature Reserve could be impacted upon in terms of incorrect fire regimes if the residents accidentally or purposefully set fire to the area. ▪ The collection of firewood by residents could impact on the vegetation within the nature reserve. ▪ Red and Orange data plant species that occur in the Botshabelo Nature Reserve could be impacted upon in terms of the collection and sale of these plants for medicinal purposes. ▪ Alien plants could be introduced into areas disturbed by construction, which are not rehabilitated. If alien plants are utilized in the gardens, they could spread and impact on the surrounding vegetation in terms of the deterioration of primary grassland and reducing biodiversity.	LOCAL SITE LOCAL LOCAL LOCAL LOCAL LOCAL	PERMANENT LONG LONG LONG LONG PERMANENT LONG	DEFINITE HIGHLY PROBABLE HIGHLY PROBABLE HIGHLY PROBABLE HIGHLY PROBABLE HIGHLY PROBABLE PROBABLE	HIGH NEGATIVE HIGH NEGATIVE MEDIUM NEGATIVE MEDIUM NEGATIVE MEDIUM NEGATIVE MEDIUM NEGATIVE MEDIUM NEGATIVE	LOW NEGATIVE LOW NEGATIVE LOW NEGATIVE LOW NEGATIVE LOW NEGATIVE LOW NEGATIVE LOW NEGATIVE	**Decommissioning of the services, roads and buildings:** ▪ During the decommissioning phase, building rubble and any polluted soil will be removed from the site and disposed of accordingly. The said area will then be top soiled, shaped to conform to the original slope of the area and revegetated with indigenous grass species. Over time, the vegetation should revert back to natural grassland if continuous monitoring and rehabilitation takes place.	SITE	LONG	PROBABLE	MEDIUM POSITIVE	MEDIUM POSITIVE

ENVIRONMENTAL FEATURE(S)	PREDICTED IMPACT CONSTRUCTION PHASE AREA: ± 80 ha	EXTENT	DURATION	PROBABILITY	SIGNIFICANCE (PRE-MITIGATION)	SIGNIFICANCE (POST MITIGATION)	PREDICTED IMPACT OPERATIONAL PHASE AREA: ± 80 ha	EXTENT	DURATION	PROBABILITY	SIGNIFICANCE (PRE-MITIGATION)	SIGNIFICANCE (POST MITIGATION)	PREDICTED IMPACT PHASE: DECOMMISSIONING PHASE AREA: ± 80 ha	EXTENT	DURATION	PROBABILITY	SIGNIFICANCE (PRE-MITIGATION)	SIGNIFICANCE (POST MITIGATION)
ANIMAL LIFE	**Installation of services, construction of roads and buildings:** ▪ Section 5.8 of this report provides an indication of the animal life present on site. ▪ The site is indicated as 'Highly Significant' and 'Important and Necessary' in terms of the terrestrial biodiversity assessment of the Mpumalanga Biodiversity Conservation Plan (2006). ▪ The site is also located within a proclaimed nature reserve. ▪ According to Deacon (2012), the said site could potentially provide habitat to 255 different species. ▪ Deacon (2012) identified the two main animal habitats on site as Primary Grassland and Pan Wetland. ▪ 18 Red Data species could possibly occur in the Primary Grassland biotope. ▪ 7 Red Data species (e.g. Giant Bullfrog) could possibly occur in the Pan Wetland biotope. ▪ The Lesser Kestrel and Black Wildebeest were confirmed to occur in the nature reserve. ▪ In total, 7.2 % of the site comprises pans and wetlands of High Sensitivity and Conservation Importance (Figure 5.13). As per Layout Plan No. 2, the pans (Pan 1 and Pan 2) on site and the wetlands (HSW1 and HSW2) adjacent to the site will be excluded from development. Other areas (e.g. 50 m buffer zone, fire break, etc.) were also excluded from development (Figure 6.6). The proposed development will thus not have a direct impact on the Pan Wetland habitat type and associated animal life. ▪ The development of the site will however, directly impact on 80ha (i.e. 130 ha minus 50 ha public open space area) of Primary Grassland habitat. During construction, the more mobile faunal species (e.g. birds and large mammals) will be driven out of the area. Smaller fauna (e.g. reptiles, moles, arachnids, etc.) will most probably be destroyed when the vegetation layer is removed. In addition, 80 ha of the Primary Grassland biotope will no longer be available for grazing purposes, shelter, etc. ▪ The Giant Bullfrog (Protected Species) was noted in the Pan Wetland biotope located on site. Due to its habitat restrictions and lack of mobility, the Giant Bullfrog is especially vulnerable when areas are being developed. These frogs also aestivate underground relatively far away from the pan area. Construction activities in the Primary Grassland biotope could thus have a direct impact on the Giant bullfrog if construction takes place during the winter months when they are aestivating underground. ▪ Noise, dust and human activity at the construction site could also have an indirect impact on faunal species utilizing the portions of the nature reserve close to the construction site. The nature reserve is however, 2 300 ha in extent. ▪ In addition, construction workers could impact (e.g. driving vehicles through these areas, dumping waste, etc.) on Pan 1, Pan 2, HSW1 and HSW2 and the associated animal life if these areas are not demarcated as No-Go Areas. Mitigation measures would have to be implemented.	SITE LOCAL SITE SITE LOCAL SHORT SITE SHORT HIGHLY PROBABLE MEDIUM NEGATIVE LOW NEGATIVE	SHORT HIGHLY PROBABLE LOW NEGATIVE LOW NEGATIVE	PERMANENT DEFINITE LONG HIGHLY PROBABLE HIGH NEGATIVE MEDIUM NEGATIVE	MEDIUM NEGATIVE MEDIUM NEGATIVE	**Utilization of services, roads and buildings:** ▪ No further direct impact on animal life since no further construction will take place. ▪ Residents could impact on Pan 1, Pan 2, HSW1 and HSW2 and the associated animal life (through the dumping of waste, driving, footpaths, etc.) if these areas are not demarcated as No-Go Areas. Mitigation measures would have to be implemented. ▪ Any operational activities (e.g. cattle grazing, human activities, footpaths) that are not restricted to the physical footprint of the development could impact on the areas of high sensitivity (i.e. Pan 1, Pan 2, HSW1 and HSW2, Botshabelo Nature Reserve) and the associated animal life. ▪ Fauna could be indirectly impacted upon if proper waste management measures (e.g. rubbish bins, fenced waste storage facility, etc.) are not implemented at the development. Animals could ingest waste (windblown litter), get trapped (e.g. pipes, barb wire, etc.) or injured (e.g. wire, nails, etc.). ▪ Alien invading vegetation: Spread of exotic plant species will reduce the area covered by primary grassland, deteriorate the natural environment and reduce biodiversity and animal habitat. ▪ The introduction of livestock (e.g. cattle) into the Botshabelo Nature Reserve could lead to an outbreak of disease amongst the wildlife. ▪ Livestock within the Botshabelo Nature Reserve will reduce the carrying capacity of the reserve, which could lead to overgrazing and a resultant negative impact on the wildlife. ▪ Trampling of fauna on the roads by cars driving through the area, especially slow moving animals (tortoise and hedgehog). Owls and small mammals are night blinded by lights (mongoose and wild cat species).	SITE LOCAL LOCAL LOCAL LOCAL LOCAL LOCAL LOCAL LOCAL LOCAL LOCAL	LONG LONG LONG LONG LONG LONG LONG LONG LONG LONG LONG	HIGHLY PROBABLE HIGHLY PROBABLE HIGHLY PROBABLE PROBABLE PROBABLE PROBABLE PROBABLE PROBABLE PROBABLE PROBABLE PROBABLE	MEDIUM NEGATIVE MEDIUM NEGATIVE MEDIUM NEGATIVE MEDIUM NEGATIVE MEDIUM NEGATIVE MEDIUM NEGATIVE MEDIUM NEGATIVE MEDIUM NEGATIVE MEDIUM NEGATIVE MEDIUM NEGATIVE MEDIUM NEGATIVE	LOW NEGATIVE LOW NEGATIVE LOW NEGATIVE LOW NEGATIVE LOW NEGATIVE LOW NEGATIVE LOW NEGATIVE LOW NEGATIVE LOW NEGATIVE LOW NEGATIVE LOW NEGATIVE	**Decommissioning of the services, roads and buildings:** ▪ During the decommissioning phase, building rubble and any polluted soil will be removed from the site and disposed of accordingly. The said area will then be top soiled, shaped to conform to the original slope of the area and revegetated with indigenous grass species. Over time, the vegetation should revert back to natural grassland if continuous monitoring and rehabilitation takes place. Animal habitat will thus be created and various faunal species should move back into the area.	SITE	LONG	PROBABLE	MEDIUM POSITIVE	MEDIUM POSITIVE

ENVIRONMENTAL FEATURE(S)	PREDICTED IMPACT CONSTRUCTION PHASE AREA: ± 80 ha	EXTENT	DURATION	PROBABILITY	SIGNIFICANCE (PRE-MITIGATION)	SIGNIFICANCE (POST MITIGATION)	PREDICTED IMPACT OPERATIONAL PHASE AREA: ± 80 ha	EXTENT	DURATION	PROBABILITY	SIGNIFICANCE (PRE-MITIGATION)	SIGNIFICANCE (POST MITIGATION)	PREDICTED IMPACT PHASE: DECOMMISSIONING PHASE AREA: ± 80 ha	EXTENT	DURATION	PROBABILITY	SIGNIFICANCE (PRE-MITIGATION)	SIGNIFICANCE (POST MITIGATION)
ANIMAL LIFE	▪ Construction workers may poach/hunt animals in the nature reserve or collect slow moving animals (e.g. hedgehog, tortoise, birds eggs) as pets or for food.	LOCAL	SHORT	HIGHLY PROBABLE	MEDIUM NEGATIVE	LOW NEGATIVE	▪ Birds (e.g. bustards, storks, cranes and various species of water birds) could get killed through collision and electrocution as a result of powerlines near the pans and wetlands.	LOCAL	LONG	PROBABLE	MEDIUM NEGATIVE	LOW NEGATIVE						
	▪ Fauna utilizing the Pan Wetland biotope (e.g. frogs) could be indirectly impacted upon in terms of animal trapping, road kill, noise and dust.	SITE	SHORT	HIGHLY PROBABLE	MEDIUM NEGATIVE	LOW NEGATIVE	▪ Residents may poach/hunt animals in the nature reserve or collect slow moving animals (e.g. hedgehog, tortoise, birds eggs) as pets or for food.	LOCAL	LONG	HIGHLY PROBABLE	MEDIUM NEGATIVE	LOW NEGATIVE						
	▪ Dust from the construction activities may affect the health and longevity, and ultimately the breeding success of the amphibian population utilizing the Pan Wetland biotope.	SITE	SHORT	PROBABLE	MEDIUM NEGATIVE	LOW NEGATIVE	▪ Snaring and poisoning of predators (mongoose and wild cat species) and snakes due to misinformation.	LOCAL	LONG	HIGHLY PROBABLE	MEDIUM NEGATIVE	MEDIUM NEGATIVE						
	▪ Fauna could also be indirectly impacted upon if proper waste management measures are not implemented at the construction site. Animals could ingest waste, get trapped (e.g. pipes, barb wire, etc.) or injured (e.g. wire, nails, etc.).	LOCAL	LONG	PROBABLE	MEDIUM NEGATIVE	LOW NEGATIVE	▪ Giant Bullfrog: Persecution and road kills. Presence of humans and noise (especially during breeding season). Water and habitat quality deterioration. Collection as pets or food sources by locals.	SITE	LONG	HIGHLY PROBABLE	HIGH NEGATIVE	LOW NEGATIVE						
							▪ Increased runoff from the development and deterioration of the water quality in Pan 1, Pan 2, HSW1 and HSW2 will influence the breeding and survival of tadpoles and thus the frog populations.	SITE	LONG	PROBABLE	MEDIUM NEGATIVE	LOW NEGATIVE						
							▪ Dust from the vehicles travelling on the village roads may affect the health and longevity, and ultimately the breeding success of the amphibian population utilizing the Pan Wetland biotope.	SITE	LONG	PROBABLE	MEDIUM NEGATIVE	LOW NEGATIVE						
							▪ Changes in lighting in an area (e.g. use of high mast lights) can significantly affect some species' behavioral and biological rhythms, which are guided by natural cycles of light and dark. Nocturnal species, particularly birds, can become disoriented by night-time lighting.	SITE	LONG	PROBABLE	MEDIUM NEGATIVE	LOW NEGATIVE						
							▪ Some ecosystems, especially grasslands are changed significantly by inappropriate fire regimes. The Primary Grassland biotope and associated animal species could thus be impacted upon by the continuous accidental/purposeful setting of fires.	LOCAL	LONG	PROBABLE	MEDIUM NEGATIVE	LOW NEGATIVE						

ENVIRONMENTAL FEATURE(S)	PREDICTED IMPACT CONSTRUCTION PHASE AREA: ± 80 ha	EXTENT	DURATION	PROBABILITY	SIGNIFICANCE (PRE-MITIGATION)	SIGNIFICANCE (POST MITIGATION)	PREDICTED IMPACT OPERATIONAL PHASE AREA: ± 80 ha	EXTENT	DURATION	PROBABILITY	SIGNIFICANCE (PRE-MITIGATION)	SIGNIFICANCE (POST MITIGATION)	PREDICTED IMPACT PHASE: DECOMMISSIONING PHASE AREA: ± 80 ha	EXTENT	DURATION	PROBABILITY	SIGNIFICANCE (PRE-MITIGATION)	SIGNIFICANCE (POST MITIGATION)
SENSITIVE LANDSCAPES	The sensitive landscapes on site and in the surrounding area include the surface water environments (pans: Pan 1 and Pan 2 and wetlands: HSW1 and HSW2), vegetation, animal life and the site of archaeological/cultural interest (Botshabelo Historical Village). Please refer to these sections in the impact assessment for a detailed description of the potential impacts identified. It should be noted that the two pans located on site (Pan 1 and Pan 2) as well as the adjacent hillslope seepage wetlands (HSW1 and HSW2) were excluded from development. These sensitive environments and the 50 m buffer zone around the pans and wetlands will thus not be directly impacted upon by the proposed development.																	
SURFACE WATER	**Installation of services, construction of roads and buildings:** ▪ The proposed site is located in the Olifants River catchment, more specifically the B12E quaternary sub-catchment. No rivers, streams or dams are located on site. ▪ However, two pans (Pan 1 and Pan 2) extend across the eastern and western boundaries of the site (Figure 5.19). The pan/depression wetlands cover 7.11 ha on site and 20.77 ha in total. Surface water from the central and northern portions of the site (including Pan 2) flows towards Pan 1. ▪ Two hillslope seepage wetlands (HSW1 and HSW2) were identified by Wetland Consulting Services (Pty) Ltd., covering an area of 2.39 ha on site and 72.52 ha off site (Figure 5.19). HSW 1 is located north west of the site and HSW2 is located south of the site. Surface water runoff from the southern portion of the site would be towards HSW2, whilst surface water from the central and northern portions of the site would be towards Pan 1 and HSW1. ▪ Wetland Consulting Services (Pty) Ltd. (2011) indicated that all the wetlands in the study area are considered of Moderate importance and sensitivity (i.e. C rating), except for the southern hillslope seepage wetland (HSW2; Figure 5.19) which, due to its larger size and greater levels of saturation, is considered to be of High importance and sensitivity (i.e. B rating). ▪ **In total, 7.2 % of the site comprises pans and wetlands of High Sensitivity and Conservation Importance (Figure 5.13). As per Layout Plan No. 2, the pans (Pan 1 and Pan 2) on site and the wetlands (HSW1 and HSW2) adjacent to the site as well as a 50 m buffer zone will be excluded from development. The proposed development will thus not have a direct impact on these surface water environments.** ▪ Due to the slope of the site in a southerly, westerly and northwesterly direction, Pan 2 should not be directly impacted upon since no drainage is expected from the construction site towards the pan.						**Utilization of services, roads and buildings:** ▪ In total, 7.2 % of the site comprises pans and wetlands of High Sensitivity and Conservation Importance (Figure 5.13). As per Layout Plan No. 2, the pans (Pan 1 and Pan 2) on site and the wetlands (HSW1 and HSW2) adjacent to the site as well as a 50 m buffer zone will be excluded from development. The proposed development will thus not have a direct impact on these surface water environments. ▪ Due to the slope of the site in a southerly, westerly and northwesterly direction, Pan 2 should not be directly impacted upon since no drainage is expected from the development site towards the pan. ▪ During the operational phase, increased yields could be expected due to increased paved areas and buildings, which would facilitate increased run-off quantities due to quicker run-off and less infiltration into the soil. This could lead to soil erosion if proper storm water control measures are not implemented, which could eventually impact on Pan 1, HSW1 and HSW2 as well as the downstream surface water environments (e.g. tributary of the Klein Olifants River). ▪ Although the 50 m buffer zone is expected to limit a number of impacts on the wetlands and pans (e.g. erosion control and protection of biodiversity), Wetland Consulting Services (Pty) Ltd. (2011) is of the opinion that it is *unlikely to compensate for the loss of storage capacity within the catchment soils and a shift in the balance of flows in the catchment from diffuse, subsurface drainage to surface runoff.* In light of this, it cannot be guaranteed that the inclusion of a buffer zone will completely prevent a change in the hydrology and condition of the wetlands.	LOCAL LOCAL	LONG LONG	HIGHLY PROBABLE HIGHLY PROBABLE	MEDIUM NEGATIVE MEDIUM NEGATIVE	LOW NEGATIVE MEDIUM NEGATIVE	**Decommissioning of the services, roads and buildings:** ▪ During the decommissioning phase, building rubble and any polluted soil will be removed from the site and disposed of accordingly. The said area will then be rehabilitated in order to establish a vegetation cover and prevent soil erosion. This would result in clean runoff from the site entering the pan (Pan 1) and wetlands (HSW1, HSW2) and eventually the tributaries of the Klein Olifants River. It would thus have a positive impact on surface water. ▪ Drainage to Pan 1, HSW1 and HSW2 would be repaired, which would lead to a decrease in surface water runoff velocity and a smaller risk of soil erosion and sedimentation of these surface water environments.	LOCAL SITE	LONG LONG	HIGHLY PROBABLE PROBABLE	LOW POSITIVE LOW POSITIVE	MEDIUM POSITIVE MEDIUM POSITIVE

ENVIRONMENTAL FEATURE(S)	PREDICTED IMPACT CONSTRUCTION PHASE AREA: ± 80 ha	EXTENT	DURATION	PROBABILITY	SIGNIFICANCE (PRE-MITIGATION)	SIGNIFICANCE (POST MITIGATION)	PREDICTED IMPACT OPERATIONAL PHASE AREA: ± 80 ha	EXTENT	DURATION	PROBABILITY	SIGNIFICANCE (PRE-MITIGATION)	SIGNIFICANCE (POST MITIGATION)	PREDICTED IMPACT PHASE: DECOMMISSIONING PHASE AREA: ± 80 ha	EXTENT	DURATION	PROBABILITY	SIGNIFICANCE (PRE-MITIGATION)	SIGNIFICANCE (POST MITIGATION)
SURFACE WATER	▪ In general, the removal of the vegetation and the earthworks required during the construction phase over an area of ± 80 ha would result in changed runoff patterns, which could result in erosion of the pans and wetlands if proper storm water control measures are not implemented. Construction activities in the southern portion of the site could thus indirectly impact on HSW2. Construction activities in the central and northern portions of the site could thus indirectly impact on Pan 1 and HSW1.	SITE	LONG	HIGHLY PROBABLE	MEDIUM NEGATIVE	LOW NEGATIVE	▪ It is expected that diffuse flows will be concentrated into confined flows, which will be discharged as point discharges into the surrounding area and possibly Pan 1 and HSW2. This may lead to extensive erosion at the points of discharge. Mitigation measures would have to be implemented.	SITE	LONG	HIGHLY PROBABLE	MEDIUM NEGATIVE	LOW NEGATIVE						
	▪ Pan 1, HSW1 and HSW2 could also be impacted upon through sedimentation caused by erosion from the cleared areas.	SITE	LONG	PROBABLE	MEDIUM NEGATIVE	LOW NEGATIVE	▪ Alterations to water quality (eutrophication, increased salinity and increased acidity), through effluents, storm water runoff and seepage. ▪ The water quality of Pan 1, HSW1 and HSW2 could be impacted upon by run-off water containing contaminants such as hydrocarbons, nutrients, sediment, litter, etc. collected in the urban area. Indirect pollution of surface water could also take place if the sewage infrastructure (biological toilets) is not maintained on a regular basis and proper waste management measures are not implemented. ▪ The quality of surface water generally declines following urbanization, which could impact on downstream users (tributaries of Klein Olifants River).	LOCAL	LONG	PROBABLE	MEDIUM NEGATIVE	LOW NEGATIVE						
	▪ Surface water from the southern portion of the site flows towards HSW2, whilst surface water from the central and northern portions of the site flows towards Pan 1 and HSW1. During construction, surface water flow and runoff patterns will be altered, which could lead to hydrological changes within the pan/wetland system (i.e. Pan 1, HSW1 and HSW2) as well as changes in vegetation composition and associated animal habitat (i.e. wetland habitat deterioration). ▪ Although the 50 m buffer zone is expected to limit a number of impacts on the wetlands and pans (e.g. erosion control and protection of biodiversity), Wetland Consulting Services (Pty) Ltd. (2011) is of the opinion that it is *unlikely to compensate for the loss of storage capacity within the catchment soils and a shift in the balance of flows in the catchment from diffuse, subsurface drainage to surface runoff*. In light of this, it cannot be guaranteed that the inclusion of a buffer zone will completely prevent a change in the hydrology and condition of the wetlands.	LOCAL	LONG	HIGHLY PROBABLE	MEDIUM NEGATIVE	MEDIUM NEGATIVE											
	▪ Construction workers could impact on the wetland/pan vegetation (e.g. driving vehicles through these areas, dumping waste, etc.) if these areas are not demarcated as a NO-GO AREA. Mitigation measures would have to be implemented.	LOCAL	SHORT	HIGHLY PROBABLE	MEDIUM NEGATIVE	LOW NEGATIVE											
	▪ During the construction phase, boreholes will need to be drilled to provide the development with water. One of the potential drill sites is located within Pan 2. Pan 2 could thus be directly impacted should the borehole be drilled in this location.	SITE	SHORT	PROBABLE	MEDIUM NEGATIVE	LOW NEGATIVE											

ENVIRONMENTAL FEATURE(S)	PREDICTED IMPACT CONSTRUCTION PHASE AREA: ± 80 ha	EXTENT	DURATION	PROBABILITY	SIGNIFICANCE (PRE-MITIGATION)	SIGNIFICANCE (POST MITIGATION)	PREDICTED IMPACT OPERATIONAL PHASE AREA: ± 80 ha	EXTENT	DURATION	PROBABILITY	SIGNIFICANCE (PRE-MITIGATION)	SIGNIFICANCE (POST MITIGATION)	PREDICTED IMPACT PHASE: DECOMMISSIONING PHASE AREA: ± 80 ha	EXTENT	DURATION	PROBABILITY	SIGNIFICANCE (PRE-MITIGATION)	SIGNIFICANCE (POST MITIGATION)
GROUNDWATER	**Installation of services, construction of roads and buildings:** ▪ In total, 7.2 % of the site comprises pans and wetlands of High Sensitivity and Conservation Importance (Figure 5.13). As per Layout Plan No. 2, the pans (Pan 1 and Pan 2) on site and the wetlands (HSW1 and HSW2) adjacent to the site as well as a 50 m buffer zone will be excluded from development. The proposed development will thus not have a direct impact on the groundwater associated with these sensitive environments. ▪ The pans and wetlands also correspond with Geotechnical Zone 2D, which was recommended by Engeolab 2011b for No Development. Any development within this zone would impact on the groundwater of the site as well as on the buildings constructed. As per the current layout plan, no buildings will be constructed within Zone 2D. ▪ The geotechnical investigation (Engeolab 2011b) identified that Geotechnical Zone 2B (Figure 5.6) may support a perched water table during the rainy season due to underlying ferricrete (Figure 5.6 – Zone 2B). These areas fall outside of the delineated wetlands since the extent and duration of saturation is not sufficient to influence the vegetation or result in active redoxymorphic features (i.e. mottling). However, a perched water table is expected during the rainy season. 8 residential stands are located in Zone 2B. The houses, services and roads could be impacted upon if mitigation measures (i.e. sub-surface drainage) were not implemented. ▪ During the construction phase, boreholes will need to be drilled to provide the development with water. One of the potential drill sites is located within Pan 2. Pan 2 and its associated groundwater could thus be directly impacted should the borehole be drilled in this location.	SITE ... SITE	LONG ... SHORT	PROBABLE ... PROBABLE	MEDIUM NEGATIVE ... MEDIUM NEGATIVE	LOW NEGATIVE ... LOW NEGATIVE	**Utilization of services, roads and buildings:** ▪ Water for the proposed development will be obtained from boreholes. Groundwater will thus be abstracted. The development could thus directly impact on the groundwater levels of the area (and downstream users) if water is not abstracted sustainably. ▪ The residents could be impacted if the boreholes do not provide sufficient water or dry up. ▪ The buildings will continue to be impacted upon if the recommendations in the geotechnical report were not implemented during the construction phase (i.e. no development in Zone 2D and sub-surface drains for Zone 2B). ▪ Groundwater could be indirectly impacted upon if proper sanitation facilities and waste management measures are not put in place and maintained.	LOCAL SITE SITE LOCAL	LONG LONG LONG LONG	HIGHLY PROBABLE HIGHLY PROBABLE PROBABLE PROBABLE	MEDIUM NEGATIVE HIGH NEGATIVE MEDIUM NEGATIVE MEDIUM NEGATIVE	LOW NEGATIVE LOW NEGATIVE LOW NEGATIVE LOW NEGATIVE	**Decommissioning of the services, roads and buildings:** ▪ During the decommissioning phase, building rubble and any polluted soil will be removed from the site and disposed of accordingly. The said area will then be rehabilitated in order to establish a vegetation cover and prevent soil erosion. This would result in clean runoff from the site entering the pan (Pan 1) and wetlands (HSW1, HSW2) and eventually the tributaries of the Klein Olifants River. It would thus have a positive impact on groundwater associated with these systems. ▪ Groundwater would no longer be abstracted for the proposed development, which would have a positive impact on groundwater yields and downstream users.	LOCAL LOCAL	LONG LONG	HIGHLY PROBABLE HIGHLY PROBABLE	LOW POSITIVE MEDIUM POSITIVE	MEDIUM POSITIVE MEDIUM POSITIVE
SITES OF ARCHAEOLOGICAL/ CULTURAL INTEREST	**Installation of services, construction of roads and buildings:** ▪ According to Dr. J. Pistorius (2011), the Phase 1 Heritage Impact Assessment revealed **no** types and ranges of heritage resources as outlined in Section 3 of the National Heritage Resources Act (No. 25 of 1999) on the development site (i.e. 130 ha). No heritage resources of significance were observed. The construction activities will thus have no direct impact on any sites of archaeological/cultural importance. ▪ However, the Botshabelo Historical Village/Mission Station and Fort Merensky could indirectly be impacted upon if building material is scavenged from the existing infrastructure, or if the construction workers unlawfully access these sites.	LOCAL	LONG	PROBABLE	HIGH NEGATIVE	LOW NEGATIVE	**Utilization of services, roads and buildings:** ▪ According to Dr. J. Pistorius (2011), the Phase 1 Heritage Impact Assessment revealed **no** types and ranges of heritage resources as outlined in Section 3 of the National Heritage Resources Act (No. 25 of 1999) on the development site (i.e. 130 ha). No heritage resources of significance were observed. The operational activities will thus have no direct impact on any sites or archaeological/cultural importance. ▪ However, the Botshabelo Historical Village/Mission Station and Fort Merensky could indirectly be impacted upon if residents unlawfully access/vandalize these sites.	LOCAL	LONG	PROBABLE	HIGH NEGATIVE	LOW NEGATIVE	**Decommissioning of the services, roads and buildings:** ▪ None, since no heritage resources are present on site.					

ENVIRONMENTAL FEATURE(S)	PREDICTED IMPACT CONSTRUCTION PHASE AREA: ± 80 ha	EXTENT	DURATION	PROBABILITY	SIGNIFICANCE (PRE-MITIGATION)	SIGNIFICANCE (POST MITIGATION)	PREDICTED IMPACT OPERATIONAL PHASE AREA: ± 80 ha	EXTENT	DURATION	PROBABILITY	SIGNIFICANCE (PRE-MITIGATION)	SIGNIFICANCE (POST MITIGATION)	PREDICTED IMPACT PHASE: DECOMMISSIONING PHASE AREA: ± 80 ha	EXTENT	DURATION	PROBABILITY	SIGNIFICANCE (PRE-MITIGATION)	SIGNIFICANCE (POST MITIGATION)
AIR QUALITY	**Installation of services, construction of roads and buildings:** ▪ The construction activities could impact on the air quality of the site in terms of dust and vehicle emissions. The extent of the impact would depend on the portion of the site being developed, the extent of vegetation removal, the wind direction, season and other environmental factors. ▪ No homesteads are however, located close enough to the said site to be impacted. ▪ Dust generation is unlikely to impact on the N11 national road due to the distance from the site. ▪ The Middelburg Aeroclub may be impacted depending on the portion of the site being developed, the extent of vegetation removal, the wind direction, season and other environmental factors. Dust generation could impact on visibility during the landing and take off of planes, which could result in accidents. Mitigation measures would have to be implemented.	SITE SITE	SHORT SHORT	PROBABLE PROBABLE	MEDIUM NEGATIVE MEDIUM NEGATIVE	LOW NEGATIVE LOW NEGATIVE	**Utilization of services, roads and buildings:** ▪ During the operational phase, no impact on the air quality is anticipated due to the residential development being supplied with electricity. In addition, no noxious (scheduled processes) industries would be permitted on the two business/special stands. ▪ However, the air quality could be impacted if the development is not supplied with electricity and the residents have to utilize coal/wood fires for cooking and heating purposes. ▪ The air quality of the surrounding area could be impacted upon in terms of smell if the biological toilets do not have sufficient capacity and are not maintained. ▪ The air quality could be impacted upon if waste removal does not take place and the temporary waste storage area is not kept clean. ▪ The Middelburg Aeroclub may be impacted in terms of dust generation (gravel roads) and coal fires. This could impact on visibility during the landing and take off of planes, which could result in accidents. Mitigation measures would have to be implemented.	LOCAL SITE LOCAL	LONG LONG LONG	PROBABLE HIGHLY PROBABLE HIGHLY PROBABLE	MEDIUM NEGATIVE MEDIUM NEGATIVE MEDIUM NEGATIVE	LOW NEGATIVE LOW NEGATIVE LOW NEGATIVE	**Decommissioning of the services, roads and buildings:** ▪ Dust generation and vehicle emissions due to decommissioning activities and use of heavy machinery could impact on site workers and surrounding environment. The extent of the impact would depend on the time of year, wind direction and velocity. ▪ Once rehabilitated, the impact on air quality is expected to be positive in terms of dust generation, coal fires, etc.	SITE LOCAL	SHORT LONG	PROBABLE PROBABLE	MEDIUM NEGATIVE MEDIUM POSITIVE	LOW NEGATIVE MEDIUM POSITIVE
VISUAL	**Installation of services, construction of roads and buildings:** ▪ The topography of the proposed site is relatively flat. The site is visible from the Middelburg Aeroclub property, the gravel road along the northern boundary of the site as well as the immediate surrounding area (i.e. part of nature reserve). The construction activities would thus be highly visible from these areas. It would thus be very important to keep the construction area neat and tidy at all times. ▪ The site is not visible from the southern and western portions of the nature reserve or from the Historical Village (located behind the ridge), Fort Merensky or the N11 national road.	SITE	SHORT	DEFINITE	LOW NEGATIVE	LOW NEGATIVE	**Utilization of services, roads and buildings:** ▪ The site is visible from the Middelburg Aeroclub property, the gravel road along the northern boundary of the site as well as the immediate surrounding area (i.e. part of nature reserve). The development would thus be highly visible from these areas. It would thus be very important to keep the development neat and tidy at all times and well maintained. ▪ The presence of high mast lights and buildings will degrade the character of the Botshabelo Nature Reserve, specifically the northeastern portion of the reserve.	SITE SITE	LONG LONG	DEFINITE HIGHLY PROBABLE	MEDIUM NEGATIVE MEDIUM NEGATIVE	LOW NEGATIVE LOW NEGATIVE	**Decommissioning of the services, roads and buildings:** ▪ During the decommissioning phase, building rubble and any polluted soil will be removed from the site and disposed of accordingly. The said area will then be top soiled, shaped to conform to the original slope of the area and revegetated with indigenous grass species. Over time, the vegetation should revert back to natural grassland if continuous monitoring and rehabilitation takes place. If the site is rehabilitated properly it could have a positive impact in terms of visual aspects.	SITE	LONG	PROBABLE	LOW POSITIVE	MEDIUM POSITIVE

ENVIRONMENTAL FEATURE(S)	PREDICTED IMPACT CONSTRUCTION PHASE AREA: ± 80 ha	EXTENT	DURATION	PROBABILITY	SIGNIFICANCE (PRE-MITIGATION)	SIGNIFICANCE (POST MITIGATION)	PREDICTED IMPACT OPERATIONAL PHASE AREA: ± 80 ha	EXTENT	DURATION	PROBABILITY	SIGNIFICANCE (PRE-MITIGATION)	SIGNIFICANCE (POST MITIGATION)	PREDICTED IMPACT PHASE: DECOMMISSIONING PHASE AREA: ± 80 ha	EXTENT	DURATION	PROBABILITY	SIGNIFICANCE (PRE-MITIGATION)	SIGNIFICANCE (POST MITIGATION)
NOISE	**Installation of services, construction of roads and buildings:** ▪ In general, the area is relatively quiet since it is located within a rural area and nature reserve. The major contributing factor to the ambient noise in the area would be as a result of activities at the Middelburg Aeroclub, planes flying overhead, nearby agricultural activities and vehicles using the gravel road. ▪ No homesteads are located close enough to the said site to be impacted by noise generated as a result of the construction activities. ▪ The use of heavy machinery during the construction phase could result in an increase in ambient noise levels, which could impact on the local wildlife, workers on site and the adjacent Middelburg Aeroclub. Visitors to the Botshabelo Nature Reserve could also be impacted depending on where they are within the reserve. Construction activities should be limited to daylight hours and noise should be kept as low as possible.	SITE	SHORT	HIGHLY PROBABLE	MEDIUM NEGATIVE	LOW NEGATIVE	**Utilization of services, roads and buildings:** ▪ Noise generation would be due to noise associated with residential activities and increased traffic. Since the site is located within a nature reserve, visitors to the Botshabelo Nature Reserve could be impacted depending on where they are in the reserve. ▪ No homesteads are located close enough to the said site to be impacted by noise generated at the new development.	SITE	LONG	HIGHLY PROBABLE	MEDIUM NEGATIVE	LOW NEGATIVE	**Decommissioning of the services, roads and buildings:** ▪ In general, the use of heavy machinery for decommissioning activities would impact on the surrounding area in terms of noise. ▪ Once rehabilitated, the impact on the ambient noise level is expected to be positive.	SITE SITE	SHORT LONG	PROBABLE PROBABLE	MEDIUM NEGATIVE MEDIUM POSITIVE	LOW NEGATIVE MEDIUM POSITIVE
TRAFFIC	**Installation of services, construction of roads and buildings:** ▪ Access to the proposed development will be obtained from the existing gravel road located on the northern boundary of the Botshabelo Nature Reserve. This road connects to the N11 national road and provides access to the farms located north and northwest of the proposed site. ▪ In general, the construction of buildings and roads and installation of infrastructure would not directly impact on the traffic utilizing the N11 or the gravel road since all activities will be limited to the said site. ▪ The delivery of building material during the construction period could however, lead to a slight increase in traffic along these roads. The deliveries would however, not occur on a continuous basis. ▪ During the construction phase, heavy vehicles will utilize the gravel road for the delivery of building material. Depending on the frequency of deliveries, the heavy vehicles could impact on the condition of the gravel road and therefore on the surrounding landowners utilizing this road. ▪ The connection of the site access road to this gravel road could impact on the landowners utilizing this road.	LOCAL SITE SITE	SHORT SHORT SHORT	IMPROBABLE PROBABLE PROBABLE	LOW NEGATIVE MEDIUM NEGATIVE LOW NEGATIVE	LOW NEGATIVE LOW NEGATIVE LOW NEGATIVE	**Utilization of services, roads and buildings:** ▪ The operational activities would result in an increased trip generation as illustrated in Section 5.16 of this report. Proper intersections (e.g. N4/gravel road) as recommended by SANRAL and WSP (2012) would have to be constructed to cater for the additional traffic. If this is not done, it could lead to an increased risk in accidents and could impact on the general road user. ▪ The surrounding landowners could also be impacted upon during the operational phase if the gravel road is not maintained. ▪ The utilization of the road network within the proposed development could impact on the residents if the road surface and intersections are not maintained. ▪ The residents and surrounding landowners could be impacted upon if storm water pipes are not installed along the access road as recommended by WSP (2012). ▪ Possible conflict between existing road users and the new road users using the existing gravel road.	LOCAL SITE SITE SITE SITE	LONG LONG LONG LONG SHORT	HIGHLY PROBABLE PROBABLE PROBABLE PROBABLE PROBABLE	MEDIUM NEGATIVE MEDIUM NEGATIVE LOW NEGATIVE MEDIUM NEGATIVE LOW NEGATIVE	LOW NEGATIVE LOW NEGATIVE LOW NEGATIVE LOW NEGATIVE LOW NEGATIVE	**Decommissioning of the services, roads and buildings:** ▪ In general, the decommissioning of services, roads and buildings would not directly impact on the traffic utilizing the N11 or the gravel road since all activities will be limited to the said site. ▪ However, building rubble and other waste would have to be removed from site. This could lead to a slight increase in traffic on the road network. ▪ Impact on traffic after decommissioning would however, depend on the intended end land use.	SITE	SHORT	PROBABLE	LOW NEGATIVE	LOW NEGATIVE

ENVIRONMENTAL FEATURE(S)	PREDICTED IMPACT CONSTRUCTION PHASE AREA: ± 80 ha	EXTENT	DURATION	PROBABILITY	SIGNIFICANCE (PRE-MITIGATION)	SIGNIFICANCE (POST MITIGATION)	PREDICTED IMPACT OPERATIONAL PHASE AREA: ± 80 ha	EXTENT	DURATION	PROBABILITY	SIGNIFICANCE (PRE-MITIGATION)	SIGNIFICANCE (POST MITIGATION)	PREDICTED IMPACT PHASE: DECOMMISSIONING PHASE AREA: ± 80 ha	EXTENT	DURATION	PROBABILITY	SIGNIFICANCE (PRE-MITIGATION)	SIGNIFICANCE (POST MITIGATION)
SENSE OF PLACE	**Installation of services, construction of roads and buildings:** ▪ The said site is located approximately 9 km north of Middelburg in a rural area. No existing services are available. ▪ In addition, the site is located within the proclaimed Botshabelo Nature Reserve. ▪ The Middelburg Aeroclub is present on the eastern boundary of the site. ▪ The proposed development will thus have a direct impact on the sense of place of the area.	LOCAL	LONG	DEFINITE	HIGH NEGATIVE	MEDIUM NEGATIVE	**Utilization of services, roads and buildings:** ▪ The said site is located approximately 9 km north of Middelburg in a rural area. No existing services are available. ▪ In addition, the site is located within the proclaimed Botshabelo Nature Reserve. ▪ The Middelburg Aeroclub is present on the eastern boundary of the site. ▪ The proposed development will thus continue to have a direct impact on the sense of place of the area.	LOCAL	LONG	DEFINITE	HIGH NEGATIVE	MEDIUM NEGATIVE	**Decommissioning of the services, roads and buildings:** ▪ The impact of the decommissioning of the development on sense of place will depend on the character of the area at that time as well as the intended end land use.					
INTERESTED AND AFFECTED PARTIES	**Installation of services, construction of roads and buildings:** ▪ More people in the area during the construction phase could lead to increased theft and burglaries in the area, including theft of fences, livestock and crop on the adjacent farms. This would have a financial impact on the farmer. ▪ In addition, the surrounding landowners could be impacted upon if building material for temporary dwellings is sourced from adjacent farms (e.g. fences, corrugated iron, droppers, etc.)	LOCAL	SHORT	HIGHLY PROBABLE	MEDIUM NEGATIVE	LOW NEGATIVE	▪ Very few employment opportunities will be created if adequate funding for identified projects cannot be sourced. This could lead to a rise in the unemployment level in the area, which could lead to crime, safety risks to the surrounding community and a decrease in property value.	LOCAL	LONG	HIGHLY PROBABLE	MEDIUM NEGATIVE	LOW NEGATIVE	**Decommissioning of the services, roads and buildings:** ▪ The impact of the decommissioning of the development in terms of interested and affected parties will depend on the character of the area at that time as well as the intended end land use.					
	▪ Dust as a result of the construction activities could impact on the adjacent agricultural crops, which could have a financial impact on the farmer.	SITE	SHORT	PROBABLE	MEDIUM NEGATIVE	LOW NEGATIVE	▪ Dust as a result of the residents travelling on the gravel access road and gravel roads within the village could impact on the adjacent agricultural crops, which could have a financial impact on the farmer.	SITE	SHORT	PROBABLE	MEDIUM NEGATIVE	LOW NEGATIVE						
	▪ The Middelburg Aeroclub could be impacted upon in terms of safety and security (e.g. people crossing the runway, animals on runway, vandalism, etc.) if mitigation measures are not implemented.	SITE	SHORT	HIGHLY PROBABLE	HIGH NEGATIVE	LOW NEGATIVE	▪ The Middelburg Aeroclub could be impacted upon in terms of safety and security (e.g. people crossing the runway, animals on runway, vandalism, etc.) if mitigation measures are not implemented (e.g. construction and maintenance of the fence around the Aeroclub). ▪ In addition, the Aeroclub could be impacted upon if high rise buildings were constructed, which are located within the flight paths of the planes.	SITE	LONG	HIGHLY PROBABLE	HIGH NEGATIVE	LOW NEGATIVE						
	▪ Construction workers could accidentally set the surrounding area (i.e. nature reserve, air field, farms) on fire if their activities (e.g. preparing food on open fires) are not regulated and monitored.	LOCAL	SHORT	PROBABLE	MEDIUM NEGATIVE	LOW NEGATIVE	▪ Residents could accidentally set the surrounding area (i.e. nature reserve, air field, farms) on fire if their activities are not regulated and monitored.	LOCAL	SHORT	PROBABLE	MEDIUM NEGATIVE	LOW NEGATIVE						
	▪ Contractors working on site could be directly impacted upon if the necessary safety and occupational health measures are not adhered to.	SITE	SHORT	PROBABLE	LOW NEGATIVE	LOW NEGATIVE	▪ Surrounding landowners could be impacted upon if the firebreaks are not maintained and runaway fires originate at the development.	LOCAL	SHORT	PROBABLE	MEDIUM NEGATIVE	LOW NEGATIVE						

ENVIRONMENTAL FEATURE(S)	PREDICTED IMPACT CONSTRUCTION PHASE AREA: ± 80 ha	EXTENT	DURATION	PROBABILITY	SIGNIFICANCE (PRE-MITIGATION)	SIGNIFICANCE (POST MITIGATION)	PREDICTED IMPACT OPERATIONAL PHASE AREA: ± 80 ha	EXTENT	DURATION	PROBABILITY	SIGNIFICANCE (PRE-MITIGATION)	SIGNIFICANCE (POST MITIGATION)	PREDICTED IMPACT PHASE: DECOMMISSIONING PHASE AREA: ± 80 ha	EXTENT	DURATION	PROBABILITY	SIGNIFICANCE (PRE-MITIGATION)	SIGNIFICANCE (POST MITIGATION)
INTERESTED AND AFFECTED PARTIES	▪ An area of approximately 130 ha (5.6%) of the 2 300 ha proclaimed Botshabelo Nature Reserve will no longer be accessible to the tourists.	LOCAL	LONG	DEFINITE	LOW NEGATIVE	LOW NEGATIVE	▪ An area of approximately 130 ha (5.6%) of the 2 300 ha proclaimed Botshabelo Nature Reserve will no longer be accessible to the tourists.	LOCAL	LONG	DEFINITE	LOW NEGATIVE	LOW NEGATIVE						
	▪ The ownership of the property is currently being disputed. The development of the site could thus impact on the rights of the land claimants should the land claim be overturned.	LOCAL	LONG	PROBABLE	HIGH NEGATIVE	HIGH NEGATIVE	▪ The ownership of the property is currently being disputed. The development of the site could thus impact on the rights of the land claimants should the land claim be overturned.	LOCAL	LONG	PROBABLE	MEDIUM NEGATIVE	LOW NEGATIVE						
							▪ The Botshabelo beneficiaries will not be located close to any social facilities and will thus need to travel to Middelburg.	SITE	LONG	HIGHLY PROBABLE	MEDIUM NEGATIVE	LOW NEGATIVE						
							▪ Beneficiaries will receive a lower level of engineering services than what they currently enjoy.	SITE	LONG	HIGHLY PROBABLE	MEDIUM NEGATIVE	LOW NEGATIVE						
							▪ Beneficiaries will have access to communal agricultural land for agricultural activities.	LOCAL	LONG	HIGHLY PROBABLE	LOW POSITIVE	LOW POSITIVE						
							▪ Beneficiaries will settle on ancestral land.	SITE	LONG	PROBABLE	HIGH POSITIVE	HIGH POSITIVE						
							▪ Living costs of the beneficiaries will increase due to extended commuting distance and municipal rates and taxes.	SITE	LONG	HIGHLY PROBABLE	MEDIUM NEGATIVE	MEDIUM NEGATIVE						
							▪ Beneficiaries who do not work in close proximity to the site will have to look for alternative employment.	SITE	LONG	PROBABLE	MEDIUM NEGATIVE	MEDIUM NEGATIVE						
							▪ The implementation of identified projects will lead to 438 employment opportunities.	REGIONAL	LONG	IMPROBABLE	LOW POSITIVE	MEDIUM POSITIVE						

ENVIRONMENTAL FEATURE(S)	PREDICTED IMPACT CONSTRUCTION PHASE AREA: ± 80 ha	EXTENT	DURATION	PROBABILITY	SIGNIFICANCE (PRE-MITIGATION)	SIGNIFICANCE (POST MITIGATION)	PREDICTED IMPACT OPERATIONAL PHASE AREA: ± 80 ha	EXTENT	DURATION	PROBABILITY	SIGNIFICANCE (PRE-MITIGATION)	SIGNIFICANCE (POST MITIGATION)	PREDICTED IMPACT PHASE: DECOMMISSIONING PHASE AREA: ± 80 ha	EXTENT	DURATION	PROBABILITY	SIGNIFICANCE (PRE-MITIGATION)	SIGNIFICANCE (POST MITIGATION)
INTERESTED AND AFFECTED PARTIES							▪ If all the beneficiaries do not relocate to the area, third parties may move into the area, which might lead to tension.	SITE	LONG	PROBABLE	MEDIUM NEGATIVE	LOW NEGATIVE						
							▪ The Botshabelo Historical Village can be marketed as a tourist destination with conference and wedding facilities.	REGIONAL	LONG	IMPROBABLE	LOW POSITIVE	LOW POSITIVE						
							▪ The provision of water service infrastructure may have a negative impact on the municipal budget.	LOCAL	LONG	PROBABLE	MEDIUM NEGATIVE	LOW NEGATIVE						
							▪ The surrounding landowners fear that it would be easy to block off the gravel access road during protests, in which case adjacent landowners would not have access to their properties.	LOCAL	SHORT	IMPROBABLE	LOW NEGATIVE	LOW NEGATIVE						
							▪ The farmers in the surrounding area already lose large portions of their harvest and cattle to theft. It is feared that they would most probably have to stop farming and sell their properties.	LOCAL	LONG	PROBABLE	LOW NEGATIVE	LOW NEGATIVE						

8. DISCUSSION AND CONCLUSION

The project applicant, *Botshabelo Community Development Trust,* intends to establish a rural village on the Remaining Extent of the farm Toevlugt 320 JS, Middelburg. Approximately 1000 'Residential 1' stands, a business stand, community facilities and a combined school are proposed. The site is located within the Botshabelo Nature Reserve, approximately 9 km north of Middelburg along the N11 national road.

The farm Toevlugt 320 JS, which forms part of the Botshabelo Nature Reserve, was awarded to the Botshabelo Community Development Trust in 2005 as part of a Land Claim. The community (930 beneficiaries) indicated that they intend to resettle on the said property. The Steve Tshwete Local Municipality subsequently agreed to assist the community to establish a township on their land.

8.1 Public participation

Section 4 provides an indication of the public participation process undertaken during the scoping and EIA phases. In essence, it involved identifying and consulting authorities, stakeholders and interested and affected parties within a 5 km radius of the site and obtaining their comment on the proposed project.

Table 4.14 provides a summary of all the objections and comments received during the Scoping and EIA phases of the project (including the public meeting) as well as a response to these comments.

It should be noted that no persons registered as interested and affected parties in terms of the advertising of the project.

8.1.1 Comment received from authorities and stakeholders

Details regarding objections/comment/requirements received from the authorities and stakeholders are indicated in Section 4 and Table 4.14 of this report.

Table 8.1 provides a summary of the authorities and stakeholders consulted and which of those raised concerns and/or indicated requirements. A detailed account of the concerns, objections and requirements is provided in Section 4 and Table 4.14 of this report.

As indicated in Table 8.1, the developer will have to comply with the requirements of the Department of Economic Development, Environment and Tourism, Steve Tshwete Local Municipality, Eskom, SA Civil Aviation Authority, South African Heritage Resources Agency and the South African National Roads Agency. Further details with regards to these requirements are provided in Section 4.

From a conservation point of view, the Mpumalanga Tourism and Parks Agency (MTPA) indicated that they do not support the development of the current site and that alternative land to the east of the tar road should be considered for the development.

Table 8.1: Comment received from authorities and stakeholders

Authorities							
Name	**Comment received**					**Objection**	**Requirements**
	Background document	**Draft Scoping**	**Final Scoping**	**Public meeting**	**Other**		
Department of Agriculture, Forestry and Fisheries	No	No	No	No	**Yes** (i.t.o. townplanning process)	No	No
Department of Agriculture, Rural Development and Land Administration	No	**Yes**	No	No	No	No	No
Department of Co-operative Governance and Traditional Affairs	No	No	**Yes**	No	No	No	No
Department of Culture, Sports and Recreation	No	No	No	No	No	No	No
Department of Economic Development, Environment and Tourism	No	**Yes** (acknowledgement of receipt)	No	No	**Yes** (during site visit)	No	**Yes**
Department of Mineral Resources	No	No	No	No	**Yes** (i.t.o. townplanning process)	No	No
Department of Public Works	No	No	No	No	No	No	No
Department of Rural Development and Land Reform	No	No	No	No	No	No	No
Department of Water Affairs	No	No	No	No	No	No	No
Nkangala District Municipality	No	No	No	No	No	No	No
Steve Tshwete Local Municipality	No	No	**Yes** (acknowledgement of receipt)	No	No	No	**Yes** (i.t.o. townplanning process)
Stakeholders							
4 SAI	No	No	No	No	No	No	No
Birdlife South Africa	**Yes**	No	No	No	No	No	No
Botlalo Mining and Energy Resources (Pty) Ltd.	No	No	No	No	No	No	No

Authorities							
Name	**Comment received**					**Objection**	**Requirements**
	Background document	**Draft Scoping**	**Final Scoping**	**Public meeting**	**Other**		
Councillor J. Dyason	No	No	No	**Yes**	No	No	No
Endangered Wildlife Trust	No	No	No	No	No	No	No
Eskom	**Yes**	**Yes**	**Yes**	No	No	No	**Yes**
Heritage South Africa (M. Kent)	**Yes**	No	No	No	No	No	No
Middelburg Birding Club	No	No	No	**Yes**	No	No	No
Middelburg Chamber of Commerce and Industry	No	No	No	No	No	No	No
Middelburg Distriks Landbou Unie	No	No	No	No	No	No	No
Mpumalanga Agriculture	**Yes**	**Yes**	No	No	No	No	No
Mpumalanga Heritage Foundation (A. Barlow)	**Yes**	No	No	**Yes**	No	No	No
Mpumalanga Provincial Heritage Authority	No	No	No	No	No	No	No
Mpumalanga Tourism and Parks Agency	No	No	No	No	**Yes** (after public meeting)	**Yes**	No
Mpumalanga Wetland Forum	No	No	No	No	No	No	No
SA Civil Aviation Authority	**Yes**	No	No	No	No	No	**Yes**
Simon van der Stel Foundation	**Yes**	No	No	**Yes**	No	No	No
South African Heritage Resources Agency	No	No	No	No	**Yes** (i.t.o. Heritage Impact Study)	No	**Yes**
South African National Roads Agency	No	No	No	No	**Yes** (i.t.o. Traffic Impact Study)	No	**Yes**
Telkom	No	No	No	No	No	No	No
Wildlife and Environment Society of South Africa	No	No	No	No	No	No	No

As indicated in Section 4.6.3, the MTPA is currently busy negotiating with the community of Botshabelo to consider other options/sites for the location of the residential stands owing to the sensitivity of the site (MBCP value) as well as the location near a pan and the fact that the site is located within a declared nature reserve.

It should be noted that Clean Stream Environmental Services was not included as part of this process. To date, no feedback has been received in this regard from either the MTPA or the Botshabelo Community Development Trust.

Botshabelo Nature Reserve

The proposed site is located within the proclaimed Botshabelo Nature Reserve and is currently used for conservation and recreational purposes. The development of the site will thus have a direct negative impact on the existing land use. As indicated in Section 7, an area of ± 80 ha of the 2 300 ha nature reserve would be directly impacted (this equates to 3.4% of the reserve) with an indirect impact possibly extending beyond the development boundaries. Mitigation measures would have to be implemented to keep the indirect impacts as small as possible.

In addition, the proposed development is in conflict with the land-use guidelines of the Mpumalanga Biodiversity Conservation Plan (MBCP) over much of the site. The untransformed habitats within the study area have been ranked as Highly Significant by the Mpumalanga Biodiversity Conservation Plan (MBCP) and are regarded as being in need of 'strict land-use controls'. According to the MBCP land-use guidelines, the site should be maintained as natural vegetation cover and need to be managed for the conservation of biodiversity.

The Botshabelo Nature reserve was proclaimed on 11 December 1985 in terms of Section 14 of the Nature Conservation Ordinance , 1983 (Ordinance 12 of 1983). In order for the proposed development to proceed, the said site (i.e. 130 ha) would have to be excluded from the above notice.

Section 14 of the Ordinance states as follows:
"14. The Administrator may by notice in the Provincial Gazette declare an area defined in the notice to be a nature reserve and he may at any time by like notice amend the definition of such an area or withdraw the declaration of such an area to be a nature reserve."

According to Plan Associates Town and Regional Planners (2013), Section 14 thus allows the Administrator to withdraw the above notice should it be necessary. However, in terms of the National Environmental Management Protected Areas Act 57 of 2003 the definition of a "nature reserve" is as follows:
*"**nature reserve" means –***
(a) An area declared, or regarded as having been declared, in terms of section 23 as a nature reserve; or
(b) An area which before or after the commencement of this Act was or is declared or designated in terms of provincial legislation for a purpose for which that area could in terms of section 23(2) be declared as a nature reserve, and includes an area declared in terms of section 23(1) as part of an area referred to in paragraph (a) or (b) above.

The implication of the above definition is that the activities in the Botshabelo Nature Reserve are governed by but not limited to the regulations contained in the Nature Conservation Ordinance, 1983 (Ordinance 12 of 1983) and National Environmental Management Protected Areas Act 57 of 2003.

Special attention is drawn to Section 50 (5) of the National Environmental Management Protected Areas Act 57 of 2003 which states as follows:
"(5) No development, construction or farming may be permitted in a national park, nature reserve or world heritage site without the prior approval of the management authority."

The "management authority" is defined as the organ of state or other institution or person in which the authority to manage the protected area is vested.

In order for the Botshabelo Community Development Trust to be able to authorize the construction of houses and allow farming on the land parcel within the Botshabelo Nature Reserve, they need to be assigned as the management authority in terms of Section 2(b) of National Environmental Management Protected Areas Act 57 of 2003.

The management authority is however, not exempted from any other legislation which also governs development in/of the nature reserve, including but not limited to the Town Planning Ordinance, National Environmental Management Act, and the National Environmental Management Protected Areas Act (Act 57 of 2003) which contains further regulations that are applicable to the area and will have to be implemented by the Botshabelo Community Development Trust.

Before the proposed Botshabelo Rural Village could be established the proposed site would have to be deproclaimed as indicated above. This could impact on the project.

8.1.2 Comment received from interested and affected parties

The landowners/users within a 5 km radius of the site were identified and consulted regarding the proposed development. Table 8.2 provides an indication of the landowners/users identified as well as those who raised concerns and objected to the proposed development.

A detailed account of the concerns and objections is provided in Section 4 and Table 4.14 of this report.

As indicated in Table 8.2, the main objectors to the proposed development are the Middelburg Aeroclub, Mr. R.W. Glintzer and Mr. P. Steenkamp. Comment was also received from Mr. N.J. Hesselman, Ms. M. Heyns and Ms. S.D. Adams.

Table 8.2: Comment received from interested and affected parties

Interested and Affected Parties					
Name	**Comment received**				**Objection**
	Background document	**Draft Scoping**	**Final Scoping**	**Public meeting**	
Botshabelo Community Development Trust	No	No	No	**Yes**	No
Middelburg Aeroclub	**Yes**	No	No	**Yes**	**Yes**
V.C. Fourie	No	No	No	No	No
S. Mabena	No	No	No	No	No
Emarubini Communal Property Association (W. Mtsweni)	No	No	No	No	No
P. Steenkamp	**Yes**	No	No	No	**Yes**
Ramohlakane Groenfontein Community Trust	-	-	-	-	-
N.J. Hesselman	**Yes**	No	No	No	No
R.W. Glintzer	**Yes**	No	No	**Yes**	**Yes**
R. Masondo	No	No	No	No	No
LIJ Boerdery (S.J. Bester)	No	No	No	No	No
E.J. de Meyer	-	-	-	-	-
B.J. Mayerhofer	No	No	No	No	No
D.P.J. van den Bergh	No	No	No	No	No
G. van der Walt	No	No	No	No	No
D.B. Snyman	No	No	No	No	No
A.R. Potgieter	No	No	No	No	No
M. Heyns	No	No	No	**Yes**	No
Neels Moolman Familie Trust (F. Nel)	No	No	No	No	No
M.T. Podges	No	No	No	No	No
K. Nell	No	No	No	No	No

Interested and Affected Parties					
Name	Comment received				Objection
	Background document	Draft Scoping	Final Scoping	Public meeting	
K. Erichsen	No	No	No	No	No
S.D. Adams	**Yes**	No	No	No	No
A. James	No	No	No	No	No
J.J.M. Mthombeni	No	No	No	No	No
L. van der Merwe	No	No	No	No	No
T.J. Mahlangu	-	-	-	-	-
P.R. Spies	No	No	No	No	No
T.E. van Niekerk	-	-	-	-	-
E.I. Tosen	No	No	No	No	No
V.O. Louw	No	No	No	No	No
P.J. Haarhoff	No	No	No	No	No
Mid-Malanga X104 cc (R. van Zyl)	No	No	No	No	No
Harbou Boerdery (O. Hartman)	No	No	No	No	No
H.M. van der Westhuizen	No	No	No	No	No
J.M. Ruthven	No	No	No	No	No
M.M. Herbst	-	-	-	-	-
J.A.M. Pieterse	No	No	No	No	No
G.G. Gordon	No	No	No	No	No
K. Erichsen	No	No	No	No	No
Pots Galore cc (Seymore)	No	No	No	No	No
C.J. Hattingh	No	No	No	No	No
T. Viljoen	No	No	No	No	No
C.P. Nagel	No	No	No	No	No
Philmar Trust (L. Roodman)	No	No	No	No	No

8.1.3 Summary of issues

Through the Scoping and EIA phases, it was determined that the main issues of concern are with regards to:

- Status of the Botshabelo Nature Reserve;
- The location of the proposed development;
- Sense of place;
- Potential impact on the natural environment (i.e. natural vegetation, animal life, surface water, groundwater, pans and wetlands, air quality, etc.);
- Potential impact on traffic (including maintenance of access road);
- Potential impact on groundwater quality and quantity;
- Potential impact on the Botshabelo Historical Village and Fort Merensky (archaeological/cultural);
- Socio-economic impact on the beneficiaries (i.e. Botshabelo Community Development Trust);
- Potential impact on the Middelburg Aeroclub;
- Potential impact on the surrounding farms (agriculture, safety and security);
- Service provision (water, sewage, electricity, waste removal);
- Management of the development.

Table 4.14 provides a response with regards to the various issues raised and should be consulted for further details.

8.2 Potential environmental impact

As indicated in Section 8.1.3, the potential impact on the natural environment (i.e. natural vegetation, animal life, surface water, groundwater, pans and wetlands, air quality, etc.) was indicated as an issue of concern through the Scoping and EIA phases of this project.

Based on Layout Plan No. 2, only approximately 80 ha of the proposed site (130 ha in total) would be directly impacted upon. Section 7 of this report provides details regarding the potential impact identified as part of this EIA process. Herewith a summary of the impacts identified.

Sense of place

The proposed site is located approximately 9 km north of Middelburg in a rural area. No existing services are available. In addition, the site is located within the proclaimed Botshabelo Nature Reserve. The Middelburg Aeroclub is present on the eastern boundary of the site.

As indicated, the proposed site is located within the proclaimed Botshabelo Nature Reserve and is currently used for conservation and recreational purposes. The development of the site will thus have a direct negative impact on the existing land use. An area of ± 80 ha of the 2 300 ha nature reserve would be directly impacted (this equates to 3.4% of the reserve) with an indirect impact possibly extending beyond the development boundaries. Mitigation measures would have to be implemented to keep the indirect impacts as small as possible.

In addition, the proposed development is in conflict with the land-use guidelines of the Mpumalanga Biodiversity Conservation Plan (MBCP) over much of the site. The untransformed habitats within the study area have been ranked as Highly Significant by the Mpumalanga Biodiversity

Conservation Plan (MBCP) and are regarded as being in need of 'strict land-use controls'. According to the MBCP land-use guidelines, the site should be maintained as natural vegetation cover and needs to be managed for the conservation of biodiversity.

The proposed development will thus have a direct impact on the Botshabelo Nature Reserve and the sense of place of the area.

Wetlands and pans

7.2 % of the site comprises pans and wetlands of High Sensitivity and Conservation Importance (Figure 5.13). Wetland Consulting Services (Pty) Ltd. (2011) indicated that all the wetlands in the study area are considered of Moderate importance and sensitivity (i.e. C rating), except for the southern hillslope seepage wetland (HSW2; Figure 5.19) which, due to its larger size and greater levels of saturation, is considered to be of High importance and sensitivity (i.e. B rating).

The impact assessment (Section 7) was done based on Layout Plan No. 2 (Figure 6.6), in which the pans (Pan 1 and Pan 2) and the hillslope seepage wetlands (HSW1 and HSW2; Figure 5.19) were identified as NO-GO areas and excluded from the development. These sensitive environments and the 50 m buffer zone around the pans and wetlands will thus not be directly impacted upon by the proposed development.

The proposed development will thus not have a direct impact on the topography, geology, soil, vegetation, animal life, surface water or groundwater of these sensitive natural environments.

Although the 50 m buffer zone is expected to limit a number of impacts on the wetlands and pans (e.g. erosion control and protection of biodiversity), Wetland Consulting Services (Pty) Ltd. (2011) is of the opinion that it is *unlikely to compensate for the loss of storage capacity within the catchment soils and a shift in the balance of flows in the catchment from diffuse, subsurface drainage to surface runoff.* In light of this, it cannot be guaranteed that the inclusion of a buffer zone will completely prevent a change in the hydrology and condition of the wetlands.

Construction workers/residents could indirectly impact on the wetland/pan vegetation (e.g. driving vehicles through these areas, dumping waste, etc.) if these areas are not demarcated as a NO-GO AREA. Mitigation measures would have to be implemented.

During the operational phase, increased yields could be expected due to increased paved areas and buildings, which would facilitate increased run-off quantities due to quicker run-off and less infiltration into the soil. This could lead to soil erosion if proper storm water control measures are not implemented, which could eventually impact on Pan 1, HSW1 and HSW2 as well as the downstream surface water environments (e.g. tributary of the Klein Olifants River).

It is expected that diffuse flows will be concentrated into confined flows, which will be discharged as point discharges into the surrounding area and possibly Pan 1 and HSW2. This may lead to extensive erosion at the points of discharge. Mitigation measures would have to be implemented.

Soils/agricultural potential
In general, the average soil profile on site consists of a relatively thin (<500 mm) topsoil layer, which is sequentially underlain by a sandy residuum, ferruginised residuum, some pedocrete and bedrock.

No cultivation has recently taken place on site. However, the site could have been utilized for agricultural purposes (grazing or cultivated lands) in the past as part of the old Mission Station. According to the Department of Agriculture, Fisheries and Forestry the site comprises moderate potential arable land and a below average grazing capacity.

The development will have a direct impact on the agricultural potential of the 80 ha area even though the site is not currently used for agricultural purposes (i.e. cultivation and grazing),

Soil pollution would occur if proper waste management does not take place, especially since domestic waste would be stored on site temporarily until collected by the Steve Tshwete Local Municipality. Soil pollution could also occur if the biological toilets are not properly installed and maintained.

Topography
The proposed development will impact directly on the topography of approximately 80ha of the site (i.e. 130 ha minus 50 ha public open space). In general, the removal of vegetation, sloping of the site and the formation of voids and topographical highs would result in changed runoff patterns and an increased risk of soil erosion. The risk is however, expected to be low due to the relatively flat nature of the site (i.e. slight slope of approximately 1: 10 to 1: 20). It should be noted that the slope of the said site is suitable for development purposes.

Surface water/drainage
The proposed site is located in the Olifants River catchment, more specifically the B12E quaternary sub-catchment. No rivers, streams or dams are located on site.

The southern portion of the site slopes in a southerly direction towards a hillslope seepage wetland (HSW2; Figure 5.19). Disturbance in the southern portion of the site could impact indirectly on HSW2.

The central and northern portions of the site slope in a westerly and north westerly direction towards Pan 1 and HSW1 (Figure 5.19). Disturbance in the central and northern portions of the site could have an indirect impact on Pan 1 and HSW1 in terms of erosion and sedimentation.

Surface water flow and runoff patterns will be altered, which could lead to hydrological changes within the pan/wetland system (i.e. Pan 1, HSW1 and HSW2) as well as changes in vegetation composition and associated animal habitat (i.e. wetland habitat deterioration).

Due to the slope of the site in a southerly, westerly and northwesterly direction, Pan 2 should not be impacted upon in terms of erosion and sediment transport since no drainage is expected from the site towards the pan.

During the operational phase, the direct impact on the topography of 80ha of the site will continue in terms of slope, changed runoff patterns and an increased risk of soil erosion.

Indirect impacts could include:

- Alterations to water quality (eutrophication, increased salinity and increased acidity), through effluents, storm water runoff and seepage.
- The water quality of Pan 1, HSW1 and HSW2 could be impacted upon by run-off water containing contaminants such as hydrocarbons, nutrients, sediment, litter, etc. collected in the urban area. Indirect pollution of surface water could also take place if the sewage infrastructure (biological toilets) is not maintained on a regular basis and proper waste management measures are not implemented. The quality of surface water generally declines following urbanization, which could impact on downstream users (tributaries of Klein Olifants River).

Geology /geotechnical aspects

The majority of the site is located within Geotechnical Zone 1A, where normal construction would apply (Figure 5.6). In general, the installation of services and construction of roads and buildings should not be problematic.

No development is recommended for Geotechnical Zone 2D (i.e. Pan 1, Pan 2, HSW1 and HSW2). As per Layout Plan No. 2, the pans (Pan 1 and Pan 2) on site and the wetlands (HSW1 and HSW2) adjacent to the site will be excluded from development. Other areas (e.g. buffer zone around pans, fire break, etc.) were also excluded from development (Figure 6.6). The geology associated with these environments as well as Geotechnical Zone 2D will thus not be directly impacted upon.

Approximately 70 stands in the centre and southern portion of the site are located in Geotechnical Zone 1B (Figure 5.6). Excavatability constraints may be experienced at depths >1.5m (Figure 5.6). The geology could thus impact on the installation of services, and construction of buildings depending on the required depths of the trenches/foundations.

A portion of the school and 14 residential stands are located in Geotechnical Zone 2A (Figure 5.6), which is present in the western and northern portions of the site. Zone 2A comprises compressible soils and would require compaction and modified construction. In addition, excavatability problems may occur in some areas where ferricrete is present. The geology could thus impact on the installation of services and construction of buildings if mitigation measures were not implemented.

Geotechnical Zone 2B is underlain by a shallow hardpan ferricrete layer and is present adjacent to Pan 2 (excluded from development) and in the northern portion of the site (Figure 5.6). A perched water table is expected during the rainy season. The installation of services during the rainy season could be problematic if the trenches fill up with water. The buildings could be impacted upon if mitigation measures were not implemented (i.e. sub-surface drainage). Eight (8) residential stands and a community facility are located in Zone 2B.

Geotechnical Zone 2C (Figure 5.6) is present in the northern portion of the site and within Pan 2 (which was excluded from development). This zone comprises compressible soil, which would require compaction and modified construction. The services and buildings could be impacted upon if mitigation

measures were not implemented to accommodate the differential soil movements. 18 residential stands will be located within this zone.

Natural vegetation

The site is located in the Rand Highveld Grassland, which has been classified as Endangered in Mucina et. al. (2006) and Vulnerable in the National List of Ecosystems that are threatened and in need of protection (GN 1002 of 2011). The development of the site will impact directly on 80 ha (i.e. 130 ha minus 50 ha public open space area) of Rand Highveld Grassland.

91.3 % of the site comprises untransformed grassland, with only 1.5% being transformed (Figure 5.13). The natural grasslands on site were classified as being of high conservation importance by De Castro & Brits (2010). In addition, the untransformed habitats within the study area have been ranked as Highly Significant by the Mpumalanga Biodiversity Conservation Plan (MBCP) and are regarded as being in need of 'strict land-use controls'. According to the MBCP land-use guidelines, Highly Significant areas should be maintained as natural vegetation cover and need to be managed for the conservation of biodiversity. The proposed development would result in the loss of most of the natural vegetation cover and would thus not result in the conservation of biodiversity. The development of the site could lead to the potential elevation of adjacent Highly Significant areas to Irreplaceable status.

One plant species classified as Declining (*Crinum cf. macowanii*) and a number of protected and medicinally important plants were noted in the untransformed grassland on site. In addition, there are at least four other species of conservation concern that have a moderate or high likelihood of occurring on site. The construction activities (i.e. removal of vegetation) would impact on these plant species if they are not identified, protected and/or relocated before any construction commences.

De Castro & Brits (2012) indicated that further surveys are required during spring/early summer to confirm the presence of the following four (4) species on site: *Crinum bulbispermum; Callilepis leptophylla; Eucomis autumnalis* subsp*. clavata; Hypoxis hemerocallidea.* The presence of these species will confirm the high sensitivity value placed on the untransformed grassland.

Any operational activities (e.g. cattle grazing, human activities, footpaths) that are not restricted to the physical footprint of the development could impact on the areas of high sensitivity (i.e. Pan 1, Pan 2, HSW1 and HSW2) as well as the adjacent Botshabelo Nature Reserve. Mitigation measures would have to be implemented.

The vegetation of the Botshabelo Nature Reserve could be degraded if:

- Livestock is kept within the nature reserve and allowed to graze anywhere.
- If the residents accidentally or purposefully set fire to the area (incorrect fire regimes).
- Firewood is collected by residents.
- Red and Orange data plant species are collected for medicinal purposes.
- Alien plants are introduced into areas disturbed by construction or used in the gardens and spread into the surrounding vegetation resulting in the deterioration of the primary grassland reducing biodiversity.

Animal life

In terms of animal life, the site is indicated as 'Highly Significant' and 'Important and Necessary' in terms of the terrestrial biodiversity assessment of the Mpumalanga Biodiversity Conservation Plan (2006). As already indicated, the site is located within a proclaimed nature reserve (2 300 ha in extent).

According to Deacon (2012), the said site could potentially provide habitat to 255 different species. The Lesser Kestrel and Black Wildebeest were confirmed to occur in the nature reserve.

Deacon (2012) identified the two main animal habitats on site as Primary Grassland and Pan Wetland. 18 Red Data species could possibly occur in the Primary Grassland biotope. 7 Red Data species (e.g. Giant Bullfrog) could possibly occur in the Pan Wetland biotope.

In total, 7.2 % of the site comprises pans and wetlands of High Sensitivity and Conservation Importance (Figure 5.13). As per Layout Plan No. 2, the pans (Pan 1 and Pan 2) on site and the wetlands (HSW1 and HSW2) adjacent to the site will be excluded from development. Other areas (e.g. 50 m buffer zone, fire break, etc.) were also excluded from development (Figure 6.6).

As already indicated, the pans (Pan 1 and Pan 2) on site and the wetlands (HSW1 and HSW2) adjacent to the site will be excluded from development. The proposed development will thus not have a direct impact on the Pan Wetland habitat type and associated animal life. Any construction and/or operational activities (e.g. cattle grazing, human activities, footpaths) that are not restricted to the physical footprint of the development could impact on these areas of high sensitivity (i.e. Pan 1, Pan 2, HSW1 and HSW2, Botshabelo Nature Reserve) and their associated animal life. Mitigation measures would have to be implemented.

The Giant Bullfrog (Protected Species) was noted in the Pan Wetland biotope located on site. Due to its habitat restrictions and lack of mobility, the Giant Bullfrog is especially vulnerable when areas are being developed. These frogs also aestivate underground relatively far away from the pan area. Construction activities in the Primary Grassland biotope could thus have a direct impact on the Giant bullfrog if construction takes place during the winter months when they are aestivating underground.

Ideally, a Specialist Giant Bullfrog Study should be conducted to determine the size and extent of the bullfrog population and to make recommendations regarding the proposed buffer zone and other mitigation measures.

The development of the site will however, directly impact on 80ha (i.e. 130 ha minus 50 ha public open space area) of Primary Grassland habitat. During construction, the more mobile faunal species (e.g. birds and large mammals) will be driven out of the area. Smaller fauna (e.g. reptiles, moles, arachnids, etc.) will most probably be destroyed when the vegetation layer is removed. In addition, 80 ha of the Primary Grassland biotope will no longer be available for grazing purposes, shelter, etc. Indirect impacts (e.g. noise, dust, poaching/hunting, waste, etc.) could also impact on the animal life.

Fauna could be indirectly impacted upon if proper waste management measures (e.g. rubbish bins, fenced waste storage facility, etc.) are not

implemented at the development. Animals could ingest waste (windblown litter), get trapped (e.g. pipes, barb wire, etc.) or injured (e.g. wire, nails, etc.). Other indirect impacts (e.g. trampling of fauna; snaring; poisoning, etc.) could also impact on the animal life.

Groundwater

Due to the exclusion of the pans and wetlands from the development area, the proposed development will not have a direct impact on the groundwater associated with these sensitive environments.

The pans and wetlands correspond with Geotechnical Zone 2D, which was recommended by Engeolab 2011b for No Development. Any development within this zone would impact on the groundwater of the site as well as on the buildings constructed. As per the current layout plan, no buildings will be constructed within Zone 2D.

The geotechnical investigation (Engeolab 2011b) identified that Geotechnical Zone 2B (Figure 5.6) may support a perched water table during the rainy season due to underlying ferricrete (Figure 5.6 – Zone 2B). These areas fall outside of the delineated wetlands since the extent and duration of saturation is not sufficient to influence the vegetation or result in active redoxymorphic features (i.e. mottling). However, a perched water table is expected during the rainy season. 8 residential stands are located in Zone 2B. The houses, services and roads could be impacted upon if mitigation measures (i.e. sub-surface drainage) were not implemented.

During the construction phase, boreholes will need to be drilled to provide the development with water. One of the potential drill sites is located within Pan 2. Pan 2 and its associated groundwater could thus be directly impacted should the borehole be drilled in this location.

Water for the proposed development will be obtained from boreholes. Groundwater will thus be abstracted. The development could thus directly impact on the groundwater levels of the area (and downstream users) if water is not abstracted sustainably. The residents could be impacted if the boreholes do not provide sufficient water or dry up.

Groundwater could be indirectly impacted upon if proper sanitation facilities and waste management measures are not put in place and maintained.

Sites of archaeological/cultural interest

According to Dr. J. Pistorius (2011), the Phase 1 Heritage Impact Assessment revealed **no** types and ranges of heritage resources as outlined in Section 3 of the National Heritage Resources Act (No. 25 of 1999) on the development site (i.e. 130 ha). No heritage resources of significance were observed. The construction and operational activities will thus have no direct impact on any sites of archaeological/cultural importance.

However, the Botshabelo Historical Village/Mission Station and Fort Merensky could indirectly be impacted upon if building material is scavenged from the existing infrastructure, or if the construction workers/residents unlawfully access and vandalize these sites.

The South African Heritage Agency evaluated the Phase 1 Heritage Impact Assessment conducted and indicated that an Integrated Heritage Impact

Assessment is required. This report must include track paths, visual assessment, etc. In addition a paleontological study must also be conducted.

Air quality
The construction and operational activities could impact on the air quality of the site in terms of dust, smoke and vehicle emissions. The extent of the impact would depend on the portion of the site being developed, the extent of vegetation removal, the wind direction, season and other environmental factors.

No homesteads are however, located close enough to the said site to be impacted. Dust generation is unlikely to impact on the N11 national road due to the distance from the site.

The Middelburg Aeroclub may however be impacted. Dust generation and smoke could impact on visibility during the landing and take off of planes, which could result in accidents. Mitigation measures would have to be implemented.

The air quality of the surrounding area could be impacted upon in terms of smell if the biological toilets do not have sufficient capacity and are not maintained. The air quality could also be impacted upon if waste removal does not take place and the temporary waste storage area is not kept clean.

Visual
The topography of the proposed site is relatively flat. The site is visible from the Middelburg Aeroclub property, the gravel road along the northern boundary of the site as well as the immediate surrounding area (i.e. part of nature reserve). The construction and operational activities would thus be highly visible from these areas. It would thus be very important to keep the construction area neat and tidy at all times.

The site is not visible from the southern and western portions of the nature reserve or from the Historical Village (located behind the ridge), Fort Merensky or the N11 national road.

The presence of high mast lights and buildings will degrade the character of the Botshabelo Nature Reserve, specifically the northeastern portion of the reserve.

Noise
In general, the area is relatively quiet since it is located within a rural area and nature reserve. The major contributing factor to the ambient noise in the area would be as a result of activities at the Middelburg Aeroclub, planes flying overhead, nearby agricultural activities and vehicles using the gravel road.

No homesteads are located close enough to the said site to be impacted by noise generated as a result of the construction and operational activities. However, the local wildlife, Middelburg Aeroclub and visitors to the Botshabelo Nature Reserve could be impacted.

Traffic
Access to the proposed development will be obtained from the existing gravel road located on the northern boundary of the Botshabelo Nature Reserve.

This road connects to the N11 national road and provides access to the farms located north and northwest of the proposed site.

The operational activities would result in an increased trip generation as illustrated in Section 5.16 of this report. Proper intersections (e.g. N4/gravel road) as recommended by SANRAL and WSP (2012) would have to be constructed to cater for the additional traffic. If this is not done, it could lead to an increased risk in accidents and could impact on the general road user.

The South African National Roads Agency (SANRAL) granted conditional approval for the proposed access point. However, the following recommendations were made:

- A butterfly configuration intersection must be provided at the access point;
- A road master plan must be prepared for the section of the road between Harry Kwala Street and the site;
- Final approval and wayleave permission can only be obtained after the submission of the new detailed access drawings.

Additional funding would first have to be obtained for the additional work required by SANRAL.

The surrounding landowners could also be impacted upon during the operational phase if:

- the gravel road is not maintained.
- storm water pipes are not installed along the access road as recommended by WSP (2012).
- There is possible conflict between existing road users and the new road users using the existing gravel road.

The utilization of the road network within the proposed development could impact on the residents if the road surface and intersections are not maintained.

8.3 Socio-economic impacts

Plan Associates (2013) indicated that based on the findings of the Socio Economic Impact Assessment, it is evident that the development will have both positive and negative impacts on the Botshabelo Community, the nature reserve and the adjacent landowners.

According to Plan Associates (2013), the negative impacts however, outweigh the positive impacts due to the various factors outlined below.

The mitigation measures and proposed monitoring framework proposed by Plan Associates (2013) and indicated below will help lessen some of the negative impacts but will unfortunately not entirely remove them.

8.3.1 Botshabelo Community/Beneficiaries

The following POSITIVE impacts were identified:

- Beneficiaries will have access to communal agricultural land for agricultural activities.
- Beneficiaries will settle on ancestral land.
- Historical town can be developed as a tourist destination with conference and wedding facilities.

According to Plan Associates (2013), the community will have free access to land for agricultural activities seeing as the whole community are co-owners of the land obtained through the land claim process. Plan Associates (2013) indicated that beneficiaries could grow their own fresh produce and that the excess vegetables could be sold locally. Cultivation and management of communal land should however, be structured as informal agreements are usually unsuccessful.

Plan Associates (2013) indicated that the development and marketing of the Historical town as a tourist destination would benefit the Botshabelo Community/Beneficiaries and increase the tourism potential of the area. It would thus have a wider positive impact on the surrounding area.

The following NEGATIVE impacts were identified:

- The Botshabelo beneficiaries will not be located close to any social facilities and will thus need to travel to Middelburg.
- Beneficiaries will receive a lower level of engineering services than what they currently enjoy.
- Living costs of the beneficiaries will increase due to extended commuting distance and municipal rates and taxes.
- Beneficiaries who do not work in close proximity to the site will have to look for alternative employment.
- Very few employment opportunities will be created if adequate funding for identified projects cannot be sourced. This could lead to a rise in the unemployment level in the area, which could lead to crime, safety risks to the surrounding community and a decrease in property value.
- If all the beneficiaries do not relocate to the area, third parties may move into the area, which might lead to tension.
- The unemployment level in the study area may rise if proper measures are not put in place

Impact: Engineering Services and Social Facilities
According to Plan Associates (2013), the social structure of the families will further be impacted upon by moving from their existing communities to settle in the study area. Due to the limited project budget the beneficiaries will receive a lower level of engineering services than what the majority currently enjoy, which will negatively impact on their quality of life.

Plan Associates (2013) indicated that given the financial constraints and the distance of the settlement from existing bulk services, the following three options are available towards a higher level of services:

- Beneficiaries to provide private funding for improved engineering services;
- May be able to lower costs by pursuing more energy efficient energy sources (e.g. solar power);
- Department of Human Settlements may provide funding for the installation of engineering services.

Given the distance of the proposed settlement from existing social facilities, the community will have to commute to access the following basic social facilities: education facilities, health facilities, pay-out points for grants, emergency services.

Plan Associates (2013) indicated that the development of a clinic or a hospital in the area would not be feasible given the proposed population. However the

Municipality could provide a mobile clinic service to the community on a weekly or monthly basis.

It should be noted that stands for community and education facilities were provided as part of Layout Plan no. 2.

Impact: Living costs
The beneficiaries will be required to pay normal rates and taxes as calculated by the Steve Tshwete Local Municipality. Plan Associates (2013) indicated that prior to relocation beneficiaries will have to be made aware of the implications of paying rates and taxes.

However, if the market value of the residential units is below R300 000 people would be able to apply for indigent support from the Municipality. Should this be successful it may relieve some of the living costs of the beneficiaries. Beneficiaries will then only be responsible to pay for electricity and water usage (Steve Tshwete Municipality IDP 2013/2014).

The commute to and from work will increase, leading to a total increase in the living costs/monthly expenses of beneficiaries. Plan Associates (2013) indicated that it will be every individual's responsibility to determine (prior to relocation) if employment is available locally (i.e. at proposed site), especially if the increased living costs can not be afforded.

Impact: Employment and Unemployment
According to Plan Associates (2013), precautionary and pro-active measures will need to be put in place to prevent unemployment levels from rising, should people settle on the said site. Plan Associates (2013) indicated that proper policing and monitoring should be employed to curb any form of crime throughout the municipal area.

Rapheal and Winter-Ebmer (2001) state that people who are unemployed are more likely to revert to crime. Inversely, people who gain more income from employment than from crime are less likely to get involved in crime.

According to Plan Associates (2013), the possible increase in unemployment may thus lead to an increase in crime if proper measures are not put in place.

The proposals in the Botshabelo Settlement and Business Plan would only create approximately 438 employment opportunities. In the short term, the community would have to commute to existing activity nodes for employment.

Plan Associates (2013) indicated that the Business Plan should be revisited to determine which projects are still feasible and implement them to create jobs. Alternatively, the people should remain in the communities where they currently have employment and only relocate to the site once alternative employment has been secured.

A steering committee or board of community members should be established to re-examine the proposals identified in the Botshabelo Settlement and Business Plan. An implementing agent (community member) could be appointed to champion each project. The agent could be appointed on an outcome-based approach to ensure buy-in and commitment from the agent (Plan Associates, 2013). In addition, the different funding mechanisms as outlined in the Botshabelo Settlement and Business Plan need to be explored.

Plan Associates (2013) indicated that the Local Economic Development (LED) unit of the Steve Tshwete Local Municipality and other knowledgeable people should be approached to play a key role in the implementation of various projects and capacity building.

According to Plan Associates (2013), some of the beneficiaries who obtain a site might opt not to relocate, and accordingly sell or rent the stand to a third party. This will mean that 'outsiders' will move into the community who might not share the same value system. This situation has potential to lead to friction and even confrontation.

Plan Associates (2013) indicated that if all agree, the beneficiaries could take a resolution that only beneficiaries are allowed to initially own stands in the rural village. Furthermore, a condition could be included in the Conditions of Establishment of the township that approval from the beneficiaries should be obtained before a stand may be sold and that no backyard dwellings will be allowed.

8.3.2 Botshabelo Nature Reserve and Historical Village

The following NEGATIVE impacts were identified:

- An area of approximately 130 ha (5.6%) of the 2 300 ha proclaimed Botshabelo Nature Reserve will no longer be accessible to the tourists.
- 40% of the wildlife has already been sold and the remainder of the wildlife belong to Steve Tshwete Local Municipality (and will also be sold)
- Construction of high mast lights will degrade nature reserve character
- Degradation to nature reserve if livestock are kept in nature reserve

These impacts would also impact on the tourist potential of the Botshabelo Nature Reserve.

Impact: Environment

According to Plan Associates (2013), almost a third of the Botshabelo Beneficiaries' reason for resettlement is the perceived agricultural opportunities in the area. It was found that the area has medium agricultural potential (arable, grazing). Additionally, should the beneficiaries wish to keep livestock in the nature reserve the impact on the Nature Reserve will be much larger than 130 ha earmarked for the rural village. And, despite the unavoidable environmental degradation, the character of a nature reserve is to have wildlife roaming around and not livestock. Thus the character of the entire Reserve will be compromised.

It is known that the introduction of livestock (e.g. cattle) into a nature reserve could lead to an outbreak of disease amongst the wildlife. In addition, livestock within the Botshabelo Nature Reserve would reduce the carrying capacity of the reserve, which could lead to overgrazing and a resultant negative impact on the wildlife.

Plan Associates (2013) indicated that beneficiaries should be capacitated to understand that livestock cannot be kept in the Nature Reserve area. Ample space is available on other portions of land which were obtained through the land restitution process.

Livestock holding facilities should be developed on these adjacent farm portions where livestock can be safely kept overnight, with overnight accommodation for the livestock herders. Plan Associates (2013) indicated that funding for fencing should be sourced from the Department of Agriculture or the Land Claims Commission.

Plan Associates (2013) indicated that the beneficiaries should be capacitated to understand the importance of preserving the character and environment of the Nature Reserve. In addition, the development should be contained within the township boundaries, including agricultural activities. Larger scale activities (e.g. cattle farming) should be directed to the other farms owned by the Botshabelo Community Development Trust (i.e. outside of the Nature Reserve).

In order to prevent the settlement from growing illegally through squatting, the Steve Tshwete Local Municipality Municipal Management and Control of Informal Settlements Bye-laws would need to be enforced. The bye-laws make provision for the eviction and removal of informal dwellings. The Municipality should thus monitor the settlement on a continuous basis to ensure that no illegal structures are established.

Impact: Wildlife
The Botshabelo Settlement and Business Plan indicated that the wildlife in the Botshabelo Nature Reserve belongs to the Steve Tshwete Municipality. 40% of the wildlife has already been sold and the money transferred to the Steve Tshwete Municipality. This will negatively influence the Nature Reserve's character. Any future income generated from the sale or hunting of wildlife in the Reserve belongs to the Municipality.

Plan Associates (2013) indicated that the community should be educated on the importance of wildlife management and the benefits which it could hold for the community. The beneficiaries should attempt to source the necessary funding to replace the wildlife which has been sold. A wildlife management plan can be developed for the active management and breeding of wildlife in the Reserve.

Plan Associates (2013) recommended that an annual game count should be undertaken to determine the number of wildlife species within the Reserve.

Impact: Heritage and Tourism
Portion 6 of the farm Toevlugt where the Historical Village is located formed part of the land restitution process and now belongs to the Botshabelo Community Development Trust.

Plan Associates (2013) indicated that the Ndebele Heritage of the settlement should be protected and could be utilized as an asset.

The Historical Village has potential to be marketed as a tourist attraction, including a conference facility and wedding venue as proposed in Izwe Libanzi's Business Plan. This project should be revisited to determine if it is still feasible. If so, then the beneficiaries should actively pursue this and other feasible projects. However, the Historical Village and its significance may be totally lost if proper mitigation and management measures are not put in place.

Plan Associates (2013) indicated that the required funding should be sourced to upgrade and restore the village to a marketable product. The Mpumalanga Provincial Heritage Authority must capacitate the beneficiaries on the importance of the historical towns and the Ndebele heritage. The Department should further monitor that the buildings are kept intact and that none of the material is used for alternative purposes.

Although the proximity of the airfield could be used as an advantage to the Botshabelo Nature Reserve and surrounds, the nature reserve will first need to be re-established as a tourism destination. Plan Associates (2013) also indicated that the beneficiaries should do their part in preserving this commodity (i.e. the Middelburg Aeroclub).

RDV Consulting Electrical Engineers indicated that the overhead midblock electrical system to be installed in the settlement will be supplemented with 30m high mast overhead lights. These high mast lights will have a negative impact on the animals in the Reserve and cause light pollution in an otherwise rural area. Plan Associates (2013) indicated that an alternative for lighting (e.g. street lights with a design that minimizes light pollution) needs to be investigated

Deacon (2012) indicated that changes in an area (e.g. use of high mast lights) can significantly affect some species' behavioural and biological rhythms, which are guided by natural cycles of light and dark. Nocturnal species, particularly birds, can become disoriented by night-time lighting.

According to Plan Associates (2013), the Botshabelo Community Development Trust will need to ensure that they comply with all the regulations related to a nature reserve.

8.3.3 Adjacent land users

The following NEGATIVE impacts on adjacent land users were identified:

- Possible conflict between existing road users and new road users on private access road.
- Airfield fencing will probably not be upgraded by the Municipality because the Municipality is no longer the owner (impact on Middelburg Aeroclub).
- Pedestrians crossing airfield to N11. Smoke created from coal fires may have a negative impact on airfield (impact on Middelburg Aeroclub).
- Potential veldfires and issues around management (firebreaks, etc).
- If refuse does not take place regularly it may cause pollution.

These impacts would also impact on the Botshabelo Community/Beneficiaries.

Impact: Access Road

There is some dispute as to the ownership of the access road leading from the N11 freeway across the Remaining Extent of the farm Toevlugt 320 JS. Though the access road seems to be located on the aforementioned property which belongs to the Botshabelo Community Development Trust, it is currently being maintained by existing users. These users are concerned that the access road may be blocked if protests take place, and wonder if contributions will be made by the new community to maintain the road.

Plan Associates (2013) indicated that the exact alignment of the road should be determined in order to identify the landowner. The exact cadastral

boundaries and the alignment of the road can only be determined by a land surveyor who can resolve the matter.

If it is found that the road traverses or is located on the farm Toevlugt it should be included in the township layout and the public roads transferred to the local authority (Steve Tshwete Local Municipality) who would be responsible for its maintenance. The Steve Tshwete Local Municipality would also be responsible to resolve any conflict that arises between the adjacent landowners and the Botshabelo Community regarding the said road.

Otherwise, resources of all users should be pooled for the maintenance of the road (Plan Associates, 2013).

Impact: Middelburg Aeroclub
The Middelburg Aeroclub leases the airfield from the Steve Tshwete Municipality, who leases the land from the Botshabelo Community Development Trust. The Middelburg Aeroclub raised concern regarding the dilapidated fencing around the airfield and claims that the responsibility for its maintenance lies with the Municipality. The Steve Tshwete Municipality has indicated that a phased plan for the upgrade of the fence is in place.

Plan Associates (2013) indicated that the Municipality who is the lessee of the airfield should budget for the upgrade of the fencing with concrete palisades. (The concrete palisades cannot easily be used for the construction of border fencing for farms or residential stands and is more durable). Plan Associates (2013) indicated that the erection of the boundary fence of the airfield should be made a priority in the municipal IDP to ensure that funds are made available.

If the fence remains in its current state, wildlife, possibly livestock and pedestrians are likely to cross the landing strips and be a safety hazard. Pedestrians are likely to use the shortcut to access public transport along the N11.

Plan Associates (2013) indicated that the beneficiaries would have to be educated with regard to the dangers of aeroplanes in order to avoid pedestrian and livestock-related incidents. Plan Associates (2013) also recommended that a dedicated pedestrian walkway towards the N11 be provided in order to encourage people not to walk across the airfield.

Rural villages are known for using coal for cooking and heating, which causes thick white smoke. Visibility at the Middelburg Aeroclub may be negatively impacted by smoke generated in the proposed village. Plan Associates (2013) indicated that smoke could be avoided if cleaner/alternative energy solutions are sought.

Plan Associates (2013) indicated that the Botshabelo Community Development Trust should be capacitated to realize the value of the airfield on their property in order to renew the lease with the Middelburg Aeroclub when it lapses.

Impact: Veld-fires
Some of the I&APS are concerned about the danger of veld-fires that may originate from the proposed site. Veld-fires are common in Mpumalanga but in terms of the National Veld and Forest Fire Act No 101 of 1998 Chapter 4, Section 12.1 states:

'Every owner on whose land a veld-fire may start or burn or from whose land it may spread must prepare and maintain a firebreak on his or her side of the boundary between his or her land and any adjoining land (South Africa, 1998)'.

The Botshabelo Community Development Trust is thus required by law to maintain the necessary firebreaks. However, experience has shown that some landowners disregard the act that leads to damage caused by veldfires. Furthermore, the 1000 residential stands will eventually be transferred to individuals – thus further complicating the issue of responsibility.

Plan Associates (2013) indicated that the Botshabelo Community Development Trust should be educated with regards to the National Veld and Forest Fire Act No 101 of 1998 and the liability that can be faced for non-compliance. The Department of Agriculture must ensure that the beneficiaries are aware of, and comply with the National Veld and Forest Fire Act No 101 of 1998. Plan Associates (2013) indicated that a framework should be put in place for the making and the maintenance of the required firebreaks.

The steering committee/board should oversee the task of making and maintaining the necessary firebreaks every year.

Plan Associates (2013) indicated that if the community lacks the necessary skills or equipment a contractor can be appointed to undertake the task, or a working relationship could be established with adjacent landowners to guide and assist with the process, thus empowering beneficiaries.

Impact: Refuse Removal
If the Steve Tshwete Municipality does not implement a weekly refuse removal system it may lead to illegal dumping in and around the area which will negatively impact adjacent landowners.

The layout of the area does, however, make provision for a 'Municipal' stand which will be utilized for a waste transfer site. The beneficiaries will be responsible to place the refuse at the designated site in recognizable containers (e.g. black bags, wheel bins, etc.) for removal. Individual community members need to ensure that refuse is placed in the correct containers in order to comply with municipal procedures. The Steve Tshwete Local Municipality must inform the residents of the approved refuse removal containers that may be used.

Plan Associates (2013) indicated that the community should be capacitated to understand the importance of a clean environment especially in relation to the Nature Reserve and the nearby Middelburg Aeroclub. Illegal dumping should be firmly dealt with in the form of fines, etc.

The Steve Tshwete Local Municipality must monitor that the refuse is collected on a weekly basis. The Steve Tshwete Local Municipality and the applicant should not allow the disposal of waste or the burning of waste on site.

It should be noted that depending on the volumes and types of waste to be stored on site (i.e. waste transfer station), a waste license application would have to be submitted in terms of the National Environmental: Waste Act, 2008 (Act 59 of 2008).

Impact: Municipal budget (installation of services)
Plan Associates (2013) indicated that the provision of water service infrastructure may have a negative impact on the municipal budget which will have a negative impact on the Steve Tshwete Local Municipality and the tax payer.

According to the Steve Tshwete IDP, the Municipality has committed to act as implementing agent for the establishment of the rural village on the Remaining Extent of the farm Toevlugt 320 JS. The Municipality committed to supply water to the development and is responsible for the sanitation services.

If the settlement was located adjacent to an existing urban area, the installation of services would have been much easier and cheaper.

Currently, no potable waste is on site. Water will be provided through the drilling of 3 boreholes on site. Water will be pumped to high level water tanks and then distributed to communal/pillar taps. Based on the hydrocensus and geophysical data, Engeolab cc (2011a) believes that the three priority boreholes should suffice and the target of 96 m^3 per day should be achieved.

The cost of the drilling and equipping of the boreholes will be borne by the Steve Tshwete Local Municipality. The Municipality will further be responsible for the maintenance and future upgrading of the services.

The boreholes have not yet been drilled and should that not provide sufficient water, three alternative water sources have been proposed namely:

- The construction of a number of small earth embankment dams to the west and to the south of the proposed site (Engeolab, 2011a);
- The construction of a weir in the Klein Olifants River and pumping the water to the site (Engeolab, 2011a);
- The municipality installing a water pipeline to the site or delivering water with the use of water tankers.

According to Plan Associates (2013), the above-mentioned alternatives are more sustainable but also more expensive. Additional environmental authorizations (including water use licences) would be required for these activities, if pursued.

Plan Associates (2013) indicated that the Steve Tshwete Local Municipality needs to weigh up the costs of providing a temporary solution (e.g. boreholes) versus a permanent solution (e.g. piped water), noting that the geohydrological report indicated that the groundwater might become unusable after a time.

Engeolab cc (2011a) indicated that before any construction can take place the following is required:

- New boreholes will have to be drilled in accordance with the priority list;
- Borehole yield testing (48 hour constant discharge tests);
- Groundwater sampling (2 samples of each borehole for chemical analysis).

In addition, the groundwater levels and quality of the adjacent landowners should be tested to determine the pre-development environment and a

groundwater monitoring programme should also be compiled and implemented.

It should be noted that once the boreholes have been drilled and equipped, the water quality and supply should be monitored on a quarterly basis to ensure that the water is suitable for human consumption and is sufficient to meet the settlement's demand.

The alternative would be to establish the township closer to existing townships and services. Section 6 of the EIR provides details regarding alternatives (including alternative sites) investigated as part of this EIA.

8.4 Conclusion

Proposed development layout plan
As indicated, Layout Plan no. 2 did take into account, the sensitive pans and wetlands on site. These identified pans and wetlands were demarcated, a 50-m buffer zone included and the said areas indicated as Public Open Space where no development will take place. This resulted in only 80 ha of the overall 130ha being available for development purposes.

As indicated in Section 7, mitigation measures will have to be implemented as part of an Environmental Management Plan (EMP) in order to ensure that these systems are not indirectly impacted during both the construction and operational phases of the development.

Other impacts (direct and indirect) as a result of both the construction and operational phases were also identified (see Section 7) for which mitigation measures must be provided in the EMP.

It should be noted that the proposed site is currently not provided with any services (i.e. water, sewage, waste removal, etc.) and that a number of issues with regards to service provision still need to be resolved.

Impact on Botshabelo Nature Reserve
The proposed site is located within the proclaimed Botshabelo Nature Reserve and is currently used for conservation and recreational purposes. In addition, the proposed development is in conflict with the land-use guidelines of the Mpumalanga Biodiversity Conservation Plan (MBCP) over much of the site. The untransformed habitats within the study area have been ranked as Highly Significant by the Mpumalanga Biodiversity Conservation Plan (MBCP) and are regarded as being in need of 'strict land-use controls'. According to the MBCP land-use guidelines, the site should be maintained as natural vegetation cover and need to be managed for the conservation of biodiversity.

From a conservation point of view, the Mpumalanga Tourism and Parks Agency (MTPA) indicated that they do not support the development of the current site and that alternative land to the east of the tar road should be considered for the development.

The MTPA indicated that they are currently busy negotiating with the community of Botshabelo to consider other options/sites for the location of the residential stands owing to the sensitivity of the site (MBCP value) as well as the location near a pan and the fact that the site is located within a declared nature reserve.

Land claim dispute
Through the EIA process, it was discovered that the ownership of the property is currently being disputed.

According to information provided in the Middelburg Observer (6 September 2013), the legitimacy of the land claim awarded to the Botshabelo Community Development Trust is being disputed. The Bapedi Batubatse Corporate Society is part and parcel of this dispute.

According to the newspaper report, the Public Protector announced that it would investigate whether government followed correct procedures with regards to the Botshabelo land claim.

Sustainability of overall development
The sustainability of the overall development is questioned.

Proposals that emanated from the Botshabelo Business Plan indicated that approximately 400 employment opportunities could be created. This would however, require funding in excess of R30 million (Plan Associates, 2013). If the necessary funds cannot be accessed, the beneficiaries would have to find employment in towns in the vicinity. Migrant labour would have social implications such as workers only returning home over weekends, combined with increased transport costs.

Plan Associates (2013) indicated that before relocating, beneficiaries should be able to prove that they are currently employed and intend to commute to work from the new settlement, or have found alternative work in or near the proposed site.

Plan Associates (2013) indicated that the Department of Rural Development and Land Reform is responsible for monitoring land obtained through the Restitution process and should monitor whether the beneficiaries are utilizing the land productively or not. This Department would have to conduct capacity building courses with regards to sustainable farming practices with the Botshabelo Community. The Business Plan would also have to be revisited in order to determine which agricultural activities can be sustainably pursued in the area.

Plan Associates (2013) indicated that in order to prevent the development from forming part of another statistic of high unemployment and social unrest, the Botshabelo Community Development Trust and other role players should actively strive for the reestablishment of the nature reserve and the optimum utilization of resources.

In conclusion, it is felt that the above-mentioned issues should be addressed before the development of the proposed site within the Botshabelo Nature Reserve is approved.

It is also felt that all stakeholders (e.g. government departments, MTPA, STLM, etc.) should be actively involved in assisting the Botshabelo beneficiaries in trying to resolve the above-mentioned issues.

If the above-mentioned issues cannot be resolved, then an alternative site would have to be identified.

Report compiled by:

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Riana Janse van Rensburg

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Adie Erasmus *Pr. Sci. Nat.*

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Date

REFERENCES

- De Castro & Brits. 2012. **Flora and Red Data Plant Survey of the Botshabelo Wetland, Middelburg (Mpumalanga).** Report compiled by: Warren McCleland. Report dated: February 2012.

- Deacon, A. 2012. **Ecological Assessment – Residential Development within the Botshabelo Nature Reserve. Specialist Study – Fauna.** Report compiled by: Dr. A. Deacon. Report dated: March 2012.

- Engeolab cc. 2011a. **Geohydrological Investigation on the Proposed Botshabelo Township, Middelburg, Mpumalanga.** Report compiled by: P.G. Hansmeyer and B.D. Cilliers. Report dated: July 2011. Report number: LL1816.

- Engeolab cc. 2011b. **Report on a Geotechnical Investigation at Botshabelo.** Report compiled by: P.G. Hansmeyer. Report dated: August 2011.

- Izwe-Libanzi Development Consultants cc. 2004. **Botshabelo Settlement and Business Plan.** Report dated: September 2004.

- Lotter, M.C. & Ferrar, A.A. 2006. **Mpumalanga Biodiversity Conservation Plan.** Mpumalanga Parks Board, Nelspruit.

- Mucina, L. & Rutherford, M. C. (eds). 2006. **The Vegetation of South Africa, Lesotho and Swaziland.** *Strelitzia 19*. South African National Biodiversity Institute, Pretoria.

- Pistorius, J. 2011. **A Phase I Heritage Impact Assessment (HIA) Study for a Proposed New Residential Development in the Botshabelo Nature Reserve Near Middelburg In the Mpumalanga Province of South Africa.** Report compiled by: Dr. J. Pistorius. Report dated: June 2011.

- Plan Associates Town and Regional Planners Incorporated. 2013. **Socio-Economic Impact Assessment for the Establishment of a Rural Village on the Remaining Extent of the Farm Toevlugt 320 JS, Middelburg.** Report compiled by: H. Strydom and A. Basson. Report dated: June 2013. Report number: 222628 Version 2.

- Steve Tshwete Local Municipality - **Spatial Development Framework**. Report dated: June 2010.

- Urban Dynamics Town and Regional Planners. 2011. **Motivating Memorandum in Support of an Application for the Establishment of Botshabelo Rural Village on a Portion of the Remaining Extent of the Farm Toevlugt 302-JS, Nkangala District.** Report dated: September 2011.

- Wetland Consulting Services (Pty) Ltd. 2011. **Wetland Delineation & Assessment. Proposed Residential Development on a Portion of the Farm Toevlugt 320 JS, Middelburg, Mpumalanga.** Report dated: August 2011.

- WSP SA Civil and Structural Engineers (Pty) Ltd. 2012. **Traffic Impact Study: Botshabelo Rural Village, Middelburg.** Report compiled by: E.D. Kotze and B. Bloxham. Report dated: November 2012. Report number: 15281.R.

Supporting documentation:

- Clean Stream Environmental Services. 2012. Final Scoping Report: **The establishment of a rural village on the Remaining Extent of the farm Toevlugt 320 JS, Middelburg.** Report dated: October 2012. Report number: EIA 2011/01.

APPENDIX 1:

APPLICATION FORM

- Letter to the Department of Economic Development, Environment and Tourism (dated: 29 May 2012; Ref: EIA 2011/01) with regards to the submission of the application form – signed by Ms. M. Seshweni (Environmental Impact Assessment)
- Copy of application form.

APPENDIX 2:

CURRICULUM VITAE

- Mrs. A. Erasmus *Pr. Sci. Nat.*
- Ms. R. van Rensburg
- List of reports compiled by Clean Stream Environmental Services

APPENDIX 3:

TOWNPLANNING MEMORANDUM

- Urban Dynamic Town and Regional Planners. 2011. **Motivating Memorandum in Support of an Application for the Establishment of Botshabelo Rural Village on a Portion of the Remaining Extent of the Farm Toevlugt 302-JS, Nkangala District.** Report dated: September 2011.
- Title Deed information

APPENDIX 4:

GEOTECHNICAL REPORT

- Engeolab cc. 2011b. **Report on a Geotechnical Investigation at Botshabelo.** Report compiled by: P.G. Hansmeyer. Report dated: August 2011.

APPENDIX 5:

ADVERTISING OF THE PROJECT

- The advertisement published in the Middelburg Observer – 22 June 2012.
- A copy of the on-site notice (dated: 22 June 2012) – English.
- Printout of company website page www.cleanstreamsa.co.za – New Projects – Notices.
- Printout of company website page www.cleanstreamsa.co.za – New Projects – Background Information Documents.
- E-mail (dated: 30 July 2012) from Clean Stream Environmental Services to the Department of Economic Development, Environment and Tourism.

APPENDIX 6:

BACKGROUND INFORMATION DOCUMENT

APPENDIX 7:

CORRESPONDENCE WITH THE AUTHORITIES AND INTERESTED AND AFFECTED PARTIES

- Letter from the Department of Economic Development, Environment and Tourism (dated: 20 June 2012; Ref: 17/2/3 N-167) to Clean Stream Environmental Services (CSES).
- E-mail from CSES (dated: 10 July 2012) to:
  - Department of Mineral Resources (M. Mokonyane);
  - Department of Water Affairs (M. Mudau);
  - Mpumalanga Tourism and Parks Agency (A. Hoffman, M. Lotter, F. Krige);
  - Department of Agriculture, Rural Development and Land Administration (J. Venter);
  - Steve Tshwete Local Municipality (M. Mahamba, P. Ndlovu);
  - Department of Rural Development and Land Reform (G. Mathonsi);
  - Mpumalanga Provincial Heritage Authority (B. Moduka);
  - Department of Culture, Sports and Recreation (S. Singh);
  - Department of Agriculture, Rural Development and Land Administration (E. van Jaarsveld);
  - Department of Agriculture, Forestry and Fisheries (D. Cindi);
  - Department of Public Works (M. Mokgohloa);
  - Nkangala District Municipality (G. Mathalise).
- E-mail from CSES (dated: 12 July 2012) to the South African Heritage Resources Agency.
- E-mail from CSES (dated: 19 July 2012) to Birdlife South Africa.
- E-mail from CSES (dated: 30 July 2012) to Botlalo Mining and Energy Resources (Pty) Ltd.
- E-mail from CSES (dated: 10 July 2012) to:
  - Wildlife and Environment Society of South Africa (L. Betha);
  - Middelburg Birding Club (H. Hoffman);
  - Endangered Wildlife Trust (U. Franke);
  - Middelburg Chamber of Commerce and Industry (A. Ott);
  - Telkom (J. Kruger);
  - J. Dyason (councilor);
  - Eskom (E. Lennox, A. Pretorius);
  - South African National Road Agency Limited (M. Yorke-Hart);
  - Middelburg Distriks Landbou Unie (J. Schmall);
  - Middelburg Aeroclub;
  - SA Civil Aviation.
- E-mail from CSES (dated: 10 July 2012) to the Mpumalanga Wetland Forum (G. Cowden).
- E-mail from G. Cowden (dated: 20 August 2012) to all the Mpumalanga Wetland Forum members.
- E-mail from CSES (dated: 12 July 2012) to the Simon van der Stel Foundation.
- Letter from Mpumalanga Agriculture (dated: 20 August 2012) to CSES.
- E-mail from Eskom (dated: 25 July 2012) to CSES.
- E-mail from Birdlife South Africa (dated: 20 July 2012) to CSES.
- E-mail from the SA Civil Aviation Authority (dated: 11 July 2012) to CSES.
- Letter from the SA Civil Aviation Authority (dated: 12 April 2012) to Urban Dynamics.
- E-mail from the Simon van der Stel Foundation (dated: 25 July 2012) to CSES.

- E-mail from the Simon van der Stel Foundation (dated: 31 July 2012) to CSES.
- E-mail from M. Kent (dated: 2 August 2012) to CSES.
- E-mail from M. van der Merwe/Middelburg Aeroclub (dated: 11 July 2012) to CSES.
- E-mail from M. van der Merwe (dated: 11 July 2012) to CSES.
- Facsimile from CSES (dated: 13 August 2012) to Mr. S. Mabena.
- Facsimile from CSES (dated: 13 August 2012) to Major Gysman.
- E-mail from CSES (dated: 13 August 2012) to:
    - P. Steenkamp;
    - V. Louw;
    - M. Heyns;
    - S. Bester.
- E-mail and letter from P. Steenkamp (dated: 16 August 2012) to CSES.
- Letter from R. Glintzer (not dated) to CSES.
- E-mail from S. Adams (dated: 18 July 2012) to CSES.
- E-mail from CSES (dated: 11 July 2012) to:
    - N. van der Walt;
    - L. van der Merwe;
    - M. Snyman;
    - J. Pieters;
    - R. Masondo;
    - K. Hesselman;
    - P. Haarhoff;
    - M. Glintzer;
    - R. Glintzer;
    - S. Adams.
- Facsimile from CSES (dated: 11 July 2012) to CSES.

APPENDIX 8:

EVALUATION OF DRAFT AND FINAL SCOPING REPORT

- Letter from Clean Stream Environmental Services (dated: 10 September 2012; Ref: EIA 2011/01) to the Department of Economic Development, Environment and Tourism (DEDET).
- Letter from DEDET (dated: 23 October 2012; Ref: 17/2/3 N-167) to CSES.
- Letter from CSES (dated: 29 October 2012; Ref: EIA 2011/01) to DEDET.
- E-mail from CSES (dated: 20 November 2012) to DEDET.
- Letter from Clean Stream Environmental Services (CSES) (dated: 10 September 2012; Ref: EIA 2011/02) to the Department of Water Affairs.
- Letter from CSES (dated: 10 September 2012; Ref: EIA 2011/02) to the Mpumalanga Tourism and Parks Agency.
- Letter from CSES (dated: 10 September 2012; Ref: EIA 2011/02) to the Steve Tshwete Local Municipality.
- Letter from CSES (dated: 10 September 2012; Ref: EIA 2011/02) to the Botshabelo Community Development Trust.
- Copy of the notice displayed at the library and the register.
- Copy of the advert placed in the Middelburg Observer on 14 September 2012 regarding the draft Scoping Report.
- www.cleanstreamsa.co.za web page printouts regarding the draft Scoping Report.
- Example of the e-mail from CSES (dated: 11 September 2012) forwarded to the various I&APs regarding the draft Scoping Report.
- Example of the e-mail from CSES (dated: 29 October 2012) forwarded to the various I&APs regarding the final Scoping Report.
- www.cleanstreamsa.co.za web page printouts regarding the final Scoping Report.
- E-mail from CSES (dated: 12 April 2013) to I&APs regarding the EIA progress.
- Letter from the Steve Tshwete Local Municipality (dated: 6 November 2012; Ref: 15/3/75) to CSES.
- Steve Tshwete Local Municipality Council Resolution regarding the townplanning process (dated: 12 October 2012).
- Letter from Eskom Distribution (dated: 12 September 2012) to CSES.
- E-mail from Eskom Transmission (dated: 14 September 2012) to CSES.
- Letters from Eskom Transmission (dated: 19 November 2012 and 26 April 2013) to CSES.
- E-mail from Mpumalanga Agriculture – H. Laas (dated: 30 October 2012) to CSES.
- Letter from the Department of Agriculture, Rural Development and Land Administration (dated: 10 October 2012) to CSES.
- Letter from the Department of Co-operative Governance and Traditional Affairs (dated: 2 November 2012) to CSES.
- Letter from the Department of Mineral Resources (dated: 19 July 2012) to Urban Dynamics Town and Regional Planners.
- Letter from the Department of Agriculture, Forestry and Fisheries (dated: 3 October 2011) to Urban Dynamics Town and Regional Planners.
- Letter from the South African National Roads Agency Ltd. (dated: 24 May 2013; Ref: N11/4/3-4/10-1) to WSP SA Civil and Structural Engineers.
- E-mail from the Simon van der Stel Stigting – P. Benhow-Hebbert (dated: 12 April 2012) to CSES.
- E-mail from the South African Heritage Resources Agency – J. Lavin (dated: 6 May 2013) to CSES.
- Proof of the online application lodged (2 August 2013) with the South African Heritage Resources Agency.
- Letter from the South African Heritage Resources Agency (dated: 14 August 2013) to CSES.
- E-mail from Mr. R. Glintzer (dated: 23 April 2013) to CSES.
- E-mail from CSES (dated: 20 May 2013) to Mr. S. Steenkamp (Middelburg Aeroclub).
- E-mail from Mr. F. van der Merwe – Aeroclub (dated: 22 May 2013) to CSES.

APPENDIX 9:

VEGETATION STUDY

- De Castro & Brits. 2012. **Flora and Red Data Plant Survey of the Botshabelo Wetland, Middelburg (Mpumalanga).** Report compiled by: Warren McCleland. Report dated: February 2012.

APPENDIX 10:

ANIMAL STUDY

- Deacon, A. 2012. **Ecological Assessment – Residential Development within the Botshabelo Nature Reserve. Specialist Study – Fauna.** Report compiled by: Dr. A. Deacon. Report dated: March 2012

APPENDIX 11:

WETLAND REPORT

- Wetland Consulting Services (Pty) Ltd. 2011. **Wetland Delineation & Assessment. Proposed Residential Development on a Portion of the Farm Toevlugt 320 JS, Middelburg, Mpumalanga.** Report dated: August 2011.

APPENDIX 12:

GEOHYDROLOGICAL STUDY

- Engeolab cc. 2011a. **Geohydrological Investigation on the Proposed Botshabelo Township, Middelburg, Mpumalanga.** Report compiled by: P.G. Hansmeyer and B.D. Cilliers. Report dated: July 2011. Report number: LL1816.

APPENDIX 13:

HERITAGE STUDY

- Pistorius, J. 2011. **A Phase I Heritage Impact Assessment (HIA) Study for a Proposed New Residential Development in the Botshabelo Nature Reserve Near Middelburg In the Mpumalanga Province of South Africa.** Report compiled by: Dr. J. Pistorius. Report dated: June 2011.

APPENDIX 14:

TRAFFIC IMPACT ASSESSMENT

- WSP SA Civil and Structural Engineers (Pty) Ltd. 2012. **Traffic Impact Study: Botshabelo Rural Village, Middelburg.** Report compiled by: E.D. Kotze and B. Bloxham. Report dated: November 2012. Report number: 15281.R.

APPENDIX 15:

SOCIO-ECONOMIC IMPACT ASSESSMENT

- Plan Associates Town and Regional Planners Incorporated. 2013. **Socio-Economic Impact Assessment for the Establishment of a Rural Village on the Remaining Extent of the Farm Toevlugt 320 JS, Middelburg.** Report compiled by: H. Strydom and A. Basson. Report dated: June 2013. Report number: 222628 Version 2.

APPENDIX 16:

PUBLIC MEETING

- E-mail from Clean Stream Environmental Services (CSES) (dated: 26 and 30 April 2013) to the Botshabelo Community Development Trust (Mr. Seloane and Ms. Motsifane).
- Letter from CSES (dated: 26 April 2013) to the Botshabelo Community Development Trust (Mr. L. Seloane).
- Letter from CSES (dated: 26 April 2013) to the Steve Tshwete Local Municipality (Mr. W. Fouche).
- Letter from the Steve Tshwete Local Municipality (dated: 2 May 2013; Ref: 3/2/4/1/9) to CSES.
- E-mail from CSES (dated: 2 May and 13 May 2013) to I&APs regarding the public meeting.
- Invitation from CSES (dated: 2 May 2013) to the public meeting.
- Flyer distributed.
- The notice placed in the Middelburg Observer on Friday, 17 May 2013.
- The article placed in the Middelburg Observer on Friday, 17 May 2013.
- The Agenda and comment sheet.
- The minutes of the meeting (including attendance register).
- An e-mail from CSES (dated: 4 June 2013) to I&APs regarding the minutes of the meeting.
- www.cleanstreamsa.co.za webpage printouts regarding the minutes of the meeting.

APPENDIX 17:

NATURE RESERVE PROCLAMATION