

Draft Basic Assessment Report

Eldorette Extension 53

Gaut 002/16-17/E0325

April 2017

Executive Summary



TEXTURE
ENVIRONMENTAL CONSULTANTS



Executive Summary

1 INTRODUCTION

Cosyspro (Pty) Ltd (the applicant) appointed Texture Environmental Consultants as the independent Environmental Assessment Practitioner (EAP) to undertake the Environmental Impact Assessment (EIA) for the proposed development of Eldorette Extension 53.

An application for environmental authorisation will be submitted to the Gauteng Department of Agriculture and Rural Development (GDARD). The GDARD will require a Basic Assessment for this project. The Basic Assessment will conform to the National Environmental Management Act 107 of 1998 and to the Environmental Impact Assessment Regulations published in GN R982/2014 - R985/2014 of 8 December 2014. The Basic Assessment will provide information about the proposed Eldorette Extension 53, and its scope is restricted to this component of the project.

The study site is located on holding 45 in the Heatherdale Agricultural Holdings, some 11km north west of the Pretoria central business district. The holding is located in 1st Avenue, immediately opposite the junction between Rose Street and 1st Avenue. The property measures some 5.2ha in total size. The site falls within the City of Tshwane Metropolitan Municipality, Gauteng Province.

2 APPROACH TO THE BASIC ASSESSMENT PROCESS

The approach followed by the consultants is based on the specifications for the Basic Assessment Report in terms of the Environmental Impact Assessment Regulations, 2014, promulgated in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998), as amended.

Gauteng Provincial Department of Agriculture and Rural Development, is the lead authority for this Environmental Impact Assessment (EIA) process and the development needs to be authorised by this Department in accordance with the National Environmental Management Act 107 of 1998 (NEMA) (as amended).

To ensure that all requirements and processes in terms of the Acts are followed the following tasks need to be conducted:

The following has to be submitted to the GDARD:

- ✓ Application form for Authorisation
- ✓ Draft Basic Assessment Report
- ✓ Environmental Management Plan (EMP)
- ✓ Final Basic Assessment Report

The environmental authority will review the Application and final Basic Assessment Report and the following decisions may be made:

- ✓ Grant authorisation of the activity
- ✓ Refuse the activity
- ✓ Request further information or investigations
- ✓ Refer the application to a scoping process where substantial additional investigations or assessments are required in order to make a decision.

3 PROJECT DESCRIPTION

This environmental application is for the proposed Eldorette Extension 53 Township. The project involves the proposed construction of a residential township on a property of 5,1838 hectares with complementary non-residential land uses on the subject property. The proposed township will comprise of four (4) erven to be zoned "Residential 3", "Educational" and "Private Open Space":

1. Erf 319 and 392 will be zoned "Residential 3" with a density of 80 units per hectare to enable the development of a maximum of 102 units;

2. Erf 393 will be zoned “Educational” to allow for the development of a place of childcare; while
3. Erf 394 which represent the bulk of the township area will be zoned “Private Open Space”.

In addition to the environmental application, an application by Metroplan Town planners is made in terms of Section 16 (4) of the City of Tshwane Land Use Management By-law, 2016 and as required in terms of Schedule 6 to the said By-law for the establishment of Eldorette Extension 53 on Holding 45, Heatherdale Agricultural Holdings.

The proposed development composition (i.e. zoning, land use, stand number, number of stands, extent etc.) is set out in the Table below as well as on the attached township layout plan for Eldorette Extension 53.

Table 1: Development Composition

Zoning	Land Use	Proposed Erf no	No of Stands	No of Units	Area in Ha	% of Area
Residential 3	Residential (80u/ha)	1 & 2	2	105	1.3260	25.81
Educational	Place of Childcare	3	1	-	0.3067	5.98
Private Open Space	Park	4	1	-	3.3804	65.79
Existing Streets	Streets	-	-	-	0.1248	2.42
Total		-	4	-	5.1379	100

The proposal includes the construction of associated infrastructure, including access road, civil services (water, sewer and stormwater reticulation) and electricity.

4 PROJECT LOCALITY

The study site is located on Holding 45, Heatherdale Agricultural Holdings. The subject property falls in the jurisdictional area of the City of Tshwane Metropolitan Municipality (CTMM) and forms part of Planning Region 1 and Ward 98. The study site is situated on 1st Avenue, south of the N4 Highway and east of the Mabopane Highway (R80). The proposed project is set out in the Location Map below.

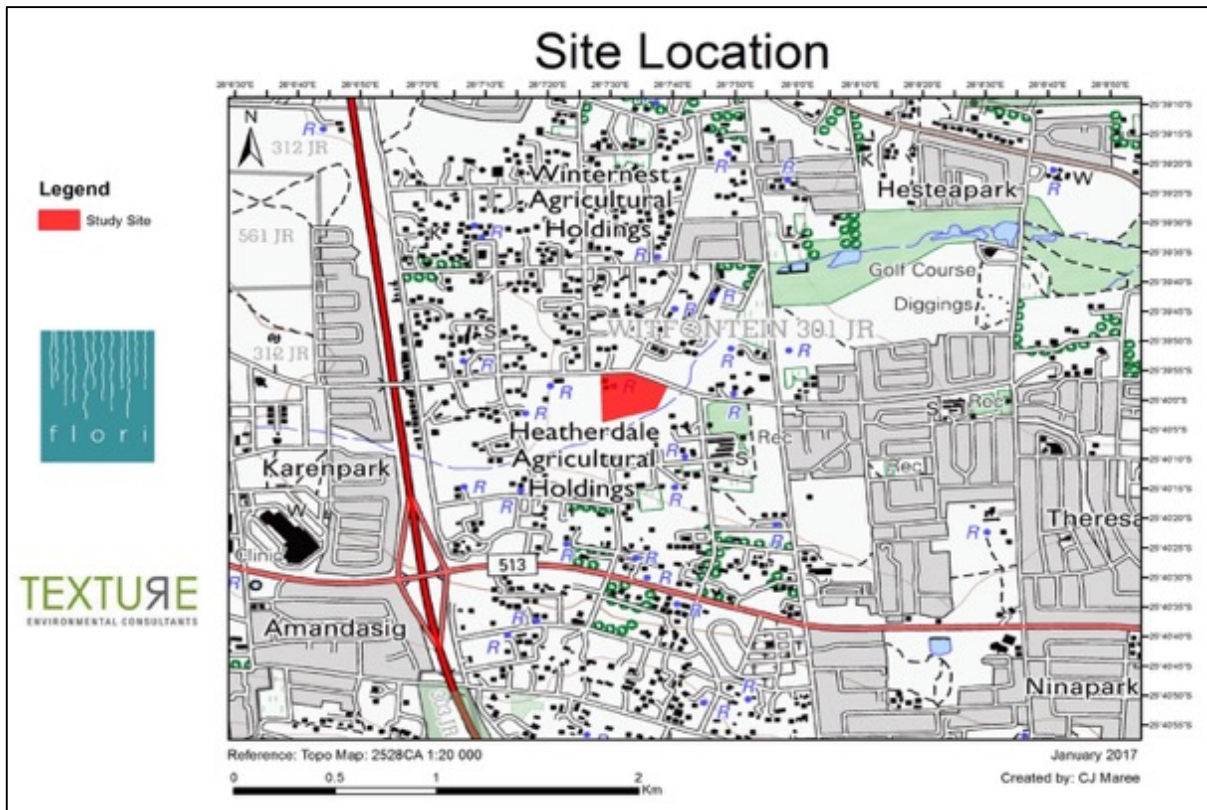


Figure 1: Site Location

The GPS coordinates of the main landmarks within the project area are as follows:

- Karenpark: 25°39'43.93"S; 28° 6'49.62"E.
- Study site (Approximate centre point): 25°39'59.15"S; 28° 7'32.95"E.
- 1:50 000 map grid references: 2528CA (2528CA18).



Figure 2: Study area location (Google Earth)

The site is bound by First Avenue to the north, Portion 405 of the farm Witfontein 301-JR to the west, Portion 394 of the farm Witfontein 301-JR to the south. A small, semi-perennial stream flows south and east of the study area. The stream is just outside of the boundaries of the study area in the south, but flows just within the southeast corner.

5 PROPERTY DESCRIPTIONS

The proposed township to be known as Eldorette Extension 53 will be established on Holding 45, Heatherdale AH. The Surveyor-general 21-digit site (erf/farm/portion) reference number is T0JR0105000004500000. The

The subject property has a split zoning in terms of the provisions of the Tshwane Town Planning Scheme, 2008 (Revised 2014), viz.

- Part A: is zoned 'Agricultural' and constitutes the bulk of the subject property; and
- Part B: is zoned 'Proposed Streets and Widening'.

6 TOPOGRAPHY

The topography of the immediate region and the study site is that of plateaus, lowlands, hills and mountains with moderate to high relief. The study area is situated within a narrow band of lowlands between parallel hills, which are oriented in an east-west direction. The study site itself is situated on top of a flat (plains) plateau. The average elevation for the site is 1 278m a.s.l. and is flat, only varying a few metres in height across the entire site.

7 GEOLOGY AND SOILS

Most of the area is underlain by the mafic intrusive rocks of the Rustenburg Layered Suite of the Bushveld Igneous Complex. Rocks include gabbro, norite, pyroxenite and anorthosite. The shales and quartzites of the Pretoria Group (Transvaal Supergroup) also contribute. Mainly vertic melanic clays with some dystrophic or mesotrophic plinthic catenas and some freely drained, deep soils. Land types mainly Ea, Ba and Ae.

8 SITE AND SURROUNDING LAND USES

The present landcover of the region is predominantly medium-to high-density urbanisation in the form of housing and related infrastructure, such as roads, powerlines, etc.

The established neighbourhoods surrounding the Heatherdale Agricultural Holdings includes Eldorette, Theresapark, Heatherview, Amandasig and Karenpark. Most of the agricultural holdings however still serves a single residential function although several of the holdings is in the process of being developed as residential townships. Examples of nearby township where construction has commenced, includes Eldorette Extension 51 situated on the opposite side of First Avenue along Rose Street, Heatherview Extension 36 situated along Main Street south-east of the subject property and Eldorette Extension 21 situated along Iris Street south-west of the subject property.

The recognised 'Akasia nodal area' consisting of the Wonderpark Shopping, the Akasia Netcare Hospital and the surrounding business is situated approximately 2 km west of the subject property. Other prominent land uses identified in a 2 km radius from the subject property includes amongst others (in a clock-wise direction):

1. Akasia Golf Club;
2. Thornbrook Golf Estate;
3. Akasia High School;
4. Theresapark Primary School;
5. Hatfield Christian Church North,
6. Heatherdale Cemetery;
7. Akasia Town Hall;
8. Akasia Municipal Office; and
9. Wonderpark Estate.

The site itself is within the mentioned Heatherdale agricultural holding (A.H.) area that is becoming more and more urbanised, but was previously cultivated on a regular basis. The state of the veld is therefore a combination of some older, established trees, but predominantly that of younger, regenerating trees and Marikana Thornveld, with open patches of old, cultivated lands still visible. The bulk of the holding constituted open, vacant land. The property is developed with a dwelling house on the north-western boundary of the property.

9 NEED AND DESIRABILITY

The proposed development will contribute to redressing past spatial imbalances by the densification and diversification of the housing options within a previously low density suburb. The proposed development will make housing available in an established area near shopping facilities, employment opportunities and educational facilities and therefore, contribute to the past spatial and other imbalances being redressed.

The development as proposed is based on open market competition and that of a competitive economy. The proposed development will contribute to provision of much needed housing in the area and economic growth by the redevelopment of an existing structure. It represents a private sector initiative, planned and applied for in the context of such open market competition.

Having taken all the relevant factors into account, it is the applicant's submission that the proposed development is desirable in terms of the following:

1. The location of both the R80 Mabopane Highway (PWV 9) and the Platinum Highway (PWV 2) in proximity to the subject property ensure that the development will be well connected and easily accessible on a regional and local level.

2. The proposed development is situated in an established urban area where municipal engineering services and infrastructure are readily available as reflected in the specialist studies. Any upgrades required to the services infrastructure will be for the account of the developer. Bulk contributions will also be payable to the Municipality for purposes of the improvement and maintenance of the infrastructure network.
3. The proposed development is situated in an established urban area where economic and social amenities are readily available such as; the Akasia Golf Club, the Akasia High School, Theresapark Primary School, the Hatfield Christian Church North, Heatherdale Cemetery, the Wonderpark Shopping Centre, the Akasia Netcare Hospital, the Akasia Town Hall and the Akasia Municipal Office.
4. The densification and compaction of the area by means of the proposed development will have the following advantages:
 - A more compact urban form that discourages dispersed urban sprawl; and
 - The provision of a wider range of housing typologies in the Montana area.
5. The proposed development is compatible with the surrounding land uses due to the following factors:
 - The proposed land use will be residential and should blend in well with the predominant residential character of the surrounding developments; and
 - The proposed residential development will also be subject to a density of 80 units per hectare (maximum of 105 dwelling units) with an overall height of 15m, 45% coverage and an FSR of 0.75.

In view of the above it is the applicant’s opinion that the proposed Township Establishment is desirable and will not have a detrimental impact on the surrounding properties or the environment.

10 LEGAL REQUIREMENTS

10.1 National Environmental Management Act

In terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA) as amended and the EIA Regulations 2014, an application for environmental authorisation for certain listed activities must be submitted to the relevant authority, the Gauteng Department of Agriculture and Rural Development (GDARD).

A Basic Assessment (BA) process for this proposed project is being undertaken by Texture Environmental. The listed activities for the proposed Eldorette X53 are the following:

Table 2: Listed Activities

Listed Activity	Activity/ Project Description
<p><u>GN R983/2014 Activity 19</u> The infilling or depositing of any material of more than 5 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 5 cubic metres from –</p> <p>(i) a watercourse; (ii) the seashore; or (iii) the littoral active zone, an estuary or a distance of 100 metres inland of the high-water mark of the sea or an estuary, whichever is the greater –</p> <p>but excluding where such infilling, depositing, dredging, excavation, removal or moving –</p> <p>(a) will occur behind a development setback; (b) is for maintenance purposes undertaken in accordance with a maintenance management plan; or falls within the ambit of activity 21 of this Notice, in which case that activity applies.</p>	<p>To make provision for the excavation or infilling of more than 5 cubic metres of soil from a watercourse if required. Infilling and / or excavation within the 1:100 year flood lines will have to be done to construct roads and civil services along the southern peripheral edge of the site.</p>
<p><u>GN R983/2014 Activity 27</u> The clearance of an area of 1 hectare or more, but less than 20 hectares of indigenous vegetation, except where such clearance of indigenous vegetation is required for –</p> <p>(i) the undertaking of a linear activity; or</p>	<p>The construction of the proposed development will entail the clearance of more that 1 hectares of indigenous vegetation, but less than 20 hectares. The impacted</p>

<p>(ii) maintenance purposes undertaken in accordance with a maintenance management plan.</p>	<p>study area is 5,1379 ha of which 3,3804 ha will be zoned as private open space and maintained as park area. As a result, approximately 1,7575 hectares of indigenous vegetation will thus be cleared.</p>
<p><u>GN R985/2014 Activity 4</u> The development of a road wider than 4 metres with a reserve less than 13,5 metres.</p> <p>(c) In Gauteng:</p> <ul style="list-style-type: none"> i. A protected area identified in terms of NEMPAA, excluding conservancies; ii. National Protected Area Expansion Strategy Focus Areas; iii. Gauteng Protected Area Expansion Priority Areas; iv. Sites identified as Critical Biodiversity Areas (CBAs) and Ecological Support Areas (ESAs) in the Gauteng Conservation Plan or in bioregional plans; v. Sites identified within threatened ecosystems listed in terms of the National Environmental Management Act: Biodiversity Act (Act No.10 of 2004); vi. Sensitive areas identified in an environmental management framework adopted by relevant environmental authority; vii. Sites identified as high potential agricultural land in terms of Gauteng Agricultural Potential Atlas; viii. Important Bird and Biodiversity Area (IBA); ix. Sites or areas identified in terms of an International Convention; x. Sites managed as protected areas by provincial authorities, or declared as nature reserves in terms of the Nature Conservation Ordinance (Ordinance 12 of 1983) or the National Environmental Management: Protected Areas Act (Act No. 57 of 2003); xi. Sites designated as nature reserves within municipal SDFs; or xii. Sites zoned for a conservation or public open space or equivalent zoning. 	<p>According to the Gauteng Conservation Plan (C-Plan) version 3.3, the study area is outside of Critical Biodiversity Areas (CBAs), but borders on an Ecological Support Area (ESA). The demarcated ESA is the small stream that flows south and east of the study area.</p> <p>Access to the development will be via an extension of Rose street from the existing First Avenue at the northern boundary of the site. This extension of Rose street will be in the form of a cul de sac with a turning circle and this road will be 5.5 metres wide.</p>
<p><u>GN R985/2014 Activity 14</u> The development of-</p> <ul style="list-style-type: none"> (i) canals exceeding 10 square metres in size; (ii) channels exceeding 10 square metres in size; (iii) bridges exceeding 10 square metres in size; (iv) dams, where the dam, including infrastructure and water surface area, exceeds 10 square metres in size; (v) weirs, where the weir, including infrastructure and water surface area, exceeds 10 square metres in size; (vi) bulk storm water outlet structures exceeding 10 square metres in size; (vii) marinas exceeding 10 square metres in size; (viii) jetties exceeding 10 square metres in size; (ix) slipways exceeding 10 square metres in size; (x) buildings exceeding 10 square metres in size; (xi) boardwalks exceeding 10 square metres in size; or (xii) infrastructure or structures with a physical footprint of 10 square metres or more; <p>where such development occurs-</p> <ul style="list-style-type: none"> a) within a watercourse; b) in front of a development setback; or c) if no development setback has been adopted, within 32 metres of a watercourse, measured from the edge of a watercourse; - <p>excluding-</p> <p>the development of infrastructure or structures within existing ports or harbours that will not increase the development footprint of the port or harbour;</p> <p>(a) In Gauteng:</p> <ul style="list-style-type: none"> (i) A protected area identified in terms of NEMPAA, excluding conservancies; (ii) National Protected Area Expansion Strategy Focus Areas; (iii) Gauteng Protected Area Expansion Priority Areas; 	<p>According to the Gauteng Conservation Plan (C-Plan) version 3.3, the study area borders on an Ecological Support Area (ESA). The demarcated ESA is the small stream that flows south and east of the study area.</p> <p>Excavation of channels within the 1:100 year flood lines will have to be done to construct civil services along the periphery of the site.</p>

<ul style="list-style-type: none"> (iv) Sites identified as Critical biodiversity areas (CBAs) and Ecological Support Areas (ESAs) in the Gauteng Conservation Pan or in bioregional plans;- (v) Sites identified within threatened ecosystems listed in terms of the National Environmental Management Act; Biodiversity Act (Act No. 10 of 2004); (vi) Sensitive areas identified in an environmental management framework adopted by relevant environmental authority; (vii) Sites or areas identified in terms of an International Convention; (viii) Sites managed as protected areas by provincial authorities, or declared as nature reserves in terms of the Nature Conservation Ordinance (Ordinance 12 of 1983) or the National Environmental Management: Protected Areas act (Act No. 57 of 2003); (ix) Sites designated as nature reserves within municipal SDFs ; or (x) Sites zoned for conservation or public open space or equivalent zoning. 	
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10.2 National Water Act

The National Water Act, 1998 (Act No. 36 of 1998) as amended (NWA) regulates the use of water and the protection of water resources.

An application for a General Authorisation is to be submitted to the Department of Water and Sanitation (DWS), for a water use authorisation in terms of the General Notice 509, Government Gazette 40229, dated 26 August 2016, “General Authorisation in terms of Section 39 of the National Water Act, 1998 (Act No. 36 of 1998)”.

The application will be completed in terms of the requirements of NWA and policies of DWS for a water use authorisation (Section 22 of the NWA), “to change the beds, banks or characteristics of a watercourse” (Section 21(i) of the NWA), as required in terms of Section 40 of the NWA.

Implications for development

The study area is affected by a 1:100 year flood line. Should storm water be discharged into the Boepens Spruit it will require a General Authorisation in terms of the National Water Act. In addition, any civil services to be developed in the flood line area will require authorization.

11 FEASIBLE AND REASONABLE ALTERNATIVES

During investigations various alternatives were investigated. The best options will be determined through the environmental and specialist studies, as well as public opinion.

The following alternatives have been identified and are described as follows:

11.1 Layout Alternatives

The layout options were investigated in terms of the layout for the proposed establishment so as to accommodate the watercourse area. The property is impacted by flood lines as indicated and endorsed by the relevant engineer on the below Layout Plan. The flood line Assessment was conducted by SRK Consulting.

Preferred Layout

The preferred and final layout was in consideration of the flood lines and sensitive water course area. As indicated on the layout plan, the majority of the subject property falls below the 1:100-year flood line area and is therefore not deemed suitable for development. The remaining portion of the property is however suitable for development and will be utilised as such. The area affected by the floodline was accommodated in a ‘Private Open Space’ property and will therefore not form part of the housing development.

Layout Alternative 1

This layout Alternative was without consideration of the flood lines and the sensitive areas of the watercourse. As seen in the layout plan below a huge portion of the development are within the 1:100 year floodline areas.

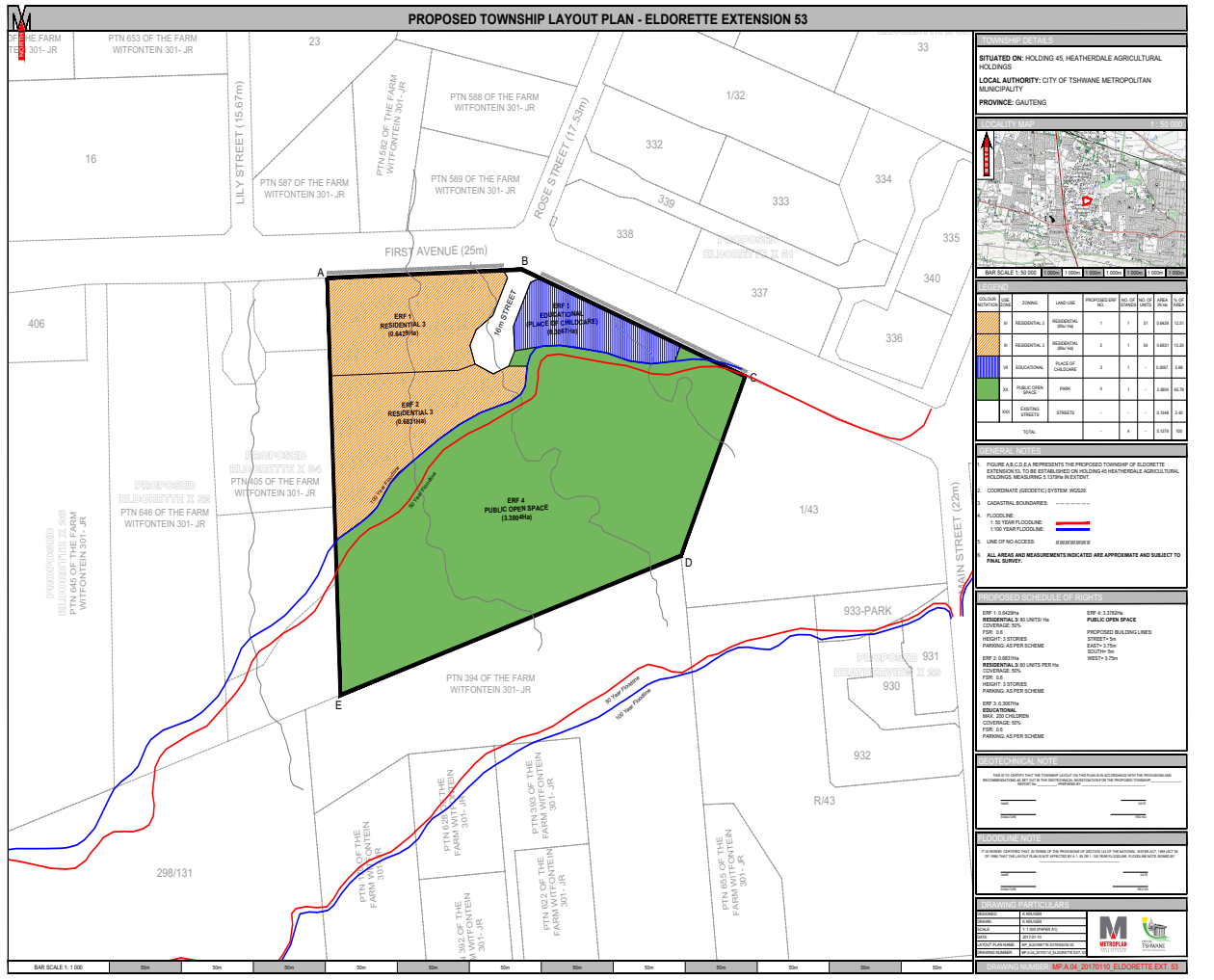


Figure 3 : Preferred Layout

11.2 Activity alternative

The agricultural potential of the study area in terms of crop production has been indicated as medium. The agricultural potential in terms of cattle farming is 'low potential grazing land'. In summary, the study area as a single unit has medium/low agricultural potential.

Most the surrounding properties are also zoned 'Agricultural' terms of the Tshwane Town Planning Scheme, 2008 (Revised 2014). But as mentioned, several of the surrounding agricultural holdings is in the process of being developed as townships. Examples of nearby township where construction has commenced, includes Eldorette Extension 51 situated on the opposite side of First Avenue along Rose Street, Heatherview Extension 36 situated along Main Street south-east of the subject property and Eldorette Extension 21 situated along Iris Street south-west of the subject property. In addition Eldorette Extension 34, Extension 42 and Extension 26 which is situated successively to the west of the subject property.

Agriculture could therefore not be considered as an alternative for this property.

11.3 No-Go Alternative

It is suggested that to maintain the status quo is not the best option for the macro environment. The do-nothing ("no go") option would entail not using the site and maintaining the site as is. From certain perspectives this is not a viable option as the site is situated within an urban area surrounded by either upcoming or already existing residential communities. By not developing the site, the site will be anomalous in the context of the surrounding urban residential land-uses, and some of the direct and indirect socio-economic benefits (i.e. job creation, etc.) will not materialise.

From an environmental perspective, the site has a certain degree of ecological sensitivity due to the presence of the Boepenspruit that flows south and east of the study area. The stream is just outside of the boundaries of the study area in the south, but flows just within the southeast corner. The site is impacted by flood lines as indicated and endorsed by the relevant engineer.

However much of the ecological linkages between the site and surrounding natural areas have been lost due to the increase in development around the site. Not developing the site will assist in protecting the natural features on the site, however the development as proposed will maintain the floodline/watercourse area as an undeveloped but importantly as an actively managed and controlled area. The floodline areas are proposed to be zoned as public open space (erf 4). This will entail 3,3804 ha and approximately 65% of the township.

The No-Go development alternative could therefore not be considered the responsible way to manage the site.

12 SPECIALIST INPUT

Specialist input was obtained to investigate the impact of the various alternatives that could accomplish the purpose of the project. The specialist input is summarised as follows:

12.1 Biodiversity Assessment

A Biodiversity Assessment has been conducted by Texture Environmental. Refer to Appendix G. The report identified the following:

1 Terrestrial Ecology

Vegetation

The vegetation of the study area is characteristic of Marikana Thornveld, with *Acacia thorn* trees being dominant in the landscape. The site is within an agricultural holdings (A.H.) area that is becoming more and more urbanised, but was previously cultivated on a regular basis. The state of the veld is therefore a combination of some older, established trees, but predominantly that of younger, regenerating trees and Marikana Thornveld, with open patches of old, cultivated lands still visible. There is no pristine Marikana thornveld vegetation present on the study site. Due to the years of cultivation there are a number of alien plant species present on the site.

Priority species

Aloe greatheadii, *Gladiolus eliotii*.

Protected trees in the study area

There are no protected trees in the study area.

Fauna

No priority faunal species (which includes red data species) were encountered during field investigations.

2 Aquatic Ecology

Watercourses in the study area

A small, unnamed semi-perennial stream flows south and east of the study area. The stream is just outside of the boundaries of the study area in the south, but flows just within the southeast corner. The small stream has been partially impounded (blocked) by hand-dug trenches and soil mounds along the northeast of the study area, immediately south of 1st Avenue. The small stream is heavily choked with vegetation that includes reeds (*Phragmites australis*), various grasses, shrubs and trees. Many of the trees and some of the herbaceous plants are alien species. For example, syringe trees.

The floodplain of the small stream is large due to the very flat topography of the study area and surrounding area. It would appear that over the last few years the total floodplain of the stream has not been saturated (flooded). As previously mentioned there are no other watercourses on the study site, including seasonal drainage lines.

PES & EIS

The PES of the small stream is Category D (Largely modified).

The EIS of the small stream is Category C (Moderate). This is because there are not many watercourses of significance in the area, but the watercourse is not large enough or perennial enough to be important in terms of migratory birds, breeding and foraging area for various waterfowl, etc. Therefore, the EIS is not high (Category B or A).

Drainage regions

The study area is situated within the primary drainage area (PDA) of A, and the quaternary drainage areas (QDA) of A23E. The study area is within the Crocodile (West) & Marico West Management Area (WMA 3) and under the jurisdiction of the Limpopo Catchment Management Agency (CMA 1).

Sensitivity analyses

The ecological sensitivity of the study area is determined by combining the sensitivity analyses of both the floral and faunal components. The highest calculated sensitivity unit of the two categories is taken to represent the sensitivity of that ecological unit.

Ecological community	Floristic sensitivity	Faunal sensitivity	Ecological sensitivity	Development Go-ahead
Thornveld	Medium/Low	Medium/Low	Medium/Low	Go-Slow
Stream	Medium	Medium	Medium	Go-But

The ecological sensitivity of the study area is medium/low (thornveld) and medium (Stream). In other words, the ecological recommendation is that development may go ahead in the thornveld but it must be done 'slowly', with the correct procedures and the implementation of mitigating measures. Although the stream's sensitivity is calculated to be a 'go-but' area, where development may proceed 'but' only if certain criteria are met, such as obtaining a Water Use Licence, or remaining outside or the main channel and riparian zone. However, watercourses are always viewed as high sensitive, even if the actual analyses show lower sensitivities.

Fatal flaws

There are no fatal flaws.

Priority areas

The study site does not impact on any priority areas.

According to the Gauteng Conservation Plan (C-Plan) version 3.3, the study area is outside of Critical Biodiversity Areas (CBAs), but borders on an Ecological Support Area (ESA). The demarcated ESA is the small stream that flows south and east of the study area.

Figure 4: Sensitivity map of the study area



12.2 Heritage Impact Assessment

A Heritage Impact Assessment has been conducted by Archaetnos Culture & Cultural Resource Consultants. Refer to Appendix G.

A Heritage Impact Assessment (HIA) is the process to be followed in order to determine whether any heritage resources are located within the area to be developed as well as the possible impact of the proposed development thereon.

- A Phase I Heritage Impact Assessment (HIA) study was done and no site of cultural heritage significance as outlined in Section 3 of the National Heritage Resources Act 25 of 1999 was identified in the project area. This is due to the entire area being disturbed by former and recent human interventions.
- It is therefore recommended that the proposed development may continue. This report is seen as ample mitigation.

Recommendations/Mitigation

Should construction work begin for this project:

- It should be noted that the subterranean presence of archaeological and/or historical sites, features or artifacts is always a distinct possibility. Due to the density of vegetation it also is possible that some sites may only become known later on. Operating controls and monitoring should therefore be aimed at the possible unearthing of such features. Care should therefore be taken when development commences that if any of these are discovered, a qualified archaeologist be called in to investigate the occurrence.
- If archaeological materials are uncovered, work should cease immediately and the SAHRA be notified and activity should not resume until appropriate management provisions are in place.
- If any evidence of archaeological sites or remains (eg, remnants of stone-made structures, indigenous ceramics, bones, stone artefacts, ostrich eggshell fragments, marine shell and charcoal/ash concentrations), unmarked human burials, or other categories of heritage resources are found during the proposed activities, SAHRA APM Unit (Philip Hine, 021 462 4502) must be alerted immediately, and a professional archaeologist or palaeontologist, depending on the nature of the finds, must be contacted as soon as possible to inspect the findings. If the newly discovered heritage resources prove to be of archaeological significance, a Phase 2 rescue operation might be necessary.

This report concludes that the impacts of the proposed development on the cultural and environmental values are not significant.

12.3 Town Planning

Metroplan Town Planners and Urban Designers is submitting an Application in terms of Section 16 (4) of the City of Tshwane Land Use Management By-law, 2016 and as required in terms of Schedule 6 to the said By-law for the establishment of Eldorette Extension 53 on Holding 45, Heatherdale Agricultural Holdings.

The purpose of the application is to obtain permission to establish a residential township with complementary non-residential land uses on the subject property. The proposed township will comprise of four (4) erven to be zoned "Residential 3", "Educational" and "Private Open Space".

12.4 Geotechnical investigation

A Phase 1 Geotechnical investigation was conducted by Soilkraft CC. Appendix G refers. The findings are summarised as follows:

The property is regarded as being of intermediate favourability for the proposed development, provided areas below the delineated flood lines are excluded from development. The following issues must be taken into account:

Geology: Trial holes suggest that the site is underlain by noritic bedrock associated with the Bushveld Igneous Complex. This was supported by the characteristic soil profiles encountered during the investigation.

Soil Profiles: Soil profiles on the site consisted of successive horizons of residual norite. The two upper residual horizons proved to be highly to very highly expansive, while the lowermost horizon is granular and non-expansive. Surficial fill and rubble materials occur near trial hole six.

Groundwater: No seepage or perched water was encountered in any of the trial holes; however it is expected that perched water levels or seepage water may occur during years of normal or high rainfall. Such seepage water will be dictated by the adjacent non-perennial water course.

Founding Conditions: The site is divided into two zones. The first zone is classified as H3. Conditions of high soil heave are present in this zone, while surficial fill materials must be removed prior to construction. The second zone is classified as PFlooding and includes all parts of the site below the flood lines. This zone is not suitable for the proposed development.

Conditions of Excavation: Conditions of clayey excavation dominate the site. Gradual refusal of excavation was encountered in three of the six trial holes excavated, with trial hole depths varying from 1300mm to 2400mm.

Soil Corrosivity: Conditions of extremely corrosive soils must be anticipated.

Historic Monuments: There are no historic monuments on the site.

Undermining: The site is not undermined.

Dolomite Stability: The site is not located on dolomitic land.

Seismicity: The annual probability for an earthquake with intensity of 4.2 on the Modified Mercalli Scale to occur in the area to be less than 100; and with an intensity of 7.1 to occur the probability is 10-3. A 10% probability exists that an earthquake with Peak Ground Acceleration of 0.12g to 0.16g may take place once in 50 years.

Recommendations

Proposals for Founding and Construction

1 Geotechnical Zone 1: H3

Construction and founding may commence once all surficial fill and rubble had been removed. Construction may be done by means of a reinforced raft or soil replacement raft, depending on which option is most cost effective. The exact amount of heave to be accommodated on individual erven must be determined during the phase two geotechnical investigation, but a general guideline is that between 60mm and 100mm of heave should be anticipated. The superstructure should also have reinforced masonry and articulation joints, as per the engineering design.

It is critical that site drainage and storm water be planned carefully to ensure efficient drainage. No storm water or surface runoff should accumulate or pond within 1.5m of the structures. Services and plumbing precautions must be put in place to ensure that underground services are not disrupted by the heaving action of expansive in situ soils.

2 Geotechnical Zone 2: PFlooding

This zone falls entirely below the 1 : 100 year flood line and is not deemed suitable for the proposed development as is without extensive site modifications.

Conditions of Excavation

General recommendations on excavation are given below, based on the parameters of “Conditions of Excavation” as per SANS 1200. The following is recommended:

Fill Material: The fill materials may be considered machine excavatable. Care should be taken to ensure the stability of excavations made through fill materials.

Residual Norite 1: Provision should be made for clayey excavation in this material, particularly when in a moist to wet state. The excavability of the horizon is also likely to be moisture dependent and will likely be more difficult to excavate when in a dry state.

Residual Norite 2: Recommendations for this horizon is similar to those given above for the residual norite 1 horizon.

Residual Norite 3: It is recommended that this horizon be excavated using a backhoe or excavator. The latter may achieve greater depths than attained using a backhoe. Regardless of this, it is likely that even an excavator would encounter gradual refusal of excavation once the horizon grades into weathered bedrock.

Depth of Excavation: The general guideline in this regard is that excavation by backhoe was proven to depths between 1300mm and 2400mm.

Excavation Stability: Provisions must be made to ensure excavation stability. The safety of all persons working in or near open excavations must be ensured. It is recommended that provision be made for bracing, shoring or battering of excavation walls to mitigate expected instability.

Seepage Water: It must be anticipated that excavations may be affected by water ingress during years of normal or high rainfall.

Seismicity

The risk of a seismic event occurring is within bounds of the SANS634 specification.

12.5 Electrical Services

An Electrical Services report has been compiled by Sebokwa Engineering. Refer to Appendix G. The total demand for the development was calculated as 254.04 kVA. Single phase prepaid metering is proposed for the residential units and three phase prepaid metering for the place of childcare. An overhead MV network exist in First Avenue. An application is lodged to upgrade the existing connection to a bulk connection in the range of 300kVA or 250kVA depending on standard available connection sizes.

12.6 Engineering Services

Reports titled “*Services report: Water and Sanitation*” and “*Services report: Roads & Stormwater*” have been compiled by LJR Civil Consultants. Refer to Appendix G.

Water Reticulation

An existing 200 Ø water pipe runs on the southern side of First Avenue past the development’s northern boundary. The development can connect to the mentioned 200 Ø line. Due to the fire flow, it is proposed that a 160 Ø must be done. No upgrading to existing water reticulation is required.

The total new daily water demand is 132.6729 kl/day.

Sewer Network

The closest existing sewer line to where the site can drain is a 200 Ø sewer line east of the Township on the corner of First Avenue and Main Street. As the southern portion of the development (erf 349 and 350) is public open space, they do not require sewer connections. According to the report bulk sewer lines need to be installed to accommodate the development in the existing sewer system. The total new sewage outflow will be 71.6904 kl/day.

Access

Access to the development will be via an extension of Rose street from the existing First Avenue at the northern boundary of the site.

Roads

The Traffic Impact Assessment recommended certain road intersection improvements.

In addition, the services report indicated that the existing road (First Avenue) on the northern boundary is not to the current standards of CoT. A portion of the road in front of the development needs to be upgraded. The cul de sac with turning circle (extension of Rose street) will be transferred to CoT.

Stormwater

No stormwater infrastructure exists in First Avenue. On the southern side of the site is a stream which is defined by the 100 and 50 years flood lines. An earth channel is to the east of the site, which drains northwards to Main street, with pipe culverts under First Avenue. It is proposed that the developer install the total sewer line from the western boundary to the earth channel.

12.7 Waste Management

The collection of solid waste should be carried out by the CoT. A refuse area will be accommodated on site and waste will be disposed of at the municipal dumping site as per the requirements of the Municipal Health Bylaws.

12.8 Flood line Assessment

A flood line Assessment was conducted by SRK Consulting. Appendix G refers.

The Boepenspruit, a tributary of the Apies River, runs on the southern side of the proposed development site flowing into the north easterly direction. The subject property is therefore impacted by flood lines as indicated and endorsed by the relevant engineer on the Site Development Plan.

The following was concluded:

- Approximately 65% of the proposed development is situated within the 1:50 year floodline.
- The average flood depth of the 1:100 year floodline along the flood plains is expected to be 0,23m along the floodplains where development is to be done and thus inconvenience due to 1:50 and 1:100 year flood events can be expected without causing any damage to infrastructure.
- Soil erosion of floodplains due to flood velocities of 0.65m/s can be expected within the proposed development site.

Recommendations

The following is recommended:

- Ensure that no new development is situated within the 1:100 year flood line.
- Floodlines should be revised should watercourse/control structures be modified in the future.
- The river banks to be stabilized to avoid erosion due to high 1:100 year flood velocities.
- If there is a need to retain the locations of the proposed ervens, a flood hazard assessment study is recommended to further analyse and categorise the risk associated with flooding in the affected areas. Based on this, relevant flood remedial measures can be determined to maximize the development potential of the area and to also avoid possible liability claims against the Town or City Council.

12.9 Traffic

A Traffic Impact Assessment was conducted by WSP/ Parsons Brinckerhoff Consulting Engineers. Appendix G refers.

The proposed development is expected to generate approximately 287 and 247 trips (in an outbound) during the weekday morning and afternoon peaks hours, respectively.

The impact of the development traffic can be mitigated by means of the following road intersection improvements:

Intersection First Avenue and Rose street: That Rose street be extended to the south with a cul de sac, and that the intersection be converted into a traffic circle.

First Avenue/ Oribi street/ Willem Cruywagen Lane intersection: It is proposed that the existing all-way stop intersection be converted into a traffic circle and that the service road be closed.

In addition, it is proposed that a 2m wide paved sidewalk be constructed along the frontage to facilitate ease of movement.

13 IMPACT ASSESSMENT

The impacts that may result from the planning and design, construction, operational, decommissioning and closure phases as well as proposed management of identified impacts and proposed mitigation measures have been addressed in the Basic Assessment Report.

14 ENVIRONMENTAL MANAGEMENT PROGRAMME (EMPr)

An Environmental Management Programme was prepared to detail a plan of action to ensure that recommendations for preventing the negative environmental impacts (and where possible improving the environment) are implemented during the life-cycle of the project.

15 CONCLUSION

In summary the following is recommended for authorisation:

The maps attached in Appendix A indicates/highlights the whole area (inclusive of floodline area) that was investigated to inform GDARD on the area that is part of the authorisation. The wider area that was investigated will allow future potential amendments to the EA should it be necessary (at a later stage). Should small changes be done to the layout of the site after authorisation it will not be considered crucial and will not warrant a new application.

However, development will not be allowed in the 1:100 year flood line area, except for the construction of a peripheral road and civil services, which will require a General Authorisation in terms of the National Water Act should it encroach on the flood line area.

The Preferred Layout Alternative is recommended for authorisation of the proposed development.
