Ref no: Gaut: 002/15-16/E0024

FINAL SCOPING REPORT

THE PROPOSED BRAKPAN X 13 RESIDENTIAL DEVELOPMENT

14 JUNE 2015

PREPARED FOR:
The Gauteng Department of Agriculture and Rural Development

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FINAL SCOPING REPORT FOR THE PROPOSED BRAKPAN X 13 RESIDENTIAL DEVELOPMENT

This process was managed by:

ENVIRONMENTAL CONSULTANTS – Galago Environmental

Vanessa Marais: BL Landscape Architecture (Principal EAP)

Expertise of the EAP

Vanessa Marais has a BL Degree in Landscape Architecture with more than 12 years relevant experience in reviewing and conducting EIAs at DEAT, Africon and Galago Environmental.

Vanessa Marais has specialized in the development of management processes and guidelines for the review of environmental impact assessments. She has been extensively involved in policy decisions relating to environmental impact management within the ambit of the national context. Her field of expertise is environmental impact management, evaluation and review with analysis of processes used for environmental impact management as well as the mitigation of these impacts within the environmental management plan context.

While working at a big engineering firm, her experience in the field of Environmental Impact Assessments (EIAs) has enabled her to develop mechanisms for determining impacts associated with developments as well as mitigating measures for Environmental Management Plans (EMP). She gained valuable experience in project management while contributing to various projects in the environmental field. She has used the vast experience in EIAs and EMPs to externally audit environmental conditions at various construction projects, notably the Kruger Mpumalanga International Airport, the Development Bank of Southern Africa, Rabali Weir (Limpopo) and wind measuring masts in Port Nolloth.

She has compiled more than 20 Basic Assessment, Scoping or EIA reports in the last 10 years as part of a team, team leader and single Environmental Assessment Practitioner while also working on EMF's, Policies and other IEM related projects.

This report was prepared by the following:

Retha Weir: BSc Hon (EAP)

Retha has twenty two years' experience as an environmentalist; she started as an environmental education officer then became an environmental officer in the wetland section of the National Department of Environmental Affairs and Tourism. In 1999 she moved to the EIA section where she evaluated Scoping and EIA reports.

Thereafter, she became an environmental consultant in private practice. Retha has a very good track record and vast experience in conducting environmental impact assessments and drawing up environmental management plans for large and small industries, mines, housing and lodge developments.

Retha holds a BSc (Botany and Zoology) from the University of Port Elizabeth and a BSc Honours from Wits University. Retha's main responsibility is the overall management of the EIA process where her knowledge and experience adds value to the overall team.

	Authored By	**Reviewed By**
Name	Retha Weir	Vanessa Marais
Designation	Environmental Consultant	Quality Reviewer
Signature		
Date	2015-04-28	2015-05-12

EXECUTIVE SUMMARY

Ekurhuleni Metropolitan Municipality (EMM) has appointed **Galago Environmental CC: Environmental Consultants and Specialists** as the independent environmental consultants to identify and assess the potential environmental impacts associated with the proposed establishment of the **Brakpan x13 Residential Development** (also known as the Brakpan Old Location) through an **Environmental Impact Assessment** (EIA) process.

This Final Scoping Report is for the proposed development of a mixed use residential development situated on Part of the Remainder and Portion 13 of the farm Weltevreden 118 IR. The properties are registered in favour of **Ekurhuleni Metropolitan Municipality**. The Remainder of the farm Weltevreden 118 IR is 315.69 ha in extent and Portion 13, as per the Deed of Transfer is 5.75 ha. The total area of the site under investigation is ± 160 hectares. The site is located southeast of Brakpan "Proper" and is close to Brakpan and Springs CBD's and industrial areas.

The site is earmarked for residential purposes in the spatial development framework (SDF). The aim of the project is to fast-track formal housing delivery in order to relieve Ekurhuleni's current housing backlog that is estimated to be in the region of 200 000 units and is still growing.

Proposed development:
In contrast with its history, Brakpan Old Location will be a modern, integrated and sustainable residential area where a variety of income groups, races and cultures will thrive and live in harmony with each other. While acknowledging its apartheid history, the proposed development will reflect the new South African reality where opportunities are created, choices are maximized and the spiritual and material welfare of all the people are catered for.

The extension of **Boundary Avenue** is proposed as a major **east-west arterial** through the proposed development.

Two major **north-south arterials** are proposed through the proposed development, linking Brakpan CBD to the north with the proposed K132 on the southern edge of the proposed development. The above arterial routes can be seen as potential **activity spines** through the proposed development, with high density mixed use areas clustered along them. A **mixed-use node** will be developed at the intersection of these spines.

A ring road system will be created through the proposed development, linking to existing streets in Brakpan Proper and complementing the arterial routes described above.

The existing wetlands in the northern and south-eastern parts of the proposed development will form the focal points of a **linked open space system** throughout the proposed development. The above structuring elements combine to demarcate **distinct residential cells/neighbourhoods** in the proposed development.

Elements of the original Brakpan Old Location layout plan are incorporated in the proposed development concept.

Project process:
A meeting was held in July 2013 with the Environmental section of EMM to establish whether there is any issues or concerns with regard to the proposed development after the EMM GIS database was consulted.

A pre-application meeting was held with GDARD on 10 February 2015 to establish the process under the new 2014 EIA regulations and to establish whether there are any issues from GDARD that will need special attention.

A public participation process was followed to inform Interested and/or Affected parties (I&APs) about the proposed development and to gather issues and concerns to be investigated during the EIA process. This process will be discussed further in section 5.

This Scoping Report was made available to registered I&APs and the State Departments and the EMM for comment on 18 May 2015. Their issues and concerns were addressed and included in the Final Scoping Report. The application form was submitted to GDARD on 18 May 2015 and a reference number was obtained.

Conclusion:
During the Scoping Phase, alternatives of the proposed development, were investigated and issues and concerns determined through the public participation process. It was determined that a mixed use residential development on the site is a viable alternative.

During the Environmental Impact Assessment phase the different design and technology alternatives for residential development on the site will be compared in terms of the potential environmental impacts associated with the residential development. Specialist studies will be undertaken during the EIA phase in order to determine the potential impacts on the social and biophysical environment.

Specialist studies:

The potential social and biophysical impacts associated with the proposed development will be assessed through the following specialist studies:

- Biophysical
  - Flora red data studies;
  - Wetland delineation study
  - Geotechnical Assessment
- Social
  - Cultural Heritage Assessment
  - Traffic impact study
  - Urban design report
  - Infrastructure provision study
  - Stormwater management study

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ABBREVIATIONS

GDARD	Gauteng Department of Agriculture and Rural Development
GPDA	Gauteng Planning and Development Act
EBOSS	Ekurhuleni Biodiversity and Open Space Strategy
EIA	Environmental Impact Assessment
EMM	Ekurhuleni Metropolitan Municipality
EMP	Environmental Management Plan
EMSDF	Ekurhuleni Metropolitan Spatial Development Framework.
F.A.R.	Floor Area Ratio
I&APs	Interested and/or Affected Parties
IDP	Integrated Development Plan
NEMA	National Environmental Management Act
NEMBA	National Environmental Management Biodiversity Act
SAHRA	South African Heritage Resources Act
WWTP	Waste Water Treatment Plant

DEFINITIONS

Sustainability:	An attempt to provide the best social, environmental and economic outcomes for the human and natural environments both now and into the indefinite future.

1. INTRODUCTION

1.1. Project introduction and background

Ekurhuleni Metropolitan Municipality (EMM) has appointed **Galago Environmental CC: Environmental Consultants and Specialists** as the independent environmental consultants to identify and assess the potential environmental impacts associated with the proposed establishment of the **Brakpan x13 Residential Development** (also known as the Brakpan Old Location) through an **Environmental Impact Assessment** (EIA) process.

This Final Scoping Report is for the proposed development of a mixed use residential development with approximately 5500 houses, situated on Part of the Remainder and Portion 13 of the farm Weltevreden 118 IR. The properties are registered in favour of **Ekurhuleni Metropolitan Municipality**. The Remainder of the farm Weltevreden 118 IR is 315.69 ha in extent and Portion 13, as per the Deed of Transfer is 5.75 ha. The total area of the site under investigation is ± 160 hectares. The site is located southeast of Brakpan "Proper" and is close to Brakpan and Springs CBD's and industrial areas.

The site is earmarked for residential purposes in the spatial development framework (SDF). The aim of the project is to fast-track formal housing delivery in order to relieve Ekurhuleni's current housing backlog that is estimated to be in the region of 200 000 units and is still growing.

1.2. Project location

The proposed development is situated in the south-eastern part of the Ekurhuleni Municipal area within the Brakpan area of jurisdiction on Part of the Remainder (Deed of Transfer T80023/2000) and Portion 13 (Deed of Transfer No. T292/1947) of the farm Weltevreden 118 IR. A central point at the development can be found at 26^{o}14'25.33"S and 28^{o} 23'13.42"E (WGS84).

More specifically (Figure 1), the proposed development abuts Brakpan Proper on the south-southeast. It has an irregular shape and the southern boundary, approximately 1300m in length, follows the planned alignment of future Provincial Road K132. The eastern boundary follows the old farm boundary, leading from Brakpan "Proper" direction south-east for approximately 1000m where it turns due south for a further ± 1000m, intersecting with K132. The western boundary follows the property boundaries of the Muriel Brand and Felicitas Schools, to the west thereof. The site boundary follows the Brakpan "Proper" Township boundaries in a zig-zag pattern up to Hamilton Avenue, the latter which forms the northern boundary of the site. The Brakpan "Bird Sanctuary" (Pan) is included in the study area.

As far as its sub-regional context is concerned, the site is centrally located within the core area of the Far East Rand, close to Brakpan CBD and the Brakpan and Springs industrial areas – Vulcania, Fulcrum and New Era.

Access to the National and Regional Road System is indirect with Route R51 (Kingsway / Paul Kruger Highway) linking northwards to the N12 (some 6 kilometres to the north), which is situated approximately 3 kilometres to the east of the site. The Denne Road / N17 Interchange is about the same distance (3km), in a south-westerly direction.

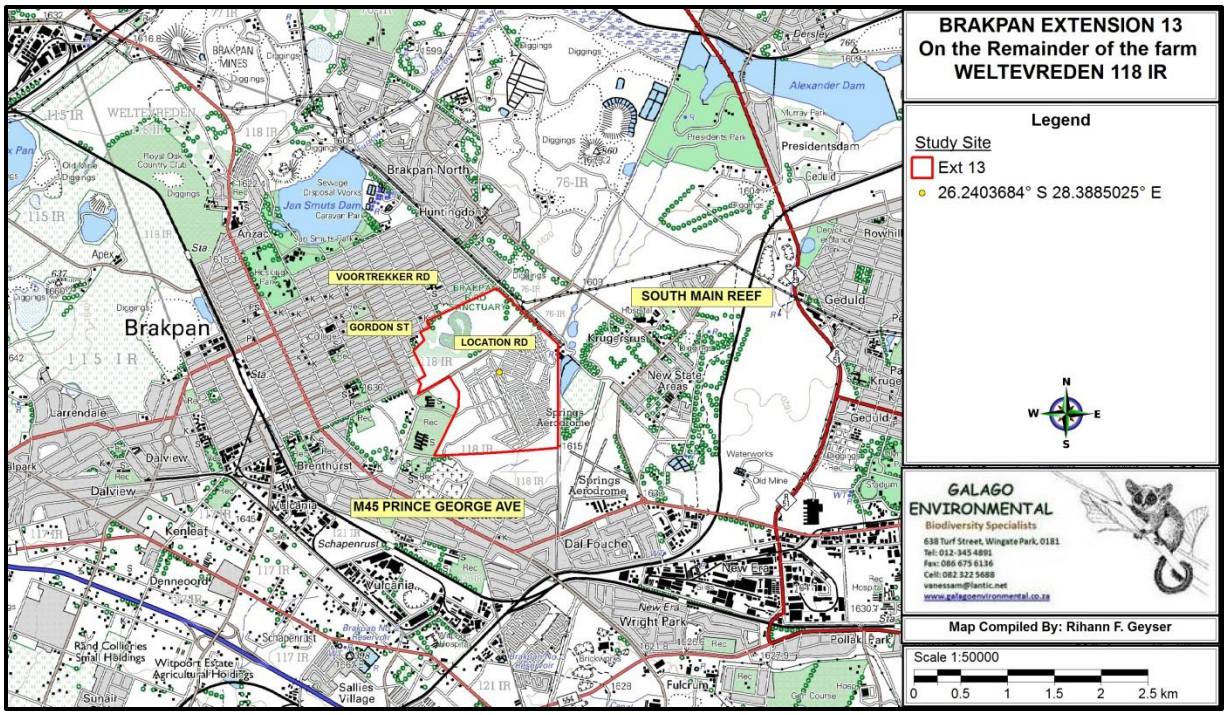

Figure 1: Locality map of the study area

The 1:50 000 map indicating the study site together with all the requirements for a map is included as Appendix A.

1.3. Project description

The study area consists in part of the land on which the original “Brakpan Old Location” was situated, before the forced removal of its residents in the 1960’s and 70’s to what is now known as Tsakane. These forced removals and the demise of the township was caused by the apartheid government’s perception that it was too close to the white areas of Brakpan.

The redevelopment of this site as a major residential area aimed at accommodating the very communities (and their descendants) which were forcibly removed from that land during the apartheid era will go some way in addressing past injustices. It will also (perhaps more importantly) create living opportunities for poverty-stricken people in a very central location within the East Rand, close to all the urban amenities in the Brakpan CBD and the job opportunities in the surrounding industrial areas such as Vulcania, Fulcrum and New Era.

The ±63 existing land claimants will be accommodated on 500m^2 erven within the proposed development, as per agreement. About 240 bonded units on 500m^2 erven will be situated in the northern part of the proposed development as part of the low density housing land use.

People have different lifestyles and a choice of unit types and tenure options will be provided to fit individual preferences and a range of income groups. The medium density housing will cover 26.7 ha and consist of about 1200 erven ranging in size from 80-120m^2, mostly for subsidy-linked units.

Because of its proximity to existing urban amenities/facilities and employment areas, as well as its central location in the Far East Rand core urban area, high residential densities will be

developed in the proposed development. High density housing will cover about 52 ha consisting of 4205 units. These will comprise of two and three-storey walk-up subsidy-linked units and rental stock, situated adjacent to main transport routes and parks.

Elements of the Old Location layout will be retained in the new proposed development design, not only because of historic reasons, but also to take advantage of the old street infrastructure which may be usable as sub-base during the building of new streets.

Schools, community facilities and retail / business properties will also be provided in the proposed development.

A linked open space system is planned and the old “Bird Sanctuary” will be redeveloped as a regional open space node.

1.3.1. Civil and electrical Infrastructure

A bulk services report was requested from the Ekurhuleni Water and Sewer Masterplan consultants, GLS – this report will be included in the EIA report.

1.3.1.1. Water

There is insufficient spare capacity at Brakpan Reservoir to service the proposed development. The reservoir, pump station, main feeder and network pipes in the area will have to be upgraded. A specialist study during the EIA will determine capacity and what infrastructure will be needed for the proposed development.

1.3.1.2. Sewer

Peak sewage flow has been calculated at approximately 41l/s. A specialist study during the EIA will determine capacity and what infrastructure will be needed for the proposed development.

1.3.1.3. Storm water management

There is no storm water infrastructure on the site. Storm water run-off from the site must be controlled in terms of the EMM requirements. A number of storm water attenuation ponds will thus have to be constructed. A Storm water management plan will be developed during the EIA phase to properly manage Storm water on the site.

1.3.1.4. Electricity

Electricity can be made available from the Brakpan North Substation for the development as an interim measure, however the required load will necessitate an application to Eskom to increase the existing 2x10 MVA transformers to 2x20 MVA transformers.

1.3.2. Access and street system

Access to the site is obtained from Location Road which runs east-west through the central part of the site, and from Hamilton Avenue, which forms its northern boundary.

Surrounding major arterial routes include *inter alia* the following:

- **Prince George Avenue (P65-1 / M45)** which runs roughly north-south west of the site, linking up with New Era / Fulcrum to the southeast and Benoni CBD to the northwest.

- **South Main Reef Road (M46)** which runs roughly east-west southeast of the site, linking up with Paul Kruger Highway.

- **Paul Kruger Highway (R51 / R29)** which runs roughly north-south east of the site, linking to the N12 freeway in the north.

The following proposed Provincial K and PWV Routes run in the vicinity of the site:

- **Proposed Provincial Road K132**, running east-west and connecting Paul Kruger Highway (proposed K161) ± 3km east of the site with proposed K163 ± 2km west of the site, forms the southern boundary of the site. Two access points into the site is provided from this planned route.

- **Proposed Provincial Road PWV17** runs north-south past the eastern edge of the site linking the N17 in the south with the N12 in the north. An interchange between proposed PWV17 and proposed K118, northeast of the site, is provided for.

Access to the National and Regional Road System is indirect with Route R51 (Kingsway / Paul Kruger Highway) linking northwards to the N12 (some 6 kilometres to the north), which is situated approximately 3 kilometres to the east of the site. The Denne Road / N17 Interchange is about the same distance (3km), in a south-westerly direction.

The development concept as shown on Figure 2 is based on the following major structuring elements:

- Location Road is a major east-west arterial through the proposed development, linking with Boundary Avenue to the west and Hospital Road the east.
- A major north-south arterial is proposed through the proposed development, linking Brakpan CBD to the north with Prince George Avenue and the industrial areas to the south and southeast.
- Both the above arterial routes can be seen as potential activity spines through the proposed development, with high density mixed use areas clustered along them.
- A mixed-use node will be developed at the intersection of the two spines.
- A ring road system will be created through the proposed development, linking to existing streets in Brakpan Proper and complementing the two arterial routes described above.
- The above structuring elements combine to demarcate distinct residential cells/neighbourhoods in the proposed development.
- Elements of the original Brakpan Old Location layout plan are incorporated in the proposed development concept.

The Benoni/Brakpan/Springs railway line runs west and south of the site, with Brakpan station situated ± 2km west of it and Pollak Park Station situated ± 1.5km southwest of it.

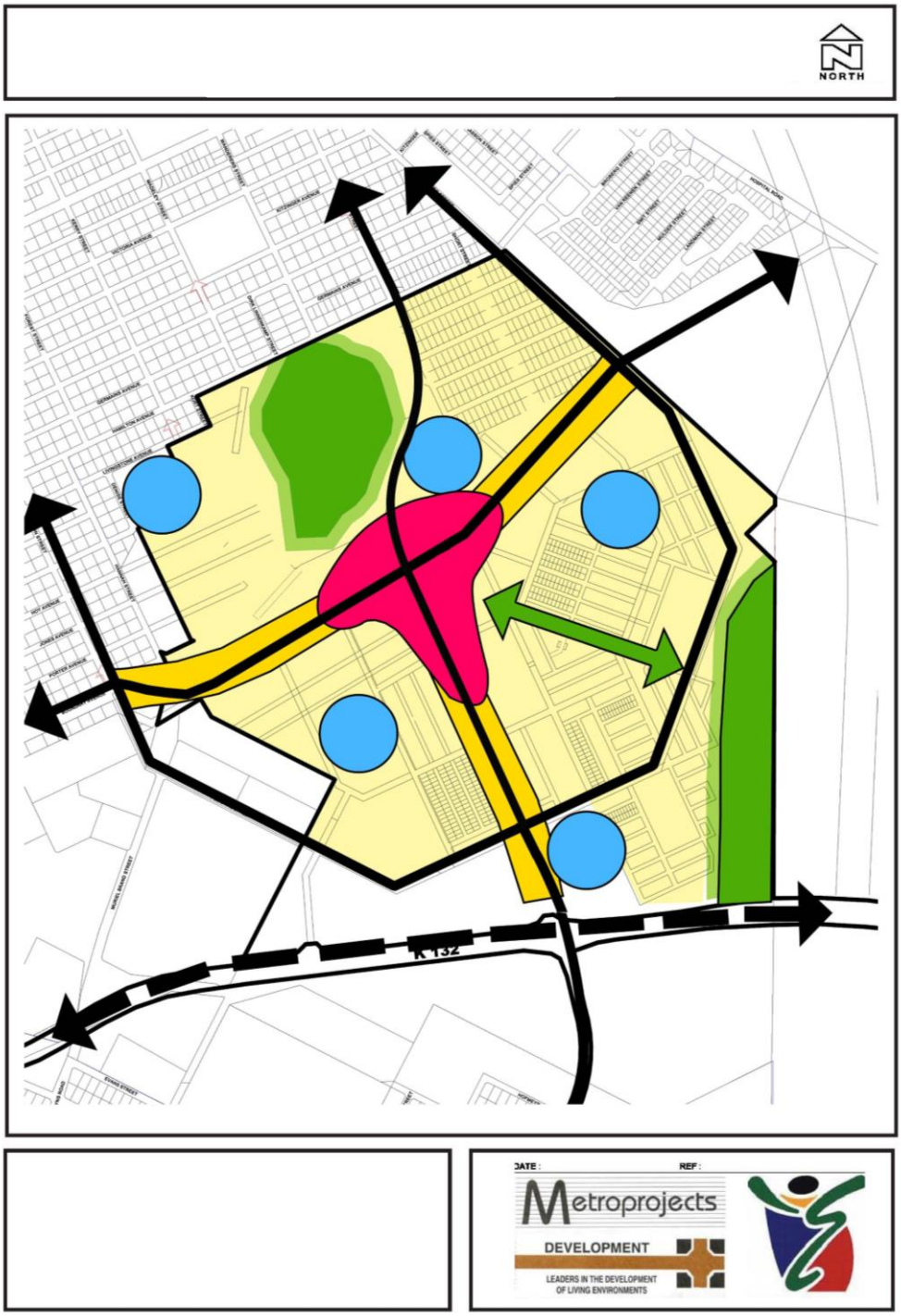

Figure 2: Road network in the proposed Brakpan x13 residential area

1.3.3. Servitudes

No servitudes are registered on the site.

To the best of our knowledge and as a result of documentary examination, the site does not appear to be affected by any future infrastructure planned by Rand Water, Erwat, Eskom, Sasol Gas, Transnet, etc.

Care should be taken in respect of municipal services on site. Presence of electricity cables are in evidence due to the presence of the mini-sub on Location Road and a second substation in the south-eastern extreme of the site, next to the spruit.

1.4. Statutory and institutional procedure

There are certain legislative requirements to which the proposed establishment of a residential development must conform. The requirements of the applicable legislations or acts must be applied to this development proposal.

1.4.1. Constitution of Southern Africa Act, 1996 (Act No. 108 of 1996)

The Constitution of South Africa provides the legal foundation for the republic and sets out the rights and duties of its citizens and defines the structure of the government. In terms of Section 24 of the Constitution every person has the right to an environment that is not harmful to their health or wellbeing and to have the environment protected through reasonable legislative measures.

1.4.2. National Environmental Management Act (NEMA), 1998 (Act No. 107 of 1998) (as amended) and the Environmental Impact Assessment Regulations, 2014

NEMA aims to provide for co-operative environmental governance by establishing principles for decision-making on matters affecting the environment, institutions that will promote cooperative governance and procedures for coordinating environmental functions exercised by organs of state and to provide for matters connected therewith.

In April 2006 the Minister of Environmental Affairs and Tourism passed Environmental Impact Assessment Regulations in terms of Chapter 5 of the National Environmental Management Act, 1998 (NEMA). The regulations replaced the Environmental Impact Assessment (EIA) regulations which were promulgated in terms of the Environment Conservation Act, 1989 in 1997. These regulations were again replaced on 18 June 2010, and on 8 December 2014, therefore, all new applications must be made in terms of the New NEMA regulations, 2014. The purpose of this process is to determine the possible negative and positive impacts of the proposed development on the surrounding environment and to provide measures for the mitigation of negative impacts and to maximise positive impacts.

Notice No. R 983, R984 and R 985 of the New Regulations list activities that indicate the process to be followed. The Activities listed in Notice No. R 983 requires that a Basic Assessment process be followed and the Activities listed in Notice No. R984 requires that the Scoping and EIA process be followed. However, the guidelines document supplied by DEA states that if any activity being applied for is made up of more than one listed activity and the

scoping and EIA process is required for one or more of these activities, the full EIA process must be followed for the whole application.

The proposed development includes the following listed activities and therefore it will be necessary to follow a full EIA process (as an independent process) in terms of NEMA (**Error! Reference source not found.**).

Table 1: The activity is covered by the following sections of the Environmental Regulations

Regulation No:	Activity No:	Description of the activity
No. 984	15.	The clearance of an area of 20 hectares or more of indigenous vegetation, excluding where such clearance of indigenous vegetation is required for- (i) the undertaking of a linear activity; or (ii) maintenance purposes undertaken in accordance with a maintenance management plan.

This description encompasses all relevant infrastructures, which will be associated with the construction of the proposed development. The legislation requires that the Environmental Impact Assessment (EIA) procedure for the proposed development has to be followed. This procedure entails a permitting process meeting various environmental reporting requirements.

Other legislative procedures that have been considered or need to be taken into account for the proposed project are the following:

- The National Water Act, 1998 (Act No. 36 of 1998);
- The National Water Act, 1998 (Act No. 36 of 1998) General Notice 1199 - development within 500 meters of a wetland;
- The National Water Act, 1998 (Act No. 36 of 1998) General Notice 1198 - Rehabilitation of a wetland area;
- National Environmental Management: Biodiversity Act, (Act No. 10 of 2004);
- Gauteng Planning and Development Act , 2003 (Act No. 3 of 2003) (GPDA);
- Conservation of Agricultural Resources Act, 1983 (Act No. 43 of 1983);
- The Gauteng Draft Red Data Policy;
- The Gauteng Draft Ridges Policy;
- GDARD Conservation Plan, Version 3.3;
- GDARD Requirements for Biodiversity Assessments (Version 2, 2012);
- Gauteng Agricultural Hubs Policy;
- Ekurhuleni Metropolitan Municipality Spatial Development Framework (MSDF) and Integrated Development Plan (IDP);
- EMM Bioregional Plan (2011);
- EMM Biodiversity and Open Space Strategy (EBOSS), May 2009;
- Section 108 of the Town Planning and Townships Ordinance, 1986 (Ord. 15 of 1986);
- The South African Heritage Resources Act (SAHRA), 1999 (Act No. 25 of 1999); protects the cultural resources on a proposed development site;
- The Municipal Systems Act, 2000 (Act No. 32 of 2000) and the Integrated Development Plans (IDP) regulates the planning processes of the local Municipality. The site is earmarked for residential development in the Ekurhuleni Metropolitan Spatial Development Framework (EMSDF).

- National Environment Management Protected Areas Act, 2003 (Act No. 57 of 2003);
- National Environment Management Waste Act, 2008 (Act No. 59 of 2008);
- National Veld and Forest Fire Act, 1998 (Act No.101 of 1998);
- Mountain Catchment Act, 1970 (Act No. 63 of 1970);
- National Heritage Recourses Act, 1999 (Act No. 25 of 1999);
- World Heritage Convention Act, 1999 (Act No. 49 of 1999);
- Conservation of Agricultural Resources Act, 1983 (Act No. 43 of 1983);
- Land Use Planning Ordinance 15 of 1985 and the planning ordinances depending on the province in South Africa where construction will take place.

1.5. Project process

A meeting was held in July 2013 with the Environmental section of EMM to establish whether there is any issues or concerns with regard to the proposed development after the EMM GIS database was consulted.

A pre-application meeting was held with GDARD on 10 February 2015 to establish the process under the new 2014 EIA regulations and to establish whether there is any issues from GDARD that will need special attention.

A public participation process was followed to inform Interested and/or Affected parties (I&APs) about the proposed development and to gather issues and concerns to be investigated during the EIA process. This process will be discussed further in section 5.

This draft Scoping Report will be made available to registered I&APs and the State Departments and the EMM for comment on 18 May 2015. Their issues and concerns will be addressed and included in the Final Scoping Report. The application form will be submitted to GDARD on 20 May 2015 and a reference number will be obtained.

1.6. Project need and desirability

The table below gives a summary of the need and desirability considerations for this project (Table 2).

Table 2: Need and desirability considerations

NEED (TIMING)		
QUESTION A1: Is the land use (associated with the activity being applied for considered within the timeframe intended by the existing approved SDF agreed to by the relevant environmental authority.		
Yes X	~~No~~	The project is aligned with the objectives of the municipal Spatial Development Framework (SDF) and Integrated Development Plan (IDP) and will not compromise the integrity of these respective forward planning documents. Specific reference is made to the Provincial Strategic Priorities identified for Gauteng and the West Rand District Municipality: • Job Creation • Investment Creation • Rural/Urban Development • Infrastructure Development

		• Combating Crime • Skills Development • Combating the impact of HIV/AIDS • Poverty Alleviation The residential development and associated operational activities and impacts are aligned with these provincial priorities and will contribute in achieving the strategic priorities set for the province.
QUESTION A2: Should the development concerned, in terms of the land use (associated with the activity being applied for) occur here at this point in time?		
Yes X	~~No~~	The site is situated within the demarcated Ekurhuleni Urban Edge. The site is earmarked for residential development in the Ekurhuleni Metropolitan Spatial Development Framework, 2011. Ekurhuleni's current housing backlog is estimated to be in the region of 200 000 units and is still growing. The obvious need and huge demand for formal housing is an indisputable fact. Fast-tracking housing delivery is one of the top priorities of central, provincial and local government. An integrated, sustainable township will be developed, offering a range of housing typologies and tenure options as well as various community facilities and urban amenities. Functional urbanism and the creation of a sense of place/community lie at the heart of the township design.
QUESTION A3: Does the community/area need the activity and the associated land use concerned (is it a societal priority)?		
Yes X	~~No~~	Unemployment is a major problem within the Ekurhuleni Metropolitan Municipality and is as high as 28.8% (Source: Census 2011 Municipal Fact Sheet, published by Statistics South Africa). The proposed residential development will employ a large amount of people during construction, which will have a significant positive impact on the baseline socio-economic conditions of the local communities involved. The development will contribute towards the socio-economic development of the region as a whole through social upliftment and job creation as primary agents. The future incomes earned by these employees will translate into spending power, benefiting businesses and entrepreneurs not only in the area surrounding the operation where the employees spend their working week, but also in those economies further away. Besides the positive impact the development will have on the livelihoods of the households of its future employees in the neighbouring and labour sending communities, the development will contribute to the upliftment of the beneficiaries receiving houses in this development, especially the 63 existing land claimants. In addition to a contribution to the economy, the development will also pay significant amounts in annual taxes, which will be used by the Government for social upliftment. The construction sector will also benefit from a large residential development such as this.
QUESTION A4: Are the necessary services with the adequate capacity currently available (at the time of application), or must additional capacity be created to cater for the		

development?		
~~Yes~~	No X	Current access roads are present. Electricity, sewage system and water is not currently available on site. Internal roads and storm water systems will have to be built as part of the development.
QUESTION A5: Is this development provided for in the infrastructure planning of the municipality, and if not what will the implication be on the infrastructure planning of the municipality (priority and placement of services and opportunity costs)?		
Yes X	~~No~~	The current drainage area is the Hamilton and Old Location Pump Stations and the Jan Smuts WWTP. These two pump stations must be abandoned and the President dam Pump Station must be upgraded to accept outflow from the site, pumping it to Welgedacht waste water treatment plant (WWTP), which will also have to be upgraded as it has no spare capacity. Main outfall sewers will also have to be upgraded. There is no storm water infrastructure on the site. Storm water run-off from the site must be controlled in terms of the EMM requirements. A number of storm water attenuation ponds will thus have to be constructed. Electricity can be made available from the Brakpan North Substation for the development as an interim measure, however the required load will necessitate an application to Eskom to increase the existing 2x10 MVA transformers to 2x20 MVA transformers. EMM is aware of all of the infrastructure that must be upgraded and their Civil services department is dealing with this provision so that it is ready in time for the proposed development.
QUESTION A6: Is this project part of a national programme to address an issue of national concern or importance?		
Yes X	~~No~~	Ekurhuleni's current housing backlog is estimated to be in the region of 200 000 units and is still growing. The obvious need and huge demand for formal housing is an indisputable fact. Fast-tracking housing delivery is one of the top priorities of central, provincial and local government.
B) DESIRABILITY (PLACING)		
QUESTION B1: Is the development the best practicable environmental option for this land/site?		
Yes X	~~No~~	The study area has been transformed to a large degree, by the Brakpan Old Location development and the current groundwork and dumping taking place on the site. Alternative land uses for the site would include grazing and farming activities. However, the site is situated within the demarcated Ekurhuleni Urban Edge. The site is earmarked for residential development in the Ekurhuleni Metropolitan Spatial Development Framework, 2011. Ekurhuleni's current housing backlog is estimated to be in the region of 200 000 units and is still growing. The obvious need and huge demand for formal housing is an indisputable fact. Fast-tracking housing delivery is one of the top priorities of central, provincial and local government. An integrated, sustainable township will be developed, offering a range of

		housing typologies and tenure options as well as various community facilities and urban amenities. Functional urbanism and the creation of a sense of place/community lie at the heart of the township design.
QUESTION B2: Would the approval of this application compromise the integrity of the existing approved and credible municipal IDP and SDF as agreed to by the relevant authorities?		
~~Yes~~	No X	The project is aligned with the objectives of the municipal Spatial Development Framework (SDF) and Integrated Development Plan (IDP) and will not compromise the integrity of these respective forward planning documents.
QUESTION B3: Would the approval of this application compromise the integrity of the existing environmental management priorities of the area (e.g. as defined in EMFs), and if so, can it be justified in terms of sustainability considerations?		
~~Yes~~	No X	The project is aligned with the objectives of the municipal Spatial Development Framework (SDF) and Integrated Development Plan (IDP) and will not compromise the integrity of these respective forward planning documents.
QUESTION B4: Do location factors favour this land use (associated with the activity applied for) at this place, etc.)?		
Yes X	~~No~~	The site is situated within the demarcated Ekurhuleni Urban Edge. The site is earmarked for residential development in the Ekurhuleni Metropolitan Spatial Development Framework, 2011. Ekurhuleni's current housing backlog is estimated to be in the region of 200 000 units and is still growing. The obvious need and huge demand for formal housing is an indisputable fact. Fast-tracking housing delivery is one of the top priorities of central, provincial and local government. An integrated, sustainable township will be developed, offering a range of housing typologies and tenure options as well as various community facilities and urban amenities. Functional urbanism and the creation of a sense of place/community lie at the heart of the township design. The proposed development is flanked by existing residential developments on three sides.
QUESTION B5: Will the activity or the land use associated with the activity applied for, impact on sensitive natural and cultural areas (built and rural/natural environment)?		
~~Yes~~	No X	The proposed site for the residential development is located within an area which is already severely disturbed. The study area is highly impacted by historical activities and the local population. Road grading and site clearing training takes place in the north-eastern part of the site. Rubble and litter dumping occurs over large areas on the site. The pan in the northwest is fringed by bluegum and other exotic trees. Sensitive areas such as the wetlands will be excluded from the development area. Most of the southern part of the site consists of the land on which the original "Brakpan Old Location" was situated, before the forced removal of its residents in the 1960's and 70's to what is now known as Tsakane. Brakpan Old Location was situated in the southern part of the site, south

		of Location Road. The old street pattern and even some of the foundations can still be clearly discerned on the aerial photo. The old street names form an inextricable part of the heritage of the place and should be retained where appropriate – this issue should be work-shopped with the beneficiary community. A multi-purpose community centre is proposed as a central focus area. This node of ± 8 ha is earmarked for community facilities, retail development, heritage site/memorial and educational facilities, etc.
QUESTION B6: Will the development impact on people's health and wellbeing (e.g. in terms of noise, odours, visual character and sense of place, etc.)?		
Yes X	~~No~~	Noise, dust and visual impacts will increase during the construction phase, but with the proper mitigation measures and good practice environmental management measures, it will result in minimal impacts and it is not expected to reach beyond the property boundary. Once the development is completed it is expected that there will be a large improvement in comparison to the current situation.
QUESTION B7: Will the proposed land use result in unacceptable cumulative impacts?		
~~Yes~~	No X	As already mentioned, through the implementation of good practice environmental management measures as well as mitigation measures, all direct and cumulative impacts which may result from the proposed development will be addressed and ensure that the environment is affected to the minimum.

2. ENVIRONMENTAL BASELINE DESCRIPTIONS

The following section provides a description of the baseline, or status quo assessment of the environmental and socio-economic parameters of the site. From this assessment the specific and pertinent issues to be addressed by the assessment will be identified, together with issues identified by interested and affected parties and the authorities.

2.1. Biophysical descriptions

2.1.1. Topography and drainage

The site has a moderate fall, sloping from the west towards the east, south of Location Road, at a gradient of approximately 1:30, terminating in a localised north draining spruit area along the eastern boundary of the site. No prominent topographical features are evident on the site. There is a shallow pan on the north-western part of the site, between Location Road and Brakpan Proper, with the topography at this locality draining northwards and westwards towards this localized depression. It forms part of the "Bird Sanctuary" and is undevelopable. Just east of the pan, drainage is again in an easterly direction. Average slope on this part of the site is 1:60 which increases to ± 1:35 in the south eastern extreme.

Other than this wetland, no prominent topographical features are evident on the site.

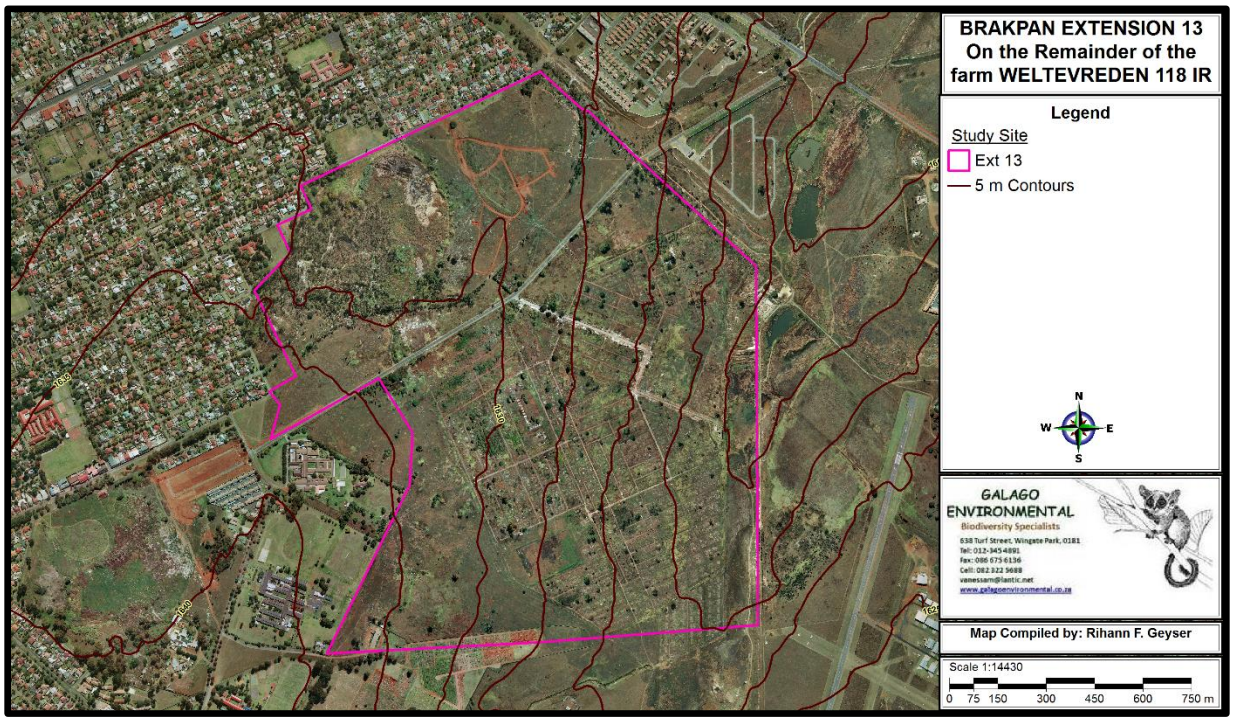

Figure 3: The five meter interval contours topography of the study site

2.1.2. Climate and rainfall

The climate of the site is typical of the Highveld region. Precipitation is usually in the form of thundershowers, often accompanied by hail in the summer months followed by dry winters. The mean annual precipitation for the area is between 600 and 700 mm, with the dominant precipitation received during the months of October to March.

The area generally receives little rainfall during the months from April to September. The highest monthly temperature of 35.3°C is recorded in January and the lowest monthly temperature of -3.3°C is recorded in July. The area is significantly colder than Pretoria itself, with winter temperatures easily dropping to 4 degrees below freezing point with extensive frost during winter months (Mucina and Rutherford, 2006).

2.1.3. Geology

According to the 1:250 000 Geological Map, the site is underlain by sediments of the Vryheid Formation (Ecca Group) of the Karoo Supergroup. The sediments comprise mudrock, sandstone and coal. The hard rock geology is blanketed by a variable thickness of both colluvial and residual soils.

The site is classified as dolomitic land by the Council for Geoscience. The Geotechnical investigation study will confirm whether there is dolomite on site.

The site is undermined at a deep level, in excess of 240m below surface, and will therefore be deemed to be suitable for development by the Department of Mineral Resources (DMR).

2.1.4. Soils

With the exception of wetland soils around the pan in the north-western part of the site and the spruit along its south-eastern boundary, the soils on the site are suitable for development.

Two land types were found on the site (Figure 4): Ba 1 and Bb 3.

Ba 1 land type is described as Plinthic catena (> 10%); upland duplex and margalitic soils rare (< 10%). Moderately to highly leached, red soils > 33%. Bb 3 land type have the following qualities: Plinthic catena (> 10%); upland duplex and margalitic soils rare (< 10%). Moderately to highly leached, red soils < 33%.

There are no significant geotechnical conditions evident that prevent township establishment on this portion of land. A preliminary NHBRC soils classification for the site would be: H and H2 (total heave <7,5mm and >15mm-<30mm); C2 (total collapse of >10mm); S1 (total normal settlement 10mm-20mm); (R) (pockets of hardpan ferricrete); P (dolomite). Collapsible soils can be fairly easily overcome by a combination of ground improvement and use of concrete reinforced rafts. In general, the site may be regarded as favourable in terms of geotechnical constraints.

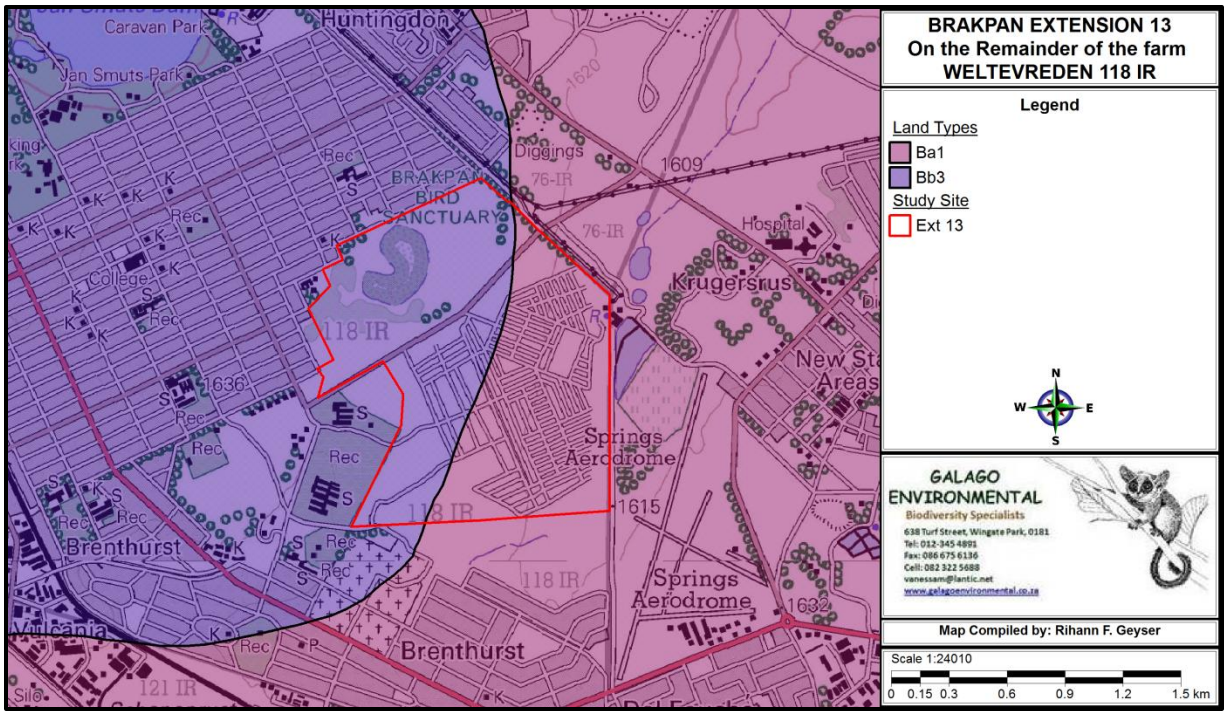

Figure 4: Land types on the study site

2.1.5. Aquatic description

The study site lies on the banks of a tributary to the Blesbokspruit in the Upper Vaal Water management area. See **Figure 5** below for the Department of Water Affair's Google Earth layer information of the site.

The site falls within quaternary catchment C21E. The study site forms part of Ecoregion 11 and is classified by the following characteristics (DWAF, 2005):

- Mean annual precipitation: Rainfall varies from low to moderately high, with an increase from west to east.
- Coefficient of variation of annual precipitation: Moderately high in the west, decreasing to low in the east.
- Drainage density: Mostly low, but medium in some areas.
- Stream frequency: Low to medium.
- Slopes <5%: >80%, but 20-50% in a few hilly areas.
- Median annual simulated runoff: Moderately low to moderate.
- Mean annual temperature: Hot in the west and moderate in the east.

The site is found in the **Highveld Ecoregion** as described in the Level 1 Ecoregions by the Department of Water Affairs and Forestry (DWAF, 2005).

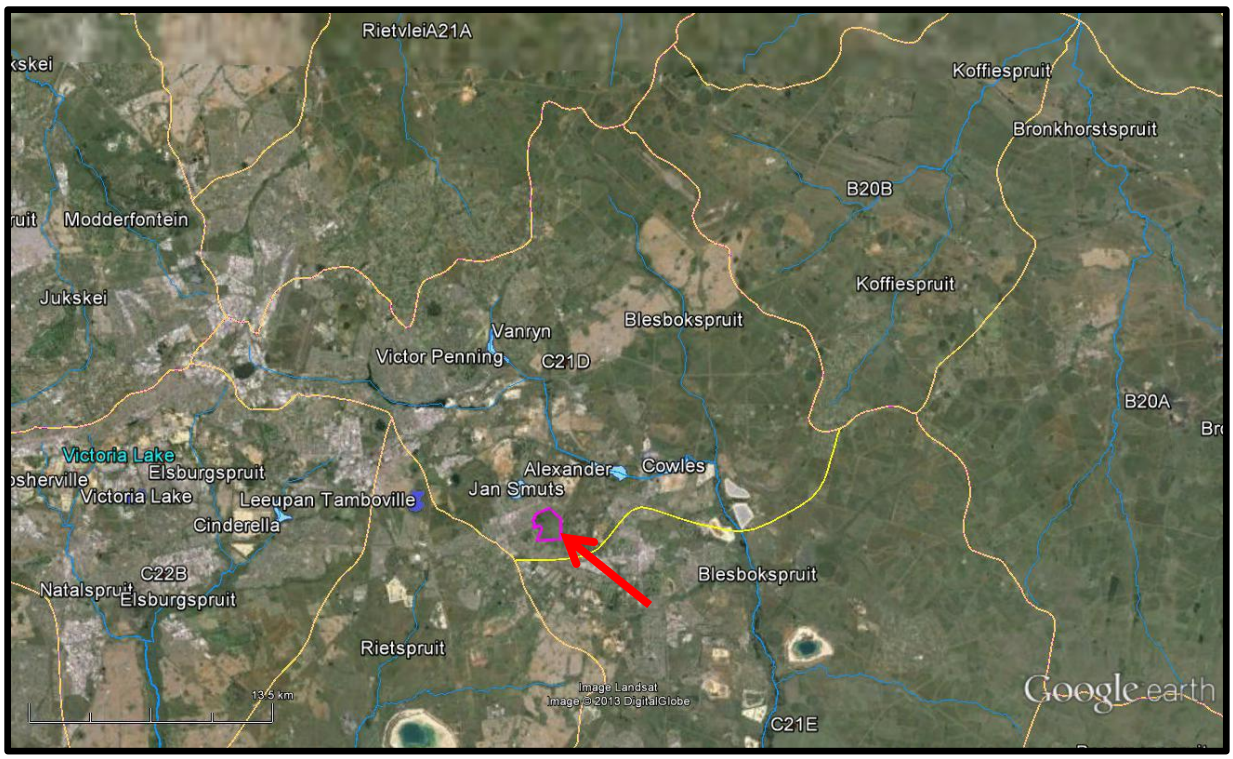

Figure 5: The Catchment and hydrological data for the study site, as available from DWA RQS services

2.1.6. Primary boundary determinants

The site has an irregular shape and the southern boundary, approximately 1300m in length, follows the planned alignment of future Provincial Road K132. The eastern boundary follows the old farm boundary, leading from Brakpan "Proper" direction south-east for approximately 1000m where it turns due south for a further ± 1000m, intersecting with K132. The eastern boundary follows the property boundaries of the Muriel Brand and Felicitas Schools, to the west thereof. The site boundary then swings north-west, up to Location Road. Beyond Location Road the site boundary follows the Brakpan "Proper" Township boundaries in a zig-zag pattern up to Hamilton Avenue, the latter which forms the northern boundary of the site. The Brakpan "Bird Sanctuary" (Pan) is included in the study area.

2.1.7. Gauteng wetland inventory

The Gauteng wetland inventory (desktop determined) was also accessed to determine if any possible wetland areas is found on or within the 500 meter extended study area.

Two wetlands have been identified on the site, one comprising the shallow pan in its north-western part and the other along the spruit on its south-eastern boundary. These wetlands are substantially disturbed/degraded, however they will be excluded from development.

A wetland delineation study will be undertaken during the EIA phase to determine the boundary of the wetland areas and the potential buffer zones that must be excluded from the proposed development.

2.2. Biological environment

2.2.1. Flora

The study site lies in the quarter degree square 2628AB (Benoni). Mucina & Rutherford (2006) classified the area into two vegetation units namely Tsakane Clay Grassland and Soweto Highveld Grassland. The authors described Tsakane Clay Grassland as a short, dense grassland on flat to slightly undulating plains and low hills. A mixture of grasses such as *Themeda triandra, Elionurus muticus* and *Eragrostis* species dominates the vegetation. The area has strongly seasonal summer rainfall with very dry winters and frequent winter frosts.

The Tsakane Clay Grassland is considered endangered. Its conservation target is 24%. Only 1.5% is conserved in statutory reserves and a few private nature reserves. More than 60% of the unit is already transformed by cultivation, urbanization, mining, dam-building and roads.
The authors (Mucina & Rutherford, 2006) described Soweto Highveld Grassland as a gently to moderately undulating landscape on the Highveld plateau supporting short to medium high, dense, tufted grassland dominated almost entirely by *Themeda triandra*, and accompanied by a variety of other grasses. It is in places undisturbed, with scattered small wetlands, narrow stream alluvia and pans. Occasional ridges or rocky outcrops interrupt the continuous grassland cover. This vegetation unit comprises shale, sandstone or mudstone, or the intrusive Karoo Suite dolerites which feature prominently. The soil is deep and red on the flat plains. It has summer rainfall and cool-temperate climate with high extremes between maximum summer and minimum winter temperatures, frequent frosts and large thermic diurnal differences, especially in autumn and spring.

The Soweto Highveld Grassland is considered endangered. Its conservation target is 24%. Only few patches are conserved in statutory reserves and a few private nature reserves. Almost 50% of the unit is already transformed by cultivation, urbanization, mining and road infrastructure and some areas have been flooded by dams.

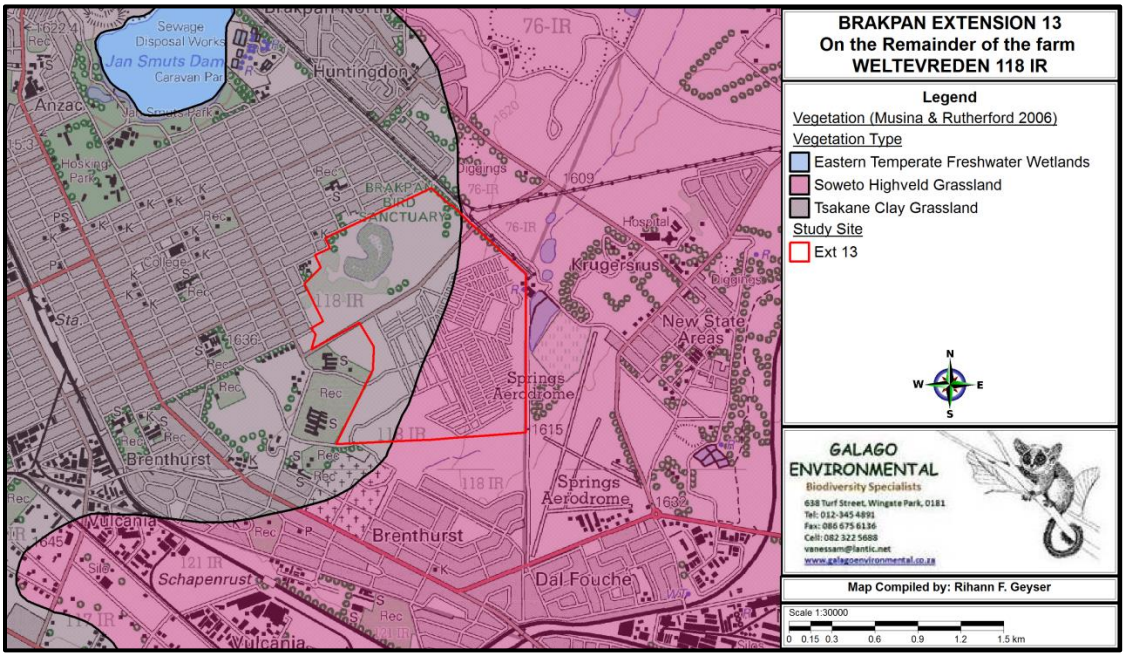

Figure 6: Vegetation units according to Mucina and Rutherford, 2006

The site is highly degraded and the habitat is regarded as marginal for any Red or Orange listed plant species that may occur in the vicinity. The pan (wetland) in the northwest is fringed by Eucalyptus and other exotic trees. Most of the southern part of the site was taken up by the Brakpan Old Location. Road grading and site clearing training takes place in the north-eastern part of the site. Rubble and litter dumping occurs over large areas on the site.

Most of the site can be categorized as an area of low biodiversity. Even in those areas where natural vegetation still exists, previous settlement and urban edge effects such as roads, footpaths and illegal dumping of litter and overburden have severely impacted natural biodiversity.

A specialist flora study will be undertaken to determine the detailed vegetation communities, sensitive areas and impacts on red listed plant species on site.

2.2.2. Fauna

All large mammals (viz. elephant, buffalo, black wildebeest, plain's zebra, lion, and spotted hyena) have a century or more ago been hunted out for sport or to favour farming practices. More recently progressively intensive land-use practices systematically displaced medium-sized mammals such as aardvark, baboons, vervet monkeys, pangolin, porcupine, the ubiquitous black-backed jackal, duiker and steenbok. Other small fauna has since been systematically displaced by agriculture and informal settlement. It is highly unlikely that any Red Data faunal species are likely to occur on the study site due to a lack of suitable breeding, roosting and/or foraging habitat.

2.3. Social environment

2.3.1. Historical and current land use of the property

The study area falls within the jurisdiction of the Brakpan Town Planning Scheme, 1980 and all the properties within the study area are zoned for "Agricultural" purposes.

The site is largely vacant and is not being optimally utilized at this stage.

The Brakpan Old Location was situated in the southern part of the site, south of Location Road. The old street pattern and even some of the foundations can still be clearly discerned on the aerial photo.

Road grading and site clearing training takes place in the north-eastern part of the site. Rubble and litter dumping occurs over large areas on the site. An electricity mini-sub is located next to and south of Location Road and a much larger sub-station in the south-east on the boundary, close to the spruit, while a sewer pump station is situated in the south-eastern part of the site, close to its eastern boundary.

Google Earth's Timeline function was used as reference imagery (Accessed April 2015). Google Earth imagery from 2002 (Figure 7) to early 2013 (Figure 8) is available and used to determine the historical land use and whether the site was extensively altered in the past or to detect largest changes in the land use of the catchment. Using this it can be seen that the land use around the site has for many years remained the same (mostly agriculture). The study site has not altered in the past 40 years.

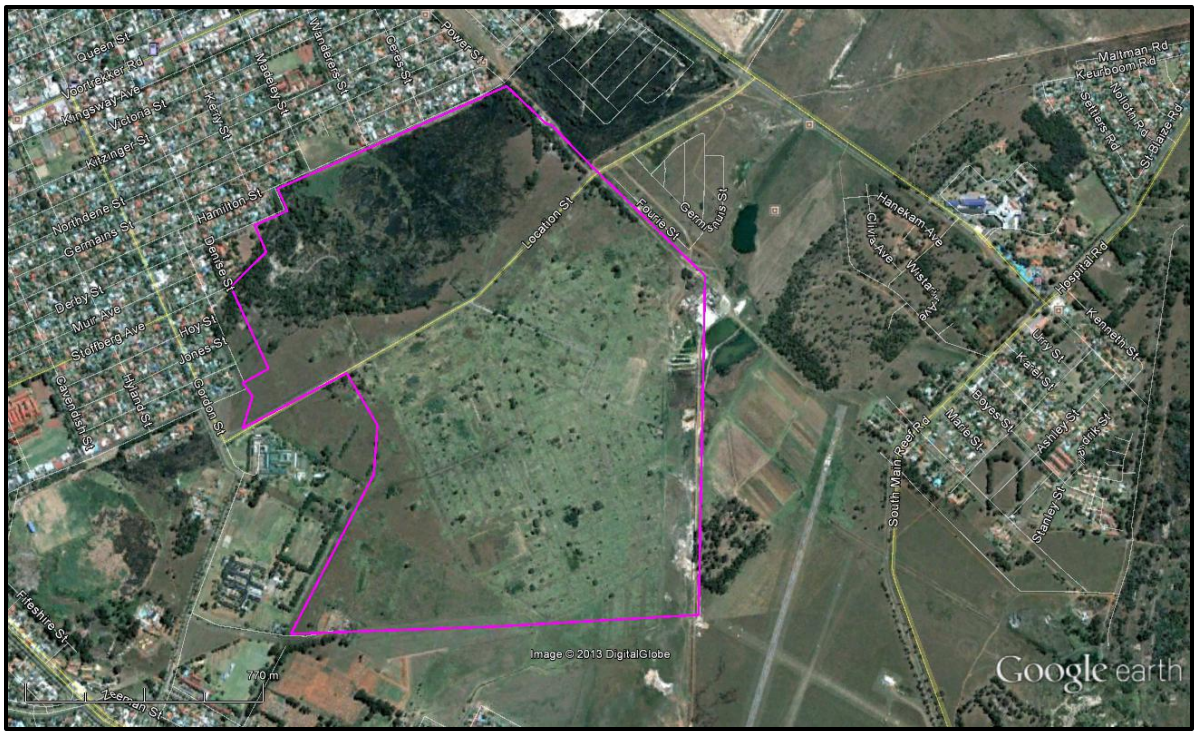

Figure 7: The oldest usable Google Earth image of the site from 2002

Figure 8: The most recent Google Earth image from 2015

The major land uses surrounding the site include the following:

- **To the northwest**

  Brakpan "Proper" township is situated to the north and northwest of the site, with old residential areas abutting it and the Brakpan CBD (Voortrekker Road spine) situated ± 600m north of the site.

- **To the northeast**

  The "Carnival Estate" residential developments (Brakpan North Extensions 8, 10, 11 and 12) are situated northeast of the site, separated from it by an Eskom servitude. These are relatively new developments – there are still a number of vacant stands in Extensions 10 and 11, while no houses have yet been built in Extension 12.

- **To the east and southeast**

  The land immediately abutting the site on the east is vacant, with the Springs Airfield situated east of it, ± 400m away from the site.

  Krugersrus Extension 1, New State Areas and the Far East Rand Hospital are situated ± 1 to 1,5km east of the site, while Dal Fouche residential area and New Era industrial area are situated to the southeast.

- **To the south**

  Brenthurst cemetery and vacant land abuts the site directly on the south, separating it from the Brenthurst residential area ± 500m away. Vulcania industrial area is situated south of Brenthurst, ± 1,5km south of the site.

- **To the west**

  Brakpan "Proper" old residential area abuts the northern part of the site on the west, while the Felicitas and Muriel Brand special schools are situated west of the southern part of the site.

2.3.2. Socio-economic profile

Brakpan falls within the Ekurhuleni Metropolitan Municipality area. The following demographic information is available, according to the Census 2011 Municipal Fact Sheet, published by Statistics South Africa (Table 3).

Table 3: Demographic information for Ekurhuleni metropolitan Municipality, 2011

Population	3 178 470
Age Structure	
Population under 15	24.30%
Population 15 to 64	71.70%
Population over 65	4.00%

Dependency Ratio	
Per 100 (15-64)	39.40
Sex Ratio	
Males per 100 females	105.00
Population Growth	
Per annum	2.47%
Labour Market	
Unemployment rate (official)	28.80%
Youth unemployment rate (official) 15-34	36.90%
Education (aged 20 +)	
No schooling	3.60%
Higher education	14.60%
Matric	35.40%
Household Dynamics	
Households	1 015 465
Average household size	2.90
Female headed households	31.30%
Formal dwellings	77.40%
Housing owned	44.00%
Household Services	
Flush toilet connected to sewerage	85.00%
Weekly refuse removal	88.40%
Piped water inside dwelling	57.20%
Electricity for lighting	82.20%

The proposed development's locality close to the Brakpan and Springs CBD's, as well as the major Far East Rand industrial areas, makes it very suitable for residential infill development aimed at poor communities who have to rely on public transport.

The study area falls in the Eastern region of Ekurhuleni comprising of Benoni, Daveyton, Etwatwa, Springs, Nigel, KwaThema, Tsakane, Duduza and Brakpan. The economic structure of the Eastern Region is focussed on the established but declining industrial areas of the Far East Rand, characterised by heavy industries. It borders onto the Mpumalanga Province in the east.

There are 5 main areas that was identified for infill development where EMM wants to use un/underdeveloped land in central locations. These are the areas previously occupied by mining activities in areas such as Springs and Brakpan.

According to EMM census information unemployment figures for EMM is approximately 28.8%. In the entire EMM, 3.6% of the adult population have no schooling (see Table 3).

The economic targets for the EMM are the following and will be taken into consideration when the proposed development is designed and implemented:

- Economic diversification
- Job creation
- Skills development
- Tourism promotion
- Investment promotion; and Economic transformation.

2.3.3. Cultural / Historical Heritage

The study area consists in part of the land on which the original “Brakpan Old Location” was situated, before the forced removal of its residents in the 1960’s and 70’s to what is now known as Tsakane. These forced removals and the demise of the township was caused by the apartheid government’s perception that it was too close to the white areas of Brakpan.

Brakpan Old Location was situated in the southern part of the site, south of Location Road. The old street pattern and even some of the foundations can still be clearly discerned on the aerial photo (Figure 9). The names of some of the major roads are listed below:

LIST OF OLD LOCATION STREET NAMES:

1. Bopape Street
2. Dlangamandla Street
3. Malepe Street
4. Manala Street
5. Mbambo Street
6. Mogotsi Street
7. Mvanao Street
8. Nchabeleng Street
9. Ngake Street
10. Nkomo Street
11. Nzimande Street
12. Raseroala Street
13. Sekhukhuni Street
14. Sixth Street
15. Solundwana Street
16. Tsabalala Street
17. Tsokolibane Street
18. Twenty Fourth Street
19. Zulu Street

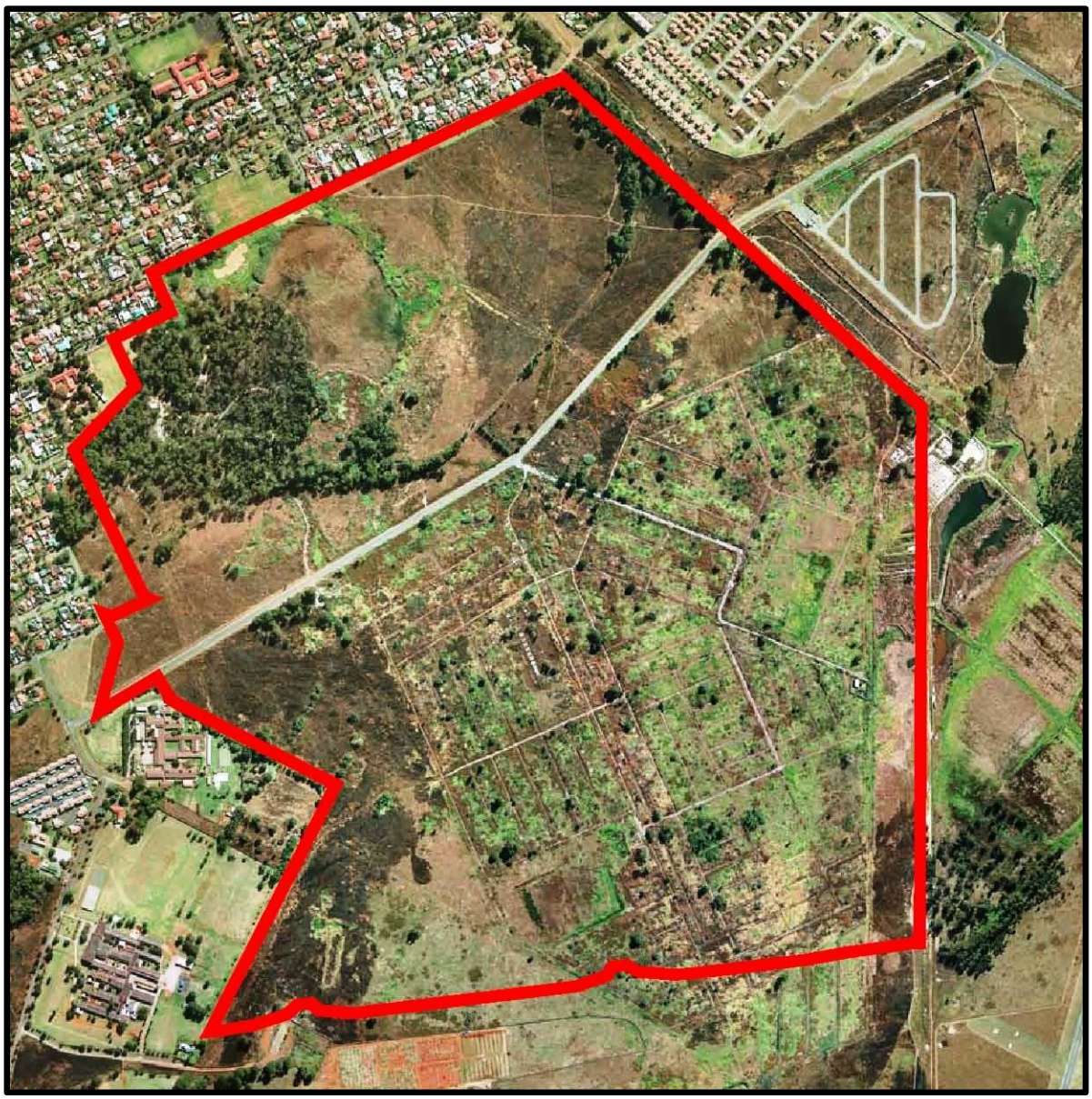

Figure 9: Aerial photo showing old street layout

The old street names form an inextricable part of the heritage of the place and should be retained where appropriate in the proposed development plan.

A multi-purpose community centre is proposed as a central focus area. This node of ± 8 ha is earmarked for community facilities, retail development, heritage site/memorial and educational facilities, etc.

A cultural heritage study will be undertaken during the EIA phase.

2.3.4. Visual character

The study area is highly impacted by historical activities and the local population. The wetland in the northwest is fringed by Eucalyptus and other exotic trees. Most of the southern part of the site were taken up by the Brakpan Old Location. Road grading and site clearing training takes place in the north-eastern part of the site. Rubble and litter dumping occurs over large areas on the site.

The site is thus currently not visually attractive. See Appendix B for a Photographic report of the site.

Figure 10: View to the south-east from the corner of Hannah Street and Boundary Avenue (north of Location Road)

3. DESCRIPTION OF ALTERNATIVES

The National Department of Environmental Affairs stresses that the no-go option be considered as a base case against which to measure the relative performance of the other alternatives. The impacts of other alternatives are expressed as changes to the base case or status quo. If considered viable the decision not to act may be considered in the evaluation and assessment process against the other alternatives. The following table (Table 4) describes the different alternatives that can be investigated in more detail during the EIA phase and comments on potential.

Table 4: The different alternatives that can be investigated in more detail during the EIA phase and comments on potential

Alternatives	Description	Comments on project implementation
Activity alternatives	Alternatives to considering other activities to address the same ends	A short summary of activity alternatives will be included in section 3.1.
Location or site alternatives	The property on which the proposal is intended and possible location for certain activities within the property. This can also include other sites to commission the project.	Site alternatives were investigated by the EMM during the feasibility phase of the project. Sites with significant environmental sensitivities were excluded from further investigations. The remaining sites are now going through EIA processes to consider the environmental impacts.
Layout / Design alternatives	Placement of land uses and infrastructure within the area available for development to optimise the site and also provide environmental safeguard to sensitive features identified. Design alternatives could also include different architectural designs of housing units, engineering designs of infrastructure services and roads	These alternatives will be investigated during the EIA phase after the finalization of all the specialist studies. The layout will attempt to avoid environmentally sensitive areas.
Scale alternatives	Refers to actual size of the development proposed and social housing components.	Scale alternatives will be investigated during the EIA phase after the finalization of all the specialist studies.
Technology alternatives	The use of solar instead of electricity to diminish the demand on the municipal electricity provision must be considered.	Technology alternatives will be investigated during the EIA phase after the finalization of all the specialist studies.
Land use alternatives	Consideration of alternative land uses on the development site aside from housing.	A short comparable analysis of land use alternatives follow in section 3.1

Alternatives	Description	Comments on project implementation
No-go option	The status quo remains and no development takes place.	The no-go option will be investigated in section 3.2

3.1. Land use/activity alternatives

Activity alternatives were investigated during the feasibility phase of the project and site alternatives will not be further investigated since the applicant is the landowner and has no other land available for residential development in the area (Table 5).

Table 5: A comparable summary of the activity alternatives

Activity	DISQUALIFYING CONSIDERATIONS
Industrial / Commercial development	The site abuts an existing residential area and was identified for infill residential development. There is no demand for further industrial development in this area. Small business and commercial units will be integrated into the residential development.
Agriculture	The site is situated within the urban edge and is earmarked for residential development in the Ekurhuleni MSDF. The wetlands on the study site also make it unviable for agricultural purposes.
Residential Development	There is a tremendous need for housing in the area. The site is on the edge of existing development and the expansion of the infrastructure can be easily incorporated. There is already a road network for easy access to the surrounding areas.

3.2. No-go alternative

The situation where the environment is left in the present condition and no interference is attempted; therefore the status quo is maintained. The site is highly impacted by anthropogenic activities dating back to before the 1960's (Brakpan Old Location). The site has subsequently been subdivided and is currently impacted by illegal dumping, road works training facility and roads.

The area surrounding the site has a growing population of squatters from people without proper housing. Should this site not be developed then the housing shortage in the area would increase the demand for resources in the area. Illegal hunting and harvesting of medicinal plants on the site could then further reduce the biodiversity on site. The housing shortage also place increasing demand on infrastructure and the social environment of Brakpan Proper and surrounding areas. The schools and health facilities are not designed to deal with the influx of people.

At present there is uncontrolled access to the site, causing increased dumping on the site and a risk of a squatter camp starting on the site. This situation has an increasing security risk for the surrounding properties.

3.3. Preferred option

The preferred option is to develop the site into a mixed use residential development with a mixture of high, medium and low density residential erven together with some businesses, community facilities and parks to facilitate a proper working township catering for the housing need in the area without compromising on the community sense of place. This option will be investigated in more detail during the EIA phase to incorporate design, scale and technology alternatives, after all the specialist studies are finalized. As stated previously in this report the integration of elements of the old location layout into the new proposed development design will be of historic value and may also have financial benefits as some of the original streets are still partially intact. This can obviously only be done in those places where the original layout complies with the desired urban design principles and town planning standards as laid down for the proposed development.

The recommended preliminary layout of this option is the following:

3.3.1. High density residential

Mostly two and three-storey walk-up subsidy-linked units and rental stock will be built on these erven. It is proposed that these erven be zoned for "**Residential 3**" purposes as per the Brakpan Town Planning Scheme, 1980, with a maximum density of 100 units per ha. These units will be placed adjacent to main transport routs and parks.

The total area allocated for high density residential development is ±52.7 ha. A total of ±4205 units will be developed.

3.3.2. Medium density residential

A total of 1200 single residential erven are proposed to provide freehold ownership to qualifying beneficiaries. The total area allocated for medium density residential development is 26.7 ha. Erf sizes of 80-120m^2, mostly subsidy-linked units, are proposed. A variety of unit typologies will be built on these erven, consisting of Ekurhulieni Unit Typologies 1-9, mainly clusters and row housing is proposed. It is proposed that these erven be zoned for "Residential 1" purposes as per the Brakpan Town Planning Scheme, 1980, with a maximum coverage of 70% and F.A.R. of 1.4.

3.3.3. Low density residential

A total of 300 single residential erven are proposed to provide freehold ownership to qualifying beneficiaries. The total area allocated for the low density residential development is 20.0 ha. The erf size of 500m^2 is proposed for land claimants and bonded units. These will be situated in the northern part of the property.

3.3.4. Community facilities

The proposed development should be a sustainable human settlement, consisting not only of houses, but including social infrastructure and urban amenities.

Four primary schools and one secondary school will be evenly-distributed throughout the area, within walking distance from surrounding residential development. A small Thusong

Centre, Clinic, Community Hall, Library, Religious and Crèche sites are provided for on about 4.4 ha.

3.3.5. Business

A retail and business area is concentrated in the central node on three erven covering about 4.5 ha in total. The taxi rank is situated in the central node at the intersection of Boundary and Ceres Roads.

The purpose of these three erven will be to cater for small businesses and retailers aimed at serving the local community. It is proposed that these erven be zoned for ”Business 3” purposes as per the Brakpan Town Planning Scheme, 1980.

3.3.6. Parks

A linked open space system is planned and the old “Bird Sanctuary” will be redeveloped as a regional open space node. These parks will be mostly situated within the wetland buffer areas but will also fulfil a storm water attenuation function. It is proposed that these erven be zoned for “Public Open Space” purposes as per the Brakpan Town Planning Scheme, 1980.

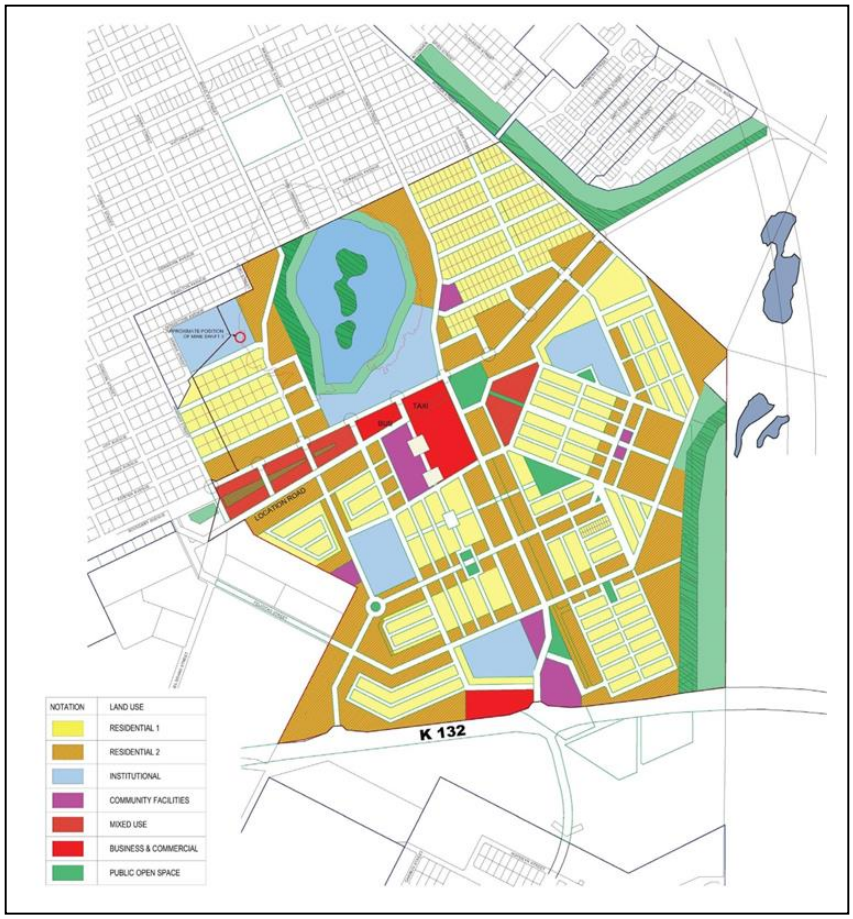

Figure 11: Proposed Layout as provided in the precinct plan phase

3.4. Conclusion

See Table 6 below for a summary of the feasible alternatives identified for the study site.

Table 6: Summary of the feasible alternatives identified

ALTERNATIVE	EVALUATION
1. No-go option	**Positive:** o Possible wetland areas will remain intact o Uncontrolled open space function of site will prevail and continue **Negative:** o An informal settlement could form on site, with increasing associated health impacts and the potential of destroying the wetland on site. o The continued harvesting of the flora and fauna on the site will reduce biodiversity over the long run. o Visual character of area will remain intact but with increasing signs of dumping and squatting. o Social impacts on neighbouring properties due to uncontrolled access to the site will continue and/or increase. o A huge capital investment will be needed in the future for rehabilitation of the site due to increased deterioration through dumping of domestic and construction rubble. o Security risk of vagrants. o Uncontrolled dumping could lead to increased health problems and increased environmental impacts with water pollution of the wetlands and downstream water courses.
2. Mixed use residential development of the area	**Positive:** o Local Authority receives taxes and income from service provision. o Shortage in housing demand will be reduced. o Infrastructure services in the area will be upgraded to accommodate the demand for the new residential development. o Upgrade of living conditions of the beneficiaries receiving houses. o Installation of infrastructure (especially sewage lines) will improve the quality of living and reduce the impact to the environment. o Settlement of restitution claims. **Negative:** o The visual character or "sense of place" of the area will change, but probably for the best. o Increasing pressure may be placed on resources such as clinics and schools until these increased demands are accommodated into new facilities in the future.

This study therefore recommends that the preferred alternative be instituted. This assessment is not strictly conducted on the conventional impact assessment process, but integrates strengths of environmental planning from the inception phase to ensure that sensitive environmental features are excluded from development, and that environmental opportunities and constraints are integrated into the planning and design of the scheme.

It is important to remember that there are also other types of alternatives that need to be investigated throughout the process as described in the tables (Table 4, Table 5 and Table 6) under Section 3. In the EIA phase alternative technologies, layout, density and design alternatives will be dealt with in more detail.

4. METHODOLOGY AND APPROACH FOR IMPACT ASSESSMENT

4.1. Introduction

An impact can be defined as any change in the physical-chemical, biological, cultural, and/or socio-economic environmental system that can be attributed to human activities relative to alternatives under study for meeting a project need.

There are numerous assessment methodologies and approaches within the international sphere of assessing the potential impact of development activities on the environment.

When a particular method for environmental impact analysis is selected or used certain general principles must be kept in mind to avoid the mystique and pseudo-science, which cloud many planning procedures. In general terms an environmental assessment evaluation comprises four main tasks:-

a. Collection of data;
b. Analysis and interpretation of this data;
c. Identification of significant environmental impacts;
d. Communication of the findings.

Further to the above the proposed mitigation and management options for the identified impacts must be provided. The selected impact evaluation method must enable these four tasks. Impact methodologies provide an organised approach for predicting and assessing these impacts. Any one methodology and approach will have opportunities and constraints, as well as resource and skill demands, and no one method is appropriate for all circumstances. The selected methodologies proposed by this document are appropriate for most situations, taking the above criteria into account.

Impact assessment methodology should comply with the following set of criteria:

a. *Be comprehensive:* The environment consists of intricate systems of biotic and abiotic factors, bound together by complex relationships. The methodology must consider the impact on these factors.
b. *Be flexible:* Flexibility must be contained in the methodology, as projects of different size and scale result in different types of impacts.
c. *Detect true impact:* The actual impact that institutes environmental change, as opposed to natural existing conditional changes. Long-term and short-term changes should be quantified.
d. *Be objective:* The methodology must be objective and unbiased, without interference from external decision-making.
e. *Ensure input of required expertise:* Sound, professional judgement must be assured by a methodology.
f. *Utilize the state of the art:* Draw upon the best available analytical techniques.
g. *Employ explicitly defined criteria:* Evaluation criteria used to assess the magnitude of environmental impacts should not be arbitrarily assigned. The methodology should

provide explicitly defined criteria and explicitly stated procedures regarding the use of these criteria, including the documented rational.

h. *Assess actual magnitude of impacts:* A method must be provided for an assessment based on specific levels of impact for each environmental concern.
i. *Provide for overall assessment of total impact:* Aggregation of multiple individual impacts is necessary to provide an evaluation of overall total environmental impacts.
j. *Pinpoint critical impacts:* The methodology must identify and emphasize particularly hazardous impacts.

Methods for identification of environmental impacts can assist in specifying the range of impacts that may occur, including their spatial dimensions and time period. Identification methods answer questions concerning the components of the project and what elements of the environment may be affected by these components (Table 7).

Table 7: Identification, prediction and evaluation methodologies

Function	Methodology
Identification	Description of the existing environmental system. Determination of the components of the project. Definition of the environment modified by the project.
Prediction	Identification of environmental modifications that may be significant. Forecasting of the quantity and/or spatial dimensions of change in the identified environment. Estimation of the probability that the impact (environmental change) will occur (time period).
Evaluation	Determination of the incidence of costs and benefits to user groups and populations affected by the project. Specification and comparison of the trade-offs (costs or effects being balanced) between various alternatives.

4.2. Evaluation methods in environmental assessment

Defined as a formal procedure for establishing an order of preference among alternatives. The use of multiple evaluation methods may seem excessively demanding. However, it is usually obtaining the inputs to evaluation methods that are demanding. Once these inputs are available, application of the methods themselves is often relatively straightforward. A particular evaluation obviously should not be seen as equivalent to a decision. Evaluation methods are designed as decision *aids* for decision makers. They do not replace the need for decisions to be made, particularly where issues such as fairness and distribution of costs and benefits are involved. Ultimately evaluation methods should serve as convenient means of connecting assumptions to consequences so that decision-makers can explore and more fully appreciate different alternatives and value sets and ultimately they can make better decisions.

4.2.1. Formal procedure

An evaluation method is a formal, explicit, and thorough way of organising and describing choices. The amount and complexity of data characteristic of evaluations of large projects, including small ones, means that the iterative Environmental Assessment process requires a

method too comprehensive to be applied casually or intuitively. Methods are intended to be applied repeatedly, each time with deliberate changes in assumptions or data that produce changes in preferences. This evaluation process gradually shows how differences in environmental preferences result in different ratings among alternatives.

Where affected interests conflict, evaluation methods are used to assist in reconciling differences as far as possible and reach compromises.

4.2.2. Methodology types

The following lists the most frequently used categories of assessment methodologies. From this schedule those most appropriate and frequently used will be selected for the specific assessment requirements. More than 50 impact analysis methodologies have been developed. Of those considered we have selected the two primary methods and variations on them, being checklists and matrices.

Checklists can be divided into simple, descriptive, scaling, and scaling-weighting checklists. Matrices are subdivided into simple and stepped matrices.

The key point with regard to all environmental impact analysis methodologies is that they are useful tools for examining relative environmental impacts of alternatives. They represent a tool that must be applied with professional judgement, and their results must also be interpreted using professional judgement.

4.3. Implementation methodology used for the impact identification

1. Establish checklists for a.) Environmental characteristics and b.) Human development activities. These lists should be comprehensive and feature all the necessary items on which to base an informed decision.
2. The checklists are further categorised by single assessment sheets for each individual activity impacting on specific environmental parameters.
3. These are evaluated in terms of the following:

4.3.1. Criteria for rating the extent or spatial scale of impacts

Table 8: Criteria for rating the extent or spatial scale of impacts

Extent Rating	
High	Widespread Far beyond site boundary Regional/national/international scale
Medium	Beyond site boundary Local area
Low	Within site boundary

4.3.2. Criteria for rating the intensity or severity of impacts

Table 9: Intensity or severity of impacts

Intensity Rating	
High	Disturbance of pristine areas that have important conservation value. Destruction of rare or endangered species.
Medium	Disturbance of areas that have potential conservation value or are of use as resources. Complete change in species occurrence or variety.
Low	Disturbance of degraded areas, which have little conservation value. Minor change in species occurrence or variety.

4.3.3 Criteria for rating the duration of impacts

Table 10: Criteria for rating the duration of impacts

Duration Rating	
High (Long term)	Permanent. Beyond decommissioning. Long term (More than 15 years).
Medium (Medium term)	Reversible over time. Lifespan of the project. Medium term (5 – 15 years).
Low (Short term)	Quickly reversible. Less than the project lifespan. Short term (0 – 5 years).

4.3.3. Categories for the rating of impact magnitude and significance

Table 11: Categories for the rating of impact magnitude and significance

Impact Magnitude and Significance Rating	
High	Of the highest order possible within the bounds of impacts that could occur. In the case of adverse impacts, there is no possible mitigation that could offset the impact, or mitigation is difficult, expensive, time-consuming or some combination of these. Social, cultural and economic activities of communities are disrupted to such an extent that these come to a halt. In the case of beneficial impacts, the impact is of a substantial order within the bounds of impacts that could occur.
Medium	Impact is real, but not substantial in relation to other impacts that might take effect within the bounds of those that could occur. In the case of adverse impacts, mitigation is both feasible and fairly easily possible. Social, cultural and economic activities of communities are changed, but can be continued (albeit in a different form). Modification of the project design or alternative action may be required. In the case of beneficial impacts, other means of

Impact Magnitude and Significance Rating	
	achieving this benefit are about equal in time, cost and effort.
Low	Impact is of a low order and therefore likely to have little real effect. In the case of adverse impacts, mitigation is either easily achieved or little will be required, or both. Social, cultural and economic activities of communities can continue unchanged. In the case of beneficial impacts, alternative means of achieving this benefit are likely to be easier, cheaper, more effective and less time-consuming.
No impact	Zero impact.

Together with the above, integrated in the evaluation checklist sheet provision is made for the:

- Description of the impact
  Nature, what causes the effect and how is it affected.
- Intervention specifications
  Design, precautionary, management, rehabilitation and documentation.

Once the above assessment has been completed an objective evaluation of the potential impact of the activity can be assured. The activity impact is then offset against the list of environmental characteristics in the cause-effect interaction matrix, which will be the evaluated significance.

Affected environmental components will be categorised as primary effect and secondary or peripheral effect.

4.4. Conclusion

A combination of the above methodologies will be used during the EIA phase of the project to determine the significance of the potential impacts associated with the proposed development. The following section will describe how the potential impacts were identified and what actions will be taken to ensure that the potential environmental impacts of the proposed development are reduced to the minimum.

5. ADVERTISING AND PUBLIC INVOLVEMENT PROCESS

5.1. Press advertising and site notices

The Public Participation Process forms the corner stone for detailing the Scoping Report. The process identifies potential interested and affected parties on the project and solicits inputs and comments pertaining to the matter/activity proposed from such parties. Public Participation allows the public to contribute to the project and provides for better decision making by collective inputs from stakeholders, organs of state and specialists. In terms of the EIA Regulations, 2014, Section 21 and Appendix 2, a Scoping report must contain details of the public participation process undertaken for the project.

The public participation process is conducted in accordance to Chapter 6, Regulation 39 to 44 of Government Notice R982 of the NEMA Regulations 2014. The process provides the public access to necessary information on the project throughout the scoping and EIA phase of the study. The public participation process for the Brakpan x13 Residential Development kicked off on 13 May 2015.

5.2. Newspaper advertisement

The project was advertised in the local press as per the GDARD requirements. The proposed activity was advertised on 13 May 2015 in the *Brakpan Herald* (regional paper) in English (Please refer to Annexure 1 for a proof of the newspaper advertisement within Appendix C: Public participation process).

5.3. Site notices

Two A2 - sized on-site notices were placed along Location Road, one on the eastern boundary and one on the western boundary. (Please refer to Annexure 2 for a proof of the notice within Appendix C: Public participation process).

In Annexure 2 there will be a photo report of the notices that was placed on site

5.4. Background information documents and notices/flyers

As part of the identification of landowners and tenants on the project site, Galago Environmental provided Background Information Documents through hand delivery to residents within the neighbouring area as well as to landowners of the neighbouring agricultural holdings. The proposed project was also discussed and explained to the residents who received the background information documents (Please refer to Annexure 3 for the BID within Appendix C: Public participation process).

The BID provides an Interested and/or Affected Party (I&AP), with background information on the proposed project, as well as information regarding the Environmental Impact Assessment process that will be undertaken. It further indicates how you can become actively involved in the project, receive information and raise issues that may concern and/or interest you. The sharing of information forms an important component of the public participation process and provides the opportunity to become actively involved in the process from the onset. I&APs were given a 30 calendar day period to raise any issues or concerns regarding the project.

Background Information documents (BID) were emailed, posted and delivered in English to stakeholders and organs of state.

5.5. I&AP correspondence

All comments received from interested and affected parties will be acknowledged and recorded in an Issues and Response Register and will be addressed in the Final Scoping Report accordingly (Please refer to Annexure 8 for the Issues and Concerns Register within Appendix C: Public participation process).

5.5.1. Issues raised and potential impacts identified during the public participation process

The Scoping Report aims to scope, identify and list the environmental issues and potential impacts that are relevant to the project and determines where further information is required in the form of specialist studies and or investigations. The identification of such issues and potential impacts are solicited from stakeholders, interested and affected parties through a public consultation process as well and desktop investigations undertaken by the environmental consultant paired with initial site investigations.

The key identified issues and potential impacts pertaining to the proposed establishment of a mix residential development outline the focus areas for the Impact Assessment phase and Specialist studies to be undertaken.

The following issues, determined through the public participation process with authorities and I&APs, would be investigated in further detail during the EIA phase and would be informed by the final draft layout plan for the Brakpan x 13 residential development (See Appendix C for the Issues and Concerns register).

5.5.2. Biophysical environment

The biophysical environment is the relation between the physical environment and the biological life forms within the environment.

- Impacts on Biodiversity (Fauna and flora).
- Impacts on aquatic ecosystems (wetlands).
- Impacts on Soils and Geology (dolomite).

5.5.3. Social environment

The social environment refers to the environment developed by humans as contrasted with the natural environment.

- Impact on cultural and heritage resources.
- Impacts on land use and also surrounding land uses.
- Impact on existing services supply (municipal capability).
- Impact on traffic (local road network).
- Socio-economic impacts (positive and negative).
- Provision of water, sewage and electricity (infrastructure) to the residents of the residential area.

- The poor and insufficient municipal infrastructure in the area that will be exacerbated by the proposed development.
- Capacity of public amenities such as schools and clinics in the area.
- Mitigation measures and management procedures to reduce the potential impact of construction activities on the environment.
- Storm water action plan associated with the layout plan.
- Reduction of property values in surrounding neighbourhoods.

5.6. Comments on the draft scoping report

During the correspondence with I&APs, stakeholders were advised that the draft Scoping Report would be prepared and made available for public review. Electronic copies as well as hard copies of the draft Scoping Report will be made available to registered interested and affected parties and organs of state on the project database on 20 May 2015. A hard copy of the draft Scoping Report was provided to the Ward Councillor for comment for a period of Thirty (30) days, from Wednesday 20 May 2015 to Monday 22 June 2015 in the study area to allow for review and commenting.

Stakeholders were informed about the comment period for the draft Scoping Report through emails and faxed letters and copies of the draft Scoping Report emailed as requested from I&APs. State Departments also received the draft Scoping Report for their comments.

The concerns raised during the public participation process and the draft Scoping Report comments period are included in the final Scoping Report and will be investigated in terms of the potential impacts associated with the proposed development in the Environmental Impact Assessment phase.

5.7. Public consultation during environmental impact phase

Interested and Affected Parties would be notified of the commencement of the EIA Phase once all specialist investigations have been undertaken. I&APs would be given the opportunity to review the findings of the EIA which is presented in a draft EIR and EMPr. The draft EIR would indicate the potential positive and negative impacts and measures to enhance positive impacts and reduce negative impacts.

As part of the assessment, an EMP is compiled. The EMP is a requirement as per the EIA Regulations, 2014. The EMP recommends how to operate and implement the project. I&APs would receive a notification letter announcing the availability of the draft EIR. The report would be distributed for public review and comment for a period of 30 calendar days.

All comments and issues received during the public review period of the draft EIR and EMP would be captured in a final EIR and submitted to GDARD for review and ultimately approval. I&APs would receive notification of the submission and would as per the scoping phase have the opportunity to request copies of the final report.

5.8. Public consultation during decision making phase

During this phase GDARD will review the Final EIR and consult with any other key organs of state e.g. The Department of Water Affairs (DWA) before granting or refusing an environmental authorisation.

The environmental authorisation will be made available for public review for a period of 20 consecutive calendar days. This provides I&AP's with an opportunity to verify that the decision taken have considered their comments and concerns raised. I&APs are also then informed of the appeal procedure, should they have a reason to appeal.

6. CONCLUSION AND RECOMMENDATION

During the Environmental Impact Assessment phase the different design and technology alternatives will be compared in terms of the potential environmental impacts associated with the preferred alternative of mixed use residential development. Specialist studies will be undertaken during the EIA phase in order to determine the potential impacts on the social and biophysical environment.

6.1. Specialist studies

The potential social and biophysical impacts associated with the proposed development will be assessed through the following specialist studies:

- Biophysical
  - Red Data Flora study;
  - Wetland delineation study
  - Dolomite investigation and Geotechnical Assessment
- Social
  - Cultural Heritage Assessment
  - Traffic impact study
  - Infrastructure provision study (Civil services)
  - Stormwater management plan

7. REFERENCES

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8. APPENDICES