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**TABLE OF CONTENTS**

<b>1. INTRODUCTION</b>	<b>1</b>
1.1 Background	1
1.2 Activities Applied for in Terms of NEMA	4
1.3 The Town Planning Process	12
1.4 Environmental Assessment Practitioner (EAP)	12
<b>2. TERMS OF REFERENCE</b>	<b>13</b>
<b>3. SCOPE OF WORK AND APPROACH TO THE STUDY</b>	<b>13</b>
3.1 Scope of Work	13
3.2 Approach to the Study	14
<b>4. REGISTERED OWNER</b>	<b>15</b>
<b>5. LOCALITY OF THE PROPOSED DEVELOPMENT</b>	<b>15</b>
<b>6. ALTERNATIVES IDENTIFIED</b>	<b>16</b>
6.1 The “No-Go” Alternative	16
6.2 Land Use Alternative	19
6.3 Locality Alternatives	20
6.4 Layout Alternatives	20
<b>7. PLANNING APPROACH</b>	<b>22</b>
<b>8. EXISTING ZONING AND LAND USE AND THE PROPOSED ZONING</b>	<b>23</b>
8.1 Existing Zoning and Land Use	23
8.2 Proposed Zoning and Land Use	23
<b>9. THE DESCRIPTION OF THE BIOPHYSICAL ENVIRONMENT</b>	<b>24</b>

<b>9.1 THE PHYSICAL ENVIRONMENT</b>	<b>24</b>
9.1.1 Geology and Soils	24
9.1.2 Hydrology	25
9.1.2.1 Surface Hydrology	25
9.1.2.2 Sub-Surface Hydrology	26
9.1.3 Wetlands	27
9.1.4 Topography	28
9.1.5 Climate	29
<b>9.2 THE BIOLOGICAL ENVIRONMENT</b>	<b>30</b>
9.2.1 Flora and Fauna	30
<b>9.3 DESCRIPTION OF THE SOCIAL ENVIRONMENT</b>	<b>33</b>
9.3.1 Archaeology/Cultural History	33
9.3.2 Agricultural Potential	34
9.3.3 Existing Land Use	35
9.3.4 Proposed Land Use	37
9.3.5 Institutional Environment	38
9.3.5.1 International Level	38
9.3.5.2 National Level	39
9.3.5.3 Provincial Level	45
9.3.5.4 Local Level	48
9.3.6 Qualitative Environment	53
9.3.6.1 Visual Environment	53
9.3.6.2 "Sense of Place"	55
9.3.6.3 Noise	56
9.3.6.4 Light Pollution	57
9.3.6.5 Air Quality and Dust	57
9.3.7 Demography	58
9.3.8 Services	58

9.3.9 Traffic	61
9.3.10 Public Participation	63
<b>10. ENVIRONMENTAL ISSUES AND SENSITIVITY</b>	<b>65</b>
10.1 Preliminary Environmental Issues and Sensitivity	65
10.2 Anticipated impacts, including cumulative impacts	65
10.3 Comparative Assessment of between Alternative 1 and Alternative 2	83
<b>11. METHODOLOGY OF ASSESSING IMPACTS THAT HAVE BEEN IDENTIFIED</b>	<b>89</b>
11.1 Specialized Processes	89
11.2 Significance Description	89
<b>12. PLAN OF STUDY FOR ENVIRONMENTAL IMPACT ASSESSMENT</b>	<b>92</b>
<b>13. CONCLUSION</b>	<b>92</b>
<b>14. RECOMMENDATIONS</b>	<b>93</b>

## LIST OF FIGURES

**Figure 1:** Locality Map.

**Figure 2:** Aerial Map.

**Figure 3:** Master Plan of the Proposed Twenty One Development

**Figure 4:** Preliminary Layout Map and Land Use

**Figure 5:** Geology Map

**Figure 6:** Hydrology Map

**Figure 7:** Ridges Map

**Figure 8:** Irreplaceable Sites Map

**Figure 9:** Agricultural Potential Map

**Figure 10:** Agricultural Hubs Map

**Figure 11:** Surrounding Land Use Map

**Figure 12:** Gauteng Urban Edge Map

**Figure 13:** Kungwini Urban Edge 2010 Map

**Figure 14:** Preliminary Visual Assessment

**Figure 15:** Preliminary Environmental Sensitivity Issues Map

## LIST OF TABLES

**Table 1:** Listed activities in terms of Notice No. 544

**Table 2:** Listed activities in terms of Notice No. 545

**Table 3:** Listed activities in terms of Notice No. 546

**Table 4:** Registered Land Owner.

**Table 5:** Proposed Land Use.

**Table 6:** Visual Impact Criteria.

**Table 7:** Preliminary environmental impact matrix of Proposed Twenty One Township 4 Development: Alternative 1- Residential development and Alternative 2 – Mixed Use (Preferred Alternative)

**Table 8:** Comparative assessment between Alternative 1 and 2 before mitigation.

**Table 9:** Comparative assessment between Alternative 1 and 2 after mitigation.

**Table 10:** Severity ratings.

## LIST OF DIAGRAMS

**Diagram1:** Preliminary Environmental issues – “No-Go” Option

**Diagram2:** Preliminary Environmental issues of the proposed development

## LIST OF ANNEXURES

**Annexure A:** Enlargements of Figures in the Scoping Report

**Annexure B:** Application Form

**Annexure C:** CV of Lizelle Gregory (Environmental Assessment Practitioner) and the Company Profile

**Annexure D:** Plan of Study

**Annexure E:** Authorisation Letter Rietvlei Farm Estate

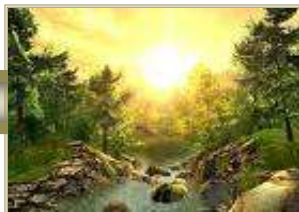
**Annexure F:** Public Participation

**Annexure F(i):** Proof of Site Notice

**Annexure F(ii):** Notices and Flyers that were Distributed

**Annexure F(iii):** Newspaper Advertisement

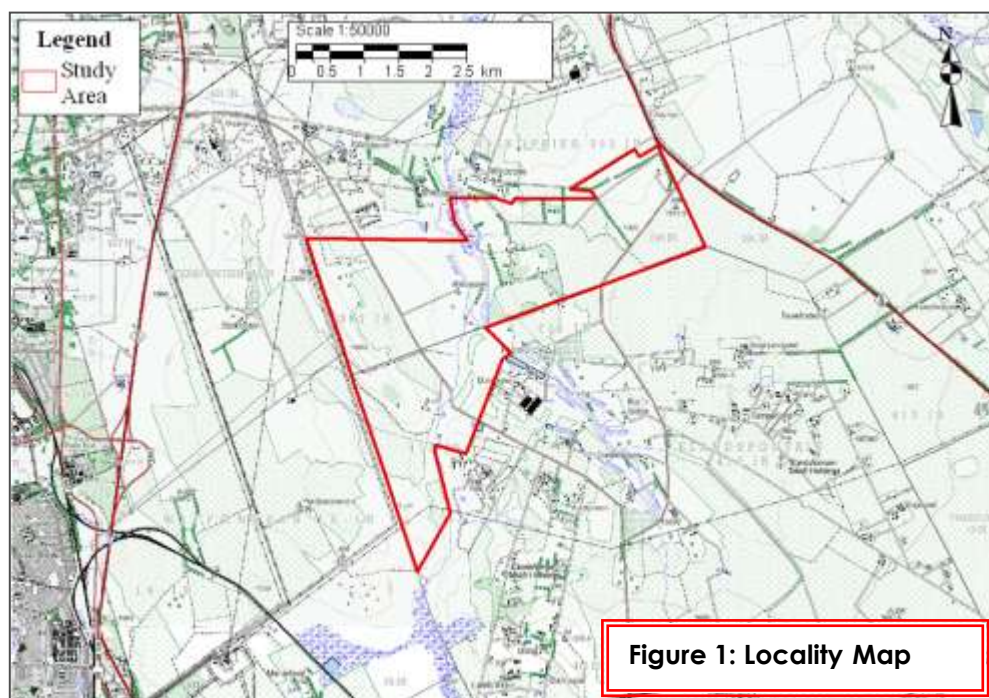
**Annexure F(iv):** Registered Interested and Affected Parties



## 1. INTRODUCTION

### 1.1 Background

**JR 209 Investments (Pty) Ltd** is planning a proposed township development on **Remainder of Portion 7, Portion 65, and Portion 61 of the Farm Elandfontein 412-JR, Portion 2, Portion 30, Remainder of Portion 29, Remainder of Portion 22 and Portion 28 of the Farm Witkoppies 393-JR, Gauteng Province** to be known as **Twenty One Township 4** (informally known as **Wolf & Van Wyk**). The size of the property is approximately **1249,1464 ha** (refer to **Figure 1: Locality Map** and **Figure 2: Aerial Map**). The proposed **Twenty One Township 4** will be the fourth phase of a larger development, known as **Twenty One Development<sup>1</sup>**, (Refer to **Figure 3 for the Master Plan of the proposed Twenty One development**).



**Figure 1: Locality Map**

<sup>1</sup> Authorisation had already been granted for Twenty One Township 2 (Gaut: 002/07-08/N0819) and Twenty One Township 3 (Gaut: 002/08-09/N0846)

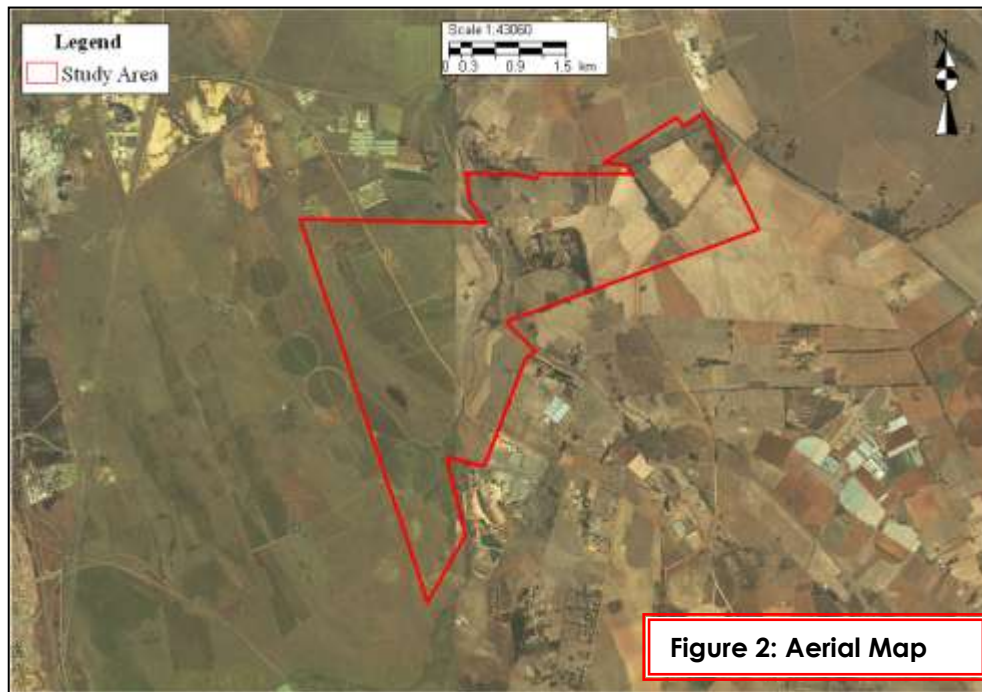


Figure 2: Aerial Map

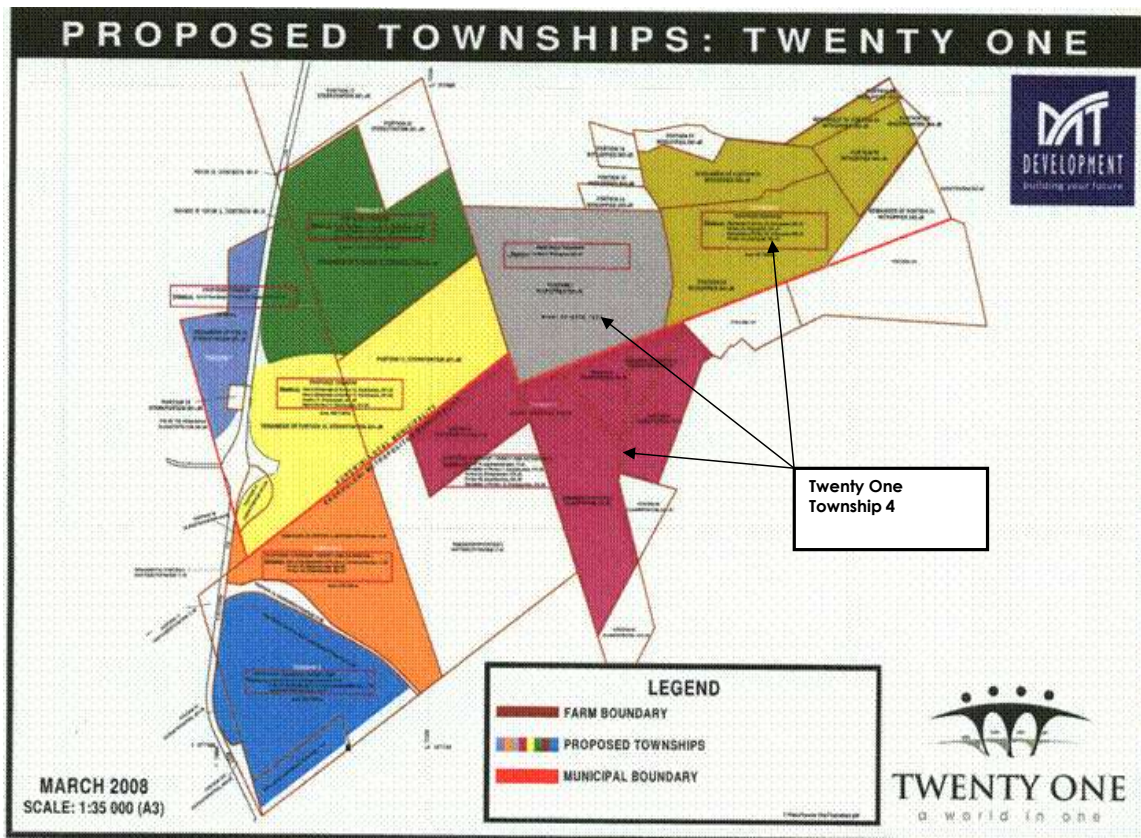


Figure 3: Master Plan Twenty One Township

**Please note: Enlargements of the Figures are included as Annexure A.**

The study area falls within the area of jurisdiction of the **Ekurhuleni Metropolitan Municipality** in **Gauteng Province**.

The application is made for the **establishment of a mixed use township** in terms of Section 96 (1) of the Town Planning and Township Ordinance, 1986 (Ordinance 15 of 1986).

Proposed **Twenty One Township 4** will comprise of **3072 erven** with the following zonings:

- **2968** erven zoned for “**Residential 1**”
- **32** erven zoned for “**Residential 2**” purposes with a density of **25 units/ha**
- **3** erven zoned “**Special**” for **commercial and agricultural** purposes
- **7** erven zoned “**Special**” for a club house and community facilities
- **1** erf zoned for “**Residential 2**” purposes with 14 dwelling units
- **3** erven zoned “**Public Open Space**”
- **42** erven zoned “**Private Open Space**”
- **8** erven zoned “**Special**” for **access control**
- **7** erven zoned “**Special**” for **access, access control and engineering services**.

In April 2006 the Minister of Environmental Affairs and Tourism passed environmental impact assessment regulations<sup>2</sup> (the Regulations) in terms of Chapter 5 of the National Environmental Management Act, 1998<sup>3</sup> (NEMA). The Regulations replaced the Environmental Impact Assessment (EIA) regulations, which were promulgated in terms of the Environmental Conservation Act, 1989<sup>4</sup> in 1997. The new regulations came into place on 3 July 2006. In June 2010 the Minister of Environmental Affairs (DEA) passed the Amended Environmental Impact Assessment Regulations in terms of Chapter 5 of the National Environmental Management Act, 1998 (NEMA). The Amended Regulations came into effect on 2 August 2010.

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<sup>2</sup>Environmental Impact Regulations, 2010

<sup>3</sup> Act No. 107 of 1998

<sup>4</sup> Act No. 73 of 1989



**JR 209 Investments (Pty) Ltd** therefore appointed **Bokamoso Landscape Architects and Environmental Consultants**, to compile an Environmental Scoping Report and Environmental Impact Assessment (EIA) for the proposed development and its associated listed activities.

The Application for Environmental Authorization for the proposed mixed use development situated on the Remainder of Portion 7, Portion 65, and Portion 61, of the Farm Elandfontein 412-JR, Portion 2, Portion 30, Remainder of Portion 29, Remainder of Portion 22, and Portion 28, of the Farm Witkoppies 393-JR was submitted on the 12 April 2011 and therefore the application must be made in terms of the New NEMA Regulations that came into place on 2 August 2010.

This report represents the Scoping Report that is prepared for the proposed development. The information contained in some specialist reports that were compiled during the scoping process, were used to identify the issues and additional specialist studies required to address/mitigate issues identified during the scoping phase.

## **1.2 Activities Applied for in Terms of NEMA**

In terms of Government Notices no. R544, no. R545 and no. R546 published in the Government Gazette no. 33306 of 02 August 2010 of the National Environment Management Act, 1998 (Act No. 107 of 1998) an Environmental Impact Assessment Process is required for the above-mentioned project, due to the fact that the following listed activities will be triggered/could be triggered.

The applicant is applying for the following listed activities:

***Also refer to Annexure B for a copy of the Application form that was submitted to Gauteng Department of Agriculture and Rural Development (GDARD).***

**Table 1: Listed activities in terms of Notice No. R 544**

Listing No. 1 R. 544, 18 June 2010	Activity 9	The construction of facilities or infrastructure exceeding 1000 metres in length for the bulk transportation of water, sewage or storm water – <ul style="list-style-type: none"> <li>(i) With an internal diameter of 0,36 metres or more; or</li> <li>(ii) With a peak throughput of 120 litres per second or more, excluding where: <ul style="list-style-type: none"> <li>a. such facilities or infrastructure are for bulk transportation of water, sewage or storm water or storm water drainage inside a road reserve; or</li> <li>b. where such construction will occur within urban areas but further than 32 metres from a watercourse, measured from the edge of the watercourse.</li> </ul> </li> </ul>
Listing No. 1 R. 544, 18 June 2010	Activity 11	The construction of: <ul style="list-style-type: none"> <li>(i) canals;</li> <li>(ii) channels;</li> <li>(iii) bridges;</li> <li>(iv) dams;</li> <li>(v) weirs;</li> <li>(vi) <b>bulk storm water outlet structures;</b></li> <li>(vii) marinas</li> <li>(viii) jetties exceeding 50 square metres in size;</li> <li>(ix) slipways exceeding 50 squares metres in size;</li> <li>(x) buildings exceeding 50 square metres in size; or more</li> </ul> where such construction occurs within 32 metres of a watercourse, measured from the edge of a watercourse, excluding where such construction will occur behind the development setback line.
Listing No. 1 R. 544, 18 June 2010	Activity 18	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 from <ul style="list-style-type: none"> <li>(i) <b>a watercourse;</b></li> <li>(ii) the sea;</li> <li>(iii) the seashore;</li> <li>(iv) 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 distance is the greater-</li> </ul> but excluding where such infilling, depositing, dredging, excavation, removal or moving <ul style="list-style-type: none"> <li>(i) Is for maintenance purpose undertaken in accordance with a management plan agreed to by the relevant environmental authority; or</li> <li>(ii) Occurs behind the development setback line.</li> </ul>

Listing No. 1 R. 544, 18 June 2010	Activity 22	The construction of a road, outside urban areas, (i) With a reserve wider than 13,5 metres or, (ii) Where no reserve exists where the road is wider than 8 metres, or (iii) For which an environmental authorization was obtained for the route determination (iv) In terms of activity 5 in Government Notice 387 of 2006 or activity 18 in notice 545 of 2010.
Listing No. 1 R. 544, 18 June 2010	Activity 47	The widening of a road by more than 6 metres, or the lengthening of a road by more than 1 kilometre- (i) Where the existing reserve is wider than 13,5 metres; or (ii) Where no reserve exists, where the existing road is wider than 8 metres- excluding widening or lengthening occurring inside urban areas.

**Table 2: Listed activities in terms of Notice No. R 545**

Listing No. 2 R. 545, 18 June 2010	Activity 15	Physical alteration of undeveloped, vacant or derelict land for residential, retail commercial, recreational, industrial or institutional use where the total area to be transformed is 20 hectares or more; Except where such physical alteration takes place for: (i) Linear development activities; or (ii) Agriculture or afforestation where activity 16 in this Schedule will apply
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**Table 3: Listed activities in terms of Notice No. R 546**

Listing No. 3 R. 546, 18 June 2010	Activity 1	The construction of billboards exceeding 18 square metres in size outside urban or mining areas or outside industrial complexes.	<b>(b) In Gauteng:</b> i. Protected area identified in terms of NEMPAA, excluding conservancies; ii. National Protected Area Expansion Strategy Focus areas; iii. Sensitive areas as identified in an environmental management framework as contemplated in chapter 5 of the Act and as adopted by the competent authority; iv. Sites or areas identified in terms of an international
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			Convention; v. <b>Sites identified as irreplaceable or important sites in the Gauteng Conservation Plan.</b>
Listing No. 3 R. 546, 18 June 2010	Activity 4	The construction of a road wider than 4 metres with a reserve less than 13.5 metres.	<p><b>(b) In Gauteng:</b></p> <ul style="list-style-type: none"> <li>i. A protected area identified in terms of NEMPAA, excluding conservancies;</li> <li>ii. National Protected Area Expansion Strategy Focus area;</li> <li>iii. Sensitive areas as identified in an environmental management framework as contemplated in chapter 5 of the Act and as adopted by the competent authority;</li> <li>iv. Sites identified in terms of the Ramsar Convention;</li> <li>v. <b>Sites identified as irreplaceable or important in the Gauteng Conservation plan;</b></li> <li>vi. Areas larger than 2 hectares zoned for use as public open space;</li> <li>vii. Areas zoned for a conservation purpose.</li> <li>viii. Any declared protected area including Municipal or Provincial Nature Reserves as contemplated by the Environmental Conservation Act, 1989 (Act No. 73 of 1989) and the Nature Conservation Ordinance (Ordinance 12 of 1983);</li> </ul>

			Any site identified as land with high agricultural potential located within the Agricultural Hubs or important Agricultural Sites identified in terms of the Gauteng Agricultural Potential Atlas, 2006
Listing No. 3 R. 546, 18 June 2010	Activity 13	<p>The clearance of an area of 1 hectare or more of vegetation where 75% or more of the vegetation cover constitutes indigenous vegetation, except where such removal of vegetation is required for:</p> <p>(1) The undertaking of a process or activity included in the list of waste management activities published in terms of section 19 of the National Management Act, 2008 (Act No. 59 of 2008) in which case the activity is regarded to be excluded from this list.</p> <p>(2) The undertaking of a linear activity falling below the thresholds mentioned in Listing Notice 1 in terms of GN No. 544 of 2010</p>	<p><b>(d) In Gauteng:</b></p> <ul style="list-style-type: none"> <li>i. A protected area identified in terms of NEMPAA, excluding conservancies;</li> <li>ii. National Protected Area Expansion Strategy Focus areas;</li> <li>iii. Any declared protected area including Municipal or Provincial Nature reserves as contemplated by the Environmental Conservation Act, 1989 (Act No. 73 of 1989), the Nature Conservation Ordinance (Ordinance 12 of 1983);</li> <li>iv. Sensitive areas as identified in an environmental management framework as contemplated in chapter 5 of the Act and as adopted by the competent authority;</li> <li>v. Sites or areas identified in terms of an International Convention</li> <li>vi. <b>Sites identified as irreplaceable or important in the Gauteng Conservation plan;</b></li> </ul>
Listing No. 3 R. 546, 18 June 2010	Activity 14	The clearance of an area of 5 hectares or more of vegetation where 75% or more of the vegetation cover	<p><b>(a) Gauteng</b></p> <p>All areas outside urban areas.</p>

		<p>constitutes indigenous vegetation, except where such removal of vegetation is required for:</p> <p>(1) purpose of agriculture or afforestation inside areas identified in spatial instruments adopted by the competent authority for agriculture or afforestation purposes;</p> <p>(2) The undertaking of a process or activity included in the list of waste management activities published in terms of section 19 of the National Environmental Management: Waste Act, 2008 ( Act No.59 of 2008) In which case the is regarded to be excluded from this list;</p> <p>(3) The undertaking of a linear activity falling below the thresholds in Notice 544 of 2010</p>	
Listing No. 3 R. 546, 18 June 2010	Activity 16	<p>The construction of:</p> <p>(i) jetties exceeding 10 square metres in size;</p> <p>(ii) slipways exceeding 10 square metres in size;</p> <p>(iii) buildings with a footprint exceeding 10 square metres in size; or</p> <p><b>(iv) infrastructure covering 10 square metres or more</b></p> <p>where such construction occurs within a watercourse or within 32 metres of a watercourse, measured from the edge of a</p>	<p><b>(b) In Gauteng:</b></p> <p>i. A protected are identified in terms of NEMPAA, excluding conservancies;</p> <p>ii. National Protected Area Expansion Strategy Focus areas;</p> <p>ii. Sensitive areas as identified in an environmental management framework as contemplated in chapter 5 of the Act and as adopted by the competent authority;</p> <p>v. Sites or areas identified in terms of</p>

		watercourse, excluding where such construction will occur behind the development setback line.	<ul style="list-style-type: none"> <li>v. an International Convention</li> <li><b>Sites identified as irreplaceable or important in the Gauteng Conservation plan;</b></li> <li>vi. Any declared protected area including Municipal or Provincial Nature reserves as contemplated by the Environmental Conservation Act, 1989 (Act No. 73 of 1989), the Nature Conservation Ordinance ( Ordinance 12 of 1983);</li> <li>ii. Areas zoned for conservation purpose.</li> </ul>
Listing No. 3 R. 546, 18 June 2010	Activity 19	The widening of a road by more than 4 metres, or the lengthening of a road by more than 1 kilometre.	<p><b>(b) In Gauteng:</b></p> <ul style="list-style-type: none"> <li>i. A protected area identified in terms of NEMPAA, excluding conservancies;</li> <li>ii. National Protected Area Expansion Strategy Focus areas;</li> <li>ii. Sensitive areas as identified in an environmental management framework as contemplated in chapter 5 of the Act and as adopted by the competent authority;</li> <li>v. Sites or areas identified in terms of an International Convention;</li> <li>v. Any site identified as land with high agricultural potential located within the Agricultural Hubs or Important Agricultural Sites identified in terms of the Gauteng Agricultural Potential Atlas, 2006.</li> </ul>

			<ul style="list-style-type: none"> <li>i. <b>All sites identified as irreplaceable or important in the Gauteng Conservation plan;</b></li> <li>ii. Any declared protected area including Municipal or Provincial Nature reserves as contemplated by the Environmental Conservation Act, 1989 (Act No. 73 of 1989), the Nature Conservation Ordinance ( Ordinance 12 of 1983) and the NEMPAA.</li> </ul>
Listing No. 3 R. 546, 18 June 2010	Activity 26	Phased activities for all activities listed in this Schedule and as it applies to a specific geographical area, which commenced on or after the effective date of this Schedule, where any phase of the activity may be below a threshold but where a combination of the phases, including expansions or extensions, will exceed a specified threshold.	All the area as identified for the specific activities listed in the schedule.

Since the proposed development includes listed activities from No. R544, No. R545 and No. R546, an application for a full EIA process was lodged at the Gauteng Department of Agriculture and Rural Development (GDARD). The reference number **Gaut: 002/11-12/E0010** had been assigned to the application.

The proposed development includes many potential listed activities<sup>5</sup> and therefore the Scoping and EIA process will be followed.

<sup>5</sup> For purpose of completeness, it was decided to apply for as many of the anticipated listed activities as possible and the listed activities were also included as part of the public participation. The final list of listed activities applied for will be finalised as soon as all the services and planning for the development has been completed.



### 1.3 The Town Planning Process

The Town Planning Application was made in terms of Section 96 (1) of the Town Planning Ordinance, 1986 (Ordinance 15 of 1986).

### 1.4 Environmental Assessment Practitioner (EAP)

The new Environmental Regulations require that relevant details of the Environmental Assessment Practitioner be included as part of the Scoping Report. In this regard, attached as **Annexure C**, is a copy of the CV of Lizelle Gregory from Bokamoso Landscape Architects and Environmental Consultants. In summary details of the EAP are indicated below:

- **Name:** Lizelle Gregory
- **Company:** Bokamoso Landscape Architects and Environmental Consultants.
- **Qualifications:** Registered Landscape Architect and Environmental Consultant (degree obtained at the University of Pretoria) with 15 years experience in the following fields:
  - o Environmental Planning and Management;
  - o Compilation of Environmental Impact Assessments;
  - o Landscape Architecture; and
  - o Landscape Contracting.

Ms. L. Gregory also lectured at the Technicon of South Africa and the University of Pretoria. She is a registered member of the South African Council of the Landscape Architects Profession (SACLAP), of the International Association of Impact Assessments (IAIA) and of the Institute of Environmental Management and Assessment (IEMA).

## **2. TERMS OF REFERENCE**

The following terms of reference have been set:

- Determine if the proposed site is a suitable site for the proposed development from an environmental point of view;
- Prepare such an Environmental Scoping Report, taking into consideration the biophysical and social environment; and
- Assess the attitude of the surrounding landowners to such a development.

## **3. SCOPE OF WORK AND APPROACH TO THE STUDY**

### **3.1 Scope of Work**

An application form for environmental authorization of the relevant activity must be submitted to GDARD. The scope of work includes the necessary investigations, to assess the suitability of the study area and the surrounding environment for the proposed activities. The scoping exercise describes the status quo of the bio-physical, social, economical and institutional environment and identifies the anticipated environmental aspects associated with the proposed development in the form of a basic issues matrix. The significance of the anticipated impacts, the assessment of the alternatives identified, the assessment of the possible impacts and the mitigation of the impacts identified will be addressed in the Environmental Impacts Assessment (EIA) report for the proposed development that will be submitted after we (Bokamoso) have received acknowledgement of receipt and acceptance of the Scoping Report and the approval of the Plan of Study for EIA, also included as part of this report.

All available material and literature were collected and used for the purpose of this study and it was further supplemented with discussions with provincial authorities, local authorities, other interested and affected parties, as well as by site surveys and photographic recording.

### **3.2 Approach to the Study**

An investigative approach was followed and the relevant physical, social and economic environmental aspects were assessed.

This Scoping Report takes into consideration the environment that may be affected by the proposed activity. Therefore, the physical, biological, social, economical and cultural aspects are considered. A description of the property on which the activity is to be undertaken and the location of the activity on the property are described. The proposed activity and any feasible and reasonable alternatives were identified. In addition, a description is included of the need and desirability of the proposed activity, as well as advantages and disadvantages that the proposed activity or alternatives may have, on the environment and community that may be affected by the activity.

An identification of all legislation and guidelines that we are currently aware of is considered in this Scoping Report. Furthermore, a description of environmental issues and potential impacts, including cumulative impacts, are identified and discussed. Information on the methodology that will be adopted in assessing the potential impacts is furthermore identified, including any specialist studies or specialized processes that were/must still be undertaken. In addition reference will be made to the mitigation of identified impacts or to further studies that may be necessary to facilitate the design and construction of an environmentally acceptable facility.

Details of the Public Participation process are included: (i) the steps that were taken to notify potentially interested and affected parties of the application; (ii) proof that the notice boards, advertisements and notices, notifying potentially interested and affected parties of the application, have been displayed, placed or given; (iii) a list of all persons or organizations that were identified and registered; (iv) a summary of the issues raised by the interested and affected parties; (v) the date of receipt of and the response of the EAP to those issues.

Lastly a Plan of Study for Environmental Impact Assessment that sets out the proposed approach to the Environmental Impact Assessment of the application (including the proposed public participation for the EIA process) is included **(Refer to Annexure D)**.

#### 4. REGISTERED OWNER AND TITLE DEEDS

The farm portions on which the proposed township is situated are all registered in the name of **JR 209 Investments (Pty) Ltd**.

The properties are registered as follows:

**Table 4: Registered Owners and Title Deeds**

Farm Description	Registered Owner	Title Deed Nr.
Remainder of Portion 7 of the Farm Elandsfontein 412-JR	JR 209 Investments (Pty) Ltd	T23045/2007
Portion 65 of the Farm Elandsfontein 412-JR	JR 209 Investments (Pty) Ltd	T23045/2007
Portion 61 of the Farm Elandsfontein 412-JR	JR 209 Investments (Pty) Ltd JR 209 Investments (Pty) Ltd	T23045/2007
Portion 2 of the Farm Witkoppies 393-JR	JR 209 Investments (Pty) Ltd	T23045/2007
Portion 30 of the Farm Witkoppies 393-JR	JR 209 Investments (Pty) Ltd	T135742/2007
Remainder of Portion 29 of the Farm Witkoppies 393-JR	JR 209 Investments (Pty) Ltd	T135742/2007
Remainder of Portion 22 of the Farm Witkoppies 393-JR	JR 209 Investments (Pty) Ltd	T135742/2007
Portion 28 of the Farm Witkoppies 393-JR	JR 209 Investments (Pty) Ltd	T135742/2007

#### 5. LOCALITY OF THE PROPOSED DEVELOPMENT

The study area (**Remainder of Portion 7, Portion 65, and Portion 61, of the Farm Elandfontein 412-JR, Portion 2, Portion 30, Remainder of Portion 29, Remainder of Portion 22, and Portion 28, of the Farm Witkoppies 393-JR**) is situated to the east of the R21 Freeway, north of the R25 and west of

the R60. The proposed township is situated directly to the east of the proposed Twenty One Township 3 Development and to the north of the Serengeti Golf and Country Estate. **Refer to Figure 1, Locality Map.**

## 6. ALTERNATIVES IDENTIFIED

Alternatives should be considered as a norm within the Scoping Process. These should include the No-Go Option, locality alternatives, land use alternatives and layout alternatives.

### 6.1 The “No-Go” Alternative

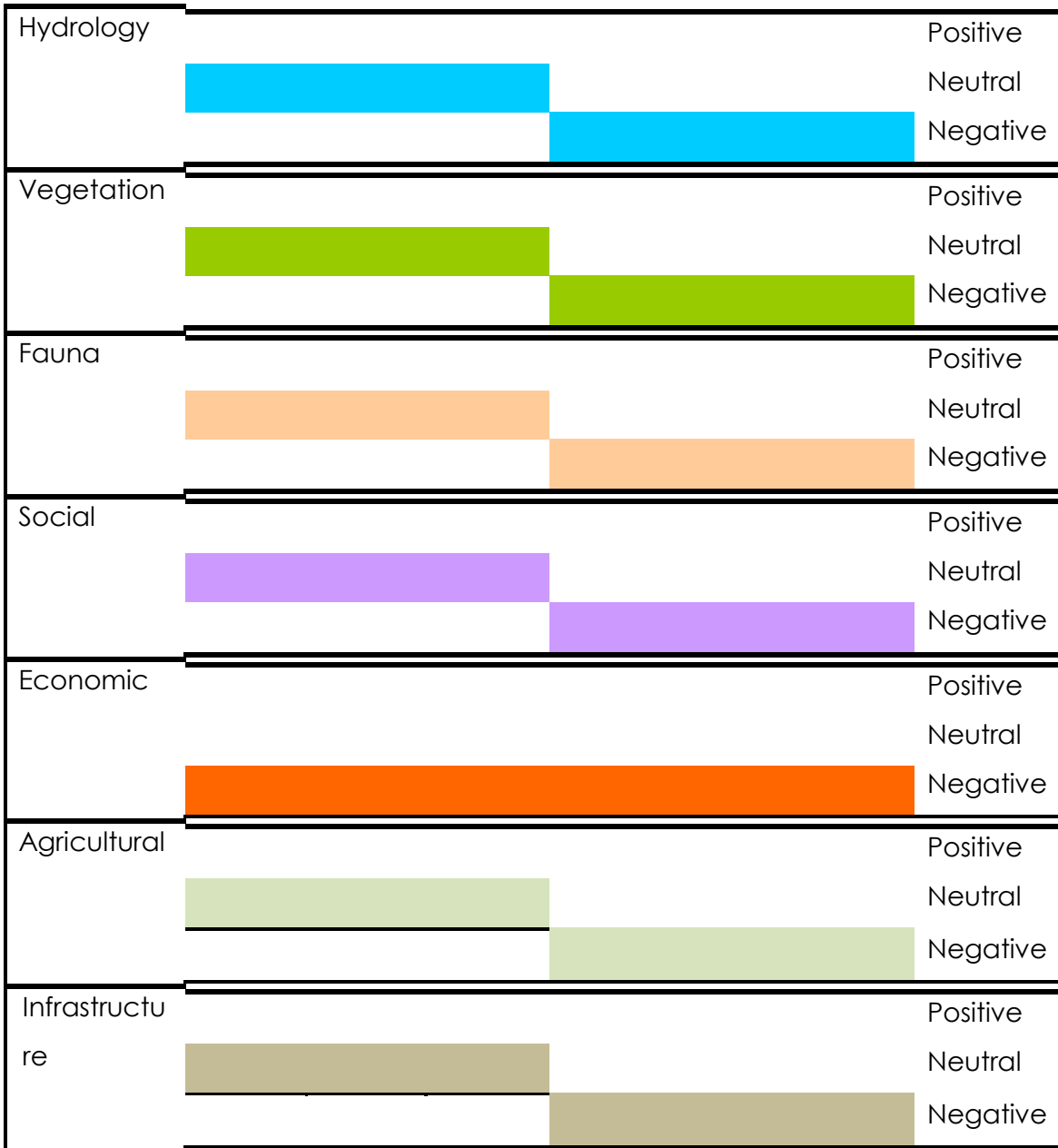
The “No-Go” alternative was not considered by the developer due to the following:

- The study area forms part of a larger portion of land that was purchased by the developer for development purposes (Twenty One Development);
- The area is situated to the east of the R21 Freeway; the R21 Development Corridor has been earmarked for development.

To follow now are tables that represent a preliminary comparison between the “No-Go” alternative and the development alternative.

**Diagram 1: Preliminary Environmental issues - “No-Go” Option.**

Issue	Short term	Medium term	Long Term	Impact
Geology and soils				Positive
				Neutral
				Negative



**Note:** The “no-go” option is predominantly neutral in the short and medium term, and turns negative in the long term.

**Diagram 2: Preliminary Environmental issues of the proposed development.**

Issue	Short term	Medium term	Long Term	Impact
Geology and soils				Positive
				Neutral
				Negative
Hydrology				Positive
				Neutral
				Negative
Vegetation				Positive
				Neutral
				Negative
Fauna				Positive
				Neutral
				Negative
Social				Positive
				Neutral
				Negative
Economic				Positive
				Neutral
				Negative
Infrastructure				Positive
				Neutral
				Negative
Agriculture				Positive
				Neutral
				Negative

**Note:** *From the preliminary investigations that were conducted, it is anticipated that the proposed development option is predominantly negative in the short term, turns neutral in the medium term and then positive in the long term.*

## **6.2 Land Use Alternatives**

The developer considered the following two land use alternatives:

### **Alternative 1 (Residential development)**

A residential development only was initially considered by the developer due to the fact that the proposed Twenty One Development focuses on more affordable and group housing, whereas Serengeti focuses more on Estate Living.

A preliminary Dolomite Stability Investigation revealed that only sections of the study area may be considered for residential development, however, detailed investigations were required to enhance the accuracy of the initial findings.

### **Alternative 2 (Mixed use development) (Preferred alternative)**

Due to the geotechnical constraints and the locality of the study area within the Kungwini-Ekurhuleni Agricultural Hub, a mixed use development consisting of residential, commercial and agricultural uses was regarded as the preferred alternative for the study area. In addition, a mixed use development will also supply employment opportunities in close proximity to residential areas and will contribute to the economy.



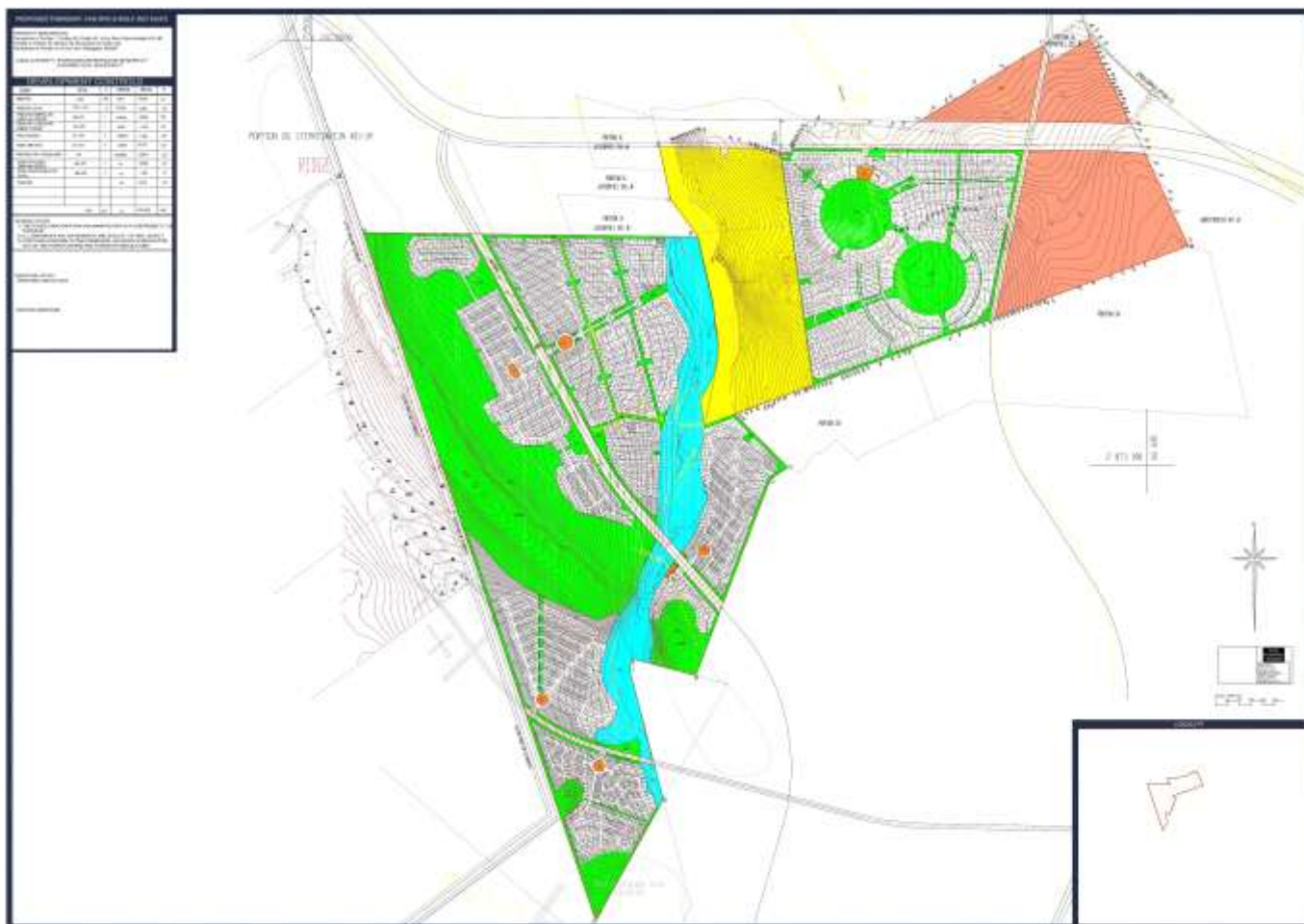
### 6.3 Locality Alternatives

The locality of the study area is desirable for the proposed development due to the following:

- The study area is in close proximity to various other townships such as Tembisa, Clayville, Olifantsfontein, which will be beneficial to the creation of employment opportunities;
- The fact that the township is situated to the east of the R21 Freeway gives it exceptional exposure from the R21 Freeway;
- The township is relatively easy accessible from the Delmas Road and the R21 situated to the west is a major east west link through Tshwane which connects with Ekurhuleni and the Oliver Tambo International Airport (ORTIA);
- Access to the township will be obtained via the proposed K220, K109 and the K147. These planned Provincial Roads are expected to be constructed up to the boundary of the township once the township is approved;
- This development complies with the GSDF in that it will adhere to improve the economic growth; and also
- Complies with the EMM (RSDF) to adhere to developing a sustainable economic corridor.

### 6.4 Layout Alternatives

Many alternative layouts for the development will be considered during the EIA phase of the development before the layout will be finalized. The physical features of the study area and the alignment of the proposed K109, K220 and K147 are considered as the main form giving elements for the layout. **Refer to Figure 4, Preliminary Layout.**



**Figure 4 – Preliminary Layout Map**

The final layout will also be tested against an environmental sensitivity map that will be compiled for the study area. **(Refer to Figure 15 for Preliminary Environmental Sensitive Issues Map).**

The final layout will be a product of a multi-disciplinary workshop (during the EIA phase) between the appointed professionals. At the workshops each discipline (including the environmental consultant) will be afforded the opportunity to share his/ her findings with the other members of the project team. The environmental consultants will also present the environmental sensitivity map to the project team during the workshops.

The following disciplines will most probably take part in the workshop:

- The civil engineers;
- The electrical engineers,
- The geotechnical engineers;
- Town and Regional Planners;
- The Urban Designers;
- The Architects and Landscape Architects;
- The Environmental Consultants (Bokamoso); and
- The Applicant.

The comments and issues raised by the interested and affected parties will also be taken into consideration during the workshops.

## **7. Planning Approach**

Based on the above, the planning approach to the proposed layout will be done by a complete professional team consisting of Land Surveyors, Town Planners, Urban Planners, Traffic Engineers, Urban Economists, Environmental Consultants, Civil Engineers, Electrical Engineers, Geotechnical Engineers and the developer.

From the specialist and other environmental information available, the project team already compiled a Conceptual Spatial Framework for the entire Twenty One development and the proposed land-uses are as follows: Light industrial; Offices; Mixed Use; High Density Residential; Medium Density Residential; and Green Open Spaces.

An effort was already made (during the preliminary layout phase) not only to make use of the opportunities, but to utilise the terrain, site features, visibility and access to the best benefit of all, including the surrounding environment.

## 8. EXISTING ZONING AND LAND USE AND THE PROPOSED LAND-USE

### 8.1 Existing Zoning and Land Use

The site is mostly vacant and undeveloped, with the exception of farm houses a shed, and former cultivated lands.

### 8.2 Proposed Zoning and Land Use

The following zonings and land uses are proposed:

**Table 5: Proposed Land-uses based on the Preliminary Layout**

ZONING	ERF No.	Q	AVERAGE	AREA Ha	%
Residential 1	1-2968	2968	1267m <sup>2</sup>	376.1036	30.11
Residential 2 (25u/ha)	2979-3010	32	0.9714ha	31.0870	2.49
Special for commercial and agricultural purposes	1969-2971	3	49.3450ha	148.0352	11.85
Special for a clubhouse & community facilities	2972-2978	7	5912m <sup>2</sup>	4.1386	0.33
Public open space	3011-3013	3	30.6027ha	91.8081	7.35
Private open space	3015-3055	42	7.5280ha	316.1763	25.31
Special for residential	3014	1	129.0908ha	129.0908	10.33
Special for access & engineering services	3066-3072	7	N.A	109.0393	8.73
Special for access control	3066-3072	8	N.A	1.7489	0.14
Public road	3058-3065		N.A	41.9186	3.36
<b>TOTAL</b>		140	N.A	1249.1464ha	100.00

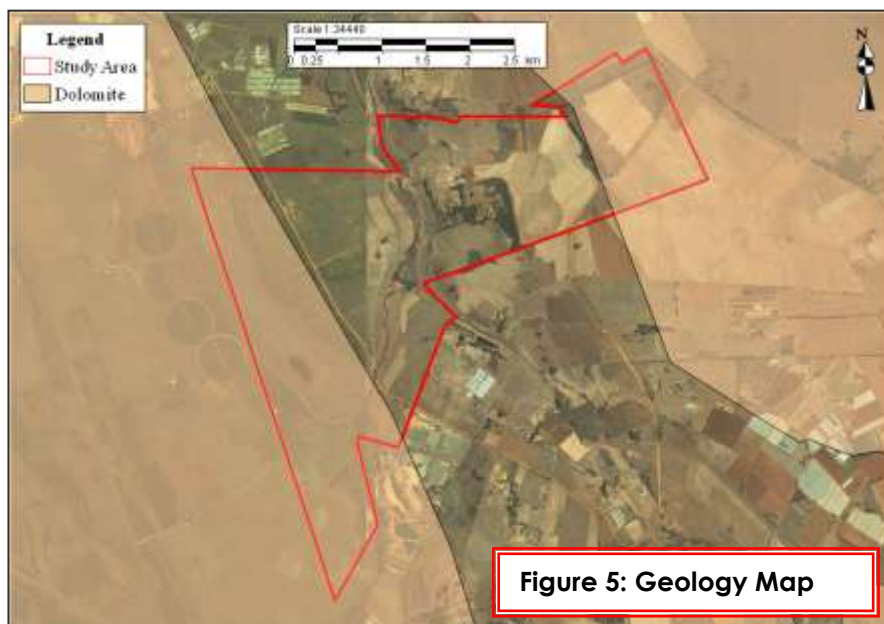
## 9. THE DESCRIPTION OF THE BIOPHYSICAL ENVIRONMENT

This section briefly describes the biophysical environment of the study area.

### 9.1 THE PHYSICAL ENVIRONMENT

#### 9.1.1 Geology and Soils

According to the GDARD C-Plan 3 the western and eastern sections of the study area are underlain by dolomite (**refer to Figure 5**). Due to the fact that portions of the study area are underlain by dolomite, some Geological constraints are expected.



#### Preliminary Issues Identified

- Risk of sinkhole and doline formation;
- Suitability of land uses according to dolomite stability zonation;
- Lowering of groundwater levels;
- Groundwater pollution;
- Stability of structures;
- Possible erosion problems; and
- The loss of topsoil.

## Additional information Or Studies Required for the EIA Phase

A detailed geotechnical investigation and dolomite stability investigation must be conducted. The detailed geotechnical report and comments on the report from the Council for Geoscience will be included as part of the EIA.

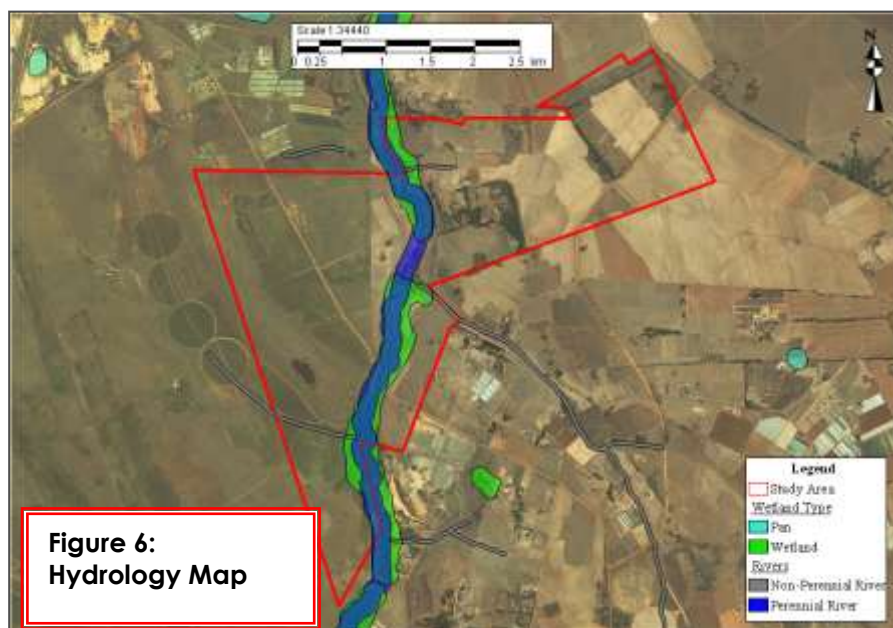
The objectives of the study should be as follows:

- Determine and/confirm the Dolomite Stability Zonation of the study area.
- Present appropriate foundation recommendations and water precautionary measures in accordance with the Council for Geoscience, National Home Builders Registration Council of Geoscience, National Home Builders Registration Council's and the Department of Public Works guidelines.
- Present a pro-active maintenance strategy for water bearing services and other infrastructure to reduce the probability of the occurrence of ground movement events.

### 9.1.2 Hydrology

#### 9.1.2.1 Surface Hydrology

The study area is affected by 1:50 and 1:100 year floodlines. A Perennial river and associated wetland system flows from the north to the south in the centre of the proposed township, and non-perennial rivers traverse the northern, south-western and south-eastern section of the property as indicated on **Figure 6**.



According to the involved storm water engineers attenuation facilities/retention dams and open channels will be implemented throughout the development (mainly in open space areas) in order to assist with storm water management.

The property has a gentle downwards slope in a west-eastern and east-western direction and the lowest point is in the middle, towards the floodline area.

#### **9.1.2.2 Sub-Surface Hydrology**

The depth of the ground water levels will be determined during the Geotechnical Survey.

#### **Preliminary Issues Identified**

- Ground water pollution, siltation and erosion problems;
- More impermeable surface will lead to an increase in the speed, quantity and quality of the storm water;
- Erosion caused at discharge points of storm water (especially if less and larger storm water pipes are used);
- Lowering of groundwater levels.
- The concentration of storm water and retention dams in dolomite areas can cause sinkhole and doline formation.

#### **Additional Information Or Studies Required for the EIA Phase**

- A detailed geotechnical survey must be conducted and the report must be included as part of the EIA.
- A detailed storm water management plan will be required for assessment and inclusion during the EIA phase. The storm water design for the proposed development must be designed to:

- Reduce and / or prevent siltation, erosion and water pollution. If erosion, siltation and water pollution is not addressed, the sustainability of the drainage and the open space systems lower down in the catchment area can be negatively impacted by the development.
- In non-dolomitic areas, storm water runoff should not be concentrated as far as possible and sheet flow should be implemented. In dolomitic areas the concentration of storm water in certain areas must be prevented.
- A groundwater management strategy must be developed and should be included as part of the EIA.

### **9.1.3 Wetlands**

According to GDARD C-Plan 3 wetlands are located in the northern and southern section of the proposed township (**refer to Figure 6, Hydrology Map**). A wetland delineation will be conducted in order to verify the presence of wetlands on the study area.

#### **Preliminary Issues Identified**

- There is a wetland present on the study area.
- Possible impacts on the integrity and sustainability of the wetlands.

#### **Additional Information Or Studies Required For The EIA Phase**

A wetland delineation study is required due to the presence of wetlands on the study area. The wetland assessment report will be included as part of the EIA.



### 9.1.4 Topography

The western portion of the study area has a gentle slope towards the east and the eastern section of the study area has a gentle slope towards the west. According to the GDARD C-Plan the study area is also affected by ridges that mainly occur in the western and southern sections of the study area.

#### Preliminary Issues Identified

- According to the consulting engineers the slope is sufficient to allow for natural stormwater drainage as well as for the cost-effective installation of essential engineering services.
- The topographical characteristics will have no detrimental effect on the development potential of the site.



#### Additional Information Or Studies Required for the EIA Phase

- A detailed storm water management plan will be required for assessment and inclusion during the EIA phase.

According to the GDARD information, the ridges in the western section are already partially transformed. Both portions drain towards the drainage line/river that runs (in a south-north) direction almost through the middle of the study area.

### **9.1.5 Climate**

The climate is typical of the Transvaal Highveld. The summers are mild to hot and the winters mild. It is a summer rainfall region with a mean annual precipitation of approximately 700mm. The moisture index is between 0 – 20, indicating a sub-humid area. The Weinert N value is approximately 2.4, which indicates that chemical decomposition is the predominant form of weathering of rock.

The climatological data for the site was taken from the weather station Irene.

#### **Wind**

Summer prevailing winds northwest, winter winds southeast.

#### **Temperature °C**

Maximum 26.7 °C, minimum 14.4 °C in summer. Winter temperature maximum 18.2 °C, minimum 2.7 °C.

#### **Rain**

Maximum rainfall 960mm, minimum 559mm, with an average of 717mm.

#### **Mist**

10 Days

#### **Lighting**

87 Days

#### **Hail**

4 Days

### **Preliminary Issues Identified**

- Should the construction phase be scheduled for the summer months, frequent rain could cause very wet conditions, which makes road construction and environmental rehabilitation works extremely difficult in flood line and wetland areas;
- Such wet conditions often cause delays to building projects and the draining of water away from the construction works (in the case of high water tables) into the water nearby water bodies, could (if not planned and managed correctly) have an impact on the water quality of these water bodies; and
- If dry and windy conditions occur during the construction phase, dust pollution could become a problem.

### **Additional Information or Studies Required for the EIA Phase**

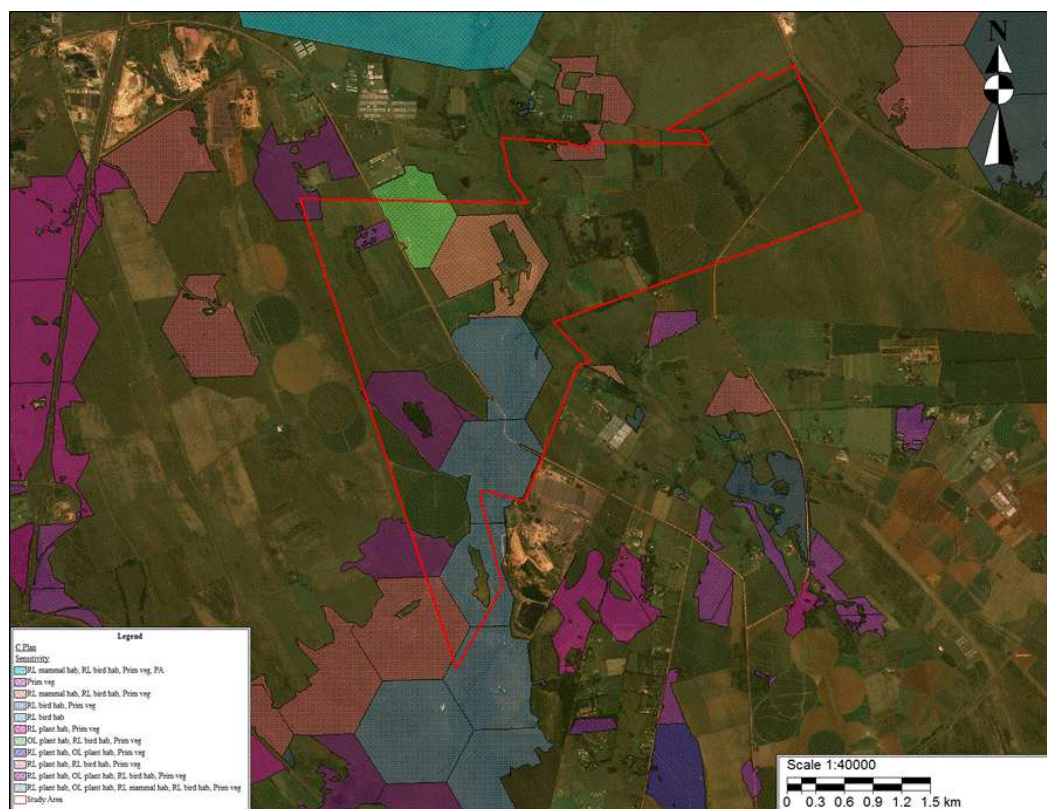
No additional studies required during the EIA phase.

## **9.2 THE BIOLOGICAL ENVIRONMENT**

### **9.2.1 Fauna and Flora**

The study area lies in the quarter degree grid square 2528CD (Rietvlei Dam) and on both sides of the boundary between Rand Highveld Grassland (large northern part of site) and Carltonville Dolomite Grassland (two southern tips of site) (Mucina & Rutherford 2006). These authors described the Rand Highveld grassland as a highly variable landscape with extensive sloping plains and a series of slightly elevated ridges. The vegetation is species-rich, wiry, sour grassland, characterized by Themeda, Eragrostis, Heteropogon and Elionurus, alternating with low sour scrubland on rocky outcrops and steeper slopes. The area comprises quartzite ridges supporting shallow soils on rocky ridges and soils of various qualities elsewhere. This vegetation unit is considered endangered. Almost 50% of the unit is already been transformed by cultivation, plantations, urbanization and dam-building.

The Carltonville Dolomite Grassland is a species-rich grassland with shallow soil and slightly undulating plains on dolomite dissected by prominent rocky chert ridges. This vegetation unit is considered vulnerable. Cultivation, urbanization, mining and the building of two dams already transformed almost a quarter of the unit. Both these vegetation units fall within a warm-temperate region with strongly seasonal summer rainfall with very dry winters and frequent winter frosts. The conservation target of both units is 24% and both units are poorly conserved in statutory reserves and a few private conservation areas. According to GDARD C-Plan the study area is affected by irreplaceable sites (**Refer to Figure 8**).



**Figure 8: Irreplaceable Sites Map**

According to the information received from GDARD, specialist biodiversity studies are required to investigate the following aspects:

- Plants with specific reference to *Habenaria mossii*, *Cheilanthes deltoidea*, *Trachyandra erythrorrhiza*.

- Birds, with specific reference to *Eupodotis senegalensis* (White-bellied Korhaan), *Tyto capensis* (African Grass Owl) and *Circus ranivorus* (African Marsh Harrier).
- Amphibians, with specific reference to *Pyxicephalus adspersus* (Gaint Bullfrog).
- Vegetation.
- Wetlands.
- River.
- Ridge.

### **Preliminary Issues Identified**

- Loss of sensitive grassland areas;
- Possible red data flora and fauna species;
- Sensitive ridge vegetation;
- Loss of habitat;
- Creation of new habitats;
- Snaring and hunting of fauna species on the property and on adjacent properties during the construction phase;
- The study area is located on dolomite and some caves could be present; and
- Loss of movement corridors and the lack of open space links (i.e. through the erection of solid walls around the development).

### **Additional Information Or Studies Required for the EIA Phase**

- A detailed fauna and flora survey (including the specialist biodiversity studies requested by GDARD) will be done and the reports be included as part of the EIAR;
- The presence of caves should be determined, and if present, an ecological cave study should be done as part of the EIA phase.

## **9.3 DESCRIPTION OF THE EXISTING SOCIAL ENVIRONMENT**

### **9.3.1 Archaeology/Cultural History**

In terms of the legislation, it is necessary to identify and list the specific legislation and permit requirements which potentially could be infringed upon by the proposed project. The necessity and possibilities for the implementation of mitigation measures should also be identified.

It should be noted that in terms of the South African Resources Act (Act 25 of 1999) Section 35(4) no person may, without a permit issued by the responsible heritage resources authority destroy, damage, excavate, alter, deface or otherwise disturb any archaeological or palaeontological site or material.

Also important is that Section 34(1) of this act states that no person may alter or demolish any structure or part of a structure, which is older than 60 years without a permit, issued by the relevant provincial heritage resources authority.

An Archaeological survey had already been conducted during the planning phases of the development. The aim of the survey was to:

- Identify possible archaeological, cultural and historic sites within the proposed development areas;
- Evaluate the potential impacts of construction, operation and maintenance of the proposed development on archaeological, cultural and historical resources; and
- Recommend mitigation measures to ameliorate any negative impacts on areas of archaeological, cultural or historical importance.

### **Preliminary Issues Identified**

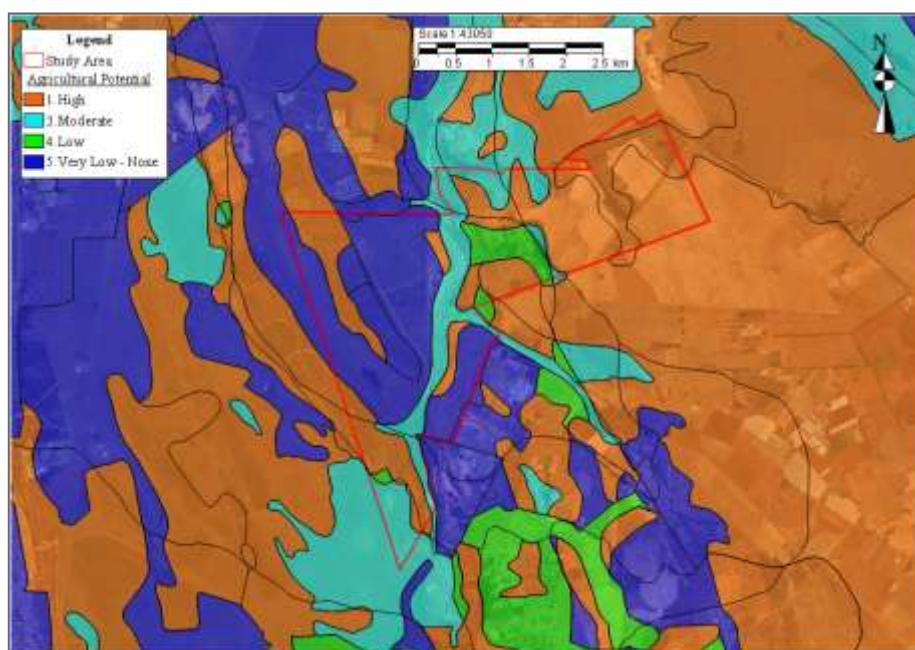
A number of sites were identified during the Archaeological survey. The sites can be categorized into two categories: Iron Age and historic period. The latter can be subdivided into Anglo Boer War, Second World War and farming related sites.

### Additional Information or Studies Required for the EIA Phase

- The cultural and historical report must be included as part of the EIA; and
- The comments from SAHRA must be addressed in the EIAR.

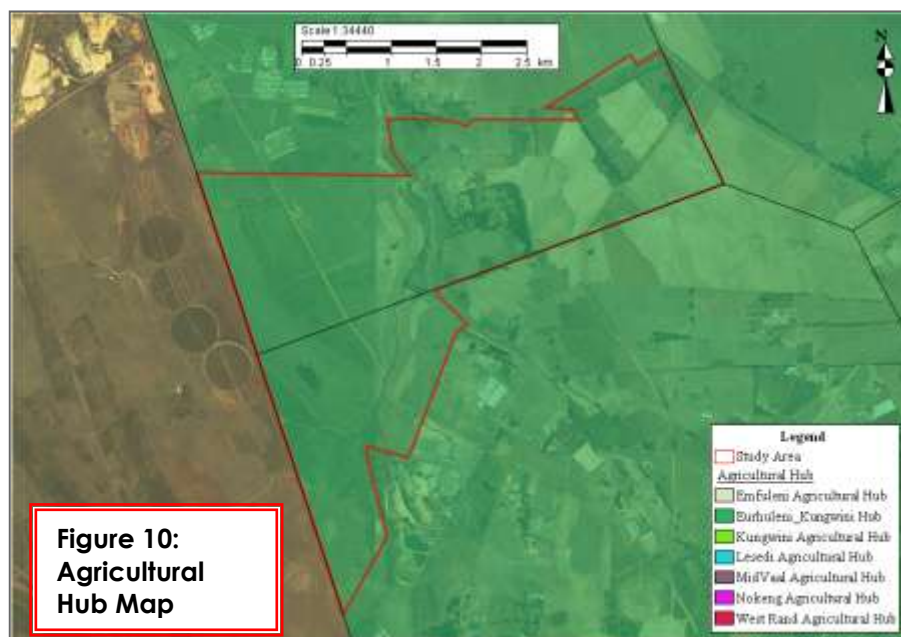
#### 9.3.2 Agricultural Potential

According to the GAPA 3 the agricultural potential of the soils on the study area range from **high to very low - none (refer to figure 9 - Agricultural Potential Map)**.



**Figure 9: GAPA 3 Agricultural Potential Map**

The study area falls within the **Ekurhuleni - Kungwini Agricultural Hub (refer to figure 10 – Agricultural Hub Map)**



### Preliminary Issues Identified

The loss of agricultural land.

### Additional Information Or Studies Required for the EIA Phase

An Agricultural Potential Survey report will be conducted and be included and assessed as part of the EIA Report.

### 9.3.3 Existing Land Use

#### 9.3.3.1 The Study Area

As already mentioned the study area is mostly vacant and undeveloped, with the exception of farm houses, a shed and former cultivated lands.

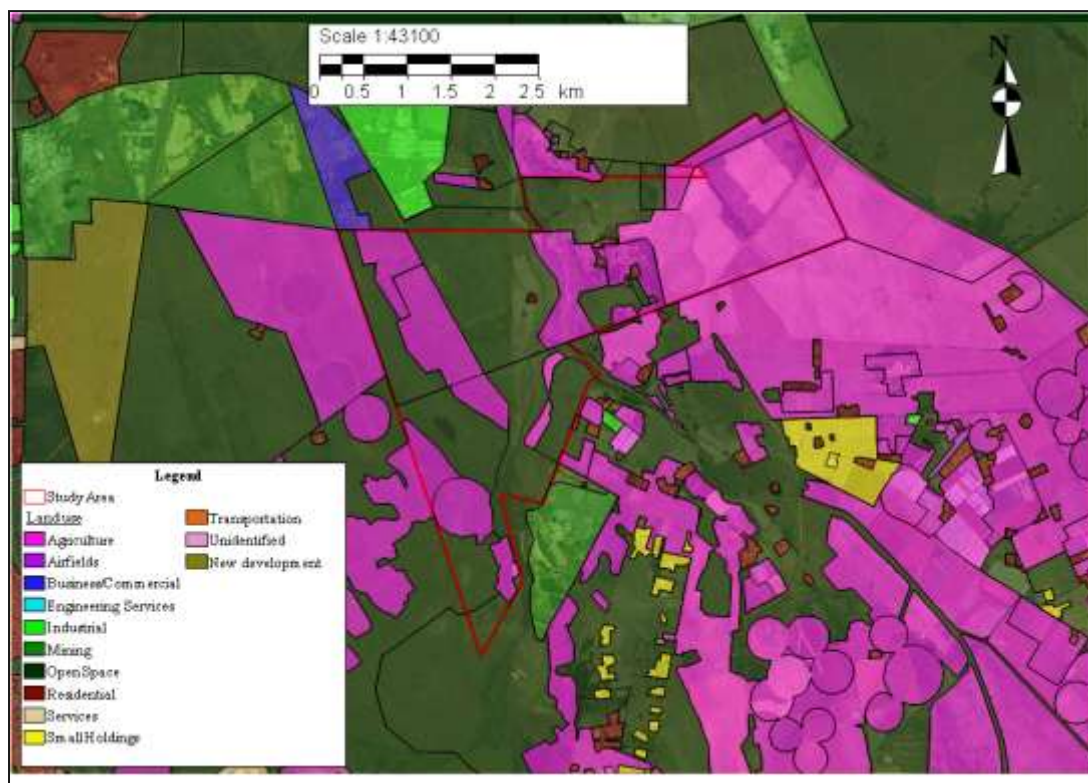


### 9.3.3.2 Surrounding Development and Land Uses

The study area is situated in an area which is currently characterized as a rural-residential area with many small farming and associated and complimentary business operations spread throughout the area. A few sand and mining other operations are also situated in the area as indicated in **Figure 11**.

Cultivated lands and commercial sites are situated to the North West, the Rietvlei View Development and Rietvlei Dam (Van Riebeeck) Nature Reserve is situated towards the north. The businesses that are spread throughout the surrounding area include, amongst others, the following:

- Restaurants and Conference Facilities
- Nurseries, and
- Engineering operations



**Figure 11: Surrounding Land Use Map**

**Preliminary Issues Identified**

- Loss of agricultural land;
- Loss of rural character;
- Compatibility with surrounding land uses; and
- Not in line with GDARD Agricultural Hub Policy.

**Additional Information Or Studies Required for the EIA Phase**

Thorough status quo investigations (economical, social, ecological and institutional) were done of the study area. From an institutional point of view the proposed development will be in line with the future land-use planning for the area, but GDARD will most probably not regard it as in line with the Agricultural Hub Policy.

The status quo investigations will be incorporated as part of the EIA and the Agricultural Hub Policy will be taken into consideration.

**9.3.4 The Proposed Land Use**

The proposed Twenty One Township 4 will be a mixed use development consisting of the following land uses and zonings: "Residential 1", "Residential 2" (25 units/ha), "Residential 2" with 14 dwelling units, "Special" for Commercial and Agricultural Purposes, "Special" for Clubhouse and Community Facilities, Public and Private Open Spaces, "Special" for Access and Engineering services and "Special" for Access and Access Control.

**Preliminary Issues Identified**

- Impacts of the proposed development on the infrastructure of the area;
- Rates and taxes payable to the authorities;
- Impacts on the values of the surrounding properties;
- Job creation

- Compatibility of the proposed land-use with the surrounding land-uses;
- Need and desirability of the proposed land-use;
- Economical viability of the proposed land-use; and
- Availability of social facilities.

### **Additional Information Or Studies Required for the EIA Phase**

The Urban Design Framework for the Twenty One Development will be incorporated as part of the EIA Report.

### **9.3.5 Institutional Environment**

#### **9.3.5.1 On An International Level**

#### **Relevant International Conventions to which South Africa is party:**

- **Convention relative to the Preservation of Fauna and Flora** in their natural state, 8 November 1993 (London);
- **Convention on Biological Diversity**, 1995  
(provided and added stimulus for a re-examining and harmonization of its activities relating to biodiversity conservation. This convention also allows for the in-situ and ex-situ propagation of gene material);
- **Agenda 21** adopted at the United Nations Conference on Environment and Development (UNCED) in 1992.  
(An action plan and blueprint for sustainable development).

### **9.3.5.2 On a National Level**

#### **The National Environmental Management Act; 1998 (Act 107 of 1998)**

In terms of Government Notices no. R544, no. R545 and no. R546 published in the Government Gazette no. 33306 of 18 June 2010 of the National Environment Management Act, 1998 (Act No. 107 of 1998) an Environmental Impact Assessment Process is required for the proposed development. This act addresses issues relating to environmental administration and it promotes sustainable development.

If the involved authorities do not take the principles of NEMA into consideration when evaluating an environmental report/ document, the involved authority can be held responsible for any damage to the environmental (social, ecological and economical).

#### **The National Water Act, 1998 (Act No: 36 of 1998)**

In terms of section 144 of the National Water Act it is required that the 1:50 and 1:100 year flood line be indicated on all relevant drawings that are being submitted for approval. The study area is affected by the perennial and a non-perennial river. Section 21 water use licenses will be required for any development which may take place within and /or impact any water resource and or floodlines. The National Water Act also required that the 1:50 and 1:100 year flood line be indicated on all the development drawings that are being submitted for approval.

Section 21 DWA (Department of Water Affairs) water use licenses are required for the proposed development.

In terms of the National Water Act, the developer will need water licenses for the proposed development, as the proposed development is influenced by 1:50 or 1:100 year flood lines and wetlands.

**National Environmental Management: Air Quality (Act No. 39 of 2004)**

This act replaced the Atmospheric Pollution Prevention Act (Act No. 45 of 1965); however Part 2 of the act is still applicable. Part 2 deals with the control of noxious or offensive gases and has no relevance to the proposed development.

The purpose of the Act is "To reform the law regulating air quality in order to protect the environment by providing reasonable measures for the prevention of pollution and ecological degradation and for securing ecologically sustainable development while promoting justifiable economic and social development; to provide for national norms and standards regulating air quality monitoring, management and control by all spheres of government; for specific air quality measures; and for matters incident thereto".

**National Environmental Management: Waste Act (Act 59, 2008)**

The Waste Management Act was finally Gazetted on 10 March 2009. Its aim is to give effect to the White Paper on Integrated Pollution and Waste Management and the National Waste Management Strategy (NWMS).

**Purpose:**

To reform the law regulating waste management in order to protect the health and the environment by providing reasonable measures for the prevention of pollution and ecological degradation and for securing ecologically sustainable development ; to provide for institutional arrangements and planning matters ;national norms and standards for regulating the management of waste by all spheres of government; to provide for specific waste management measures; to provide for the licensing and control of waste management activities; to provide for the remediation of contaminated land; to provide for the national waste information system; to provide for compliance and enforcement; and to provide for matters connected therewith.

**Objectives:**

- To ensure sound environmental management of waste.
- To provide for utilisation of environmentally-sound methods that maximise the utilisation of valuable resources and encourage resource conservation and recovery;
- To reduce risk to human health and prevent the degradation of the environment through usage of mechanisms that promote the following:
  - Pollution prevention and cleaner production
  - Volume reduction at source
  - Recycling, recovery and reuse
- Set guidelines and targets for waste avoidance and volume reduction through source reduction and waste minimisation measures, including composting, recycling, re-use, recovery, green charcoal process, and others, before collection, treatment and disposal in appropriate and environmentally sound waste management facilities in accordance with this act;
- To ensure the proper segregation, collection, transportation, storage, treatment and disposal of waste through the formulation and adoption of the best environmental practice in ecological waste management;
- To promote national research and development programs for improved waste management and resource conservation techniques, more effective institutional arrangement and indigenous and improved methods of cleaner production, waste reduction, reuse, collection, treatment, separation and recovery;
- To encourage greater private sector participation in waste management;
- To encourage cooperation and self-regulation among waste generators through the application of market-based instruments;
- To institutionalise public participation in the development and implementation of national, provincial and local integrated, comprehensive, and ecological waste management programs; and
- To strengthen the integration of ecological waste management and resource conservation and recovery topics into the academic curricula of formal and non-formal education in order to promote environmental awareness and action among the citizenry.

- To control the export, import, transit, reuse, recovery, treatment and disposal of waste to ensure that all operations relating to export, import, transit, reuse, recovery, treatment and disposal will be undertaken in an environmentally sound manner.

### **National Heritage Resources, 1999 (Act No 25 of 1999)**

The National Heritage Resources Act legislates the necessity for cultural and heritage impact assessment in areas earmarked for development, which exceed 0.5 ha. The Act makes provision for the potential destruction of existing sites, pending the archaeologist's recommendations through permitting procedures. Permits are administered by the South African Heritage Resources Agency (SAHRA).

It is important to note that in terms of the National Heritage Resources Act, (Act No 25 of 1999); all historical sites and materials older than 50 years are protected. It is an offence to destroy, damage, alter or remove such objects from the original site, or excavate any such site(s) or material without a permit from the National Monuments Council. Gravesites are subject to the requirements of the National Monuments Act, No. 28 of 1969.

Archaeological artefacts had been identified on the study area and permits for the potential destruction of existing sites must be obtained from SAHRA.

### **National Environmental Management: Biodiversity Act, 2004 (Act No 10 of 2004)**

The purpose of the Biodiversity Act is to provide for the management and conservation of South Africa's biodiversity within the framework of the NEMA and the protection of species and ecosystems that warrant national protection. As part of its implementation strategy, the National Spatial Biodiversity Assessment was developed. Specialist ecological assessment studies must be conducted for the study area.

### **National Spatial Biodiversity Assessment**

The National Spatial biodiversity Assessment (NSBA) classifies areas worthy of protection based on its biophysical characteristics, which are ranked according to priority levels.

Specialist ecological assessment studies must be conducted for the study area.

### **National Environmental Management: Protected Areas Act, 2003 (Act No 57 of 2003)**

The purpose of this Act is to provide the protection, conservation and management of ecologically viable areas representative of South Africa's biological diversity and its natural landscapes.

Specialist ecological assessment studies must be conducted for the study area.

### **The Development Facilitation Act, 1995 (Act 67 of 1995)**

This Act formulates a set of general principles to serve as guidelines for land development inter alia revolving around:

- The promotion of integration of the social, economic, institutional and physical aspects of land development;
- The promotion of integrated land development in rural and urban areas in support of each other;
- The promotions of the availability of residential land and employment opportunities in close proximity to or integrated with each other;
- The promotion of a combination of diverse land-uses, with each proposed land development area to be judged on its own merit and no specific use, whether residential, commercial, conservation etc., to be regarded as less important;
- Discouraging urban sprawl to promote more compact towns/ cities;



- Encouraging environmentally sound land development practices; and
- Promoting sustained protection of the environment.

***Information supplied by M & T Development Town Planning:***

The proposed development will ensure a coordinated development of the larger area by creating a residential enclave in harmony with the open space area. The density for the development will ensure that as many units which can be accommodated on this are being developed, without compromising the surrounding environment. Therefore existing resources will be optimally utilised for this development.

The proposed development will therefore comply in broad terms with the principles of the Development Facilitation Act, 1995 in that it will balance the economic and social needs of the developer with that of surrounding property owners and developments to create a development which will benefit the larger area.

The development will optimise the utilisation of existing resources, including resources relating to agriculture, land, minerals, bulk infrastructure, roads, transportation, and social facilities. This development was planned taking full cognisance of the physical aspects of the property and all aspects relating to existing resources of bulk infrastructure, roads, and transportation were investigated in detail. All existing resources will be fully optimised and the provision of additional service infrastructure will be to the benefit of the larger area.

The natural environment played an integral part in the design of the township and is a very important component of the township establishment process. Cognisance was taken of environmental sustainability and environmental sensitivity of surrounding land uses.

From the above mentioned it is evident that this proposed development takes cognisance of the development principals as set out in the Development Facilitation Act and will aim at compliance with the principles in broad terms.

### **Principles contained in NEMA and the DFA**

Principles of NEMA and the DFA, which give effect to sustainable development, were followed:

- Development must be socially, environmentally and economically sustainable;
- Promotion of integrated land development in rural and urban areas in support of each other;

#### **9.3.5.3 On a Provincial Level**

##### **The Gauteng Spatial Development Framework (GSDF), 2000**

The Gauteng Spatial Development Framework (GSDF) identified a “**Core Economic Focus Area**” for Gauteng Province which broadly represents the triangular area between the CBD's of Pretoria, Johannesburg and the Johannesburg International Airport (JIA). This corresponds with the N1/M1, N1/R21 and M2/N3/R24 highway. The GSDF proposed that economic development and associated investment be optimized in the area.

The primary philosophy of the **Economic Core Area** is to make optimal uses of the resources available in the area to promote economic development. In the case of the R21 Corridor the most important resources available include:

- the existing R21 Freeway which links the city of Tshwane to the Johannesburg International Airport;
- the Johannesburg International Airport which is the major entrance point of foreign visitors to Southern Africa;
- large pockets of undeveloped land surrounding route R21 in the Ekurhuleni/ Metropolitan Area with relatively easy access to bulk services provision;
- the close proximity and accessibility of workers to serve the R21 corridor, and which also benefit from the development in terms of job opportunities and income; and

- current market/development trends around route R21 which shows a natural propensity towards development along its alignment.

## Gauteng Urban Edge

The GSDF proposed the establishment of a provincial Urban Edge to serve as a mechanism towards ensuring the containment and redirection of urban growth, while addressing rural development beyond the Urban Edge.

The Urban Edge followed the movement desire line associated with the alignment of the R21 freeway in the area between Kempton Park and Pretoria. However, because the R21 freeway is part of the core economic area of Gauteng Province as reflected in the Gauteng Spatial Development Framework, it was decided that the R21 freeway and the area surrounding it should be within the proposed Urban Edge. This approach was supported by the HOD of the Department of Public Transport, Roads and Works at the time, who indicated that a road, particularly a freeway, always attracts developments on both sides thereof.

According to Mr. Neels Du Toit of the Department of Local Government and Housing now have a different approach with regards to the delineation of the Urban Edge. The urban edge is now revised on a yearly basis and areas that can be serviced with municipal services can now be included into the urban edge by provincial and local



**Figure 11 – Gauteng Urban Edge, 2010**

government.

It was proved that the proposed residential development to the north of the study area can be serviced and therefore the Kungwini Local Authority and the Department of local government and housing decided to include this almost isolated section as part of the urban edge.

The applicant already applied for many services and road upgrading in the area (on behalf of the local authority) and some of the proposed services upgrading already received RoD's, this means that the entire development will be connected to municipal services and local government will most probably request that the study area be included as part of the urban edge. It is also important to note that the urban edge is not a rigid line, but rather an area that requires transition from an urban to a rural area. The proposed development falls within a transitional zone that allows for mixed uses.

### **Gauteng Transport Infrastructure Act, 2001 (Act No 8, 2001)**

The purpose of this Act is to consolidate the laws relating to roads and other types of transport infrastructure in Gauteng. It provides for the planning, design, development, construction, financing, management, control, maintenance, protection and rehabilitation of provincial roads, railway lines and other transport infrastructure in Gauteng.

According to this provincial act, the proposed alignments for the Gautrans roads on the Gautrans Grid Road Network Map must be honoured by planners.

This Act is relevant to the proposed development.

### **GDARD Draft Ridges Policy**

According to the GDARD C-Plan, the study area is affected by ridges and therefore the Draft Ridges Policy is regarded as applicable. **(Refer to GDARD Ridges Map, Figure 7)**

### **Draft Policy on the Protection of Agricultural Land (2006)**

The study area lies within an Agricultural Hub that was identified by GDARD in 2006. The Draft policy on the protection of Agricultural Land (2006) is therefore applicable to the proposed development. **(Refer to Kungwini-Ekurhuleni Agricultural Hub, Figure 10)**

An Agricultural Potential study will be conducted on the study area during the EIA Phase. As indicated on the preliminary layout map sections of the proposed development will be utilized for agricultural purposes **(refer to Figure 4)**. **It should be noted that the proposed Rietvlei Farm Estate on Portion 1 of the Farm Witkoppies 393-JR, situated directly to the north of the study area and within the Kungwini – Ekurhuleni Agricultural Hub, received authorisation from the Department. The Rietvlei Farm Estate includes agricultural use in the development. Refer to Annexure E for Authorisation letter.**

#### **9.3.5.4 On a Local level**

### **Planning Responsibilities of the Involved Local Authority**

The prerogative to plan a development within its jurisdictional area has been, in terms of the Local Government Transitional Act, 1993 and recently the Municipal Systems Act, 2000, vested in the local authority involved.

In order to ensure that the proposed developments comply with the standards and requirements of the involved local authorities (Kungwini Local Municipality and Ekurhuleni

Metropolitan Municipality), the relevant officials were involved in the planning of the project from the start.

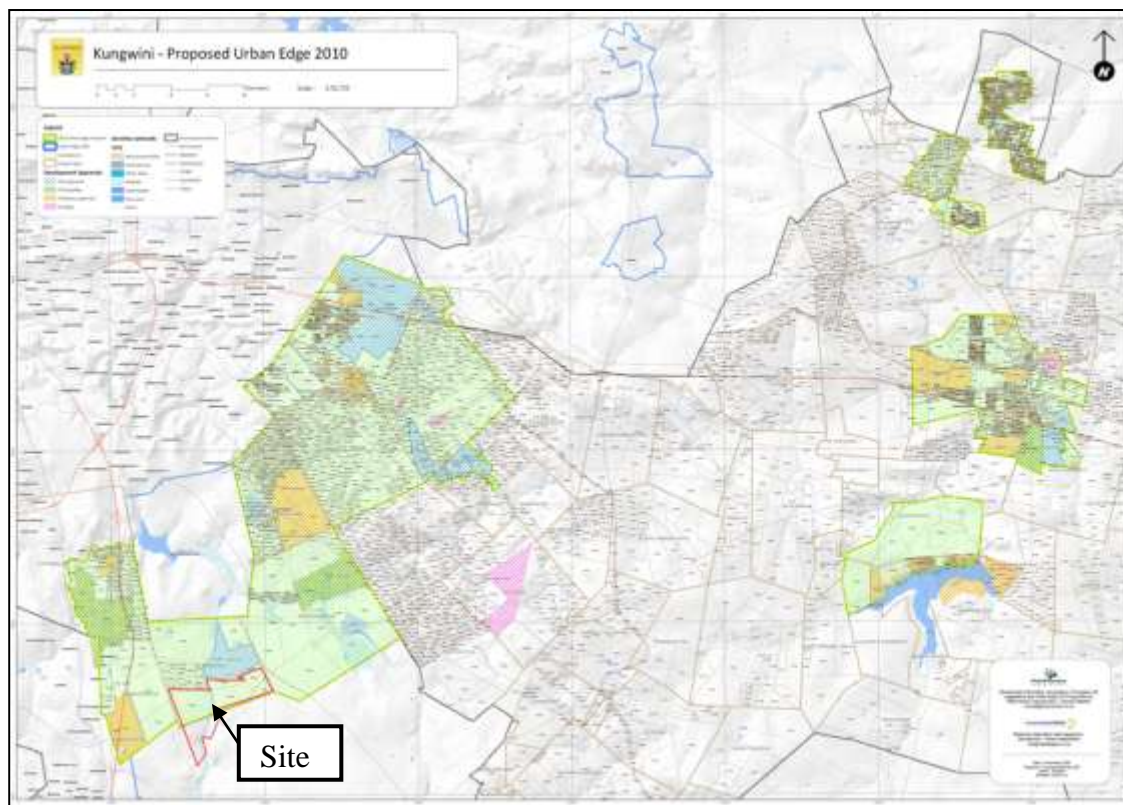
### **The Local Government Ordinance, 1939 (Ordinance 17 of 1939)**

Section 152(1) of the Ordinance states that the objects of Local government and per implication those of Kungwini Local Municipality and Ekurhuleni Metropolitan Municipality are inter alia to ensure the provision of services to communities in a sustainable manner. The proposed development will comply with this.

The capital costs for the proposed development will essentially be borne by the developer. Relative to this, however there lies an obligation on the local authority to support proposals in its interest (expansion of its tax base) as well as those in the interest of the community (investment and ensuring sustainability of development over time).

### **The Kungwini Integrated Development Plan (IDP) and Spatial Development Framework, 2002.**

According to the IDP the study area falls under Zone 1- Settlement areas and is reserved for Intense Urbanization. The area is impacted upon by development pressures from the west (Tshwane Metropolitan Municipality Area) and will have to accommodate dense urban development, including high-income housing developments. The proposed Twenty One Township development will comply with the Kungwini IDP. **(Refer to Figure 13: Kungwini Urban Edge 2010 Map)**



**Figure 13: Kungwini Urban Edge 2010 Map**

### **Municipality Systems Act – No. 32 of 2000**

This Act clearly establishes the Integrated Development Plan and Integrated Spatial Development Framework as guidelines to inform development and processes in this regard.

### **Ekurhuleni Spatial Development Framework**

The Ekurhuleni Metropolitan Municipality commenced with the compilation of its Metropolitan Spatial Development Framework process during October 2002. Important concepts that received attention were the concept of the R21 Corridor, as well as the alignment of the draft provincial Urban Edge in the Ekurhuleni Metropolitan area.

As far as the Urban Edge in the vicinity of the R21 Freeway is concerned, the Ekurhuleni Spatial Development Framework document (p.50) states as follows:

***“The Urban Development Boundary in the vicinity of the R21 Freeway represents and makes provision for development on both sides of the freeway. Subject to all environmental and other conditions, the Ekurhuleni Metropolitan Municipality will, as a principle, support development proposals in the vicinity of the R21 Freeway both to the east and the west of the road and which can and will promote development of the R21 corridor concept as planned by the metropolitan Municipality.”***

*The Ekurhuleni Metropolitan Municipality adopted the Spatial Development Framework together with the IDP during March 2003 by means of which they also adopted the **amendments** proposed to the **Gauteng Urban Edge**.*

With the above as background it is clear that route R21 should be promoted as a “development corridor”.

### **Bronberg Integrated Development Framework**

The **Bronberg Integrated Development Framework** has been approved by the council. The Bronberg's Sub Regional vision is “To promote the economic and infrastructure development of Bronberg in order to localize economic opportunities and facilities on a sustainable basis within the Bronberg area”.

The Bronberg IDP says that the “diversity of an economy is an important indicator of its potential long-term strength and sustainability. A diverse economy is generally better able to absorb the impact of downturns in important markets.



The economy is more likely to have long term sustainability if it can increase the amount of value adding tertiary or second activity. This includes activities such as primary processing of agricultural procedures, light industrial and tourism.

Bronberg currently relies heavily on primary sector activity which could be to the areas detriment being reliant on one sector. The proposed township will increase the amount of secondary, but mostly tertiary sector activities in the area.

The Bronberg IDP defines a strategic development area as "areas that focus around activities which could create jobs in the area and activities which could broaden the Bronberg tax base. These areas include two activity corridors, the R21 and the N4, and a number of activity nodes rural/non rural residential activities can be developed.

Therefore proposed township is in line with the Bronberg Integrated Development Plan.

It was shown that the development is compatible with the spatial development principles of the Gauteng Spatial Development Framework. Motivations in terms of these regional principles were also given. It is therefore clear that the site is located in relative close proximity to a principle economic development spine (R21).

### **Preliminary Issues Identified**

- All relevant legislation, policies and guidelines must be taken into consideration during the development planning; and
- The proposed development is in line with the future planning for the area.

### **Additional Information Or Studies Required For The EIA Phase**

The proposed development must comply with all the relevant legislation and it must strive to comply with the development frameworks, policies and guidelines for the area. The finalized layout must also take cognizance of the applicable institutional framework.

### 9.3.6 Qualitative Environment

#### 9.3.6.1 Visual Environment

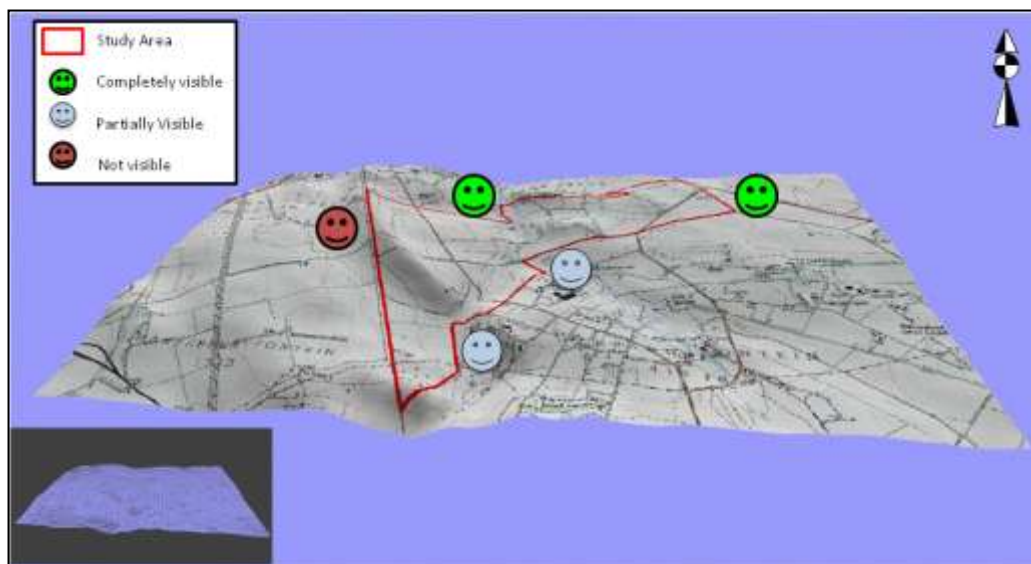
The following visual assessment criteria (**see Table 6**) has been used to determine the impact of the proposed development on the state of the environment – the significance is indicated by the respective colour coding for each of the impacts, being either high, medium or low:

**Table 6: Visual Impact Criteria**

	IMPACT		
CRITERIA	HIGH	MEDIUM	LOW
Visibility	A prominent place with an almost tangible theme or ambience	A place with a loosely defined theme or ambience	A place having little or no ambience with which it can be associated
Visual quality	A very attractive setting with great variation and interest – no clutter	A setting with some visual and aesthetic merit	A setting with no or little aesthetic value
Compatibility with the surrounding landscape	Cannot accommodate proposed development without the development appearing totally out of place – not compatible with the existing theme	Can accommodate the proposed development without it looking completely out of place	The surrounding environment will ideally suit or match the proposed development
Character	The site or surrounding area has a definite character / sense of place	The site or surrounding environment has some character	The site or surrounding environment exhibits little or no character/sense of place
Visual Absorption Capacity	The ability of the landscape not to accept a proposed development because of a uniform texture, flat slope and limited vegetation cover	The ability of the landscape to less easily accept visually a particular type of development because of less diverse landform, vegetation and texture	The ability of the landscape to easily accept visually a particular type of development because of its diverse landform, vegetation and texture
View distance	If uninterrupted view distances to the site are > 5 km	If uninterrupted view distances to the site are < 5 km but > 1 km	If uninterrupted view distances to the site are > 500 m and < 1000 m

Critical Views	Views of the site seen by people from sensitive view sheds i.e. farms, nature areas, hiking trails etc.	Some views of the site from sensitive view sheds	Limited or partial views of the site from sensitive view sheds
Scale	A landscape with horizontal and vertical elements in high contrast to human scale	A landscape with some horizontal and vertical elements in some contrast to human scale	Where vertical variation is limited and most elements are related to the human and horizontal scale

From the preliminary visual assessment (**Refer to Figure 14**) it is evident that the study area is completely visible from the north and north-east, partially visible from the south-east and not very visible from the west.



**Figure 14: Preliminary Visual Assessment**

### Preliminary Issues Identified

- Due to the location of the study area close to the R21 Freeway the proposed development could have a significant visual impact if it is not planned correctly. It could however also

have a positive impact if the development is planned well and integrated with the natural surroundings.

### **Additional Information Or Studies Required For The EIA Phase**

- A more detailed visual impact assessment must be done during the EIA stage;
- Mitigation measures must be supplied for the visual impacts during the EIA Process; and
- Architectural guidelines must be based on the mitigation measures supplied in the EIA report.

#### **9.3.6.2 Sense of Place**

Sense of place is the subjective feeling a person gets about a place by experiencing the place visually, physically, socially and emotionally. The "Sense of Place" of an area is one of the major contributors to the "Image of the area".

**The image of an area** consists of two main components, namely **place structure** and **sense of place**. These could be defined as the following:

- **Place Structure** refers to the arrangement of physical place making elements within a unique structure that can be easily legible and remembered.
- The **Sense of Place** is the subjective meaning attached to a certain area by individuals or groups and is linked to its history, culture, activities, ambience and the emotions the place creates.

#### **Preliminary Issues Identified**

- If planned and managed correctly, the proposed development could have a positive impact on the "Sense of Place" of the study area and its surroundings.

- The main "Sense of Place" creators are the Ridges (views experienced towards and from ridges), the existing rural atmosphere, the area adjacent to the river and the cultural & historical features on and around the study area.

#### **Additional Information Or Studies Required For The EIA Phase**

- A more detailed visual impact assessment must be done during the EIA stage;
- Mitigation measures must be supplied for the visual impacts during the EIA Process;
- Architectural guidelines must be based on the mitigation measures supplied in the EIA report;
- Identify cultural and historical features that will contribute to the "Sense of Place";
- Identify areas with attractive views;
- Identify areas visible from sensitive view-shreds and supply mitigation measures to prevent/restrict impacts.

#### **9.3.6.3 Noise Impact**

The construction phase could have a noise impact on the surrounding residents. The proposed provincial roads K220, K147 and K109 could have noise impacts on residential erven adjacent to these roads.

#### **Preliminary Issues Identified**

- The noise impact on surrounding residents during the construction phase;
- The noise impacts of the proposed K220, K147 and K109 on residential erven adjacent to these roads.

#### **Additional Information Or Studies Required For The EIA Phase**

- Mitigation measures must be supplied for the noise impacts during the EIA Process.

#### **9.3.6.4 Light Pollution**

Street and security lighting must be designed in order not to spread light into the eyes of oncoming traffic on existing and proposed roads (K220, K147 and K109). Internal streets and security lighting should also be designed not to disturb residents at night. Light beams must face downwards and not higher than a 45 degree angle from the ground.

#### **Preliminary Issues Identified**

- Light pollution due to street and security lighting.

#### **Additional Information Or Studies Required For The EIA Phase**

- Mitigation measures must be supplied for light pollution during the EIA Process.

#### **9.3.6.5 Air Quality / Dust**

Some dust pollution may occur during the construction phase if dry and windy conditions occur, but will only be temporary and will not occur during the operational phase. Dust suppression techniques such as sprinkling the construction site regularly with water and by putting up dust nets will mitigate this impact to an acceptable level.

#### **Preliminary Issues Identified**

- Dust pollution during construction phase.

#### **Additional Information Or Studies Required For The EIA Phase**

- Mitigation measures must be supplied for dust pollution during the EIA Process.

### **9.3.8 Demography**

Demographics, population composition, income profiles and other population statistics always play a very important role to evaluate the need for additional land uses.

Studies of demographics are very important to ascertain the need and viability of a new development, especially one of this magnitude.

#### **Preliminary Issues Identified**

- Viability of the proposed development;
- Need and desirability of the proposed development;
- Availability of social facilities.

#### **Additional Information Or Studies Required For The EIA Phase**

- Motivations from the Town and Regional Planners and the appointed Urban Economists to be included as part of the EIA.

### **9.3.8 Services**

#### **9.3.8.1 Water and sewer**

The proposed Twenty One Development was included in the **amendments and extensions** to the original **Master Plan Report for the Metsweding District Municipality and Kungwini Local Municipality compiled by GLS in 2005**.

### **9.3.8.2 Stormwater**

A Stormwater Master Plan for the Twenty One Townships was compiled by Vela VKE Consulting Engineers.

### **9.3.8.3 Electricity**

The bulk electricity supply to the proposed Twenty One Development will be taken from the proposed Junction 88/11kV substation. According to Mr. Robert Zietsman, Geopower Consulting Engineers, the Junction substation was scheduled to be commissioned by August 2010. The environmental authorization for this substation has been obtained.

The substation will be constructed in two phases. The installed capacity of phase 1 of the substation will be 40MVA which will be increased to 80MVA in the second phase. The installed capacity of the first phase of the substation is more than which is required for the anticipated electricity demand of Township 2. Eskom has allocated an initial 20 MVA supply to the Junction substation.

The electricity supply to this township development will be transferred at 11 000V by means of 11kV main feeder cables. No environmental authorization is required for the installation of these cables as their route does not cross any wetland areas.

### **9.3.8.4 Solid Waste**

According to the involved engineers, the involved local authority will be responsible for the removal of the domestic waste generated during the operational phase of the project.

### **Preliminary Issues Identified**

- The availability of services must be confirmed;
- The upgrading of existing services in the area;



- The upgrading of existing infrastructure;
- Temporary disruptions to services in surrounding area during the installation and upgrading of services.

### **Additional Information Or Studies Required For The EIA Phase**

#### **Storm water**

- A detailed storm water management plan will be required for assessment and inclusion during the EIA phase;
- All external storm water pipes and channels to be indicated on plans for purpose of the EIA process;
- Details regarding properties that will be affected by the storm water management measures to be implemented to be supplied during the EIA process. Must also include information regarding servitudes to be registered.

#### **Sewer**

- Confirmation of the capacity of the involved Waste Water Treatment Works is required for the purpose of the EIA and external upgrades need to be investigated in order to ensure available capacity for this development.

#### **Domestic Water**

- Details of the proposed reservoir(s) and associated infrastructure to be supplied during the EIA process.

#### **Electricity**

- Details regarding properties that will be affected by the proposed electricity upgrades to be supplied during the EIA process. Must also include information regarding servitudes to be registered.

## Waste Management

- Confirmation of party (local authority or waste removal contractor) for both domestic waste and industrial waste to be supplied during the EIA process – must be in writing;
- Confirmation that the local registered landfill site has the capacity to receive the waste generated by the construction and operational phases of the project.
- Details of a registered landfill site for industrial material and confirmation that it has the capacity to receive the industrial waste generated by the operational phase of the development.
- All services reports must be included and evaluated as part of the EIA.

### 9.3.9 Traffic

Transportation and Traffic Technology Africa (Pty) Ltd had been appointed to conduct a transportation and traffic impact investigation for the entire Twenty One development. These investigations at this level of planning review the traffic implications of the proposed land use location, mix and extent through trip generation assignment and modeling of the proposed network. They also form the basis of documentation for the planning applications in process.

#### The External Road Network

The proposed development is situated in close proximity to the following roads:

- **R21 Albertina Sisulu Highway:** A provincial route located to the west of the proposed development under the jurisdiction of the Gauteng Department of Transport (Gautrans). This route is of strategic importance as it connects Tshwane with Ekurhuleni and is the main route to the Johannesburg International Airport.

## Future Road Network

The following routes are planned as future routes within the study area:

- **PWV 5:** Provincial highway is situated to the south of the development.
- **K220:** Provincial route running along an east-west axis to the north of the development.
- **K129:** Provincial route extending from the K220 to the east of the site.
- **K147:** Provincial route running along a south north axis to the east of the site.
- **K27:** Provincial route running along an east-west axis to the north of the site.
- **K105:** Provincial route running along a north south axis to the west of the site.
- **K109:** Provincial route running along the north-south axis on the west of the site.
- **K60:** Provincial route running on an east-west axis some way to the south of the development where it roughly follows the current alignment of the R25 – the exact alignment has not yet been finalised.
- **R21 Expressway:** Ekurhuleni metro route running through the proposed Twenty One Development and to the east of the R21 – the Expressway will be built in future in an effort to relieve the R21 Freeway of its high traffic volumes and also open up the R21 corridor for development.

## Access

The Gautrans design standards for provincial routes prohibits direct access to any systems interchange and therefore access to the proposed township will be obtained from the future road K220, the K109 and K147.

### **Internal Road Network**

The design of the internal road system will be influenced by:

- o Geology, drainage and natural features
- o Orientation of erven
- o Access
- o Services and the provision of infrastructure

### **Preliminary Issues Identified**

- The upgrading of existing roads;
- Construction of new roads;
- Access

### **Additional Information Or Studies Required For The EIA Phase**

The transportation and traffic impact investigation for the entire Twenty One development conducted by Transportation and Traffic Technology Africa (Pty) Ltd must be included in the EIAR.

#### **9.3.10 Public Participation**

##### ***Please Refer to Annexure F for Public Participation***

Public Participation is a cornerstone of any environmental impact assessment. The principles of the National Environment Management Act, 1998 (Act No. 107 of 1998) govern many aspects of environmental impact assessments, including public participation. These include provision of sufficient and transparent information on an ongoing basis to the stakeholders to

allow them to comment and ensuring the participation of previously disadvantaged people, women and youth.

Effective public involvement is an essential component of many decision-making structures, and effective community involvement is the only way in which the power given to communities can be used efficiently. The public participation process is designed to provide sufficient and accessible information to interested and affected parties (I&AP's) in an objective manner to assist them to:

- o Raise issues of concern and suggestions for enhanced benefits.
- o Verify that their issues have been captured.
- o Verify that their issues have been considered by the technical investigations.
- o Comment on the findings of the EIA.

Stakeholders (I&AP's) were notified of the Environmental Evaluation Process through:

- 1) A site notice that was erected (at a prominent point on the study area) on 26 May 2011 **(Refer to Annexure F i for proof of notice)**.
- 2) Notices were distributed to the surrounding land-owners and interested and affected parties by means of faxes, hand delivery and e-mail on 26 May 2011 **(Refer to Annexure F ii for proof of public notice)**;
- 3) An advertisement was placed in the Beeld newspaper on 26 May 2011 **(Refer to Annexure F iii for proof of advertisement)**; and
- 4) The Scoping Report will be available for review by I&AP's for a period of 30 days and comments received will be addressed in the EIA phase.

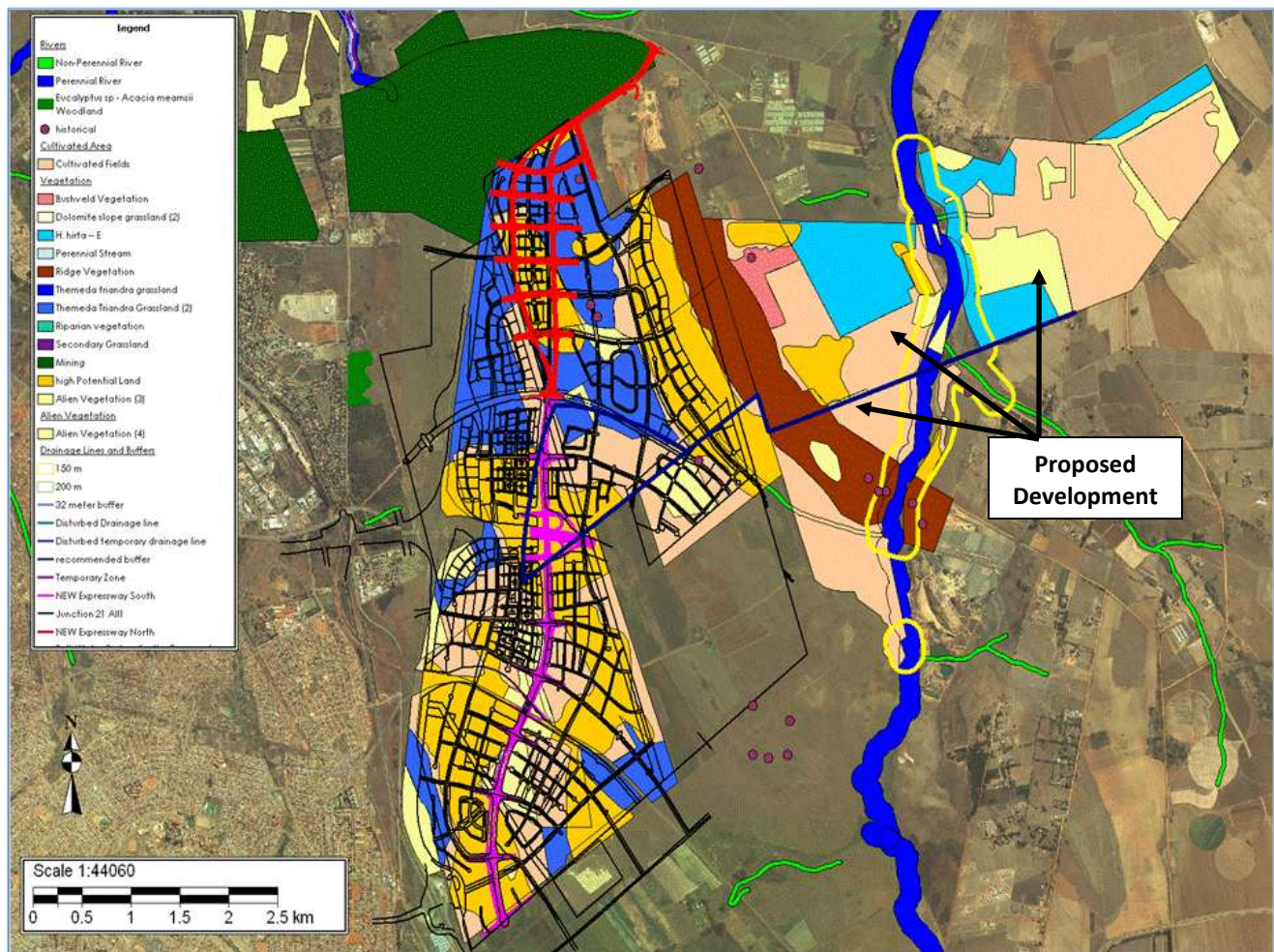
### **Additional Information Or Studies Required for the EIA Phase**

The registered I&APs will be notified of the EIA phase and the EIA Report will be available for review by I&APs for a period of thirty days.

## 10. ENVIRONMENTAL ISSUES AND SENSITIVITY

### 10.1 Preliminary Environmental Issues and Sensitivity

A preliminary environmental issues map was compiled based on information obtained during site visits, preliminary specialist studies and GDARD C-Plan 3.



**Figure 15: Preliminary Sensitive Issues Map**

## 10.2 ANTICIPATED IMPACTS, INCLUDING CUMULATIVE IMPACTS

The impacts/aspects (beneficial and adverse) of the proposed land use development on the receiving environment were identified. The specific preliminary impacts associated with the proposed development on the study area (are identified under each environment of this report), and general construction and operational phase related impacts associated with development are listed in **Table 7** below.

**Table 6: PRELIMINARY ENVIRONMENTAL IMPACT MATRIX OF PROPOSED TWENTY ONE TOWNSHIP 4 DEVELOPMENT: ALTERNATIVE RESIDENTIAL LAND-USE (LISTED AS (1) IN TABLE BELOW) AND ALTERNATIVE 2 – MIXED USE (LISTED AS (2) IN TABLE BELOW)**

Environmental Aspects	Soil and Soil Stability	Topography	Water Quality	Flora & Fauna	Existing Land-use of Study area and its surroundings	Visual Quality & Sense of Place	Qualitative Environment (Air Quality & Acoustical Environment)	Socio-Economic (I.e.. Services, Economical Impacts, Cultural & Historical)	Mitigation Possibilities High ☹ Medium 😊 Low ○ Positive Impact not necessary to mitigate ☀
<b>PLANNING PHASE</b>									
The study area is affected by ridges and therefore the Draft Ridges Policy is regarded as applicable.	■ 1&2	■ 1&2			■ 1&2	■ 1&2		■ 1&2	😊 1&2
The site lies within an Agricultural Hub that was identified by	■ 1&2		■ 1&2	■ 1&2	■ 1&2	■ 1&2			😊 1&2



Environmental Aspects	Soil and Soil Stability	Topography	Water Quality	Flora & Fauna	Existing Land-use of Study area and its surroundings	Visual Quality & Sense of Place	Qualitative Environment (Air Quality & Acoustical Environment)	Socio-Economic (I.e.. Services, Economical Impacts, Cultural & Historical)	Mitigation Possibilities High ☺ Medium ☺ Low ○ Positive Impact not necessary to mitigate ☺
GDARD in 2006. The Draft policy on the protection of Agricultural Land (2006) is therefore applicable to the proposed development.									
<b>CONSTRUCTION PHASE</b>									
Construction works could cause disturbance and eradication of the	■ 1&2		■ 1&2	■ 1&2	■ 1&2	■ 1&2		■ 1&2	☺ 1&2

Environmental Aspects	Soil and Soil Stability	Topography	Water Quality	Flora & Fauna	Existing Land-use of Study area and its surroundings	Visual Quality & Sense of Place	Qualitative Environment (Air Quality & Acoustical Environment)	Socio-Economic (I.e.. Services, Economical Impacts, Cultural & Historical)	Mitigation Possibilities High ☺ Medium ☺ Low ○ Positive Impact not necessary to mitigate ☀
sensitive ecosystems and habitats on site.									
Erosion may take place on site if storm water is not managed sufficiently during the construction phase.	■ 1&2	■ 1&2	■ 1&2	■ 1&2		■ 1&2			☺ 1&2
If not planned and managed correctly, topsoil will be lost due to construction activities.	■ 1&2			■ 1&2					☺ 1&2

Environmental Aspects	Soil and Soil Stability	Topography	Water Quality	Flora & Fauna	Existing Land-use of Study area and its surroundings	Visual Quality & Sense of Place	Qualitative Environment (Air Quality & Acoustical Environment)	Socio-Economic (I.e.. Services, Economical Impacts, Cultural & Historical)	Mitigation Possibilities High ☹️ Medium 😐 Low ○ Positive Impact not necessary to mitigate ☀️
Surface water flows will be altered during the construction phase.	■ 1&2		■ 1&2						☺️ 1&2
Construction during the dry and windy season could cause some impacts and dust pollution.	■ 1&2					■ 1&2	■ 1&2	■ 1&2	☺️ 1&2
Traffic congestion caused by heavy slow construction vehicles on the local roads.					■ 1&2	■ 1&2		■ 1&2	☺️ 1&2

Environmental Aspects	Soil and Soil Stability	Topography	Water Quality	Flora & Fauna	Existing Land-use of Study area and its surroundings	Visual Quality & Sense of Place	Qualitative Environment (Air Quality & Acoustical Environment)	Socio-Economic (I.e.. Services, Economical Impacts, Cultural & Historical)	Mitigation Possibilities High ☹️ Medium 😊 Low ○ Positive Impact not necessary to mitigate ☀️
Localized vibration							■ 1&2		😊 1&2
Construction during the rainy season can cause unnecessary delays and damage to the environment.	■ 1&2	■ 1&2	■ 1&2	■ 1&2				■ 1&2	😊 1&2
The clearing of the site and the construction of the proposed structures and infrastructure can result in the eradication of the existing	■ 1&2		■ 1&2	■ 1&2		■ 1&2		■ 1&2	😊 1&2

Environmental Aspects	Soil and Soil Stability	Topography	Water Quality	Flora & Fauna	Existing Land-use of Study area and its surroundings	Visual Quality & Sense of Place	Qualitative Environment (Air Quality & Acoustical Environment)	Socio-Economic (I.e.. Services, Economical Impacts, Cultural & Historical)	Mitigation Possibilities  High ☹️  Medium 😊  Low ○  Positive Impact not necessary to mitigate ☀️
vegetation (with and without conservation value) in and around the study area									
During the construction phase some safety and security problems (especially for the surrounding residents) are likely to occur.								■ 1&2	😊 1&2
Creation of Job opportunities								◆ 1&2	☀️ 1&2

Environmental Aspects	Soil and Soil Stability	Topography	Water Quality	Flora & Fauna	Existing Land-use of Study area and its surroundings	Visual Quality & Sense of Place	Qualitative Environment (Air Quality & Acoustical Environment)	Socio-Economic (I.e.. Services, Economical Impacts, Cultural & Historical)	Mitigation Possibilities High ☹️ Medium 😊 Low ○ Positive Impact not necessary to mitigate ☀️
Soil might be lost from the site due to heavy vehicles tracking the soils from the site onto adjacent areas and roads.	■ 1&2	■ 1&2	■ 1&2	■ 1&2					☹️ 1&2
Site office and camp, and associated waste.	■ 1&2		■ 1&2	■ 1&2	■ 1&2	■ 1&2	■ 1&2	■ 1&2	☹️ 1&2
Vehicle maintenance may cause pollution.	■ 1&2		■ 1&2	■ 1&2		■ 1&2			☹️ 1&2
Disposal of building waste & liquids.	■ 1&2		■ 1&2	■ 1&2		■ 1&2		■ 1&2	☹️ 1&2

Environmental Aspects	Soil and Soil Stability	Topography	Water Quality	Flora & Fauna	Existing Land-use of Study area and its surroundings	Visual Quality & Sense of Place	Qualitative Environment (Air Quality & Acoustical Environment)	Socio-Economic (I.e.. Services, Economical Impacts, Cultural & Historical)	Mitigation Possibilities High ☹ Medium ☺ Low ○ Positive Impact not necessary to mitigate ☀
The construction vehicles and facilities will have a negative impact on the study area and surrounding views.						■ 1&2		■ 1&2	☺ 1&2
No temporary erosion protection at release points of water (especially during the rainy season)	■ 1&2	■ 1&2	■ 1&2	■ 1&2				■ 1&2	☹ 1&2
Dumping of rubble in sensitive areas and on the surrounding	■ 1&2		■ 1&2	■ 1&2	■ 1&2	■ 1&2		■ 1&2	☹ 1&2

Environmental Aspects	Soil and Soil Stability	Topography	Water Quality	Flora & Fauna	Existing Land-use of Study area and its surroundings	Visual Quality & Sense of Place	Qualitative Environment (Air Quality & Acoustical Environment)	Socio-Economic (I.e.. Services, Economical Impacts, Cultural & Historical)	Mitigation Possibilities High ☹️ Medium 😐 Low ○ Positive Impact not necessary to mitigate ☀️
properties.									
Construction activities could disturb neighbours in terms of noise, visual and dust pollution					■ 1&2	■ 1&2	■ 1&2	■ 1&2	☹️ 1&2
Uncontrolled veld fires may cause damage to infrastructure, cause loss of vegetation and fauna				■ 1&2	■ 1&2	■ 1&2	■ 1&2	■ 1&2	☹️ 1&2
Eradication of invasive and exotic species			◆ 1&2	◆ 1&2		◆ 1&2			☹️ 1&2



Environmental Aspects	Soil and Soil Stability	Topography	Water Quality	Flora & Fauna	Existing Land-use of Study area and its surroundings	Visual Quality & Sense of Place	Qualitative Environment (Air Quality & Acoustical Environment)	Socio-Economic (I.e.. Services, Economical Impacts, Cultural & Historical)	Mitigation Possibilities High ☹ Medium ☺ Low ○ Positive Impact not necessary to mitigate ☀
from the site.									
Causing damage to fauna habitats				■ 1&2		■ 1&2			☹ 1&2
Impact on red data fauna and flora species				■ 1&2					☺ 1&2
Impact on river and wetland			■ 1&2	■ 1&2					☺ 1&2
Impact on ridges		■ 1&2		■ 1&2					☺ 1&2
Temporary disruption of services due to relocation and installation of services					■ 1&2			■ 1&2	☺ 1&2

Environmental Aspects	Soil and Soil Stability	Topography	Water Quality	Flora & Fauna	Existing Land-use of Study area and its surroundings	Visual Quality & Sense of Place	Qualitative Environment (Air Quality & Acoustical Environment)	Socio-Economic (I.e.. Services, Economical Impacts, Cultural & Historical)	Mitigation Possibilities High ☹️ Medium 😊 Low ○ Positive Impact not necessary to mitigate ☀️
The visual impact of the construction works on the surrounding communities and from the R21 highway.						■ 1&2			😊 1&2
Precautionary measures for construction on dolomite are not followed.	■ 1&2							■ 1&2	☹️ 1&2
Heavy buildings are erected without detailed Geotechnical investigation to	■ 1&2							■ 1&2	☹️ 1&2

Environmental Aspects	Soil and Soil Stability	Topography	Water Quality	Flora & Fauna	Existing Land-use of Study area and its surroundings	Visual Quality & Sense of Place	Qualitative Environment (Air Quality & Acoustical Environment)	Socio-Economic (I.e.. Services, Economical Impacts, Cultural & Historical)	Mitigation Possibilities High ☹️ Medium 😊 Low ○ Positive Impact not necessary to mitigate ☀️
determine the underlying geological conditions and foundation requirements									
OPERATIONAL PHASE									
Eradication of invasive species	◆ 1&2		◆ 1&2	◆ 1&2	◆ 1&2	◆ 1&2			☀️ 1&2
Increased surface water runoff to storm water management system from hard surfaces may impact on			■ 1&2	■ 1&2					😊 1&2

Environmental Aspects	Soil and Soil Stability	Topography	Water Quality	Flora & Fauna	Existing Land-use of Study area and its surroundings	Visual Quality & Sense of Place	Qualitative Environment (Air Quality & Acoustical Environment)	Socio-Economic (I.e.. Services, Economical Impacts, Cultural & Historical)	Mitigation Possibilities High ☹️ Medium 😊 Low ○ Positive Impact not necessary to mitigate ☀️
surface and ground water.									
Compatibility with surrounding land uses					■ 1 ◆ 2	◆ 1&2		◆ 1&2	😊 1&2
Provision of residential units/erven in close proximity to employment opportunities.					◆ 1	◆ 1		◆ 1	☀️ 1
Provision of erven for agricultural and commercial use								◆ 2	☀️ 2
Noise impacts on residential erven from the						■ 1&2	■ 1&2	■ 1&2	😊 1&2

Environmental Aspects	Soil and Soil Stability	Topography	Water Quality	Flora & Fauna	Existing Land-use of Study area and its surroundings	Visual Quality & Sense of Place	Qualitative Environment (Air Quality & Acoustical Environment)	Socio-Economic (I.e.. Services, Economical Impacts, Cultural & Historical)	Mitigation Possibilities High ☹️ Medium 😊 Low ○ Positive Impact not necessary to mitigate ☀️
proposed K220, K147 and K109									
Increased security in the area and on the study area				◆ 1&2	◆ 1&2	◆ 1&2		◆ 1&2	☀️ 1&2
Optimal use of infrastructure								◆ 1&2	☀️ 1&2
Contribution to the upgrading of infrastructure and services								◆ 1&2	☀️ 1&2
Creation of temporary and permanent jobs					◆ 1&2			◆ 1&2	😊 1&2
Creating a major contribution to rates and taxes to								◆ 1&2	☹️ 1&2

Environmental Aspects	Soil and Soil Stability	Topography	Water Quality	Flora & Fauna	Existing Land-use of Study area and its surroundings	Visual Quality & Sense of Place	Qualitative Environment (Air Quality & Acoustical Environment)	Socio-Economic (I.e.. Services, Economical Impacts, Cultural & Historical)	Mitigation Possibilities High ☺ Medium ☺ Low ○ Positive Impact not necessary to mitigate ☀
the local municipality.									
Impact of additional vehicle traffic on already busy roads due to traffic associated with development						■ 1&2	■ 1&2	■ 1&2	☺ 1&2
Light pollution during the night						■ 1&2	■ 1&2		☺ 1&2
Risk of sinkhole formation due to ineffective dolomite risk management	■ 1&2							■ 1&2	☺ 1&2
Loss of sensitive vegetation and				■ 1&2		■ 1&2			○ 1&2

Environmental Aspects	Soil and Soil Stability	Topography	Water Quality	Flora & Fauna	Existing Land-use of Study area and its surroundings	Visual Quality & Sense of Place	Qualitative Environment (Air Quality & Acoustical Environment)	Socio-Economic (I.e.. Services, Economical Impacts, Cultural & Historical)	Mitigation Possibilities High ☺ Medium ☺ Low ○ Positive Impact not necessary to mitigate ☀
fauna habitat									
Loss of agricultural land					■ 1&2				○ 1&2

■ Adverse Impact      ◆ Beneficial Impact

1 Alternative 1      2 Alternative 2

### 10.3 Comparative Assessment between Alternative 1 and Alternative 2

**Tables 7 and 8** below are preliminary comparative assessments based on the issues identified in **Table 6** above. The issues identified in **Table 6** are based on the status quo information that was available for the Scoping Phase and the Scoping Report already identified the aspects that must be investigated in more detail during the EIA phase.

The purpose of the preliminary issues identification and comparative assessment process is (1) to identify "fatal flaws" that could prevent the project from happening at an early stage, (2) to identify specialist studies and plans to be done for the EIA phase of the application, (3) to identify the mitigation possibilities of the preliminary issues identified and (4) to compare (already at an early stage) the workable alternatives identified with each other before and after mitigation. The comparative assessment will assist the EAP with the identification of the preferred alternative. However, the environmental issues and the results of the comparative assessment are only preliminary results that must still be confirmed during the EIA phase. Some of the specialist studies done during the EIA phase could identify additional issues to be addressed and it could even identify "Fatal Flaws" that could prevent the project from happening/place restrictions that could have a significant impact on the preliminary layout and alternatives identified.

Due to the fact that many of the high impact issues identified in the above mentioned tables can be mitigated to more acceptable levels, the issues ratings before and after mitigation could differ considerably. In many cases, high impact issues (mostly related to the construction phase of a development) can be mitigated completely. The comparative assessment after mitigation (**Refer to table 8 below**) will, therefore, give a more accurate indication of the preliminary preferred alternative for the project.



**Table 8: Comparative assessment between Alternative 1 and 2 before Mitigation.**

Environmental Aspects <b>Key to impacts:</b> ☺ l- Lower positive ☺ m- Medium positive ☺ h- Higher positive ☹ l- Lower negative ☹ m- Medium negative ☹ h- Higher negative ☹ - Neutral	Physical				Biological		Socio-Economical									Institutional				Total of Impacts
	Geology and Soils	Hydrology	Topography	Climate	Fauna	Flora	Qualitative Environment	Visual, Noise, Pollution, Security	Compatibility of Land-Use	Availability of municipal services	Upgrading of Municipal Services	Economical Impact Local Authority	Economical Impact I&AP's	Economical Impact Private Sector	Cultural and Historical	Impact on high agricultural potential land	In line with IDP	In line with SDF or other frameworks And open space plans	In line with policies and guidelines	
<b>CONSTRUCTION PHASE</b>																				
<b>Preliminary Issues and Impacts</b>																				
Alternative 1 Residential	☹ h	☹ m	☹ l	☹ l	☹ h	☹ h	☹ m	☹ m	☹ l	☹ m	☹ m	☹ m	☺ h	☹ h	☹ h	☺ l	☺ l	☺ h	☺ h	☺ h x 3 ☺ l x 2 ☹ x 3 ☹ l x 2 ☹ m x 5 ☹ h x 4
Alternative 2 Mixed Use	☹ h	☹ m	☹ l	☹ l	☹ h	☹ h	☹ m	☹ m	☹ l	☹ m	☹ m	☹ m	☺ h	☹ h	☹ h	☺ h	☺ h	☺ h	☺ h	☺ h x 5 ☹ x 3 ☹ l x 2 ☹ m x 5 ☹ h x 4

OPERATIONAL PHASE																				
Preliminary Issues and Impacts																				
	Geology/ soils	Hydrology	Topography	Climate	Fauna	Flora	Qualitative Env	Land-Use	Municipal Serv	Upgrading of MunServ	Econ Impact LA	Econ Impact I & AP's	Econ Impact Priv Sector	Cult & Hist	Agric Potential	IDP	SDF, Open Space Plan	Policies/ Guidelines	Acts other legislation	
Alternative 1 Residential	⊖ h	⊖ m	⊕	⊖ l	⊖ m	⊖ m	⊕ m	⊕ m	⊕ h	⊕ h	⊕ m	⊕ l	⊕ m	⊕	⊖ h	⊕ l	⊕ l	⊕ h	⊕ h	⊕ h x 4 ⊕ m x 4 ⊕ l x 3 ⊖ x 2 ⊖ l x 1 ⊖ m x 3 ⊖ h x 2
Alternative 2 Mixed Use	⊖ h	⊖ m	⊕	⊖ l	⊖ m	⊖ m	⊕ l	⊕ h	⊕ h	⊕ h	⊕ h	⊕ l	⊕ h	⊕	⊖ h	⊕ h	⊕ h	⊕ h	⊕ h	⊕ h x 9 ⊕ l x 2 ⊖ x 2 ⊖ l x 1 ⊖ m x 3 ⊖ h x 2

**Table 9: Comparative Assessment between impacts of Alternative 1 and 2 after Mitigation**

Environmental Aspects <b>Key to impacts:</b> ☺ l- Lower positive ☺ m- Medium positive ☺ h- Higher positive ☹ l- Lower negative ☹ m- Medium negative ☹ h- Higher negative ☺- Neutral	Physical				Biological		Socio-Economical							Institutional				Total of Impacts		
	Geology and Soils	Hydrology	Topography	Climate	Fauna	Flora	Qualitative Environment Visual, Noise, Pollution, Security	Compatibility of Land-Use	Availability of municipal services	Upgrading of Municipal Services	Economical Impact Local Authority	Economical Impact I&AP's	Economical Impact Private Sector	Cultural and Historical	Impact on high agricultural potential land	In line with IDP	In line with SDF or other frameworks And open space plans		In line with policies and guidelines	In line with Water Act and other legislation
<b>CONSTRUCTION PHASE</b>																				
<b>Preliminary Issues and Impacts</b>																				
Alternative 1 Residential	☹ h	☹ m	☺	☹ l	☹ m	☹ m	☹ l	☹ l	☺	☹ l	☺	☹ l	☺ h	☺	☹ h	☺ l	☺ l	☺ h	☺ h	☺ h x 3 ☺ l x 2 ☹ x 4 ☹ l x 5 ☹ m x 3 ☹ h x 2
Alternative 2 Mixed Use	☹ h	☹ m	☺	☹ l	☹ m	☹ m	☹ l	☹ l	☺	☹ l	☺	☹ l	☺ h	☺	☹ h	☺ h	☺ h	☺ h	☺ h	☺ h x 5 ☺ x 4 ☹ l x 5 ☹ m x 3 ☹ h x 2

OPERATIONAL PHASE																				
Preliminary Issues and Impacts																				
	Geology/ soils	Hydrology	Topography	Climate	Fauna	Flora	Qualitative Env	Land-Use	Municipal Serv	Upgrading of MunServ	Econ Impact LA	Econ Impact I & AP's	Econ Impact Priv Sector	Cult & Hist	Agric Potential	IDP	SDF, Open Space Plan	Policies/ Guidelines	Acts other legislation	
Alternative 1 Residential	⊖ m	⊖ m	⊖	⊖	⊖ m	⊖ m	⊕ m	⊕ m	⊕ h	⊕ h	⊕ m	⊕ l	⊕ m	⊖	⊖ h	⊕ l	⊕ l	⊕ h	⊕ h	⊕ h x 4 ⊕ m x 4 ⊕ l x 3 ⊖ x 3 ⊖ m x 4 ⊖ h x 1
Alternative 2 Mixed Use	⊖ l	⊖ l	⊖	⊖	⊖ m	⊖ m	⊖ l	⊕ h	⊕ h	⊕ h	⊕ m	⊕ l	⊕ h	⊖	⊖ h	⊕ h	⊕ h	⊕ h	⊕ h	⊕ h x 8 ⊕ m x 1 ⊕ l x 1 ⊖ x 3 ⊖ l x 3 ⊖ m x 2 ⊖ h x 1
Preferred Alternative	Based on the comparative impact assessment <b>Alternative 2</b> is regarded as the preferred alternative.																			

## Summary

From Table 9 above it can be concluded that Alternative 2 (the development proposal) is the preferred alternative.

The biological impacts for both alternatives are more or less equal for the two alternatives, and after mitigation are not regarded as significant.

From a social point of view both alternatives are regarded as desired due to the great demand for affordable housing in the area. Alternative 2 would however also supply agricultural and commercial land uses. No objections to the proposed alternatives were received during the public participation process. Both alternatives would contribute to the upgrading of services and infrastructure in the area as well as the generation of employment opportunities. Alternative 2 would, however, supply significantly more employment opportunities during the operational phase of the development.

From a physical point of view Alternative 2 (the development proposal) is the preferred alternative due to the geotechnical constraints of the property. Preliminary dolomite stability investigations revealed that various zones within the township were not suited for residential development due to underlying dolomite. It is recommended that detailed geotechnical investigation be conducted to confirm the suitable land uses of the study area. Alternative 2 would also supply clubhouse and community facilities.

Alternative 2 (the development proposal) is also the preferred alternative from an institutional point of view. The study area is situated within the Kungwini-Ekurhuleni Agricultural Hub and Alternative 2 makes provision for agricultural uses in the proposed development.

From an environmental point of view (biological, physical, socio-economical and institutional environments) Alternative 2 (the development proposal) is regarded as the preferred alternative.

## 11. METHODOLOGY OF ASSESSING IMPACTS THAT HAVE BEEN IDENTIFIED

### 11.1 Specialized processes and specialist studies

Please refer to the Plan of Study for EIA (**Annexure D**) for specialized processes and specialist studies needed to further investigate the environmental issues.

### 11.2 Significance Description Methodology

The significance of Environmental Impacts will be assessed in the EIA process in accordance with the following method:

**Significance** is the product of probability and severity. Probability describes the likelihood of the impact actually occurring, and is rated as follows:

Improbable - Low possibility of impact to occur either because of design or historic experience.  
Rating = 2

Probable - Distinct possibility that impact will occur.  
Rating = 3

Highly probable - Most likely that impact will occur.  
Rating = 4

Definite - Impact will occur, in the case of adverse impacts regardless of any prevention measures.  
Rating = 5

The **severity factor** is calculated from the factors given to “intensity” and “duration”. Intensity and duration factors are awarded to each impact, as described below.

The **Intensity factor** is awarded to each impact according to the following method:

- Low intensity - natural and man made functions not affected - Factor 1
- Medium intensity - environment affected but natural and man made functions and processes continue -Factor 2
- High intensity - environment affected to the extent that natural or man made functions are altered to the extent that it will temporarily or permanently cease or become dysfunctional - Factor 4

**Duration** is assessed and a factor awarded in accordance with the following:

- Short term - <1 to 5 years - Factor 2
- Medium term - 5 to 15 years - Factor 3
- Long term - impact will only cease after the operational life of the activity, either because of natural process or by human intervention - Factor 4.
- Permanent - mitigation, either by natural process or by human intervention, will not occur in such a way or in such a time span that the impact can be considered transient - Factor 4.

The **severity rating** is obtained from calculating a severity factor, and comparing the severity factor to the rating in the table below. For example:

$$\begin{aligned} \text{The Severity factor} &= \text{Intensity factor X Duration factor} \\ &= 2 \times 3 \\ &= 6 \end{aligned}$$

A **Severity factor** of six (6) equals a Severity Rating of Medium severity (Rating 3) as per table below:

**TABLE 10: SEVERITY RATINGS**

RATING	FACTOR
Low Severity (Rating 2)	Calculated values 2 to 4
Medium Severity (Rating 3)	Calculated values 5 to 8
High Severity (Rating 4)	Calculated values 9 to 12
Very High severity (Rating 5)	Calculated values 13 to 16
Severity factors below 3 indicate no impact	

**A Significance Rating is calculated by multiplying the Severity Rating with the Probability Rating.**

The **significance rating** should influence the development project as described below:

- ❑ Low significance (calculated Significance Rating 4 to 6)
  - Positive impact and negative impacts of low significance should have no influence on the proposed development project.
  
- ❑ Medium significance (calculated Significance Rating >6 to 15)
  - Positive impact: Should weigh towards a decision to continue
  - Negative impact: Should be mitigated to a level where the impact would be of medium significance before project can be approved.
  
- ❑ High significance (calculated Significance Rating 16 and more)



- Positive impact: Should weigh towards a decision to continue, should be enhanced in final design.
- Negative impact: Should weigh towards a decision to terminate proposal, or mitigation should be performed to reduce significance to at least medium significance rating.

## 12 PLAN OF STUDY FOR ENVIRONMENTAL IMPACT ASSESSMENT

**Refer to Annexure D** for the plan of study for Environmental Impact Assessment which sets out the proposed approach to the environment impact assessment of the application that includes:

- o A description of the tasks that will be undertaken as part of the environmental impact assessment process, including any specialized processes, and the manner in which such tasks will be undertaken;
- o An indication of the stages at which the competent authority will be consulted ;
- o A description of the proposed method of assessing the environmental issues and alternatives, including the option of not proceeding with the activity;
- o Particulars of the public participation process.

## 13 CONCLUSION

The purpose of the scoping process was to do a status quo analysis of the study area, to investigate the alternatives considered for the project, to identify the most significant environmental issues associated with the proposed project, to determine the impact of the proposed development on the social environment and to identify (already at an early stage) possible “fatal flaws” that could prevent the project from happening.

The results of the preliminary investigation of possible issues that might affect the proposed development and alternatives were used in producing a preliminary conceptual layout for the proposed township establishment. This concept layout will be assessed (mainly through the overlay method) during the EIA process.

It is also important to note that the scoping process identified other crucial issues that must be addressed in more detail during the EIA process and it is requested that the authorities that evaluate the scoping report (GDARD and the involved local authority) examine the issues listed under each environment and where possible add issues to/remove issues from the issues lists in **Section 10.1** of this report. The mitigation possibilities of the issues listed were also identified in this scoping report and we (Bokamoso) are of the opinion that it will be possible to mitigate all the detrimental issues completely or to more acceptable levels.

However, the issues listed will be assessed in more detail during the EIA phase and detailed mitigation measures to reduce or prevent the issues/impacts will be supplied and incorporated as part of an Environmental Management Plan (EMP) for the preconstruction, construction and/or operational phases of the project.

It can be concluded from the scoping process that alternative 2 (the development proposal) is regarded as the preferred alternative, due to having higher significant positive impacts than alternative 1. Other alternatives including locality, other land uses and layout alternatives as well as the no-go option were investigated and it was concluded that they would not be feasible or less feasible than the proposed two alternatives.

## **14 RECOMMENDATIONS**

Based on the above-mentioned information supplied and the conclusions that were made, it is suggested that the Scoping Report be accepted, that the Plan of Study for EIA be approved and that the applicant be allowed to commence with the EIA for the project.

The completed EIA must, amongst others, include the following information/comply with the following documents:

- The approved Plan of Study for EIA;
- The specialist reports listed by Bokamoso in this Scoping Report;
- The specialist inputs as listed in the Plan of Study for EIA; and
- Additional specialist inputs and other relevant information listed by the relevant authorities.