

Basic Assessment Report in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998), as amended, and the Environmental Impact Assessment Regulations, 2014 (Version 1)

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**Kindly note that:**

1. This **Basic Assessment Report** is the standard report required by GDARD in terms of the EIA Regulations, 2014.
2. This application form is current as of 8 December 2014. It is the responsibility of the EAP to ascertain whether subsequent versions of the form have been published or produced by the competent authority.
3. **A draft Basic Assessment Report must be submitted, for purposes of comments within a period of thirty (30) days, to all State Departments administering a law relating to a matter likely to be affected by the activity to be undertaken.**
4. **A draft Basic Assessment Report (1 hard copy and two CD's) must be submitted, for purposes of comments within a period of thirty (30) days, to a Competent Authority empowered in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998), as amended to consider and decide on the application.**
5. Five (5) copies (3 hard copies and 2 CDs-PDF) of the final report and attachments must be handed in at offices of the relevant competent authority, as detailed below.
6. The report must be typed within the spaces provided in the form. The size of the spaces provided is not necessarily indicative of the amount of information to be provided. The report is in the form of a table that can extend itself as each space is filled with typing.
7. Selected boxes must be indicated by a cross and, when the form is completed electronically, must also be highlighted.
8. An incomplete report may lead to an application for environmental authorisation being refused.
9. **Any report that does not contain a titled and dated full colour large scale layout plan of the proposed activities including a coherent legend, overlain with the sensitivities found on site may lead to an application for environmental authorisation being refused.**
10. The use of "not applicable" in the report must be done with circumspection because if it is used in respect of material information that is required by the competent authority for assessing the application, it may result in the application for environmental authorisation being refused.
11. No faxed or e-mailed reports will be accepted. Only hand delivered or posted applications will be accepted.
12. Unless protected by law, and clearly indicated as such, all information filled in on this application will become public information on receipt by the competent authority. The applicant/EAP must provide any interested and affected party with the information contained in this application on request, during any stage of the application process.
13. Although pre-application meeting with the Competent Authority is optional, applicants are advised to have these meetings prior to submission of application to seek guidance from the Competent Authority.

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**DEPARTMENTAL DETAILS**

Gauteng Department of Agriculture and Rural Development  
Attention: Administrative Unit of the of the Environmental Affairs Branch  
P.O. Box 8769  
Johannesburg  
2000

Administrative Unit of the of the Environmental Affairs Branch  
Ground floor Diamond Building  
11 Diagonal Street, Johannesburg  
Administrative Unit telephone number: (011) 240 3377  
Department central telephone number: (011) 240 2500

(For official use only)

NEAS Reference Number:	
File Reference Number:	<b>GAUT:002/18-19/2237</b>
Application Number:	
Date Received:	

If this BAR has not been submitted within 90 days of receipt of the application by the competent authority and permission was not requested to submit within 140 days, please indicate the reasons for not submitting within time frame.

Not Applicable
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Is a closure plan applicable for this application and has it been included in this report?

if not, state reasons for not including the closure plan.

Not Applicable
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Has a draft report for this application been submitted to a competent authority and all State Departments administering a law relating to a matter likely to be affected as a result of this activity?

Is a list of the State Departments referred to above attached to this report including their full contact details and contact person?

Refer to <b>Annexure E</b>
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If no, state reasons for not attaching the list.

Not Applicable
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Have State Departments including the competent authority commented?

If no, why?

The report is still at Draft report. Comments from State Departments and the Competent Authority will be included in the Final Report.
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## SECTION A: ACTIVITY INFORMATION

### 1. PROPOSAL OR DEVELOPMENT DESCRIPTION

#### 1.1 Project Title (must be the same name as per application form):

**Project Title:** Proposed development of ERF 6138, Clayville Extension 45 and associated infrastructures on the proposed Portion 1, Portion 2 and the remainder of ERF 6138 Clayville Extension 45 and Portion 41 (a portion of Portion 7) and Portion 179 (a Portion of Portion7) of the Farm Olifantsfontein 410-JR within the City of Ekurhuleni Metropolitan Municipality. The development will comprise of three components,

1. Residential development
2. Sewer line
3. Road that links the adjacent Clayville x71 to the Republic road on the eastern side of the proposed development.

This site is located directly to the north of Clayville Extension 45 along Thabana Ntlenyana Drive and west of Main Road (K111) and forms part of the current Clayville Mega City Project.

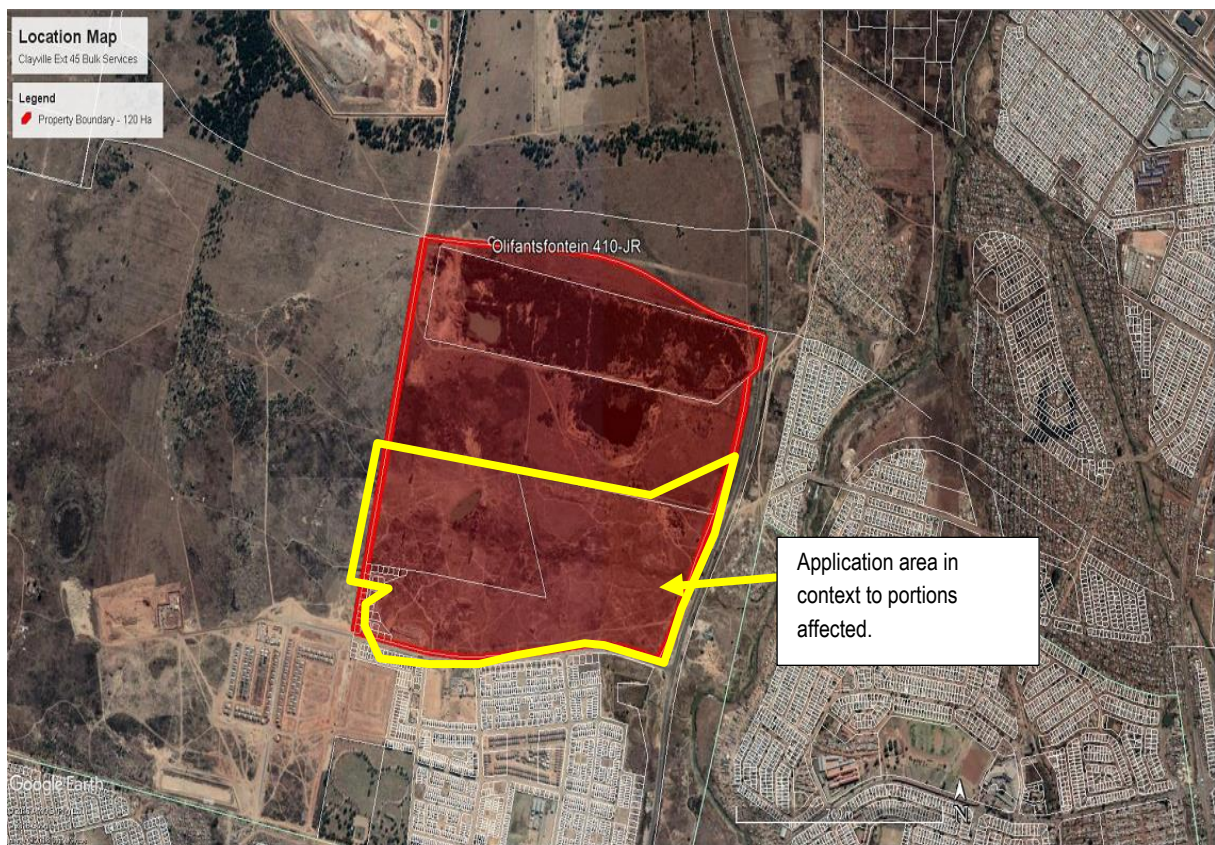


Figure 1a: Location Map

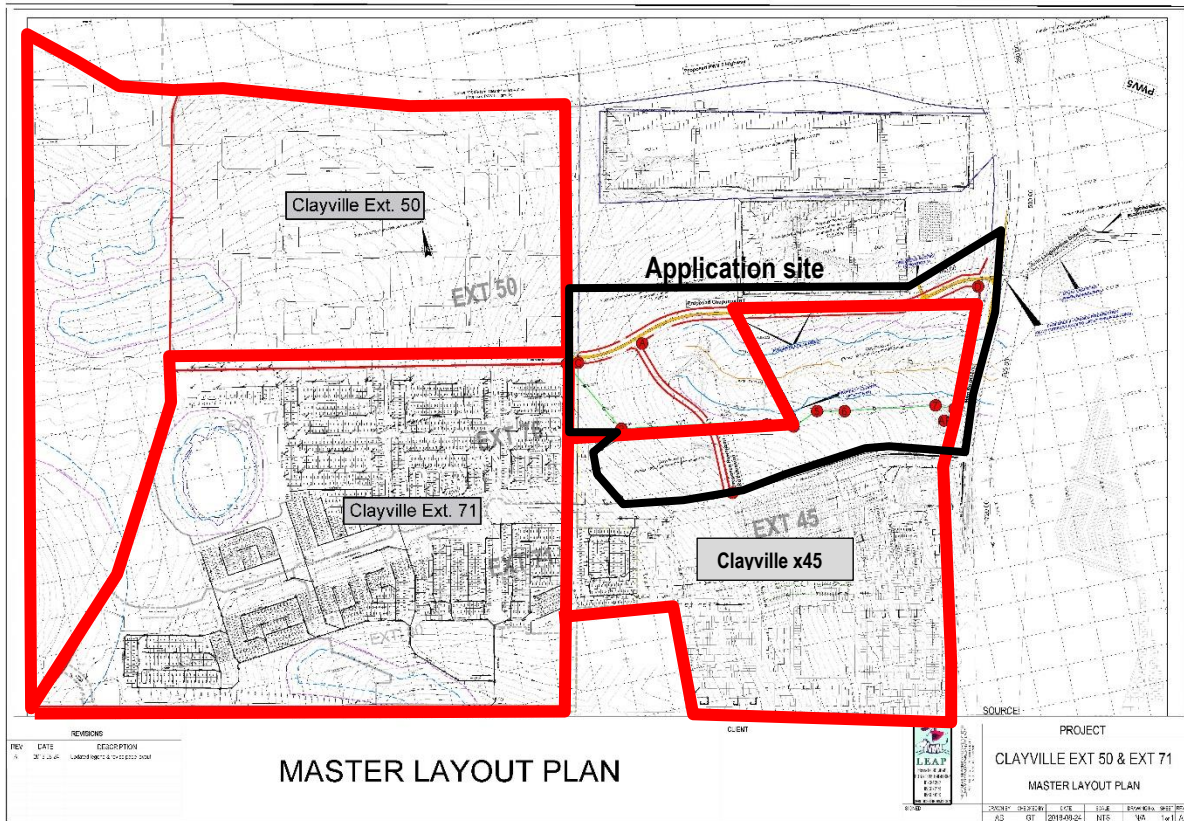


Figure 1b: Application site (in black outline) in context of Clayville 45 and Clayville x71

## 1.2 Proposed development

The development will comprise of three components,

1. Residential development
  - a. Alternative - commercial centre
2. Sewer line
  - a. No alternative – route is outside the wetlands and buffer)
3. Road that links the adjacent Clayville x71 to the Republic road on the eastern side of the proposed development.
  - a. no alternative offered – road is according to the EMM road master plan

### I. Residential Proposal

#### Alternative - commercial Shopping Centre

Proposed Mixed Use development and associated infrastructure on the Remainder of Erf 6138 Clayville Extension 45, Portion 41 (a Portion of Portion 7) and Portion 179 (a Portion of Portion 7) of the Farm Olifantsfontein 410-JR, within the City of Ekurhuleni Metropolitan Municipality, Gauteng Province.

The development is in totality located outside the 32m buffer a determined by the wetland specialist.

The establishment of a residential town comprises of Portion 1 and 2 zoned erven (Proposed Clayville Extension 45). The township is being established on the subdivision of ERF 6138 Clayville Extension 45 into 3 (3) portions to be known as

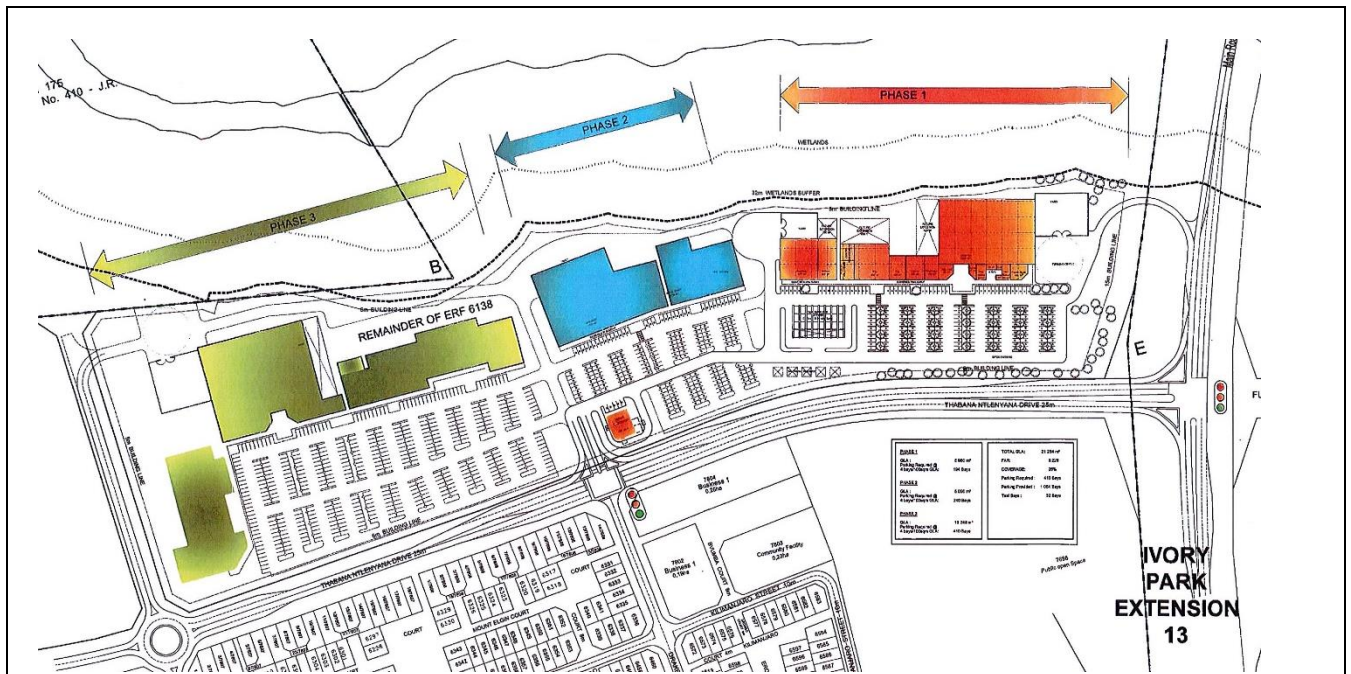
Portion 1, Portion 2, and the Remainder of ERF 6138 Clayville Extension 45 of the Farm Olifantsfontein 410-JR will be zoned as follows:

### COMPONENT A: PROPOSED RESIDENTIAL UNITS PORTION 1 OF ERF 6138

- i. As is evident from the proposed layout plan, the development will comprise of a number of residential buildings (walk-up flats), each building block accommodating several residential units for the FSH and affordable housing markets.
- ii. Also evident from the layout plan is the adherence to, and retention of a 32m wetland buffer along the northern boundary of the site. This buffer is further supported through the delineation of a proposed 5m building line. The 1:50 and 1:100-year floodlines are also retained clear of any structures.
- iii. It is proposed that primary and full access is received and taken from Thabana Ntlenyana Dr. via a new signalised intersection with Drakensberg Street. The proposed access was discussed with the COE's roads /traffic section and found acceptable. From this access point, traffic is distributed to the various residential buildings and on-grade parking areas. A secondary (partial) access is proposed along the proposed Ruwenzori Road extension located along the western side boundary of the site providing additional access to the site.
- iv. With a density of 180 dwelling units per hectare, the proposed Portion 1 can accommodate some 1,670 units on site, inclusive of sufficient on-site parking at a parking ratio of 0.5 parking spaces per unit.



Figure 2a: Draft Site Layout Plan for proposed Portion 1/6138



**Figure 2b: Alternative proposal for Shopping centre on Portion 1/6138**

**COMPONENT B of the RESIDENTIAL DEVELOPMENT/COMMERCIAL: PROPOSED SOCIAL SERVICES FACILITY ON PORTION 2 OF ERF 6138**

- i. The second part of the proposed development comprise the 'Social Services' Facility / Precinct to be located on the proposed Portion 2 of Erf 6138 Clayville Extension 45.
- ii. Whilst the current land use mix of the larger Clayville Mega-Project does provide opportunity for community and social facilities, those provided within Extension 45 are small and generally scattered throughout the township. The larger sites provided are situated within the future extensions of Extension 50 and 71.
- iii. This development proposal has the potential to act as near-term social and economic anchors for both the existing township and future township extensions of the larger Clayville.
- iv. Further potential benefits include the potential of trip rationalisation for residents as well as potentially re-evaluating the use of those large community sites contained within Extension 50 and 71 for residential densification (subject to the development of the proposed precinct). It is also put forward that abutting nature of the proposed uses possesses the potential to mutually reinforce the development of each other in a positive and accelerated manner.
- v. Considering the proposal made, it is also worth mentioning that the site chosen falls along one of the primary access roads to, and residential collectors of the Clayville Mega-Project. It also gravitates towards extension 71. The size of the site (approx. 6.7HA) is also feasible for the development of a social services facility / precinct.
- vi. Envisioned uses include those typically associated with the primary use categories listed under "Social Services" by the COE's Town-Planning Scheme, 2014 – hospitals, clinics, libraries, police stations, law courts, fire stations, municipal and government offices, institutions, places of public worship, places of instruction, child care facilities, social halls, old age home.

- vii. Access to the proposed portion and precinct is made possible via Namarunu Court at two (2) locations along the western boundary of the portion.

**COMPONENT C OF THE RESIDENTIAL/COMMERCIAL: PROPOSED REMAINING OPEN SPACE ON THE REMAINDER OF ERF 6138**

- i. In terms of the approved Township Layout Plan for Extension 45, the sensitive areas associated with the Kaalspruit and wetland was excluded and protected by means of an outfall open space/park erf, which erf is known as Erf 6138.
- ii. However, as already outlined in the preceding section of this application, the vastness of the open space initially identified for wetland conservation purposes is simply not workable and feasible from a municipal management perspective. As a result, illegal activities and land invasions have had a significant and material impact on the original ecological state of the site.
- iii. As a result, severe degradation of the original ecological state of the site has taken place. It is thus proposed that those areas that suffered damage to the south of the Kaalspruit and bordering onto the residential components of Clayville Extension 45 be used for urban development benefitting the Clayville community, whilst those areas to the north be rehabilitated, the current ecological state be improved and managed as a smaller and more appropriate area.

**COMPONENT D OF THE RESIDENTIAL/COMMERCIAL: SERVICES THAT WILL BE INSTALLED AS PART OF THE DEVELOPMENT FOOTPRINT**

**a) Storm Water**

- The Rational Method will be used in calculating the peak run-off discharge for the stormwater catchment areas.
- An underground stormwater drainage system must be installed to handle the minor floods (1:5 year) so that the traffic is not disrupted by the minor floods. Major floods (1:25 year) that cannot be accommodated in the minor stormwater drainage system will be conveyed on the surface and sufficient outlet drainage will be provided to ensure no overspill into buildings or adjacent erven.
- Stormwater pipes must have a minimum diameter of 600mm within road reserves to prevent blockages and make cleaning easier. The minimum longitudinal gradient of roads, pipes, box culverts and canals must be 1:150 owing to practicability during construction and problems with sedimentation.
- The kerb, and if required, grid inlets will be designed to accommodate the 1:25 year flood to prevent flooding of the parking lots and buildings.
- The stormwater management and mitigation will be approached primarily from the intention of Sustainable Urban Drainage Systems that will enhance the existing natural waterways, minimise or remove impact on the downstream systems and allow easy and continued maintenance such that the systems can function properly indefinitely.
- Subsoil drainage will be incorporated into the proposed stormwater systems. Overland flow systems will prevent flooding and hazards and direct major floods to safe discharge points that are protected from erosion. Underground piped systems and discharge outlets will be protected against erosion and will meet Ekurhuleni engineering standards requirements and design guidelines.
- Provision will be made for the attenuation of stormwater to control the rate of run-off from the Erf 6138 development. The difference between pre- and post-development volumes will be attenuated in proposed attenuation dams on site.

**b) Electricity**

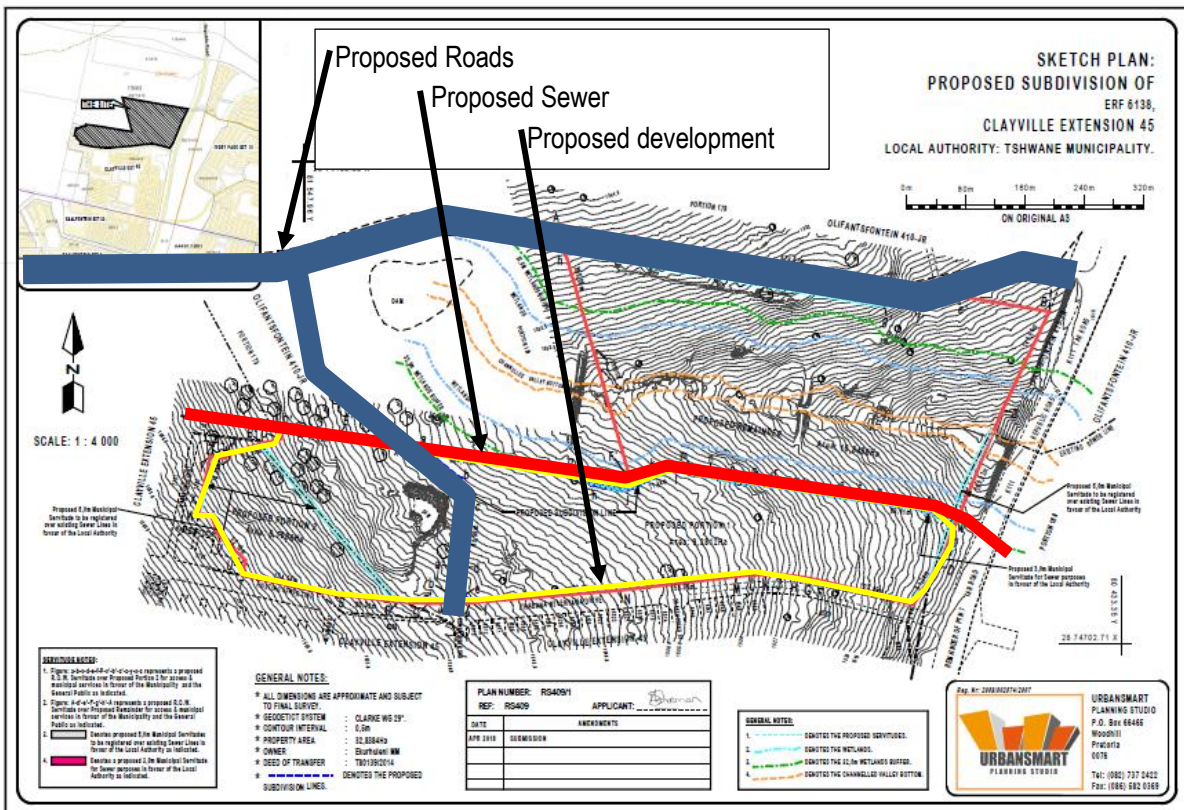
**Lebohang consulting engineers (Pty)Ltd was appointed to conduct an electrical service report.**

The estimated load requirement for the entire shopping centre (consisting of 3 phases), will be in the region of 1.8MVA while the Social Services stand will require electrical capacity of approximately 1.45MVA. Associated costs for such bulk loads will depend heavily on the final buildings which are approved for construction and capacity availability in the area.

Capacity is currently available for Phase 1 of the Shopping Centre and it is recommended that Single Bulk Meter and Internal MV Ring Method must be used to provide required capacity to each of the phases.

- **Single Bulk Meter and Internal MV Ring**

This option will entail the installation of a BMK and/or a RMU unit at the erf boundary. An MV Sub-Ring will be installed with 4x 500kVA miniature substations. This option is modular as it will allow the installation of the miniature substations as and when they are required, however it is recommended to install the complete MV sub-ring so that a backup supply route is permanently available. This option should be more cost effective than Small Substation with LV metering due to the current Shopping Centre layout and with its projected capacity requirements. Please note that all infrastructure installed after the BMK will be the responsibility of the Developer for maintenance purposes.



**Figure 3: Contour plan showing the development area, the sewer line and the proposed road connection.**

**II. SEWER LINE**

**No alternative offered**

- i. The Kempton Park Water Master Plan categorizes the project area within the “Eastern Area” served by the 750mm diameter ERWAT Regional Outfall Sewer, draining the entire area and connecting to the Olifantsfontein Waste Water Treatment Works (WWTW) located to the North West of Clayville.



- ii. The sewerage will be treated at the Olifantsfontein WWTW which has a total capacity of 105Mℓ/day. Previously Ekurhuleni Metro Municipality indicated that the treatment works are currently operating at 65Mℓ/day.
- iii. According to the Preliminary Design of the Clayville Mega-Housing Project as well as the GLS Master Planning Report, a new East Outfall Sewer line is required on the northern boundary of the proposed Portion 1 of Erf 6138 that will connect to the existing 350mm diameter outfall sewer that runs along Main Road (K111).

The sewer line is located in totality outside the 32m buffer a determined by the wetland specialist.

### III. PROPOSED ROAD CONNECTION

#### No alternative offered

To enhance the integration of the proposed social services precinct and additional FSH units with the larger Clayville mega-project area, the extension of Ruwenzori Rd in a northerly direction is proposed and further benefits of the link include:

- Linking-up with the proposed Chepunyal Street, which links up to the proposed John Langalibalele Dube Rd. This link will afford developments to the north of the site as well as the larger Tembisa complex to the east of the K111, with convenient access to the social services precinct.
- The road link will enable a secondary access point to the residential development, taking the pressure off of one access point into the site. Such secondary access is not possible along the K111.
- The proposed positioning and alignment of the link road is inter alia informed by intersection access spacing along Thabana Nhlenyana Rd as well as not having to cross the wetland.

The road is located in totality outside the 32m buffer a determined by the wetland specialist.

**Annexure I1A: Town Planning Memorandum**

**Annexure I1B: City of Ekurhuleni Township Approval**

**Annexure I2: Civil Service Report**

**Annexure I3: Electrical Service Report**

**Annexure I4: Traffic Impact Assessment**

Select the appropriate box

The application is for an upgrade of an existing development

 n/a

The application is for a new development

 X

Other, specify

 n/a

Indicate the number of the relevant

Activity No (s) (relevant notice): e.g. Listing

Describe each listed activity as per the wording in the listing notices:

**Government notices 1, 2 or 3**  
**Notice:**

GN 983 of 4 Dec 2014 as amended by GN R 327 of 7 April 2017	<b>Listing Notice 1 Activity 9</b>	The development of infrastructure exceeding 1 000 metres in length for the bulk transportation of water or storm water—  (i) with an internal diameter of 0,36 metres or more; or (ii) with a peak throughput of 120 litres per second or more;
GN 983 of 4 Dec 2014 as amended by GN R 327 of 7 April 2017	<b>Listing Notice 1 Activity 10</b>	The development and related operation of infrastructure exceeding 1 000 metres in length for the bulk transportation of sewage, effluent, process water, waste water, return water, industrial discharge or slimes –  (i) with an internal diameter of 0,36 metres or more; or (ii) with a peak throughput of 120 litres per second or more;
GN 983 of 4 Dec 2014 as amended by GN R 327 of 7 April 2017	<b>Listing Notice 1 Activity 27</b>	The clearance of an area of 1 hectare or more, but less than 20 hectares of indigenous vegetation,  The proposed development and associated infrastructure will be required clearance of vegetation where such vegetation cover constitutes indigenous vegetation.
GNR 985, 8 Dec 2014 as amended By GNR 324, 7 April 2017	<b>Listing Notice 3 Activity 4</b>	The development of a road wider than 4 metres with reserve less than 13, 5 metres  <b>c. Gauteng</b> iv. Sites identified as Critical Biodiversity Area (CBAs) or Ecological Support Areas (ESAs) in the Gauteng Conservation Plan or in biological plans
GNR 985, 8 Dec 2014 as amended By GNR 324, 7 April 2017	<b>Listing Notice 3 Activity 12</b>	The clearance of a n area of 300 square metres or more indigenous Vegetation.  <b>c. Gauteng</b> (ii) Within Critical Biodiversity Areas or Ecological Support Areas identified in the Gauteng Conservation Plan or bioregional plans.
GNR 985, 8 Dec 2014 as amended By GNR 324, 7 April 2017	<b>Listing Notice 3 Activity 15</b>	The transformation of land bigger than 1000 square metre in size, to residential, retail, commercial, industrial or institutional use, where, such land was zoned open space, conservation or had an equivalent zoning, on or after 02 August 2010.  <b>b. Gauteng</b> (i) All areas

Does the activity also require any authorisation other than NEMA EIA authorisation?

YES	NO
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If yes, describe the legislation and the Competent Authority administering such legislation

Not Applicable
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If yes, have you applied for the authorisation(s)?

YES	NO
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If yes, have you received approval(s)? (attach in appropriate appendix)

YES	NO
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**2. APPLICABLE LEGISLATION, POLICIES AND/OR GUIDELINES**

List all legislation, policies and/or guidelines of any sphere of government that are applicable to the application as contemplated in the EIA regulations:

Title of legislation, policy or guideline:	Administering authority:	Promulgation Date:
Constitution of the Republic of South Africa (Act No 108 of 1990)	Government of South Africa	18 December 1996
National Environmental Management Act, 1998 (Act No. 107 of 1998 as amended).	Department of Environmental Affairs (DEA) and Gauteng Department of Agriculture and Rural Development (GDARD)	27 November 1998
<p>Regulations GN. R. 982, 983, 984 and 985 promulgated under Chapter 5 of the National Environmental Management Act (NEMA, Act 107 of 1998) in Government Gazette 38282 on 4 December 2014 as amended by Regulations GN. R. 324, 324, 325, 326 and 327 of 7 April 2017.</p> <p>Listed activities:</p> <p><b>Notice 1</b></p> <ol style="list-style-type: none"> <li>1. GN 983 of 4 Dec 2014 as amended by GNR 327 of 7 April 2017. Listing Notice 1: Activity 9</li> <li>2. GN 983 of 4 Dec 2014 as amended by GNR 327 of 7 April 2017. Listing notice 1: Activity 10</li> <li>3. GN 983 of 4 Dec 2014 as amended by GNR 327 of 7 April 2017. Listing notice 1: Activity 27</li> </ol> <p><b>Notice 2</b></p> <ol style="list-style-type: none"> <li>1. GNR 985, 8 Dec 2014 as amended by GNR 324, 7 April 2017. Listing notice 3: Activity 4</li> <li>2. GNR 985, 8 Dec 2014 as amended by GNR 324, 7 April 2017. Listing notice 3: Activity 12</li> <li>3. GNR 985, 8 Dec 2014 as amended by GNR 324, 7 April 2017. Listing notice 3: Activity 15</li> </ol>	Gauteng Department of Agriculture and Rural Development (GDARD)	7 April 2017
National Water Act (Act No 36 of 1998)	Department of Water and Sanitation (DWA)	26 August 1998
National Heritage Resources Act No 25 of 1999 (Act No 25 of 1999 as amended)	South African Heritage Resources Agency (SAHRA)	28 April 1999
The Conservation of Agricultural Resources Act, 1983 (Act 43 of 1983)	National -Department of Agriculture Forestry and Fisheries (DAFF)	27 April 1983
Gauteng Environmental Management Framework	Gauteng DARD	-
<ol style="list-style-type: none"> <li>i. Companion Guideline on the Environmental Impact Assessment Regulations, 2010</li> <li>ii. Environmental Management Framework Guidelines, 10 October 2012.</li> </ol>	Gauteng DARD	Various dates

iii. Public Participation Guideline, 10 October, 10 October 2012. iv. Fee Regulations Guidance Document, April 2014 v. Guideline on need and desirability in terms of the Environmental Impact Assessment Regulations, 2010 vi. EIA Listed Activities and Timelines (January 2015) Section 24G and Similar Listings (January 2015)		
i. Spatial Planning and Land Use Management Act, 2013 ii. Ekurhuleni Town Planning Scheme, 2014 iii. Ekurhuleni Metropolitan Municipality Spatial Development Framework (MSDF) and Integrated Development Plan (IDP) iv. EMM Biodiversity and Open Space Strategy (EBOSS) v. The Municipal Systems Act, 2000 (Act No. 32 of 2000) and the Integrated Development Plans (IDP) regulates the planning processes of the local Municipality. The site is earmarked for residential development in the Ekurhuleni Metropolitan Spatial Development Framework (EMSDF).	City of Ekurhuleni Metropolitan Municipality	Various dates

Description of compliance with the relevant legislation, policy or guidelines:

Legislation, policy of guideline	Description of compliance
Constitution of the Republic of South Africa (Act No 108 of 1990)	<ul style="list-style-type: none"> <li>• Obligation to ensure that the proposed development will not result in pollution and ecological degradation; and</li> <li>• Obligation to ensure that the proposed development is ecologically sustainable, while demonstrating economic and social development.</li> </ul> <p>The proposed project can be considered as a sustainable development that will prevent pollution and ecological degradation whilst promoting justifiable economic and social development.</p>
National Environmental Management Act, 1998 (Act No. 107 of 1998 as amended).	<p>The National Environmental Management Act (Act No. 107 of 1998) (NEMA) is the overarching framework for environmental legislation as well as the Regulations for Environmental Impact Assessment. It sets out the principles that serve as a general framework for environmental planning, as guidelines by reference to which organs of state must exercise their functions and guide other laws concerned with the protection or management of the environment. The application takes into account the environmental and socio-economic conditions in compliance with the NEMA principles.</p>
National Water Act (Act No 36 of 1998)	<p>The Act provides for the management of South Africa's water resources. It aims to ensure that the Republic's water resources are protected, used, developed, conserved and controlled.</p>

Legislation, policy of guideline	Description of compliance
	According to the Act, any proposed water uses must be specified and registered and/or licensed. Similarly, any modifications to drainage lines on site must be investigated in terms of water use requirements. Consequently, a water use license will be submitted if required.
National Heritage Resources Act No 25 of 1999 (Act No 25 of 1999 as amended)	The paleontological sensitivity of the proposed site is very high
Gauteng Environmental Management Framework	The aim of the EMF is to guide protection and enhancement of environmental assets and natural resources along with development patterns to ensure sustainable environmental management and development patterns within and around the Gauteng Province. The development site is located in Zone 1 and 2. Zone 1 aims to promote development infill, densification and concentration of urban development within the urban development zones as defined in the Gauteng Spatial Development Framework (GSDF), in order to establish a more effective and efficient city region that will minimize urban sprawl into rural areas. Zone 2 is a high control zone within an urban development zone and prescribe as sensitive areas within the urban development zone and must be conserved and where linear development cannot avoid these areas, a proper assessment and implementation of alternatives must be undertaken. The proposed development is fully supportive of the objectives of the EMF.
<ul style="list-style-type: none"> <li>i. Companion Guideline on the Environmental Impact Assessment Regulations, 2010</li> <li>ii. Environmental Management Framework Guidelines, 10 October 2012</li> <li>iii. Public Participation Guideline, 10 October, 10 October 2012</li> <li>iv. Fee Regulations Guidance Document, April 2014</li> <li>v. Guideline on need and desirability in terms of the Environmental Impact Assessment Regulations, 2010</li> <li>vi. EIA Listed Activities and Timelines (January 2015)</li> <li>vii. Section 24G and Similar Listings (January 2015)</li> </ul>	Guidelines have informed this Application for Environmental Authorisation procedures and project / BAR.
<ul style="list-style-type: none"> <li>Spatial Planning and Land Use Management Act, 2013 <ul style="list-style-type: none"> <li>i. The National Development Framework</li> <li>ii. Gauteng Spatial Development Framework</li> <li>iii. Regional Spatial Development Framework</li> </ul> </li> </ul>	Guidelines have informed this Application for Environmental Authorisation procedures and project / BAR

Legislation, policy of guideline	Description of compliance
iv. Section 7 of the Spatial Planning and Land Use Management Act, 2013 v. Metropolitan Spatial Development Frameworks (MSDF). vi. Regional Spatial Development Frameworks (RSDF) vii. Ekurhuleni Metropolitan Municipality's Biodiversity and Open Space Strategy Ekurhuleni Metropolitan Municipality's Environmental Management Framework viii. Ekurhuleni Metropolitan Municipality's Environmental Policy and Implementation Plan	

## 1. ALTERNATIVES

Describe the proposal and alternatives that are considered in this application. Alternatives should include a consideration of all possible means by which the purpose and need of the proposed activity could be accomplished. The determination of whether the site or activity (including different processes etc.) or both is appropriate needs to be informed by the specific circumstances of the activity and its environment.

The no-go option must in all cases be included in the assessment phase as the baseline against which the impacts of the other alternatives are assessed. **Do not** include the no go option into the alternative table below.

**Note:** After receipt of this report the competent authority may also request the applicant to assess additional alternatives that could possibly accomplish the purpose and need of the proposed activity if it is clear that realistic alternatives have not been considered to a reasonable extent.

Please describe the process followed to reach (decide on) the list of alternatives below

The concept of integrated Environmental Management suggests that an Environmental Impact Assessment process, to determine the possible impact of the proposed activity, should incorporate the consideration of feasible alternatives. A reasonable number of possible proposals or alternative, to achieve the same objective should be assessed. The identification, description, evaluation and comparison of alternatives are important for ensuring a sound environmental impact assessment process.

Alternatives should be considered as norm within the Environmental Process. These should include, if applicable:

- Site Alternatives;
- Activity alternatives;
- Location alternatives;
- Technology alternatives; and
- The No-Action alternatives (NO-GO).

For any alternative to be considered feasible, the alternative must meet the need and purposes of the development proposal without presenting significantly high associated impacts. Alternatives are typically distinguished into discrete or incremental alternatives. Discrete alternatives are overall development options, which are typically identified during the pre-feasibility, feasibility and / or Basic Assessment process. Incremental alternatives typically identified arise

during the Assessment process and are usually suggested as a means of addressing / mitigating identified impacts (e.g.: waste management, noise reduction measure, contamination management, etc.) These alternatives are closely linked to the identification of migration measure and therefore are not specifically identified as distinct alternative. The types of alternatives considered for this project are presented below.

Provide a description of the alternatives considered

No.	Alternative Type: Activity	Description																														
1	<p><b>PROPOSED ACTIVITY: (Preferred Alternative)</b></p>	<p>Proposed development of erf 6138, Clayville extension 45 and associated infrastructure on the proposed portion 1, portion 2 and the remainder of Erf 6138 Clayville extension 45, and portion 41 (a portion of portion 7) and portion 179 (a Portion of portion 7) of the Farm Olifantsfontein 410-jr within the City of Ekurhuleni Metropolitan Municipality, Gauteng Province</p> <p>In line with the preliminary site layout plan, the following development controls are proposed:</p> <p><b>Portion 1</b></p> <table border="1" data-bbox="486 913 1406 1738"> <tr> <td>Use Zone Number</td> <td>4</td> </tr> <tr> <td>Land Use Category (zoning)</td> <td>"Residential 4"</td> </tr> <tr> <td>Primary rights</td> <td>As per scheme</td> </tr> <tr> <td>Secondary rights</td> <td>As per scheme</td> </tr> <tr> <td>Density</td> <td>180 du/ha</td> </tr> <tr> <td>Height</td> <td>4 storeys</td> </tr> <tr> <td>coverage</td> <td>As per scheme; 60%</td> </tr> <tr> <td>Floor Area Ratio (FAR)</td> <td>1.2 provided that no more than 1.670 dwelling units shall be developed</td> </tr> <tr> <td>Parking Requirements</td> <td>0.5 parking spaces per dwelling unit for dwelling unit and residential Buildings</td> </tr> <tr> <td>Loading Requirements</td> <td>As per scheme</td> </tr> <tr> <td>Site Development Plan</td> <td>Required in terms of clause 29</td> </tr> <tr> <td>Building Lines</td> <td>As per scheme, provided that the following building lines shall apply a. Street boundary, 5m b. Other boundaries, 3m</td> </tr> <tr> <td>Special building lines</td> <td>16m along the K11 (Main Road) provided that this may be relaxed to 10m with the permission of the Gauteng Department, Public Transport, Roads and works</td> </tr> <tr> <td>Lines of no access</td> <td>K111 (Main Road)</td> </tr> </table> <p>Considering the intend social services use of the property, the following development controls are proposed as per the guidelines of the EMM Town Planning Scheme, 2014 to retain layout and development flexibility:</p> <p><b>Portion 2</b></p> <table border="1" data-bbox="486 1980 1449 2022"> <tr> <td>Use Zone Number</td> <td>17</td> </tr> </table>	Use Zone Number	4	Land Use Category (zoning)	"Residential 4"	Primary rights	As per scheme	Secondary rights	As per scheme	Density	180 du/ha	Height	4 storeys	coverage	As per scheme; 60%	Floor Area Ratio (FAR)	1.2 provided that no more than 1.670 dwelling units shall be developed	Parking Requirements	0.5 parking spaces per dwelling unit for dwelling unit and residential Buildings	Loading Requirements	As per scheme	Site Development Plan	Required in terms of clause 29	Building Lines	As per scheme, provided that the following building lines shall apply a. Street boundary, 5m b. Other boundaries, 3m	Special building lines	16m along the K11 (Main Road) provided that this may be relaxed to 10m with the permission of the Gauteng Department, Public Transport, Roads and works	Lines of no access	K111 (Main Road)	Use Zone Number	17
Use Zone Number	4																															
Land Use Category (zoning)	"Residential 4"																															
Primary rights	As per scheme																															
Secondary rights	As per scheme																															
Density	180 du/ha																															
Height	4 storeys																															
coverage	As per scheme; 60%																															
Floor Area Ratio (FAR)	1.2 provided that no more than 1.670 dwelling units shall be developed																															
Parking Requirements	0.5 parking spaces per dwelling unit for dwelling unit and residential Buildings																															
Loading Requirements	As per scheme																															
Site Development Plan	Required in terms of clause 29																															
Building Lines	As per scheme, provided that the following building lines shall apply a. Street boundary, 5m b. Other boundaries, 3m																															
Special building lines	16m along the K11 (Main Road) provided that this may be relaxed to 10m with the permission of the Gauteng Department, Public Transport, Roads and works																															
Lines of no access	K111 (Main Road)																															
Use Zone Number	17																															

No.	Alternative Type: Activity	Description																													
		Land Use Category (Zoning)	Social Services																												
		Primary Rights	As per Scheme; Including Dwelling Units																												
		Secondary Rights	As per Scheme																												
		Density	180 du/ha; provided that no more than 1.135 dwelling units shall be developed																												
		Height	As per Scheme; provided that no building containing dwelling units shall have a height in excess of 4 storeys																												
		coverage	As per Scheme; 60%																												
		Floor Area Ratio (FAR)	1,5; provided that no more than 1.135 dwelling units shall be developed; further provided that the following maximum floor area shall be applicable: <ol style="list-style-type: none"> <li>1. Social services: 0.3</li> <li>2. Dwelling Units and Residential Buildings: 1.2</li> </ol>																												
		Parking Requirements	As per scheme, provided that a parking ratio of 0.5 parking spaces per dwelling units shall be applicable for Dwelling-units and residential buildings.																												
		Loading Requirements	As per scheme																												
		Site Development Plan (SDP)	Required in terms of clause 29																												
		Building Lines	As per scheme, 5m along all street's boundaries and 3m for all other boundaries																												
		Special Building Lines	N/A																												
		Lines of No Access	N/A																												
		<p>Considering the intend open space, use of the property, the following development controls are proposed:</p> <p><b>Remainder</b></p> <table border="1" data-bbox="486 1444 1449 2009"> <tbody> <tr> <td>Use Zone Number</td> <td>14</td> </tr> <tr> <td>Land use category (zoning)</td> <td>"Public Open Space"</td> </tr> <tr> <td>Primary Rights</td> <td>As per Scheme</td> </tr> <tr> <td>Secondary rights</td> <td>As per Scheme</td> </tr> <tr> <td>density</td> <td>As per Scheme</td> </tr> <tr> <td>Height</td> <td>As per Scheme</td> </tr> <tr> <td>Coverage</td> <td>As per Scheme</td> </tr> <tr> <td>Floor Area Ratio (FAR)</td> <td>N/A</td> </tr> <tr> <td>Parking requirements</td> <td>As per Scheme</td> </tr> <tr> <td>Loading requirements</td> <td>N/A</td> </tr> <tr> <td>Site development plan (SDP)</td> <td>Required in terms of clause 29</td> </tr> <tr> <td>Building lines</td> <td>5m along all street boundaries, 3m for all boundaries</td> </tr> <tr> <td>Special Building lines</td> <td>16m along the K111 Main road</td> </tr> <tr> <td>Line of No access</td> <td>K111 (Main road)</td> </tr> </tbody> </table>		Use Zone Number	14	Land use category (zoning)	"Public Open Space"	Primary Rights	As per Scheme	Secondary rights	As per Scheme	density	As per Scheme	Height	As per Scheme	Coverage	As per Scheme	Floor Area Ratio (FAR)	N/A	Parking requirements	As per Scheme	Loading requirements	N/A	Site development plan (SDP)	Required in terms of clause 29	Building lines	5m along all street boundaries, 3m for all boundaries	Special Building lines	16m along the K111 Main road	Line of No access	K111 (Main road)
Use Zone Number	14																														
Land use category (zoning)	"Public Open Space"																														
Primary Rights	As per Scheme																														
Secondary rights	As per Scheme																														
density	As per Scheme																														
Height	As per Scheme																														
Coverage	As per Scheme																														
Floor Area Ratio (FAR)	N/A																														
Parking requirements	As per Scheme																														
Loading requirements	N/A																														
Site development plan (SDP)	Required in terms of clause 29																														
Building lines	5m along all street boundaries, 3m for all boundaries																														
Special Building lines	16m along the K111 Main road																														
Line of No access	K111 (Main road)																														



No.	Alternative Type: Activity	Description
2	<b>ALTERNATIVES 1</b>	<p>The original development concept for the development was to develop a Commercial Shopping Centre. Refer to <b>Figure 1B</b>.</p> <p>A regional shopping centre is being developed in another part of the region and the need for a Shopping Centre on site has greatly diminished. It was thus decided that the site be developed in a similar scale and intensity to the surrounding residential areas.</p> <p>Also, the development site is located in Zone 1 which aims to promote development infill, densification and concentration of urban development within the urban development zones as defined in the Gauteng Environmental Management Framework (GEMF), in order to establish a more effective and efficient city region that will minimise urban sprawl into rural areas.</p>

No.	Alternative type, - Location	Description
1	<b>Proposal - Infill development location (preferred)</b>	<p>This is the most preferred location type due to the balance achievable between social, environmental and economic requirements:</p> <ul style="list-style-type: none"> <li>• The land belongs to the Applicant</li> <li>• Aligns to the prerequisites of the Ekurhuleni Metropolitan Municipality SDF</li> <li>• Situated within the urban realm adjacent to existing and proposed urban infrastructure, service and amenities</li> <li>• Socially inclusive due to its location to numerous communities and along public transport routes</li> </ul>
2	<b>Alternative 1 – Inner City Location</b>	<p>An inner-city location would be environmentally and socially feasible. High density residential is preferred in the inner city. The small even for the residential market are for young families that are moving from the inner city to the neighborhood to bring up their kids.</p>
3	<b>Alternative 2 – Suburban location</b>	<p>Not socially, environmentally or economically feasible due to the following:</p> <ul style="list-style-type: none"> <li>• Not situated adjacent to primary movement corridors</li> <li>• Not accessible to a range of socio-economic population groups</li> <li>• Isolated nature of development and therefore not inclusive</li> <li>• Contrasting densities and heights with regard to the mixed-use nodal development</li> <li>• Availability of land at an affordable cost minimal</li> </ul>

No.	Alternative type, Technology	Description
1	<b>Proposal Technology</b>	<p>Conventional construction equipment will be used during the construction phase, without energy, or water saving devices. Brick and other material will be sourced where it is the least expensive without regard to the sustainability of the development.</p>
2	Alternative 1	<p>The appropriate Green Building bylaws will be implemented</p> <p>Measures will put in place to make the development as ecologically responsible as possible such as the installation of:</p>

	<ul style="list-style-type: none"> <li>• Energy efficient light bulbs</li> <li>• Solar heating units,</li> <li>• Low flow water taps</li> <li>• Use of local labour</li> <li>• Use of local materials</li> </ul>
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**No-Go Alternative**

This option assumes that a conservative approach would ensure that the environment is not impacted upon any more than is currently the case. It is important to state that this assessment is informed by the current condition of the area.

Should the GDARD decline the application, the 'No-Go' option will be followed, and the status quo of the site will remain.

In the event that no alternative(s) has/have been provided, a motivation must be included in the table below.

Not applicable

**4. PHYSICAL SIZE OF THE ACTIVITY**

Indicate the total physical size (footprint) of the proposal as well as alternatives. Footprints are to include all new infrastructure (roads, services etc), impermeable surfaces and landscaped areas:

	<b>Size of the activity:</b>
Proposed activity ( <b><i>Total environmental (landscaping, parking, etc.) and the building footprint</i></b> )	Approximately 15,9898 ha.
<b>Remainder (Open space)</b>	Approximately 16,8486 ha.
<b>Alternatives: Open Space</b>	
Alternative 1 (if any)	
Alternative 2 (if any)	

Ha / m<sup>2</sup>

or, for linear activities:

	<b>Length of the activity:</b>
Proposed activity	n/a
<b>Alternatives:</b>	
Alternative 1 (if any)	n/a
Alternative 2 (if any)	n/a

m/km

Indicate the size of the site(s) or servitudes (within which the above footprints will occur):

**Size of the site/servitude:**

Proposed activity


**Alternatives:**

Alternative 1 (if any)

	n/a
	n/a
	n/a
	n/a

Alternative 2 (if any)

Ha/m<sup>2</sup>

**5. SITE ACCESS**

**Proposal**

Does ready access to the site exist, or is access directly from an existing road?

YES	NO
n/a	

If NO, what is the distance over which a new access road will be built

Describe the type of access road planned:

Thabana Ntlenyana Drive provides direct access to the site (Clayville Extension 45)

Include the position of the access road on the site plan (if the access road is to traverse a sensitive feature the impact thereof must be included in the assessment).

**Alternative 1**

Does ready access to the site exist, or is access directly from an existing road?

YES	NO
n/a	

If NO, what is the distance over which a new access road will be built

Describe the type of access road planned:

Same as above.

Include the position of the access road on the site plan. (if the access road is to traverse a sensitive feature the impact thereof must be included in the assessment).

**Alternative 2**

Does ready access to the site exist, or is access directly from an existing road?

n/a	n/a
n/a	

If NO, what is the distance over which a new access road will be built

Describe the type of access road planned:

Not Applicable

Include the position of the access road on the site plan. (if the access road is to traverse a sensitive feature the impact thereof must be included in the assessment).

**PLEASE NOTE: Points 6 to 8 of Section A must be duplicated where relevant for alternatives**

Section A 6-8 has been duplicated

0

Number of times

(only complete when applicable)

## 6. LAYOUT OR ROUTE PLAN

<b>Refer to Annexure A</b>
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A detailed site or route (for linear activities) plan(s) must be prepared for each alternative site or alternative activity. It must be attached to this document. The site or route plans must indicate the following:

- the layout plan is printed in colour and is overlaid with a sensitivity map (if applicable);
- layout plan is of acceptable paper size and scale, e.g.
  - A4 size for activities with development footprint of 10sqm to 5 hectares;
  - A3 size for activities with development footprint of > 5 hectares to 20 hectares;
  - A2 size for activities with development footprint of >20 hectares to 50 hectares);
  - A1 size for activities with development footprint of >50 hectares);
- The following should serve as a guide for scale issues on the layout plan:
  - A0 = 1: 500
  - A1 = 1: 1000
  - A2 = 1: 2000
  - A3 = 1: 4000
  - A4 = 1: 8000 (±10 000)
- shapefiles of the activity must be included in the electronic submission on the CD's;
- the property boundaries and Surveyor General numbers of all the properties within 50m of the site;
- the exact position of each element of the activity as well as any other structures on the site;
- the position of services, including electricity supply cables (indicate above or underground), water supply pipelines, boreholes, sewage pipelines, septic tanks, storm water infrastructure;
- servitudes indicating the purpose of the servitude;
- sensitive environmental elements on and within 100m of the site or sites (including the relevant buffers as prescribed by the competent authority) including (but not limited thereto):
  - Rivers and wetlands;
  - the 1:100 and 1:50 year flood line;
  - ridges;
  - cultural and historical features;
  - areas with indigenous vegetation (even if it is degraded or infested with alien species);
- Where a watercourse is located on the site at least one cross section of the water course must be included (to allow the position of the relevant buffer from the bank to be clearly indicated).

### **FOR LOCALITY MAP (NOTE THIS IS ALSO INCLUDED IN THE APPLICATION FORM REQUIREMENTS)**

- the scale of locality map must be at least 1:50 000. For linear activities of more than 25 kilometres, a smaller scale e.g. 1:250 000 can be used. The scale must be indicated on the map;
- the locality map and all other maps must be in colour;

- locality map must show property boundaries and numbers within 100m of the site, and for poultry and/or piggery, locality map must show properties within 500m and prevailing or predominant wind direction;
- for gentle slopes the 1m contour intervals must be indicated on the map and whenever the slope of the site exceeds 1:10, the 500mm contours must be indicated on the map;
- areas with indigenous vegetation (even if it is degraded or infested with alien species);
- locality map must show exact position of development site or sites;
- locality map showing and identifying (if possible) public and access roads; and
- the current land use as well as the land use zoning of each of the properties adjoining the site or sites.

## 7. SITE PHOTOGRAPHS

**Refer to Annexure E**

Colour photographs from the center of the site must be taken in at least the eight major compass directions with a description of each photograph. Photographs must be attached under the appropriate Appendix. It should be supplemented with additional photographs of relevant features on the site, where applicable.

## 8. FACILITY ILLUSTRATION

**Facility illustrations not applicable - Refer to Annexure A for Proposed Site Development Plan**

A detailed illustration of the activity must be provided at a scale of 1:200 for activities that include structures. The illustrations must be to scale and must represent a realistic image of the planned activity. The illustration must give a representative view of the activity to be attached in the appropriate Appendix.

## SECTION B: DESCRIPTION OF RECEIVING ENVIRONMENT

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**Note:** Complete Section B for the proposal and alternative(s) (if necessary)

### Instructions for completion of Section B for linear activities

- 1) For linear activities (pipelines etc.) it may be necessary to complete Section B for each section of the site that has a significantly different environment.
- 2) Indicate on a plan(s) the different environments identified
- 3) Complete Section B for each of the above areas identified
- 4) Attach to this form in a chronological order
- 5) Each copy of Section B must clearly indicate the corresponding sections of the route at the top of the next page.

Section B has been duplicated for sections of the route 

n/a
-----

 times

### Instructions for completion of Section B for location/route alternatives

- 1) For each location/route alternative identified the entire Section B needs to be completed
- 2) Each alternative location/route needs to be clearly indicated at the top of the next page
- 3) Attach the above documents in a chronological order

Section B has been duplicated for location/route alternatives 

n/a
-----

 times (complete only

when appropriate)

### Instructions for completion of Section B when both location/route alternatives and linear activities are applicable for the application

Section B is to be completed and attachments order in the following way

- All significantly different environments identified for Alternative 1 is to be completed and attached in a chronological order; then
- All significantly different environments identified for Alternative 2 is to be completed and attached chronological order, etc.

Section B - Section of Route

n/a
-----

(complete only when appropriate for above)

Section B – Location/route Alternative No.

n/a
-----

(complete only when appropriate for above)

## 1. PROPERTY DESCRIPTION

### Property Description:

(Including Physical Address and Farm name, portion etc.)

The proposed township development is situated on the corner of Thabana Ntlenyana Drive and Main Road (K111) in Clayville. The township is being established on the subdivision of ERF 6138 Clayville Extension 45 into 3 portions
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to be known as Portion 1, Portion 2, and the Remainder of ERF 6138 Clayville Extension 45 of the Farm Olifantsfontein 410-JR.

## 2. ACTIVITY POSITION

Indicate the position of the activity using the latitude and longitude of the centre point of the site for each alternative site. The co-ordinates should be in decimal degrees. The degrees should have at least six decimals to ensure adequate accuracy. The projection that must be used in all cases is the WGS84 spheroid in a national or local projection.

Alternative:	Latitude (S):	Longitude (E):
1. Project Proposal <b>Clayville Extension45</b>	25° 58' 34.44" S	28° 11' 28.88" E
2. Project Proposal <b>Portion 41 (a portion of Portion7) of the Farm Olifantsfontein 410 J.R.</b>	25° 58' 44.92" S	28° 11' 21.95" E
3. Alternative 1	Same as above	Same as above

### In the case of linear activities:

Alternative:	Latitude (S):	Longitude (E):
• Starting point of the activity	n/a	n/a
• Middle point of the activity	n/a	n/a
• End point of the activity	n/a	n/a

For route alternatives that are longer than 500m, please provide co-ordinates taken every 250 meters along the route and attached in the appropriate Appendix

Addendum of route alternatives attached n/a

The 21digit Surveyor General code of each cadastral land parcel

<b>Erf 6138 Clayville Extension 45</b>	T	0	J	R	0	0	3	6	0	0	0	0	6	1	3	8	0	0	0	0	0	0
	1	2			3				4					5								

<b>Portion 41 (a portion of Portion 7) of the Farm Olifantsfontein 410-JR</b>	T	0	J	R	0	0	0	0	0	0	0	0	0	4	1	0	0	0	0	7	
	1	2			3				4					5							



### 3. GRADIENT OF THE SITE

Indicate the general gradient of the site.

Flat	<b>1:50 – 1:20</b>	1:20 – 1:15	1:15 – 1:10	1:10 – 1:7,5	1:7,5 – 1:5	Steeper than 1:5
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### 4. LOCATION IN LANDSCAPE

Indicate the landform(s) that best describes the site.

Ridgeline	Plateau	<b>Side slope of hill/ridge</b>	Valley	Plain	Undulating plain/low hills	River front
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### 5. GROUNDWATER, SOIL AND GEOLOGICAL STABILITY OF THE SITE

a) Is the site located on any of the following?

Shallow water table (less than 1.5m deep)

Dolomite, sinkhole or doline areas

Seasonally wet soils (often close to water bodies)

Unstable rocky slopes or steep slopes with loose soil

Dispersive soils (soils that dissolve in water)

Soils with high clay content (clay fraction more than 40%)

Any other unstable soil or geological feature

An area sensitive to erosion

YES	<b>NO</b>
YES	<b>NO</b>
YES	<b>NO</b>
YES	<b>NO</b>
YES	<b>NO</b>
YES	<b>NO</b>
YES	<b>NO</b>
YES	<b>NO</b>

(Information in respect of the above will often be available at the planning sections of local authorities. Where it exists, the 1:50 000 scale Regional Geotechnical Maps prepared by Geological Survey may also be used).

b) are any caves located on the site(s)

YES	<b>NO</b>
-----	-----------

If yes to above provide location details in terms of latitude and longitude and indicate location on site or route map(s)

**Latitude (S):**

**Longitude (E):**

n/a	n/a
-----	-----

c) are any caves located within a 300m radius of the site(s)

YES	<b>NO</b>
-----	-----------

If yes to above provide location details in terms of latitude and longitude and indicate location on site or route map(s)

**Latitude (S):**

**Longitude (E):**

n/a	n/a
-----	-----

d) are any sinkholes located within a 300m radius of the site(s)

YES	NO
-----	----

If yes to above provide location details in terms of latitude and longitude and indicate location on site or route map(s)

**Latitude (S):**

**Longitude (E):**

n/a	n/a
-----	-----

If any of the answers to the above are “YES” or “unsure”, specialist input may be requested by the Department

## 6. AGRICULTURE

Does the site have high potential agriculture as contemplated in the Gauteng Agricultural Potential Atlas (GAPA 4)?

YES	NO
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**Figure 4: Gauteng Agricultural Potential Atlas (Source: GDARD)**

**Please note:** The Department may request specialist input/studies in respect of the above.

## 7. GROUNDCOVER

To be noted that the location of all identified rare or endangered species or other elements should be accurately indicated on the site plan(s).

Indicate the types of groundcover present on the site and include the estimated percentage found on site.

Natural veld - good condition % =	<b>Natural veld with scattered aliens</b> % = <b>100</b>	Natural veld with heavy alien infestation % =	Veld dominated by alien species % =	Landscaped (vegetation) % =
Sport field % =	Old Cultivated land % =	Paved surface (hard landscaping) % =	Building or other structure % =	Bare soil % =

**Please note:** The Department may request specialist input/studies depending on the nature of the groundcover and potential impact(s) of the proposed activity/ies.

A **geotechnical investigation** of the site has been undertaken by AMB. A summary of the findings is presented here, and a complete report is found in **Annexure G1**.

### **The site**

Clayville Extension 45, with an area of approximately 80ha, is situated on a portion of portion 7 of the farm Olifantsfontein 410-JR. The site falls within the jurisdiction of the Ekurhuleni Metropolitan Municipality. It borders on Kaalfontein Extension 22 (South), The R562 road (east), a cemetery (south-west) and an eastward draining gully or spruit that forms the northern boundary.

### **General**

The phase 1 geotechnical report was studied and subsequently used as reference for the phase 2 geotechnical report. The aforementioned contained sufficient laboratory test results which proved beyond doubt that the upper soil profiles in ZONE B and C classifies as potentially collapsible and non-expansive. These properties could easily, through experience, be visually confirmed during soil profiling in trenches. It is for this reason that no further laboratory tests were conducted during the phase 2 investigation.

### **Soil Profiling**

The main aim of phase 2 soil profiling was to confirm the geotechnical zoning of the site as presented in the phase 1 of geotechnical report, with the emphasis of adjusting the interpreted boundary between the various zone to confirm with the Erf boundaries where the typical soil profile beneath a specific erf or stand, complies with the zone in which it falls.

Fifty-nine soil profiles were recorded in service trenches from 17/09/2009 to 26/11/2009. Based on the results of this profiles, slight changes were made to the interpreted boundaries between various phase 1 geotechnical zones, with the exception of a reduction in the area of zone A and an inclusion of a Zone C in the south western corner of the site.

The typical soil profile and material properties for the various phase 2 geotechnical zones are very similar to those described in the phase 1 of geotechnical zones.

## **Geotechnical properties**

### **Potentially collapsible soil**

The phase 2 geotechnical investigation confirmed that the upper soil layer in zone B (average 1,5m thick) and Zone C (average 2,6m thick) has an open structure, which represent a potentially collapsible soil. This has been confirmed through laboratory test during the phase 1 Geotechnical Investigations.

### **Potentially Expansive soil**

Transported or residual soil in a granite environment are usually not known for its expansive properties, mainly due to the non-expansive properties of the clay minerals (kaolinite) that originate from granite. Laboratory tests during the phase 1 investigation has confirmed this, as total heave of less than 5mm is estimated at surface. Cracks in some of the exposed walls of the trenches are thus a results of moisture loss, rather than a sign of clay-mineral expansiveness.

### **Estimated Bearing Capacity (p-value)**

#### **Five types of soil/ weathered rock were identified on site**

- The upper 300mm soil with organic matter. It is present in all zones, except where excessive surface erosion has taken place. This soil has either been disturbed by previously agricultural activities or is slightly densified/ cemented as a results of near surface wetting and drying of the soil. It has generally been described as medium dense to dense with a P-value (dry) of 60-120 kPa and a P-value (moist) of <30Kpa. This layer has no significant role in terms of structural foundation, due to its limit thickness.
- Very dense ferricrete or dense to very dense, ferruginised transported or residual granite soil. This material underlies the aforementioned upper layer zone in the area. It has a P-value of 250-500 kPa.
- Potentially Collapsible clayey sand (transported or residual granite soil) which are typically of the upper 1,5m soil in Zone B and up to 2,6m soil in Zone C. The P- value of this soil varies between 100-250kPa. However, this value is influenced by the potentially collapsible structure of the soil i.e. foundations should be designed taking the potentially collapsibility of the soil into account, and not the P-value of the soil.
- Soft to medium hard weathered granite. It has been identified in the zone A area where it replaces the ferricrete or underlies the ferricrete or underlies the ferricrete at shallow depth. It has similar and even higher strength values as the ferrecrete. It also underlies the Zone B and Zone C areas but at depth greater than 1,5m below natural ground level. Where it is regarded as too deep to act as founding medium for the anticipated structure.

### **Excavations condition**

Excavation of the trenches were generally executed using a large machine on tracks. Very little blasting was necessary, mainly to remove occasional large granite boulders which were encountered in some of the excavations on the northern, eastern and western side of the site.

Excavations conditions for structural foundations classifies as follows (according to SABS-1200D and SABS-1200DA):

- |            |   |
|------------|---|
| Zone A     | -Soft to intermediate to an average depth of 0,80m below natural ground level |
| Zone B & C | -Soft to intermediate to an average 2,0m below natural ground level           |

Occasional boulder outcrops in the vicinity where profiles 1, 50 and 51 were taken, suggest that some of the foundation excavations on stand in the surrounding area may encounter sections of hard excavations.

### Water seepage

No water seepage was recorded in the trenches where profiles were recorded. However, some seepage did occur in the bottom of excavations on the lower lying extreme eastern portion of the site.

### Other geotechnical aspects

Geotechnical aspects such as material usage, stability of excavations, undermined ground, slope stability, soil chemistry, erodibility of the soil, steep slopes and seismic activity has been discussed in the phase 1 of geotechnical report. We agree with the conclusions and recommendations made in the report, regarding these aspects.

### Conclusion and recommendation

The typical soil profiles and material properties for the various phase 2 geotechnical zones are the same as described in phase 1 geotechnical zone.

The interpretation boundaries between the zones has been amended so that it confirms with erf or stand boundaries, where the typically soil profile beneath a specific erf or stand complies with the zone in which it falls.

The phase 2 geotechnical report confirmed and briefly discussed the various geotechnical aspects discussed in the phase 1 geotechnical report.

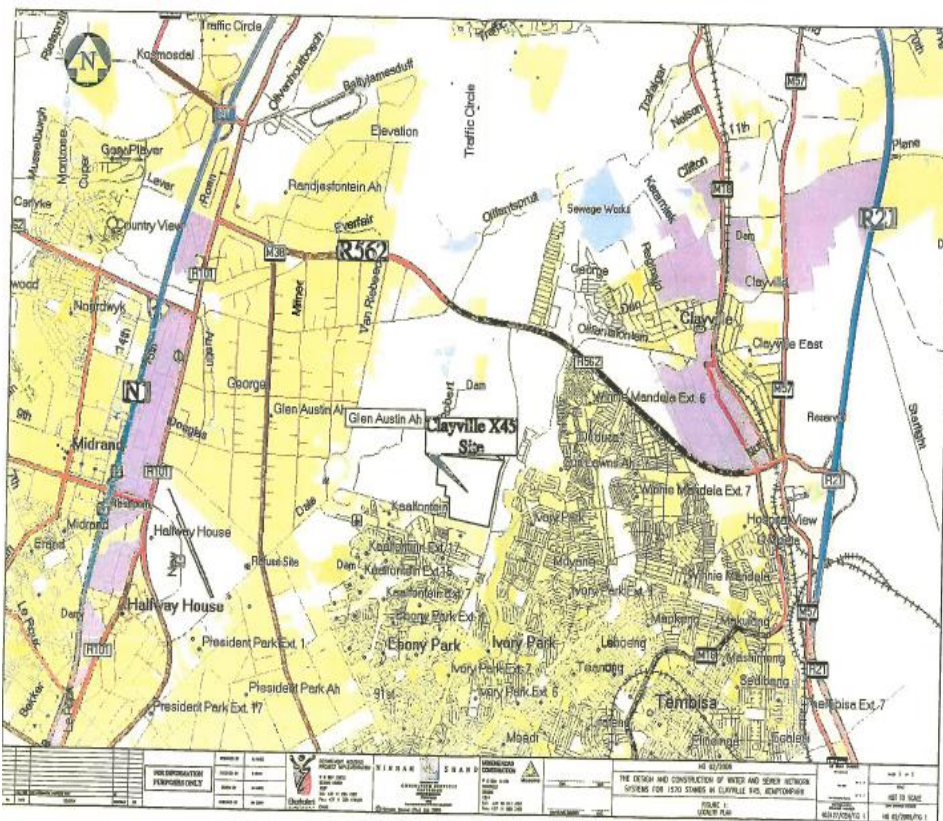


Figure 5: Geotech Map

Are there any rare or endangered flora or fauna species (including red list species) present on the site

YES	NO
-----	----

If YES, specify and explain:

Not Applicable

Are there any rare or endangered flora or fauna species (including red list species) present within a 200m (if within urban area as defined in the Regulations) or within 600m (if outside the urban area as defined in the Regulations) radius of the site.

YES	NO
-----	----

If YES, specify and explain:

Not Applicable

Are there any special or sensitive habitats or other natural features present on the site?

YES	NO
-----	----

If YES, specify and explain:

**Ecological Study – Dimela Eco Consulting** was tasked with the vegetation and vertebrate assessment for the site. This report represents the vegetation assessment. A summary of the report is presented below, and the complete report may be found in **Annexure G2**.

According to the Gauteng Conservation Plan (version 3.3), the majority of the site is situated in a Critical Biodiversity Area (CBA): Important area, with the surrounding land forming part of an Ecological Support Area (ESA).refer to **Figure 6**

The past and current land uses played a major role in the characterisation of the vegetation groups on the site. The vegetation that could be impacted on by the proposed development on the site are grouped into five broad vegetation associations and are summarised below:

1. Mined and disturbed;
2. Alien and invasive vegetation;
3. Degraded *Hyparrhenia hirta* grassland;
4. Disturbed Egoli Granite Grassland; and
5. Moist grassland.

Moist grasslands are usually indicative of wetland conditions which are protected by national legislation. The moist grasslands are essential to maintain ecological corridors for the movement and survival of species within a landscape fragmented by cultivation and urbanisation. In addition, the hydrological processes associated with the wetlands are closely associated with the intactness of the vegetation within and surrounding these areas. The vegetation plays an important role in flood attenuation, prevent soil erosion and sedimentation of wetlands and pans and promote the uptake of toxins from the water. In addition, the provincially protected orchid *Habenaria nyikana* was recorded in the moist grasslands and moist grasslands were classified as sensitive.

The majority of the vegetation on the site is not regarded as sensitive and are developable. The *Hyparrhenia hirta* grassland is not sensitive per se, however, these grasslands form part of the remaining open spaces in the fast-developing area and function as catchment for groundwater recharge and prevention of flooding of

proximate watercourses and its function increased its sensitivity rating to low-medium. However, as long as open spaces and permeable surfaces are incorporated into the development, the function of the *Hyparrhenia hirta* grassland can be substituted and the impacts mitigated.

However, the moist grasslands, as well as the relevant buffer as recommended by a wetland specialist should be regarded as sensitive and no development or edge effects are allowed to impact on these areas. The disturbed Egoli Granite Grassland is situated north of the application area and should this area also be earmarked for future development, it should be incorporated into open space planning, linked to the moist grassland areas. It is recognised that these grasslands will eventually degrade further due to development edge effects and difficulty in managing grassland on such a small scale. It is thus recommended that as much as possible of these grasslands, particularly on the north-western section of the site, be incorporated as open space to allow for groundwater recharge and ecological stepping stones in the fast-developing areas

- **Regional vegetation**

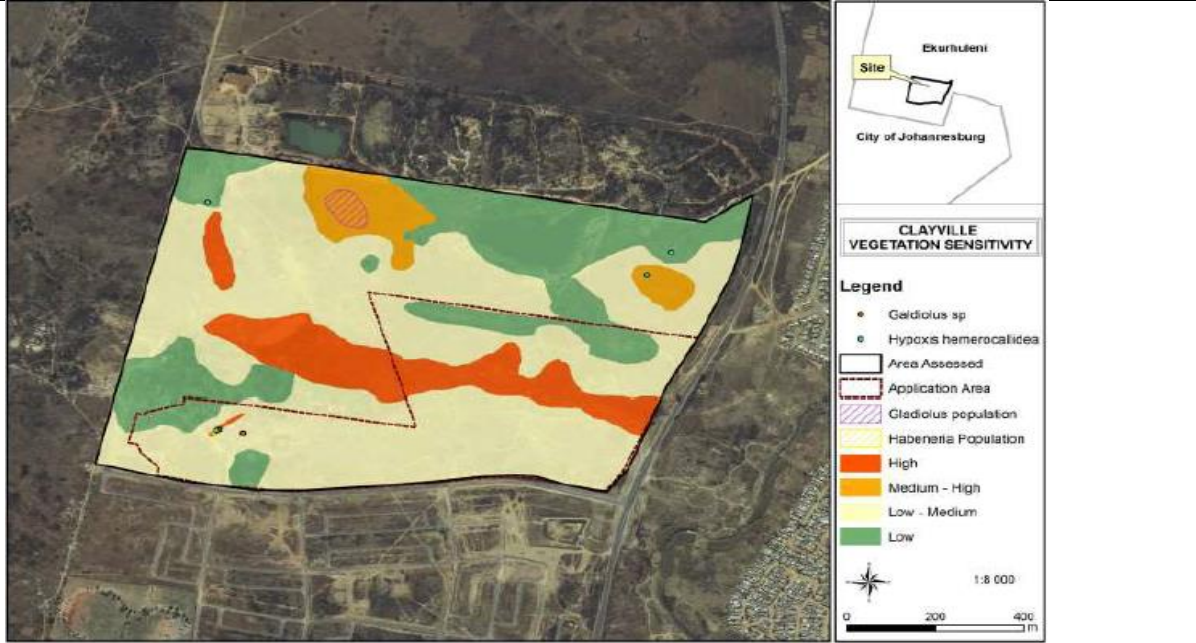
The site is situated in the Grassland Biome which experience summer rainfall and dry winters with frost (and fire), that are unfavorable to tree growth. Therefore, grasslands comprise mainly of grasses and plants with perennial underground storage organs, for example bulbs, tubers and suffrutex species. In some grassland areas, the surface topography (e.g. rocky hills and protected valleys) creates habitats that are favourable to shrublands and trees (Mucina & Rutherford, 2006). Generally, the higher the surface rock cover, the higher the occurrence of woody vegetation such as trees and shrubs, relative to herbaceous vegetation (Mucina & Rutherford, 2006). The grassland biome is under severe threat from urbanisation, industrialisation, mining and agriculture, especially in Gauteng.

- **Floral features**

The site visit was conducted on 27 April 2017 to determine whether the site and the neighboring properties within 200 meters of the boundaries of the site have suitable habitat for the Red List species and other protected species known to occur in the quarter degree square and whether a vegetation survey was deemed necessary. The vegetation on the site was examined to identify provisional vegetation study units. According to the GDARD C-Plan it ranks most of the site as "important".



**Figure 6: The GDARD C-Plan**



**Figure 7: Vegetation Sensitivity map**

- **Faunal features**

All red-listed vertebrates (except for the hedgehog and striped harlequin snake) are reliant on aquatic / wetland habitat. The conservation status of bullfrogs is of particular concern. It is recommended that grassland buffer zones along waterbodies (of 30 meters from the outer edge of riparian zones) are preserved as natural. In this manner all red-listed species will be afforded formal conservation. It is equally important the dispersal routes are identified (such as the stream connecting the on-site dam with the Kaalspruit) and steps are taken to also afford these effective conservations.



**Figure 8: Avifaunal species habitat systems identified on the study site and within the study area**



- **Herpetofauna**

The local occurrences of reptiles and amphibians are closely dependent on broadly defined habitat types, in particular terrestrial, arboreal (tree-living), rupicolous (rock-dwelling) and wetland-associated vegetation cover. It is thus possible to deduce the presence or absence of reptile and amphibian species by evaluating the habitat types within the context of global distribution ranges. From a herpetological habitat perspective, it was established that mainly two of the four major habitats are naturally present on the study site, namely terrestrial and wetland-associated vegetation cover. There are no natural rupicolous habitats on the study site, but good manmade rupicolous habitat exists in the form of building rubble and concrete fences. Due to the absence of natural rupicolous habitat, some species like yellow-throated plated lizard, common girdled lizard and rock agama were omitted.

The few trees on the study site do not provide sufficient arboreal habitat and there are no dead logs, to provide shelter or food for any herpetofauna. Due to the absence of natural arboreal habitat, some species like flap-neck chameleons were omitted.

There is an old quarry filled with water and temporary pans on the study site. To the west of the study site are the well-known Glen Austin pan and a smaller pan. To the east of the study site is the Kaalspruit. These water sources would provide habitat for most water-dependent herpetofauna.

Due to busy roads like the R562 (Olifantsfontein Road), Main Road, piles of building rubble and concrete fences, migration is difficult. However, connectivity is fair to the west and north-west of the study site.

#### **Threatened and Red listed Reptile and Amphibian Species**

The striped harlequin snake has been recorded on this quarter degree square 2528CC (Centurion) (TVL Museum Records or Ditsong Museum of Natural History), and a few moribund termitaria, where this species is most likely to be found, are present on the study site. It is very difficult to confirm whether this cryptic snake is present on any study site, but there is a small chance this species could occur on this particular study site.

The coppery grass lizard has been recorded on this quarter degree square 2528CC (Centurion) (TVL Museum Records or Ditsong Museum of Natural History), and a small part of the study site consists of pristine grassveld. Therefore, this species might occur on the study site.

Although no giant bullfrog activity was observed during the site visit, the area and the bullfrog populations at and near the site are well known to the author, having been the object of his study over a period of many years (Van Wyk, 2012). The nearby Glen Austin pan is arguably the best-known area in an urban setting in South Africa to see giant bullfrogs. The giant bullfrog population at Glen Austen Pan played a very important role in ground-breaking studies by Clayton Cook for his MSc and Caroline Yetman for her PhD studies on giant bullfrogs.

Giant Bullfrogs require four types of habitat in order to survive under natural conditions: 1) breeding sites, 2) burrowing soils, 3) foraging grounds and 4) dispersal corridors (Carruthers, 2009). The study site provides all four of these habitats.

#### **Conclusion**

Given the proposed buffer zones, no reasonable scientific objective can be raised to oppose the Clayville Extension 45 development.

Limosella Consulting was appointed to undertake a wetland and/or riparian delineation and functional assessment for the proposed Clayville x45 Residential Development, Ekurhuleni, Gauteng Province. A summary of the report is presented below, and the complete report may be found in **Annexure G3**.

The study area is located within Quaternary Catchments A21B and is in the third water management area, the Crocodile (West) and Marico. In this water management area, the major rivers include the Crocodile, Marico, Elands and Pienaars River. The proposed residential development does not traverse any major rivers but rather the wetland areas associated with the Kaalspruit and/or tributaries that drain into the Hennops River.

**Table 1: The important factors relevant to the project**

	Quaternary Catchment and WMA areas	Important Rivers possibly affected	Buffers
	A21B Crocodile (West) and Marico (WMA)	Wetland areas associated with the Kaalspruit and/or tributaries that drain into the Hennops River.	32m Generic Buffer (GDARD, 2014)
<b>NEMA Impact assessment</b>	Activity scores have a high to a medium impact score before implementation of mitigation measures and a low score after mitigation		
<b>DWS Impact assessment</b>	The activities associated with the residential development fall in the medium category. This is primarily due to the long term effect of potential impacts associated with further urban development, such as altered surface water runoff and potential changes to water flowpaths that sustain the watercourses. The locality of the site within the Halfway House Granite Dome formation including the intactness of the wetland in comparison to the surrounding wetlands and the ecosystem services that the wetland supply play a role here. It is possible that, during the detailed design phase, with the input of stormwater engineers and a geohydrologist or hydrogeologist, it can be shown that mitigation for changes to the runoff properties of the infrastructure does not have a net effect on the regional hydrograph. The score for certain activities may then be lowered to fall in the Low category. The DWS should be consulted regarding the necessity for application for a Water Use Licence.		
<b>Does the specialist support the development?</b>	Yes. However it should be done in a manner that does not further alter the natural watercourses (rivers) and their catchments.  The proposed development traverse important and ecological support areas and care should be taken to limit impacts in these areas to a minimum.		
<b>Major concerns</b>	<ul style="list-style-type: none"> <li>• Changing the quantity and fluctuation properties of the watercourse</li> <li>• Changing the amount of sediment entering water resource and associated change in turbidity (increasing or decreasing the amount)</li> <li>• Alteration of water quality – increasing the amounts of nutrients (phosphate, nitrite, nitrate)</li> <li>• Alteration of water quality – toxic contaminants (including toxic metal ions (e.g. copper, lead, zinc) and hydrocarbons</li> <li>• Changing the physical structure within a water resource (habitat)</li> <li>• Erosion of the soils in the Halfway House Granite Dome geology</li> <li>• Erosion in the Hennops River and downstream wetlands</li> </ul>		
<b>Recommendations</b>	The placement of the residential development should exclude the natural watercourses/aquatic ecosystems as far as possible. It is important that appropriate mitigation measures are put into place and carefully monitored to ensure minimal impact to regional hydrology. Install possible storm water structures associated with the residential development that allows for a slow release of water into the soil profile even higher in the catchment instead of directly releasing it into an adjacent watercourse.		
<b>CBA and other Important areas</b>	The proposed development traverses important and ecological support areas. The proposed development traverse the Egoli Granite Grassland ecosystem which is endangered (NEMBA, 2011).		

**Quaternary Catchments and Water Management Area (WMA):**

As per Macfarlane et al, (2009) one of the most important aspects of climate affecting a wetland's vulnerability to altered water inputs is the ratio of Mean Annual Precipitation (MAP) to Potential Evapotranspiration (PET) (i.e. the average rainfall compared to the water lost due to the evapotranspiration that would potentially take place if sufficient water was available). The site is situated in Quaternary Catchments A21B. In these catchments, the precipitation rate is lower than the evaporation rate with a Mean Annual Precipitation (MAP) to

Potential Evapotranspiration (PET) of 0.30. The Median Annual Simulated Runoff (mm) is 41.2. Consequently, watercourses in these areas are sensitive to changes in regional hydrology, particularly where their catchment becomes transformed and the water available to sustain them becomes redirected.

### **Methodology**

The delineation method documented by the Department of Water affairs and Forestry in their document “Manual for identification and delineation of wetlands and riparian areas” (DWAF, 2005), and the Minimum Requirements for Biodiversity Assessments (GDARD, 2014) as well as the Classification System for Wetlands and other Aquatic Ecosystems in South Africa User Manual: Inland Systems (Ollis et al, 2013) was followed throughout the field survey. These guidelines describe the use of indicators to determine the outer edge of the wetland and riparian areas such as soil and vegetation forms as well as the terrain unit indicator.

A hand-held Garmin etrex 30x was used to capture GPS co-ordinates in the field. 1:50 000 cadastral maps and available GIS data were used as reference material for the mapping of the preliminary watercourse boundaries. These were converted to digital image backdrops and delineation lines and boundaries were imposed accordingly after the field survey.

### **Desktop Delineation**

A desktop assessment was conducted of the proposed residential development, with wetland and riparian units crossed by these infrastructures identified using a range of tools, including:

- 1: 50 000 topographical maps;
- S A Water Resources;
- Recent, relevant aerial and satellite imagery, including Google Earth.

All areas suspected of being wetland and riparian habitat based on the visual signatures on the digital base maps were mapped using Google Earth.

### **Buffer Zones**

A buffer zone is defined as a strip of land surrounding a wetland or riparian area in which activities are controlled or restricted (DWAF, 2005). A development has several impacts on the surrounding environment and on a wetland. The development changes habitats, the ecological environment, infiltration rate, amount of runoff and runoff intensity of the site, and therefore the water regime of the entire site. The buffer zone identified in this report serves to highlight an ecologically sensitive area in which activities should be conducted with this sensitivity in mind.

A scientifically calculated buffer of 67m for the construction phase and 90m of the operational phase was calculated for this site. The delineated wetland, together with the buffer zones should be considered as a sensitive area excluded from the development footprint.

In the current study the wetland was assessed using, WET-Health (Macfarlane et al, 2007) and EIS (DWAF, 1999). Present Ecological Status (PES) – WET-Health the Present Ecological Score is based on the ability of the wetland to preform indirect benefits.

**Table 2: Indirect Benefits provided by wetland habitats (Macfarlane et al, 2007).**

Regulating & supporting benefits	Flood attenuation		The spreading out and slowing down of floodwaters in the wetland, thereby reducing the severity of floods downstream	
	Streamflow regulation		Sustaining streamflow during low flow periods	
	Water Quality Enhancement	Sediment trapping		The trapping and retention in the wetland of sediment carried by runoff waters
		Phosphate assimilation		Removal by the wetland of phosphates carried by runoff waters, thereby enhancing water quality
		Nitrate assimilation		Removal by the wetland of nitrates carried by runoff waters, thereby enhancing water quality
		Toxicant assimilation		Removal by the wetland of toxicants (e.g. metals, biocides and salts) carried by runoff waters, thereby enhancing water quality
		Erosion control		Controlling of erosion at the wetland site, principally through the protection provided by vegetation.
	Carbon storage		The trapping of carbon by the wetland, principally as soil organic matter	

A summary of the three components of the WET-Health namely Hydrological; Geomorphological and Vegetation Health assessment for the wetlands found on site is described in the table below. A Level 1 assessment was used in this report. Level 1 assessment is used in situations where limited time and/or resources are available.

**Table 3: Health categories used by WET-Health for describing the integrity of wetlands (Macfarlane et al, 2007)**

Description	Impact Score Range	PES Score	Summary
Unmodified, natural.	0.0.9	A	Very High
Largely natural with few modifications. A slight change in ecosystem processes is discernible and a small loss of natural	1-1.9	B	High
habitats and biota may have taken place.			
Moderately modified. A moderate change in ecosystem processes and loss of natural habitats has taken place but the natural habitat remains predominantly intact.	2-3.9	C	Moderate
Largely modified. A large change in ecosystem processes and loss of natural habitat and biota has occurred.	4-5.9	D	Moderate
The change in ecosystem processes and loss of natural habitat and biota is great but some remaining natural habitat features are still recognizable.	6-7.9	E	Low
Modifications have reached a critical level and the ecosystem processes have been modified completely with an almost complete loss of natural habitat and biota.	8.10	F	Very Low

A summary of the change class, description and symbols used to evaluate wetland health are summarised in the table below.

**Table 4: Trajectory class, change scores and symbols used to evaluate Trajectory of Change to wetland health (Macfarlane et al, 2007)**

Change Class	Description	Symbol
Improve	Condition is likely to improve over the over the next 5 years	(↑)
Remain stable	Condition is likely to remain stable over the next 5 years	(→)
Slowly deteriorate	Condition is likely to deteriorate slightly over the next 5 years	(↓)
Rapidly deteriorate	Substantial deterioration of condition is expected over the next 5 years	(↓↓)

**Land Use, Cover and Ecological State**

The study site is dominated by open grassland with some patches of trees (mostly alien), subsistence sand/soil mining with some earthen dams located within the watercourse. Informal roads/tracks also traverse the site. Formal as well as informal housing areas are located adjacent to the study site. To the north of the site evidence of historic commercial mining is still evident for example the industrial dams. Some subsistence farming is also taking place downstream of the site at the confluence with the Kaalspruit.

**Wetland Classification and Delineation**

One Channeled valley bottom wetland is located on the Clayville x45 site. More wetlands not included in the assessment are located within the surrounding area. Two channelled valley bottom wetlands are located to the east of Main Road east of the proposed development.

It is important to note that the catchment (local) of the channelled valley bottom wetland in the study area is located on a slope which is partially disturbed by historic commercial mining. The altitude of the study area ranges from 1503 to 1561m.a.m.s.l which indicates a slope of 4.5%. It is further important to note that the geology of the site comprises the Halfway House Granite Dome formation (HHGD). Erosion sets in with runoff increasing by as little as 5% in the soils found in this geological formation. Activities such as excavation and surface sealing in the catchment, adjacent and within wetlands with a HHGD geology lead to the destruction of these ecosystems. The conservation of the catchment of this wetland is thus important to avoid further erosion. The wetlands were delineated up to a 500 m from the proposed site boundaries where applicable (Figure 9).



**Figure 9: Wetlands associated with the study area.**

### Wetland Functional Assessment

The watercourse is highly impacted and has been transformed significantly from its theoretical benchmark condition, although different wetland plant species were recorded in the wetland. The particular wetland still represents typical wetland characteristics. The wetland is still relative intact in comparison to the surrounding wetlands in Tembisa and can fulfil valuable ecosystem services if conserved. Historical and current mining adjacent of the study site contributes negatively to the watercourse. Large erosion gullies can be found upstream and adjacent to the wetland. The Local residents from the Tembisa area mine soil/sand in the erosion gullies. The wetland is further impacted by dumping, infilling, trampling, alien vegetation, sewage input, formal as well as informal housing, associated erosion and channelization the downstream section of the wetland just east of the Main Road bridge is most significantly affected by channelization. Historically the wetland was unchanneled but due to activities mentioned above the surface flows became concentrated.

### Conclusion

One channeled valley bottom wetland is located on the Clayville x45 site. More wetlands not included in the assessment are located within the surrounding area. Two channeled valley bottom wetlands are located to the east of Main Road east of the proposed development.

**Table 5: The impacts on the channeled valley bottom wetland**

Affected Watercourse	Approximate central coordinates	Recorded Impacts	PES Score	EIS Score
Channeled valley bottom	25°58'32.17"S and 28°11'34.12"E	<p>Historical and current mining upstream of the study site contributes negatively to the affected watercourse. Large erosion gullies can be found upstream and adjacent to the wetland. Local residents from the Tembisa area mine some of the soil/sand in the erosion gullies. The wetland are further impacted by dumping, infilling, trampling, alien vegetation, sewage input, formal as well as informal housing, associated erosion and channelization. Historically the wetland was unchanneled but due to activities mentioned above the surface flows became concentrated.</p> <p>It is important to note that the geology of the site comprises the Halfway House Granite Dome formation. Erosion sets in with runoff increasing by as little as 5% in the soils found in this geological formation. Activities such as excavation and surface sealing in the catchment, adjacent and within wetlands with a Halfway House Granite Dome geology lead to the destruction of these ecosystems.</p>	D	C

It is important to note that the level of impact to the wetlands will likely deteriorate in the next 5 to 10 years given the amount of development occurring in the wetland's catchment, unless care is taken to develop with an approach that is sensitive to the hydrology of the landscape.

It is important that appropriate mitigation measures are put into place and carefully monitored to ensure minimal impact to regional hydrology. Mitigation should focus on:

- Management of point discharges during construction activities.
- Alien plant control.
- Implementation of best management practices regarding stormwater and earthworks.

- Prevention of erosion, and where necessary rehabilitation of eroded areas.
- Application of the SuDS Guidelines (Armitage et al, 2013) with a focus on allowing water to seep into the soil profile throughout the elevation profile in order to support natural soil water flow paths.

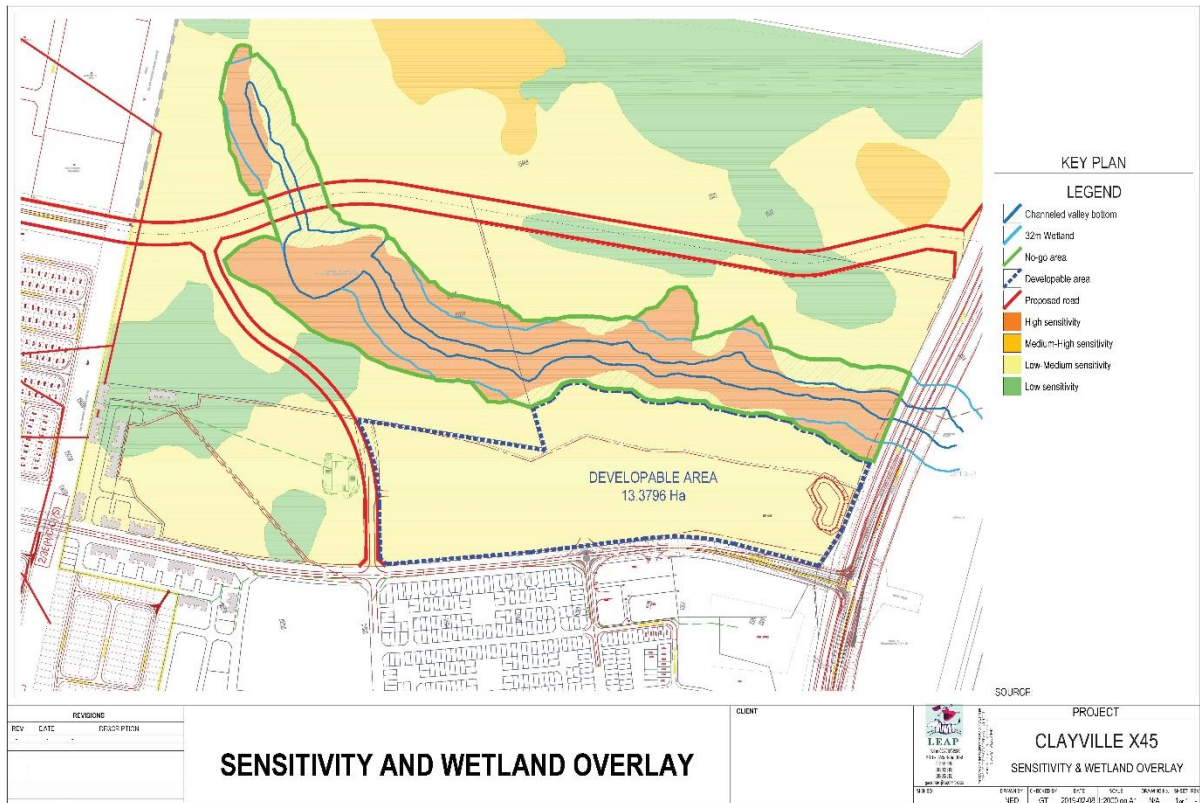


Figure 10: Sensitivity Map

Was a specialist consulted to assist with completing this section

<b>YES</b>	<b>NO</b>
------------	-----------

If yes complete specialist details

Name of the specialist:	Dimela Eco Consulting		
Qualification(s) of the specialist:	Dr. I.L. Rautenbach Ph.D., Pr.Sci.Nat. (Mammalogy) Mr. J.C.P. Van Wyk MSc., Pr.Sci.Nat. Dr. A.E. McKechnie Ph.D., Pr.Sci.Nat. (Zoology)		
Postal address:	n/a		
Postal code:	n/a		
Telephone:	n/a	Cell:	083 642 6295
E-mail:	<a href="http://www.dimela-eco.co.za">www.dimela-eco.co.za</a> antoINETTE@dimela-eco.co.za	Fax:	n/a
		<b>YES</b>	<b>NO</b>

If YES list the specialist reports attached below

Annexure G1: Geotechnical Report

Annexure G2: Ecological Reports to include: Avifauna, Flora, Herpetofauna and Mammals Report

Annexure G3: Wetland Report

Signature of  
specialist: \_\_\_\_\_

Date:

**Please note:** If more than one specialist was consulted to assist with the filling in of this section then this table must be appropriately duplicated.

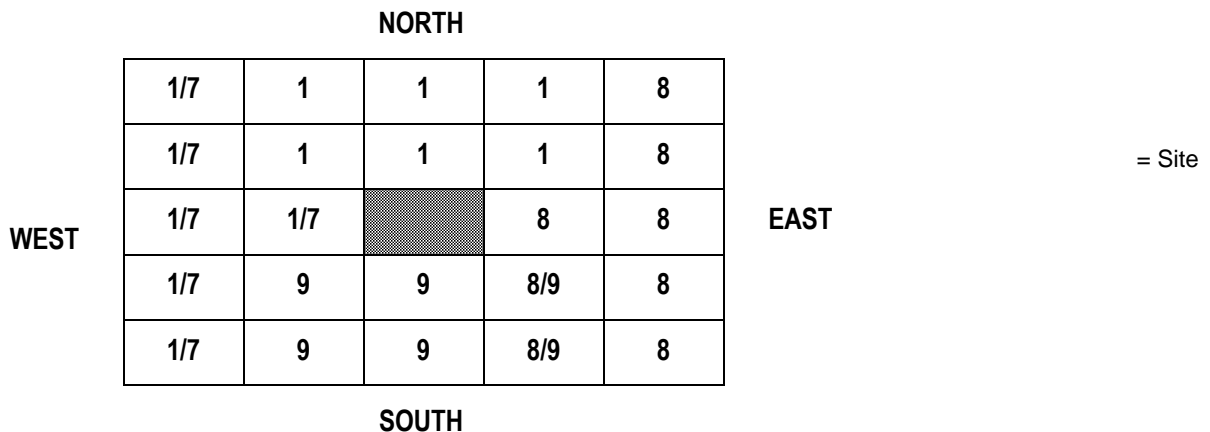


## 8. LAND USE CHARACTER OF SURROUNDING AREA

Using the associated number of the relevant current land use or prominent feature from the table below, fill in the position of these land-uses in the vacant blocks below which represent a 500m radius around the site.

1. Vacant land	2. River, stream, wetland	3. Nature conservation area	4. Public open space	5. Koppie or ridge
6. Dam or reservoir	7. Agriculture	8. Low density residential	9. Medium to high density residential	10. Informal residential
11. Old age home	12. Retail	13. Offices	14. Commercial & warehousing	15. Light industrial
16. Heavy industrial <sup>AN</sup>	17. Hospitality facility	18. Church	19. Education facilities	20. Sport facilities
21. Golf course/polo fields	22. Airport <sup>N</sup>	23. Train station or shunting yard <sup>N</sup>	24. Railway line <sup>N</sup>	25. Major road (4 lanes or more) <sup>N</sup>
26. Sewage treatment plant <sup>A</sup>	27. Landfill or waste treatment site <sup>A</sup>	28. Historical building	29. Graveyard	30. Archeological site
31. Open cast mine	32. Underground mine	33. Spoil heap or slimes dam <sup>A</sup>	34. Small Holdings	
Other land uses (describe):				

**NOTE:** Each block represents an area of 250m X 250m, if your proposed development is larger than this please use the appropriate number and orientation of hashed blocks



**Note:** More than one (1) Land-use may be indicated in a block

**Please note:** The Department may request specialist input/studies depending on the nature of the land use character of the area and potential impact(s) of the proposed activity/ies. Specialist reports that look at health & air quality and noise impacts may be required for any feature above and in particular those features marked with an "A" and with an "N" respectively.

Have specialist reports been attached

**YES**

**NO**

If yes indicate the type of reports below

A **paleontological investigation** of the site has been undertaken by Heidi Fourie Consulting. A summary of the findings is presented here, and a complete report is found in **Annexure G4**.

The Palaeontological Impact Assessment: Phase 1: Field Study was undertaken in March 2017 in the summer in dry and hot conditions (Appendix 6 of Act, 1(d)), and the following is reported:

The development is taking place on the dolomites of the Malmani Subgroup, Chuniespoort Group of the Transvaal Supergroup. A small section to the west may overlap onto the Black Reef Formation. The site is covered with lush vegetation (trees, grass) and is disturbed.

The Transvaal Supergroup fills an east-west elongated basin in the south-central part of the old Transvaal (now North – West, Gauteng and Mpumalanga) as far south as Potchefstroom. It is Vaalian in age, approximately 2600 Ma to 2100 Ma. A maximum thickness of the Transvaal Supergroup reaches 2000 m in the north-eastern section. The east-west elongated basin is filled with clastic, volcanic and chemical sedimentary rocks. Three groups based on lithological differences have been established: they are the Rooiberg, Pretoria and Chuniespoort Groups as well as other smaller groups (Kent 1980, Snyman 1996). It is the Bushveld Complex that is responsible for the tilting of the Transvaal sediments and the heat of its intrusion having created andalusite crystals (Norman and Whitfield 2006). This Supergroup is underlain by the Ventersdorp, Witwatersrand and Pongola Supergroups, and the Dominion Group. Three prominent ridges are present from the oldest to the youngest, the Time Ball Hill, Daspoort and Magaliesberg Formations (Norman and Whitfield 2006).

The Chuniespoort Group is made up of chemical and biochemical sediments such as dolomite, chert, limestone and banded iron formation, carbonaceous shale is also present. At the top of the Malmani Subgroup is the Duitschland Formation underlain by the Penge and Monte Christo Formations. Sandstone is mostly absent. It is this formation that has great economic value for its lead, zink, dolomite, and manganese (Kent 1980, Snyman 1996). Fluorspar, concrete aggregate, iron ore and managanese is also mined from this formation. Cave formation in the dolomite is a major concern in developing areas, especially in the 1500m thick dolomite of the Malmani Subgroup. Chemical sediments such as fine-grained limestone and dolomite is made up of deposits of organically derived carbonate shells, particles or precipitate. Dolomite is magnesium-rich limestone formed from algal beds and stromatolites. The Black Reef Formation is known for stromatolite carbonates and fossiliferous Late Cenozoic cave breccias similar to the Malmani dolomite.

Fossils in South Africa mainly occur in rocks of sedimentary nature and not in rocks from igneous or metamorphic nature. Therefore, if there is the presence of sedimentary rocks the palaeontological sensitivity can generally be LOW to VERY HIGH, and here locally **HIGH** for the Chuniespoort Group (SG 2.2 SAHRA APMHOB, 2012).

**Recommendation:**

The impact of the development on fossil heritage is **HIGH** and therefore a field survey or further mitigation or conservation measures were necessary for this development (according to SAHRA protocol). On the Fossil Heritage Layer Browser (SAHRA) the Black Reef Formation is rated as **HIGH**, but Groenewald and Groenewald (2014) rates it as **MODERATE**. A Phase 1 Palaeontological Impact Assessment and or mitigation were done.

Criteria used (Fossil Heritage Layer Browser/ SAHRA)

Rock unit	Significance/Vulnerability	Recommended action
Chuniespoort Group	High	Desktop study is required and based on an outcome of the desktop study, a field assessment is unlikely

Blackreef Formation	High (moderate)	Desktop study is required and based on an outcome of the desktop study, a field assessment is unlikely.
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A **Heritage Impact Assessment** of the site has been undertaken by Heritage Contracts and Archaeological Consulting CC (HCAC). The report forms part of the Basic Assessment Report (BAR) and Environmental Management Programme Report (EMPR) for the Clayville Bulk Services and Mix Use development. A summary of the findings is presented here, and a complete report is found in **Annexure G5**.

**Description of the Physical Environment:**

The property is situated directly north of Tembisa and to the east of Midrand in the Ekurhuleni Metropolitan Municipality within the Gauteng Province. The farm Olifantsfontein and surrounding properties are situated in an area which was originally a part of a gold mining hub. Historically, urban development in this area has been closely associated with gold mining: Germiston, Boksburg, Benoni, Brakpan Springs and Nigel were located on the mining belt, while Edenvale, Alberton and Kempton Park developed adjacent to the goldfields. The urban development around the study area followed the same pattern as with the above-mentioned towns. This property however, was most probably used as a grazing facility for live-stock during those early mining days. Cattle were found grazing on the property during the survey.

The study area measures approximately 51ha in size and is situated in between the residential suburbs of Clayville Extension 45 to the south, Ivory Park Extension 13 to the east and open veld to the north and west. The site is bordered by Main Road in the east, a suburban tar road to the south and open veld to the north and west.

Several cleared spaces were identified during the survey. These areas are used by people for religious gatherings. A number of religious gatherings took place on the day the survey was conducted. The area slopes down to the Kaalspruit further to the east, but it also slopes inwards to the intermittent stream that crosses the site. Most of the site is covered with lush grass after the recent spate of good rains. The vegetation and landscape is described by Mucina and Rutherford (2006) as Egoli Granite Grassland and the local geology can be described as Granite-gneiss. Apart from informal churches no tangible heritage site was identified within proposed study area.

**Built Environment (Section 34 of the NHRA)**

No standing structures older than 60 years occur in the study area.

**Archaeological and palaeontological resources (Section 35 of the NHRA)**

No archaeological sites or material was recorded during the survey and based on the SAHRIS Paleontological Sensitivity Map the area is of insignificant paleontological significance. Therefore, no further mitigation prior to construction is recommended in terms of Section 35 for the proposed development to proceed

**Burial Grounds and Graves (Section 36 of the NHRA)**

In terms of Section 36 of the Act no burial sites were recorded. However, if any graves are located in future they should ideally be preserved in-situ or alternatively relocated according to existing legislation

**Recommendations and conclusion**

No archaeological sites or artefacts were recorded during the survey. Therefore, no further mitigation prior to construction is recommended in terms of the archaeological component of Section 35 for the proposed development to proceed. The paleontological component will be assessed independently. In terms of the built environment of the

area (Section 34), no standing structures older than 60 years occur within the study area. In terms of Section 36 of the Act no burial sites were recorded. However, if any graves are located in future they should ideally be preserved in-situ or alternatively relocated according to existing legislation. No public monuments are located within or close to the study area. Some informal churches were identified in the study area and can be classified as living heritage with a Generally Protected C field rating. The study area is surrounded by residential developments and road infrastructure developments and the proposed development will not impact negatively on significant cultural landscapes or views. During the public participation process conducted for the project no heritage concerns were raised. Due to the lack of significant heritage resources in the study area the impact of the proposed project on heritage resources is considered low and it is recommended that the proposed project can commence on the condition that the following recommendations are implemented as part of the EMP and based on approval from SAHRA:

- The congregation relating to the informal churches must be involved in the public participation process and informed of the proposed development, giving them adequate time to find a suitable replacement site.
- Implementation of a chance find procedure as detailed below.

### **Chance Find Procedure**

The possibility of the occurrence of subsurface finds or previously unknown sites cannot be excluded. Therefore, if during construction any possible finds such as stone tool scatters, artefacts or bone and fossil remains are made, the operations must be stopped and a qualified archaeologist must be contacted for an assessment of the find and therefore chance find procedures should be put in place as part of the EMP. A short summary of chance find procedures is discussed below.

This procedure applies to the developer's permanent employees, its subsidiaries, contractors and subcontractors, and service providers. The aim of this procedure is to establish monitoring and reporting procedures to ensure compliance with this policy and its associated procedures. Construction crews must be properly inducted to ensure they are fully aware of the procedures regarding chance finds as discussed below.

- If during the pre-construction phase, construction, operations or closure phases of this project, any person employed by the developer, one of its subsidiaries, contractors and subcontractors, or service provider, finds any artefact of cultural significance or heritage site, this person must cease work at the site of the find and report this find to their immediate supervisor, and through their supervisor to the senior on-site manager.
- It is the responsibility of the senior on-site Manager to make an initial assessment of the extent of the find, and confirm the extent of the work stoppage in that area.
- The senior on-site Manager will inform the ECO of the chance find and its immediate impact on operations. The ECO will then contact a professional archaeologist for an assessment of the finds who will notify the SAHRA.

**9. SOCIO-ECONOMIC CONTEXT**

Describe the existing social and economic characteristics of the area and the community condition as baseline information to assess the potential social, economic and community impacts.

**Locality**

Region B is situated within the northwestern section of the Ekurhuleni Metropolitan Municipality. The City of Tshwane forms the northern boundary and the City of Johannesburg forms the western boundary of Region B. Region A is towards the south and Region C forms the eastern boundary. The region is made up of the areas of Tembisa, a portion of Kempton Park, Edenvale, Bedfordview, Olifantsfontein/ Clayville and Bredell Agricultural holdings. In terms of the metropolitan vision, the region will see major urban growth due to the proximity to the airport and its expected growth as an aerotropolis.

**Population**

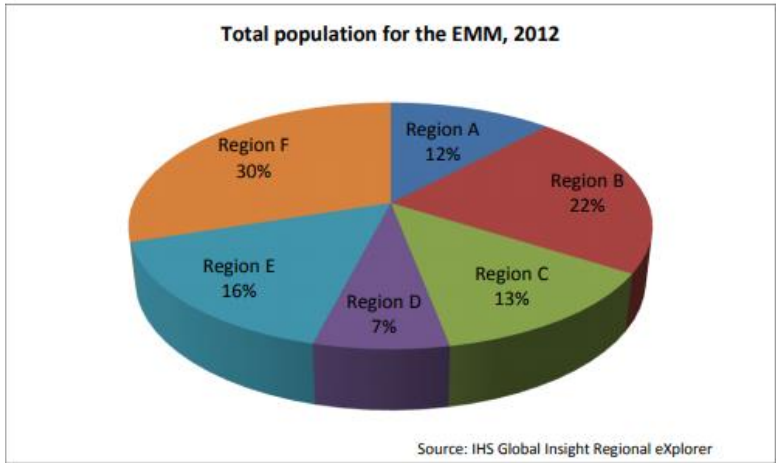
Population statistics are important when analysing a region, as the growth in population directly impacts the spatial needs, employment and unemployment and other economic indicators like economic growth and per capita income. The following table summarises the key indicators regarding the population in Region B.

**Table 6: Population figures for Region B**

Region B Population Indicators	Number/Percentage
Total Population	690 000
Number of household (2012) (Average 3 people/ household)	244 000
Average annual population growth rate (2002-2012)	3.10%
Projected population growth rate (2015-2020)	1.27%
Population forecast (2020)	784 267
Population density (2012)	1 540 people / km <sup>2</sup>
Male: female split (2012)	1.07 males per female
Predominant age category (2012)	30 – 34 age categories

The following chart illustrates the population contribution to EMM per region and indicates that Region B is the second largest region in the EMM

**Chart 1: Total population for the EMM, 2012**



The employment levels of the region can be summarised as per the table below.

**Table 7: Employment levels in Region B**

REGION B EMPLOYMENT LEVELS	NUMBER/ PERCENTAGE
Working age population (15-64 years of age)	494 514 people (2012)
Economically active population  <i>Definition: The economically active population (EAP) is defined as the number of people (between the age of 15 and 65) who are able, willing and working, or who are actively looking for work. Both employed and unemployed people are included.</i>	319 000 people (2012)
Labour force participation rate  <i>Definition: The labour force participation rate (LFPR) is the EAP expressed as a percentage of the total working age population.</i>	64.4%,
Total employment  <i>Definition: Total employment consists of two parts: employment in the official economy (formal sector), and then employment in the unofficial economy (informal sector).</i>	151 000 people
Formal employment	133 000 people
Informal employment	18 500 people
Unemployment  <i>Definition: The unemployed includes all persons between 15 and 65 who do not have a job, who are available for jobs, or who are actively seeking a job.</i>	109 000 people (2012)

## Economy

As much as spatial planning is about planning for the people, it is also about creating a favourable economic environment. In terms of the economy the spatial needs relate to what sort of economy activity is taking place, where and how much, and the associated requirements for infrastructure. The following table summarises significant economic factors relevant to the growth and development of the region.

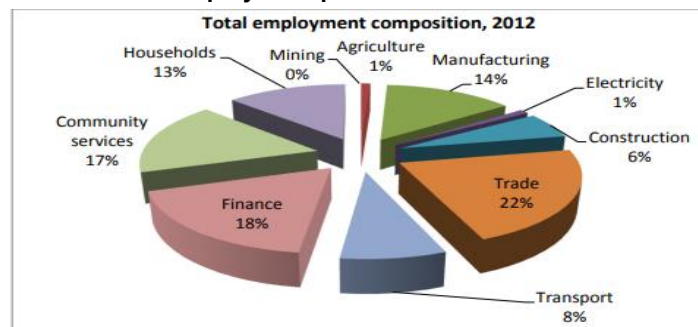
**Table 8: Economic figures for Region B**

REGION B ECONOMIC INDICATORS	NUMBER/ PERCENTAGE
Gross Domestic Product (GDP) (2012)	R 34.6 billion
<i>Definition: Gross Domestic Product by Region (GDP-R) represents the value of all goods and services produced within a region, over a period of one year, plus taxes and minus subsidies.</i>	
Contribution to the GDP of EMM (2012)	16.94%
Annual GDP growth rate	3.8%
Contributors to the economy (2012)	Agriculture – 1% Mining – 1% Manufacturing – 19% Electricity – 3% Construction – 5% Trade – 15% Transport – 13% <b>Finance – 24%</b> Community services – 19%
Average annual growth rate per sector (2012)	Agriculture – 0.3% Mining – 4% Manufacturing – 3% Electricity – 3% <b>Construction – 9%</b> Trade – 5% Transport – 6% Finance – 6% Community services – 4%

From the information above it is evident that the finance sector is the largest contributor to the economy in Region B, with the manufacturing and community services sector in second place. However, the construction sector has the fastest growth rate, followed by the finance and transport sector.

In Region B, the economic sector that recorded the largest employment number in 2012 was the trade sector with a total of 32 400 or 21.5% of the total employment (see Chart 2). The finance sector, with a total of 27 400 (18.2%) employed the second highest relative to the rest of the sectors. The mining sector with 616 (0.4%) employed the least number of people in Region B, just less than the electricity sector with 938 (0.6%) people employed.

**Chart 2: Total employment per broad economic sector**



It is necessary to take recognize that even though the agriculture sector currently contributes the least to the region's economic growth, it is a sector that offers significant opportunities for future growth and development.

#### **Applicability to the proposed development**

According to this newly approved Ekurhuleni Metropolitan Municipality Region B RSDF, the site is situated within an area earmarked as "Urban Development", which essentially means land-uses in support of the primary economic and employment areas and will primarily consist of residential development, all social facilities and services and uses as may be required to achieve sustainable urban life (i.e. limited retail, appropriate office development, nurseries, medical centres, specialized health and educational facilities, including public services.

During the drafting of this RSDF, it was estimated that Region B will require, by 2030, 6 211.2 hectares of land to accommodate the growth of the region. The following table provides a breakdown of land requirements

**Table 9: Land use demand per region**

LAND USE DEMAND 2015 TO 2030 (hectares)						
Land use	Region A	Region B	Region C	Region D	Region E	Region F
Retail	361.9	545.1	176.7	118.1	303.0	303.0
Industrial	1 364.7	851.5	355.8	371.4	450.7	1 713.4
Medical (private)	4.1	5.4	2.6	2.2	2.7	6.7
Office	266.0	141.1	65.2	73.3	52.9	310.1
Residential (subsidy)	859.5	1 502.8	592.4	532.3	1 229.6	1 586.9
Residential (rental)	63.7	111.3	43.9	39.4	76.3	117.5
Residential (bonded)	2 270.5	3 054.0	741.2	1 241.1	1 345.8	2 612.4
<b>TOTAL</b>	<b>5190.4ha</b>	<b>6 211.2ha</b>	<b>1 977.8ha</b>	<b>2 377.8ha</b>	<b>3 461.0ha</b>	<b>6 650.0ha</b>

Breakdown of land requirements per region:

The urban area within the proposed urban boundary for Region B is approximately 26 246 ha in extent of which roughly 25% – 35% will be used for housing. As per Demacon's Population and Household Estimations approximately 848 468 people will occupy the urban area by 2030. This relates to approximately 280 657 households. The proposed development is thus in line with the development proposals of the RSDF for Region B.

## **10. CULTURAL/HISTORICAL FEATURES**

Please be advised that if section 38 of the National Heritage Resources Act 25 of 1999 is applicable to your proposal or alternatives, then you are requested to furnish this Department with written comment from the South African Heritage Resource Agency (SAHRA) – Attach comment in appropriate annexure

38. (1) Subject to the provisions of subsections (7), (8) and (9), any person who intends to undertake a development categorised as-

- (a) the construction of a road, wall, powerline, pipeline, canal or other similar form of linear development or barrier exceeding 300m in length;
- (b) the construction of a bridge or similar structure exceeding 50m in length;



- (c) any development or other activity which will change the character of a site-
- (i) exceeding 5 000 m<sup>2</sup> in extent; or
  - (ii) involving three or more existing erven or subdivisions thereof; or
  - (iii) involving three or more erven or divisions thereof which have been consolidated within the past five years;
- or
- (iv) the costs of which will exceed a sum set in terms of regulations by SAHRA or a provincial heritage resource authority;
- (d) the re-zoning of a site exceeding 10 000 m<sup>2</sup> in extent; or
- (e) any other category of development provided for in regulations by SAHRA or a provincial heritage resources authority, must at the very earliest stages of initiating such a development, notify the responsible heritage resources authority and furnish it with details regarding the location, nature and extent of the proposed development.

Are there any signs of culturally (aesthetic, social, spiritual, environmental) or historically significant elements, as defined in section 2 of the National Heritage Resources Act, 1999, (Act No. 25 of 1999), including archaeological or palaeontological sites, on or close (within 20m) to the site?

YES	NO
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If YES, explain:

Not Applicable

If uncertain, the Department may request that specialist input be provided to establish whether there is such a feature(s) present on or close to the site.

Briefly explain the findings of the specialist if one was already appointed:

The subject property is significantly disturbed.

Will any building or structure older than 60 years be affected in any way?

YES	NO
YES	NO

Is it necessary to apply for a permit in terms of the National Heritage Resources Act, 1999 (Act 25 of 1999)?

If yes, please attached the comments from SAHRA in the appropriate Appendix

Should SAHRA submit comments they will be included in the Final Basic Assessment

## SECTION C: PUBLIC PARTICIPATION (SECTION 41)

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Note: The Environmental Assessment Practitioner must conduct public participation process in accordance with the requirement of the EIA Regulations, 2014.

### 1. LOCAL AUTHORITY PARTICIPATION

Local authorities are key interested and affected parties in each application and no decision on any application will be made before the relevant local authority is provided with the opportunity to give input. The planning and the environmental sections of the local authority must be informed of the application at least thirty (30) calendar days before the submission of the application to the competent authority.

Was the draft report submitted to the local authority for comment?

YES	NO
-----	----

If yes, has any comments been received from the local authority?

YES	NO
-----	----

Not Applicable since the Draft is only now being submitted to review.

If "YES", briefly describe the comment below (also attach any correspondence to and from the local authority to this application):

Not Applicable

If "NO" briefly explain why no comments have been received or why the report was not submitted if that is the case.

The public participation report is attached as **Annexure E**.

As part of the initial assessment and viability of the proposed development the City of Ekurhuleni Metropolitan Municipality - Environmental Management Department was invited to participate.

The Ward councillor of the area; Cllr Derek Thomson (Ward 01) received emails including documents like the Background Information Document. Comment from the municipality on the Draft BA will be included in the Public participation report of this Final Basic Assessment.

### 2. CONSULTATION WITH OTHER STAKEHOLDERS

Any stakeholder that has a direct interest in the activity, site or property, such as servitude holders and service providers, should be informed of the application at least **thirty (30) calendar days** before the submission of the application and be provided with the opportunity to comment.

Has any comment been received from stakeholders?

YES	NO
-----	----

If "YES", briefly describe the feedback below (also attach copies of any correspondence to and from the stakeholders to this application):

Not applicable

If "NO" briefly explain why no comments have been received

Stakeholder were given opportunity to comment on the Draft Basic Assessment Report and no comments were received within the 30-day comment period.

### 3. GENERAL PUBLIC PARTICIPATION REQUIREMENTS

The Environmental Assessment Practitioner must ensure that the public participation process is adequate and must determine whether a public meeting or any other additional measure is appropriate or not based on the particular nature of each case. Special attention should be given to the involvement of local community structures such as Ward Committees and ratepayers associations. Please note that public concerns that emerge at a later stage that should have been addressed may cause the competent authority to withdraw any authorisation it may have issued if it becomes apparent that the public participation process was flawed.

The EAP must record all comments and respond to each comment of the public / interested and affected party before the application report is submitted. The comments and responses must be captured in a Comments and Responses Report as prescribed in the regulations and be attached to this application.

### 4. APPENDICES FOR PUBLIC PARTICIPATION

All public participation information is to be attached in the appropriate Appendix. The information in this Appendix is to be ordered as detailed below:

**Annexure E provides details of the public consultation process that will be followed during the project.**

**Appendix 1** - Proof of site notices

**Appendix 2** - Written notices issued; Emails, Faxes, Letters & BID

**Appendix 3** - Proof of newspaper advertisements

**Appendix 4,7,8,10** - Communications to and from registered I&APs

**Appendix 5** - Minutes of any public and or stakeholder meetings

**Appendix 6** - Comments and Responses Report

**Appendix 9** - Copy of the I&AP Register

**Appendix 11** -Other

## SECTION D: RESOURCE USE AND PROCESS DETAILS

**Note:** Section D is to be completed for the proposal and alternative(s) (if necessary)

### Instructions for completion of Section D for alternatives

- 1) For each alternative under investigation, where such alternatives will have different resource and process details (e.g. technology alternative), the entire Section D needs to be completed.
- 2) Each alternative needs to be clearly indicated in the box below.
- 3) Attach the above documents in a chronological order.

Section D has been duplicated for alternatives  times  
(complete only when appropriate)

Section D Alternative No.  (complete only when appropriate for above)

## 1. WASTE, EFFLUENT & EMISSION MANAGEMENT

### Solid Waste Management

Will the activity produce solid construction waste during the construction/initiation phase?

YES	NO
<b>Unknown at this stage</b>	

If yes, what estimated quantity will be produced per month?

How will the construction solid waste be disposed of (describe)?

The building rubble and solid construction waste (such as sand, gravel, concrete and waste material) that cannot be used for filling and rehabilitation and other litter and waste generated during the construction phase will be removed from site and be disposed of safely and responsibly at a licensed landfill site, i.e. a landfill licensed in terms of Section 20 of the Environmental Conservation Act, 1989 (Act No. 73 of 1989).

Where will the construction solid waste be disposed of (describe)?

All non-recycled general waste will be removed by a registered waste Contractor and taken to the licensed Landfill Site.

Will the activity produce solid waste during its operational phase?

YES	NO
<b>Unknown at this stage</b>	

If yes, what estimated quantity will be produced per month?

How will the solid waste be disposed of (describe)?

Solid waste during the operational phase will primarily be household waste. It will be picked-up by the local municipality and discarded at a registered landfill site. Refuse is brought to these areas and removed on a weekly basis by Council or as necessary.

Has the municipality or relevant service provider confirmed that sufficient air space exists for treating/disposing of the solid waste to be generated by this activity?

YES	NO
-----	----

Where will the solid waste be disposed if it does not feed into a municipal waste stream (describe)?

Waste will feed into the City of Ekurhuleni Metropolitan Municipality's waste stream.

**Note:** If the solid waste (construction or operational phases) will not be disposed of in a registered landfill site or be taken up in a municipal waste stream, the applicant should consult with the competent authority to determine whether it is necessary to change to an application for scoping and EIA.

Can any part of the solid waste be classified as hazardous in terms of the relevant legislation?

YES	NO
-----	----

If yes, inform the competent authority and request a change to an application for scoping and EIA.

Is the activity that is being applied for a solid waste handling or treatment facility?

YES	NO
-----	----

If yes, the applicant should consult with the competent authority to determine whether it is necessary to change to an application for scoping and EIA.

Describe the measures, if any, that will be taken to ensure the optimal reuse or recycling of materials:

Recycling facilities for paper and glass will be available within the small waste transfer station on the property.

**General Waste Management**

- Litter and rubble on the construction site and in the construction, camp will be monitored strictly by a dedicated housekeeping team.
- All waste generated on site will be separated into metal, paper, plastic, glass & contaminated paper, glass, plastic and polystyrene and will be recycled.

**Construction rubble**

- All rubble from demolition activities will be used on site as part of the existing development or will be taken off the construction site and disposed at an appropriate landfill.
- No material shall be left on site that may harm man or animals. Broken, damaged and unused nuts, bolts and washers shall be picked up and removed from site.
- Surplus concrete will not be dumped indiscriminately.
- Concrete water will be re-used in the batching process

**Operational waste**

- As per the NEM: WA, waste is to be sorted and recycled at source.

**Liquid Effluent (other than domestic sewage)**

Will the activity produce effluent, other than normal sewage, that will be disposed of in a municipal sewage system?

YES	NO
-----	----

If yes, what estimated quantity will be produced per month?

n/a	
-----	--

If yes, has the municipality confirmed that sufficient capacity exists for treating / disposing of the liquid effluent to be generated by this activity(ies)?

n/a	n/a
-----	-----

Will the activity produce any effluent that will be treated and/or disposed of onsite?  
 If yes, what estimated quantity will be produced per month?

Yes	<b>NO</b>
n/a	

If yes describe the nature of the effluent and how it will be disposed.

Not Applicable

Note that if effluent is to be treated or disposed on site the applicant should consult with the competent authority to determine whether it is necessary to change to an application for scoping and EIA

Will the activity produce effluent that will be treated and/or disposed of at another facility?

YES	<b>NO</b>
-----	-----------

If yes, provide the particulars of the facility:

Facility name:			n/a
Contact person:			n/a
Postal address:			n/a
Postal code:			n/a
Telephone:	n/a	Cell:	n/a
E-mail:	n/a	Fax:	n/a

Describe the measures that will be taken to ensure the optimal reuse or recycling of waste water, if any:

No waste water will be produced for this proposed activity.

### Liquid Effluent (Domestic Sewage)

Will the activity produce domestic effluent that will be disposed of in a municipal sewage system?

<b>YES</b>	<b>NO</b>
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If yes, what estimated quantity will be produced per month?

To be confirmed

If yes, has the municipality confirmed that sufficient capacity exists for treating / disposing of the domestic effluent to be generated by this activity(ies)?

YES	<b>NO</b>
-----	-----------

Will the activity produce any effluent that will be treated and/or disposed of onsite?  
 If yes describe how it will be treated and disposed off.

YES	<b>NO</b>
-----	-----------

n/a

### Emissions into the Atmosphere

Will the activity release emissions into the atmosphere?

YES	<b>NO</b>
-----	-----------

If yes, is it controlled by any legislation of any sphere of government?

YES	<b>NO</b>
-----	-----------

If yes, the applicant should consult with the competent authority to determine whether it is necessary to change to an application for scoping and EIA.

If no, describe the emissions in terms of type and concentration:

Emissions during construction will mostly be in the form of dust and smoke.

Odor from the refuse yards are to be combated by the provision of a compaction unit and is to be walled.

The EMPr attached in **Annexure H** of the Basic Assessment Report indicates various ways in which these emissions will be minimized and controlled.

## 2. WATER USE

Indicate the source(s) of water that will be used for the activity

<b>Municipal</b>	Directly from water board	groundwater	river, stream, dam or lake	other	the activity will not use water
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If water is to be extracted from groundwater, river, stream, dam, lake or any other natural feature, please indicate

the volume that will be extracted per month:

Not Applicable

If Yes, please attach proof of assurance of water supply, e.g. yield of borehole, in the appropriate Appendix

Does the activity require a water use permit from the Department of Water Affairs?

YES

NO

If yes, list the permits required

A General Authorisation will be required in terms of Section 21 of the NWA. Section 21 (c) and (i) is applicable to any activity related to a wetland:

Section 21(c): impeding or diverting the flow of water in a watercourse

Section 21(i): altering the bed, banks, course or characteristics of a watercourse

The applicant will lodge a WULA after the approval of the Environmental Authorisation.

If yes, have you applied for the water use permit(s)?

YES

NO

If yes, have you received approval(s)? (attached in appropriate appendix)

YES

NO

## 3. POWER SUPPLY

Please indicate the source of power supply e.g. Municipality / Eskom / Renewable energy source

Municipality

If power supply is not available, where will power be sourced from?

See above

## 4. ENERGY EFFICIENCY

Describe the design measures, if any, that have been taken to ensure that the activity is energy efficient:

The following energy savings methods shall be investigated for possible implementation for the proposed development:

- Use of energy efficient lighting,
- Use of day light wherever possible in lieu of artificial lighting,
- Use of renewable solar powered lighting for external lighting,
- Switching off of all electrical appliances at night and times not in use,
- Use of high-efficient HVAC systems,
- Possibility of co-generation in co-operation with the supply authority,
- Use of solar water heating,
- Setting thermostats of water heaters at the most efficient level,
- Insulation of hot water pipes and hot water storage tanks,

- Use of low-flow shower heads,
- Use of high-efficient electric motors,
- Use of variable speed drives on electric motors,
- Use of appropriate conductor size to reduce distribution losses,
- Use of control methods to reduce maximum demand and exploit off peak electricity tariffs,
- Insulation of windows, walls, ceilings and roofs.

Describe how alternative energy sources have been taken into account or been built into the design of the activity, if any:

The design intent is to make use of renewable solar powered lighting for external lighting.

## SECTION E: IMPACT ASSESSMENT

The assessment of impacts must adhere to the minimum requirements in the EIA Regulations, 2014, and should take applicable official guidelines into account. The issues raised by interested and affected parties should also be addressed in the assessment of impacts as well as the impacts of not implementing the activity (Section 24(4)(b)(i)).

### 1. ISSUES RAISED BY INTERESTED & AFFECTED PARTIES

Summarise the issues raised by interested and affected parties.

Although comments were requested from the I&AP - No comments received.

Summary of response from the practitioner to the issues raised by the interested and affected parties (including the manner in which the public comments are incorporated or why they were not included)

(A full response must be provided in the Comments and Response Report that must be attached to this report):

No comments received.

### 2. IMPACTS THAT MAY RESULT FROM THE CONSTRUCTION & OPERATIONAL PHASE

Briefly describe the methodology utilized in the rating of significance of impacts.

**A combination of the following methods was used to identify impacts during the Basic Assessment:**

#### 2.1. Specialist Study Findings

A minimum of legally responsible specialist studies is conducted (as usually required by the relevant authority). These usually include a red data fauna & flora assessment and heritage impact assessment. The findings of such specialist studies will highlight potential impacts on protected or endangered species or environments.

#### 2.2. Site Inspection

The EAP and specialists conduct several site visits and identified potential sensitive environments. These areas are then red-flagged to be investigated further and excluded from development if necessary.

#### 2.3 Technical / Desktop Studies



Technical and specialist reports such as the geotechnical and agricultural assessments are used to identify those areas and aspects that may be impacted on, but that will not be identified through the other specialists' studies.

**2.4 Public Participation**

Conducting public participation produces an issues list. Such a list needs to be screened for relevant impacts which then need to be addressed by specialist studies or identified for further investigation.

**2.5 GDARD Policies, Review / Terms of Reference**

GDARD C-Plan 3 as well as the policies provides the red flags that must be investigated by the specialists. Furthermore, the GDARD officials and the different sub-directorates within the department review the application and give comments to the relevant environmental officer. The issues identified are forwarded to the environmental consultant and these issues are addressed or translated as impacts.

**2.6 Methodology to determine significance of impacts**

The significance of the identified impacts will be determined using the approach outlined below. This incorporates two aspects or assessing the potential significance of impacts (terminology from the Department of Environmental Affairs and Tourism Guideline document on EIA Regulations, April 1998), namely occurrence and severity, which are further sub-divided as follows:

**Table 1: Methodology to Assess Impacts**

Occurrence		Severity	
Probability of occurrence	Duration of occurrence	Magnitude (severity) of impact	Scale / extent of impact

To assess each of these factors for each impact, the following four ranking scales are used:

<b>Probability</b>	<b>Duration</b>
5 – Definite/don't know	5 – Permanent
4 – Highly probable	4 – Long-term
3 – Medium probability	3 –Medium-term (8-15 years)
2 – Low probability	2 – Short-term (0-7 years) (impact ceases after the operational life of the activity)
1 – Improbable	1 – Immediate
0 – None	
<b>Scale</b>	<b>Magnitude</b>
5 – International	10 – Very high/don't know
4 – National	8 – High
3 – Regional	6 – Moderate
2 – Local	4 – Low
1 – Site only	2 – Minor
0 – None	

Once these factors are ranked for each impact, the significance of the two aspects, occurrence and severity, is assessed using the following formula:

**SP (significance points) = (probability + duration + scale) x magnitude**

The maximum value is 150 significance points (SP). The impact significance will then be rated as follows:

SP >75	Indicates <b>high</b> environmental significance	An impact which could influence the decision about whether or not to proceed with the project regardless of any possible mitigation.
SP 30 – 75	Indicates <b>moderate</b> environmental significance	An impact or benefit which is sufficiently important to require management, and which could have an influence on the decision unless it is mitigated.
SP <30	Indicates <b>low</b> environmental significance	Impacts with little real effect and which should not have an influence on or require modification of the project design.

Briefly describe and compare the potential impacts (as appropriate), significance rating of impacts, proposed mitigation and significance rating of impacts after mitigation that are likely to occur as a result of the construction phase for the various alternatives of the proposed development. This must include an assessment of the significance of all impacts.

**Refer to Table 10 and Table 11 below:**

## 2.7 Significance scores of expected impacts

### Preferred Alternative – Proposed township development

**Table 10: Assessment of Potential Impact of the Preferred Alternative  
Construction Phase**

Potential Impact	Scale	Duration	Probability	Magnitude	Significance Points	Impact Significance	Confidence
<b>BIOPHYSICAL ENVIRONMENT</b>							
<b>1. ISSUE: AIR QUALITY</b>							
1.1 Dust/Air pollution - The generation of fugitive dust associated with construction activities & earthworks.	Local (2)	Short term (2)	Highly probable (4)	Moderate (6)	60	Moderate	high
<b>2. ISSUE TOPOGRAPHY</b>							
2.1 Visual Impacts: Topographical features contribute to the landscape character and sense of place of an area. Visual scarring due to cutting and embankments and areas devoid of vegetation are most obvious when located on elevated areas in the landscape	Local (2)	Long term (4)	Highly probable (4)	Moderate (6) - Situated on the urban edge in a partially developed area	60	Moderate	high
2.2 Bulk earthworks: Deep cuttings, high embankments, disposal of soil and excavations cause local changes to topography	Site only (1)	Long term (4)	Highly probable (4)	Moderate (6)	54	Moderate	high
<b>3. ISSUE GEOLOGY AND SOILS</b>							
3.1 Soil erosion, loss of topsoil, deterioration of soil quality	Local (2)	Long term (4)	Highly probable (4)	High (8)	80	High	high
3.2 Soil pollution (due to potential hydrocarbon spillages by trucks etc)	Local (2)	Medium term (4)	High probability (4)	Moderate (6)	80	High	high
<b>4. ISSUE FAUNA AND FLORA</b>							
4.1 Degradation, destruction of habitats/ ecosystem and impact on connectivity – classified as a Critical Biodiversity Area (CBA)	Site only (1)	Long term (4)	Highly probable (4)	High (8)	72	Moderate	high

Potential Impact	Scale	Duration	Probability	Magnitude	Significance Points	Impact Significance	Confidence
4.2 Impacts on fauna and flora	Local (2)	Long term (4)	Low probable (4)	Low (4)	80	High	high
<b>5. ISSUE HYDROLOGY</b>							
5.1 Storm water flow and drainage- Developments cause the modification of drainage patterns. Storm water may be concentrated at certain points, increasing the velocity of flow in one area and reducing flow in another. This may contribute to flooding, soil erosion, sedimentation, scouring and channel modification downstream of the development.	Regional (3)	Long term (4)	Highly probable (4)	High (8)	88	High	high
5.2 Impact on water quality of water resources situated within the vicinity of the proposed development.	Regional (3)	Long term (4)	High probability (4)	High (8)	88	High	high
<b>SOCIO-ECONOMIC AND CULTURAL HISTORICAL ENVIRONMENT</b>							
<b>6. ISSUE AESTHETICS, LANDSCAPE CHARACTER AND SENSE OF PLACE</b>							
6.1 Noise/ vibration	Local (2)	Long term (4)	Highly probable (4)	Moderate (6)	60	Moderate	high
6.2 Visual impact on adjacent residents and motorists	Local (2)	Long term (4)	Highly probable (4)	Moderate (6)	60	Moderate	high
<b>7. ISSUE SOCIAL WELL-BEING AND QUALITY OF THE ENVIRONMENT</b>							
7.1 Safety and Security	Local (2)	Long term (4)	Highly probable (4)	Moderate (6)	60	Moderate	high
7.2 Employment opportunities	Local (2)	Long term (4)	Highly Probable (4)	High (8)	80	High Positive	High
<b>8. ISSUE HISTORICAL ENVIRONMENT</b>							
8.1 Destruction of palaeontological resources –	Site Only (1)	Short term (2)	Highly probable (4)	Moderate (6)	42	-Moderate	-High

Potential Impact	Scale	Duration	Probability	Magnitude	Significance Points	Impact Significance	Confidence
<b>9. ISSUE INFRASTRUCTURE AND SERVICES/WASTE</b>							
9.1 Generation of waste	Local (2)	Medium term (3)	High probability (4)	High (8)	72	Moderate	high
9.1 Pressure on existing infrastructure and services	Local (2)	Short term (2)	High (4)	Moderate (6)	48	Moderate	High
<b>10. ISSUE DESIGN AND LAYOUT</b>							
10.1 Functional design	Local (2)	Long term (4)	Highly Probable (4)	High (8)	80	High Positive	High

### Operational Phase

Potential Impact	Scale	Duration	Probability	Magnitude	Significance Points	Impact Significance	Confidence
<b>BIOPHYSICAL ENVIRONMENT</b>							
<b>1. ISSUE: AIR QUALITY</b>							
1.1 Dust/Air pollution - The generation of fugitive dust associated with operational phase.	Local (2)	Short term (2)	Highly probable (4)	Moderate (6)	60	Moderate	high
<b>2. ISSUE TOPOGRAPHY</b>							
2.1 Visual Impacts: Topographical features contribute to the landscape character and sense of place of an area. Visual scarring due to cutting and embankments and areas devoid of vegetation are most obvious when located on elevated areas in the landscape	Local (2)	Long term (4)	Highly probable (4)	Moderate (6) - Situated on the urban edge in a partially developed area	60	Moderate	high
2.2 Bulk earthworks: Deep cuttings, high embankments, disposal of soil and excavations cause local changes to topography	Site only (1)	Long term (4)	Highly probable (4)	Moderate (6)	54	Moderate	high

Potential Impact	Scale	Duration	Probability	Magnitude	Significance Points	Impact Significance	Confidence
<b>3. ISSUE GEOLOGY AND SOILS</b>							
3.1 Soil erosion, loss of topsoil, deterioration of soil quality	Local (2)	Long term (4)	Highly probable (4)	High (8)	80	High	high
3.2 Soil pollution (due to potential hydrocarbon spillages by trucks etc)	Local (2)	Medium term (4)	High probability (4)	Moderate (6)	80	High	high
<b>4. ISSUE FAUNA AND FLORA</b>							
4.1 Degradation, destruction of habitats/ ecosystem and impact on connectivity – classified as a Critical Biodiversity Area (CBA)	Site only (1)	Long term (4)	Highly probable (4)	High (8)	72	Moderate	high
4.2 Impacts on fauna and flora	Local (2)	Long term (4)	Low probable (4)	Low (4)	80	High	high
<b>5. ISSUE HYDROLOGY</b>							
5.1 Storm water flow and drainage- Developments cause the modification of drainage patterns. Storm water may be concentrated at certain points, increasing the velocity of flow in one area and reducing flow in another. This may contribute to flooding, soil erosion, sedimentation, scouring and channel modification downstream of the development.	Regional (3)	Long term (4)	Highly probable (4)	High (8)	88	High	high
5.2 Impact on water quality of water resources situated within the vicinity of the proposed development.	Regional (3)	Long term (4)	High probability (4)	High (8)	88	High	high
<b>SOCIO-ECONOMIC AND CULTURAL HISTORICAL ENVIRONMENT</b>							
<b>6. ISSUE AESTHETICS, LANDSCAPE CHARACTER AND SENSE OF PLACE</b>							
6.1 Noise/ vibration	Local (2)	Long term (4)	Highly probable (4)	Moderate (6)	60	Moderate	high
6.2 Visual impact on adjacent residents and motorists	Local (2)	Long term (4)	Highly probable (4)	Moderate (6)	60	Moderate	high

Potential Impact	Scale	Duration	Probability	Magnitude	Significance Points	Impact Significance	Confidence
<b>7. ISSUE SOCIAL WELL-BEING AND QUALITY OF THE ENVIRONMENT</b>							
7.1 Safety and Security	Local (2)	Long term (4)	Highly probable (4)	Moderate (6)	60	Moderate	high
7.2 Employment opportunities	Local (2)	Long term (4)	Highly Probable (4)	High (8)	80	High Positive	High
<b>8. ISSUE HISTORICAL ENVIRONMENT</b>							
8.1 Destruction of palaeontological resources –	Not Applicable	-	-	-	-	-	-
<b>9. ISSUE INFRASTRUCTURE AND SERVICES/WASTE</b>							
9.1 Generation of waste	Local (2)	Medium term (3)	High probability (4)	High (8)	72	Moderate	high
9.1 Pressure on existing infrastructure and services	Local (2)	Short term (2)	High (4)	Moderate (6)	48	Moderate	High
<b>10. ISSUE DESIGN AND LAYOUT</b>							
10.1 Functional design	Local (2)	Long term (4)	Highly Probable (4)	High (8)	80	High Positive	High

**Table 11: Assessment of potential impacts and proposed mitigation measures**

Potential Impacts	Significance rating of impacts before mitigation	Proposed mitigation	Significance rating of impacts after mitigation
<p><b>1.1 Dust /Air pollution</b>  <b>The generation of dust associated with construction activities &amp; earthworks</b></p>	<p>Moderate</p>	<ul style="list-style-type: none"> <li>• The building area is to be physically screened off with a shade cloth fence at least 1.8m in height, to prevent dust from being blown onto the road or neighbouring properties.</li> <li>• Dust generation should be kept to a minimum.</li> <li>• Dust must be suppressed on access roads and construction areas during dry periods by the regular application of water or a biodegradable soil stabilisation agent.</li> <li>• Speed limits must be implemented in all areas, including public roads and private property to limit the levels of dust pollution.</li> <li>• It is recommended that the clearing of vegetation from the site should be selective and done just before construction so as to minimise erosion and dust.</li> <li>• Should construction in areas that have been stripped not be commencing within a short period of time the exposed areas shall be re-vegetated or stabilised. Soil stabilising measures could include rotovating in straw bales (at a rate of 1 bale/20 m<sup>2</sup>), applying mulching or brush packing, or creating windbreaks using brush or bales.</li> <li>• Excavating, handling or transporting erodible materials in high wind or when dust plumes are visible shall be avoided.</li> <li>• All materials transported to site must be transported in such a manner that they do not fly or fall off the vehicle. This may necessitate covering or wetting friable materials.</li> <li>• No burning of refuse or vegetation is permitted.</li> </ul>	<p>Low</p>
<p><b>2.1 Visual Impacts - Topographical changes</b></p>	<p>Moderate</p>	<ul style="list-style-type: none"> <li>• The site area is to be physically screened off with a shade cloth fence at least 1.8m in height.</li> <li>• The site must be managed appropriately, and all rubbish and rubble removed to a recognized waste facility.</li> <li>• Excess soil and bedrock should be disposed of at an appropriate facility.</li> <li>• A certificate of disposal must be obtained for any waste that is disposed of.</li> <li>• Waste must not remain on site for more than 2 weeks.</li> <li>• Refuse bins must be provided by the Contractor for rubbish to be used by staff.</li> <li>• Excess concrete must be disposed of correctly and at an appropriate facility.</li> <li>• No waste may be placed in any excavations on site.</li> </ul>	<p>Low</p>



Potential Impacts	Significance rating of impacts before mitigation	Proposed mitigation	Significance rating of impacts after mitigation
		<ul style="list-style-type: none"> <li>• The construction camp must be located as far from other properties as possible.</li> <li>• Light pollutions should be minimised.</li> <li>• The construction footprint must be minimised.</li> <li>• Construction / management activities must be limited to the daylight hours between 7:00am and 5:30pm weekdays; 7:00am and 1:30pm on Saturdays.</li> <li>• Lighting on site is to be sufficient for safety and security purposes, but shall not be intrusive to neighbouring residents, disturb wildlife, or interfere with road traffic.</li> <li>• Should overtime/night work be authorized, the Contractor shall be responsible to ensure that lighting does not cause undue disturbance to neighbouring residents.</li> <li>• In this situation, low flux and frequency lighting shall be utilised.</li> </ul>	
<b>2.2 Bulk earthworks</b>	Moderate	<ul style="list-style-type: none"> <li>• Avoid development on excessively steep slopes.</li> <li>• Avoid cutting steep embankments</li> <li>• Provide the necessary erosion protection measures.</li> </ul>	Low
<b>3.1 Soil erosion, loss of topsoil, deterioration of soil quality</b>	Moderate	<ul style="list-style-type: none"> <li>• Appropriate erosion and stormwater management structures must be installed around the construction site.</li> <li>• All construction vehicles, plant, machinery and equipment must be properly maintained to prevent leaks.</li> <li>• Plant and vehicles are to be repaired immediately upon developing leaks. Drip trays shall be supplied for all repair work undertaken on machinery on site or campsite area.</li> <li>• Drip trays are to be utilised during daily greasing and re-fueling of machinery and to catch incidental spills and pollutants.</li> <li>• Drip trays are to be inspected daily for leaks and effectiveness and emptied when necessary. This is to be closely monitored during rain events to prevent overflow.</li> <li>• Vehicles to be used during the construction phase are to be kept in good working condition and should not be the source of excessive fumes.</li> <li>• Fuels and chemicals must be stored in adequate storage facilities that are secure, enclosed and banded.</li> <li>• All excavations and foundations must be inspected regularly.</li> <li>• Once earthworks are complete, disturbed areas are to be stabilised with mulch, straw or other approved method.</li> </ul>	Low
<b>3.2 Soil Pollution</b>	Moderate	<ul style="list-style-type: none"> <li>• Ensure correct position of construction caps, equipment yards, refueling depots, concrete batching plant etc. to avoid areas susceptible to soil and water pollution.</li> <li>• Ensure appropriate handling of hazardous substances</li> <li>• Remediate polluted soil.</li> </ul>	Low

Potential Impacts	Significance rating of impacts before mitigation	Proposed mitigation	Significance rating of impacts after mitigation
		<ul style="list-style-type: none"> <li>• The maintenance of vehicles and equipment used for any purpose during the development will take place only in the maintenance yard. Any breakdown in the field requires the presence of a spill treatment team and equipment. This team must prevent and mitigate any spills that occur in this situation.</li> <li>• Equipment used in the development process must be adequately maintained so that during operations it does not spill oil, diesel, fuel, or hydraulic fluid.</li> <li>• In the event of spills from vehicles, the area should be cleaned immediately using a bioremediation product, such as <i>Petro-Clean™</i>. The absorbent and soil must be placed in a bin and removed from the site by a certified company and disposed of as a hazardous waste at a licensed commercial facility. No Hydrocarbons may escape into the environment. A spill recovery kit must be on site, along with trained personnel.</li> </ul>	
<p><b>4.1 Degradation, destruction or elimination of habitats/ecosystems</b></p>	<p><b>High – Moderate</b></p>	<ul style="list-style-type: none"> <li>• Red data plant species may occur (suitable habitat for several species, though presence not confirmed during field survey) on the proposed development. Wetland habitat along the eastern side of the site has been designated as ecologically sensitive.</li> <li>• No development will occur within the 32m buffer zone of the drainage line.</li> <li>• Site clearing is to be limited to only the area necessary for carrying out the specified works and the destruction of vegetation should be minimised.</li> <li>• No littering by construction workers is permitted. Any litter will be collected and removed off-site to a registered waste site.</li> <li>• Cleared indigenous vegetation can be stockpiled for possible reuse in later rehabilitation or landscaping, or as a brush pack for erosion prevention.</li> <li>• Stockpiles of vegetation are only to be located in areas approved by the ECO and may not exceed 2m in height. Methods of stacking must take cognisance of the possible creation of a fire hazard.</li> <li>• No burning of stockpiled vegetation is permitted.</li> <li>• All alien plants that occur in South Africa. None of these species may be introduced and they must all be controlled.</li> <li>• The alien plants on site will be removed during construction.</li> <li>• Care must be taken to avoid the introduction of alien plant species to the site and surrounding areas. (Particular attention must be paid to imported material).</li> <li>• Alien vegetation re-growth must be controlled throughout the entire site during the construction period.</li> </ul>	<p>Moderate</p>

Potential Impacts	Significance rating of impacts before mitigation	Proposed mitigation	Significance rating of impacts after mitigation
		<ul style="list-style-type: none"> <li>• Remaining indigenous trees (naturally occurring in the area) should be retained wherever possible</li> <li>• The wetland area including the buffer zone should be fenced-off during the construction phase.</li> <li>• Currently very few alien plants occur within this plant community (excluding the wattle bush).</li> <li>• An alien invasive management programme must be incorporated into the Environmental Management Programme (particularly the wattle bush);</li> <li>• Ongoing alien plant control must be undertaken;</li> <li>• Areas which have been disturbed will be quickly colonised by invasive alien species. An ongoing management plan must be implemented for the clearing/eradication of alien species.</li> <li>• Monitor all sites disturbed by construction activities for colonisation by exotics or invasive plants and control these as they emerge.</li> <li>• Avoid planting of exotic plant species in public areas or home gardens, use indigenous species.</li> <li>• Use indigenous plant species in all gardens</li> </ul>	
4.2 Impacts on fauna and flora	Moderate - low	<ul style="list-style-type: none"> <li>• No RDL or otherwise sensitive fauna or flora is thought to inhabit the actual proposed development site due to the generally poor PES of the area. Wetland habitat along the eastern side of the site has been designated as ecologically sensitive.</li> <li>• Other than the road crossing the wetland and services crossing within the road reserve no development will occur within the 15m buffer zone of the wetland</li> <li>• The contractor must ensure that no fauna species are disturbed, trapped, hunted or killed during the construction phase.</li> <li>• Disturbance to birds, animals and reptiles and their habitats should be prevented at all times.</li> <li>• The illegal hunting or capture of wildlife will not be tolerated. Such matters will be handed over to the relevant authorities for prosecution.</li> <li>• These species should then be relocated to a natural habitat.</li> <li>• During the construction phase, artificial lighting must be restricted to areas under construction only. Where lighting is required for safety or security reasons, this should be targeted at the areas requiring attention. Yellow sodium lights or Compressed Fluorescent Bulbs (CFL"s) should be prescribed as they do not attract as many invertebrates (insects) at night</li> </ul>	Low

Potential Impacts	Significance rating of impacts before mitigation	Proposed mitigation	Significance rating of impacts after mitigation
		<p>and will not disturb the existing wildlife. Sodium lamps require a third less energy than conventional light bulbs.</p> <ul style="list-style-type: none"> <li>• Ideally fences should not restrict the natural migratory movements of certain animals. The site offers limited suitable migratory habitat. Electric fences have a negative impact on certain animal species including Bush babies, geckoes, chameleons, bullfrogs and tortoises. Palisade fencing with adequate gaps is recommended for the conserved public open spaces.</li> <li>• Before any vegetation is removed, a suitably qualified person (i.e. on ECO request of a vegetation specialist) shall inspect the study area for any plant/ grass/ tree species that could be transplanted to other similar/ suitable areas. This includes all Red Data or Protected, or rare plants that may be found during the flora site assessment or during construction operations.</li> <li>• No medicinal / protected / Red Data Flora was found on the site however should any medicinal/ protected/ Red Data flora that will have to be removed shall be removed by a suitably qualified specialist and relocated. The applicable responsible person at the provincial department must be notified in the event of such plants being identified, who will then advise the ECO regarding what steps need to be taken and who will be responsible for the relocation and transplantation processes.</li> <li>• All invader or exotic plant species must be removed from the site and disposed of at a landfill site.</li> <li>• All Declared Weeds and invaders must be removed from the site.</li> <li>• Where herbicides are used to clear vegetation, specimen-specific chemicals should be applied to individual plants only. General spraying should be prohibited.</li> <li>• Only indigenous floral species (preferably using endemic or local species from the area), which are water wise and require minimal horticultural practices may be used during landscaping and rehabilitation.</li> <li>• Remaining indigenous trees (naturally occurring in the area) should be retained wherever possible</li> <li>• The body corporate should be encouraged to plant indigenous non-invasive plants. The attention of property owners must be drawn to the most recent Declared Weeds List (2001) in the <i>Conservation of Agricultural Resources Act 43 of 1983</i> and the associated penalties and prohibitions</li> <li>• The least environmentally damaging insecticides, to manage invertebrate pests, must be applied. Pyrethroids and</li> </ul>	

Potential Impacts	Significance rating of impacts before mitigation	Proposed mitigation	Significance rating of impacts after mitigation
		<p>Phenylpyrazoles are preferable to Acetylcholines. Use insecticides that are specific to the pest (species specific) in question. The lowest effective dosages must be applied. The suppliers advice should always be sought. Do not irrigate for 24 hours after applying insecticides in areas where there is a chance of contaminating water-courses or dams, fungal pathogens should be used in preference to chemical insecticides.</p>	
<p><b>5.1 Stormwater flow, drainage and increased runoff due to hardened surfaces</b></p>	<p>Moderate</p>	<ul style="list-style-type: none"> <li>• Natural storm water must flow freely, either as sheet flow or where necessary in open grass swales, to allow for infiltration and retention. Natural veld grass must be left undisturbed as far as possible, to allow natural drainage.</li> <li>• Drainage channels must be constructed along access roads every 50m to divert runoff during construction period.</li> <li>• Energy dissipaters (gabions/grass bales etc.) must be installed at all potential large flow volume areas, especially during the construction phase where large areas will be open soil.</li> <li>• Where feasible the use of vegetated swales should be used to accommodate surface runoff, in order to increase infiltration into the soil. The swales should be vegetated with indigenous, riparian vegetation in order to provide habitat for bird life and other aquatic and semi-aquatic species. Where feasible, the swales should be provided adjacent to the property boundaries along the natural gradient</li> <li>• The cross-section of the swale should be parabolic or trapezoidal in shape with side slopes no steeper than 1:3, to maximise the wetted channel perimeter. It is recommended that the longitudinal slope not exceed 2% where possible and that a maximum slope of 4% be used. Where a 4% slope must be exceeded, check dams should be provided at a minimum interval of 17m. As a rule of thumb the total surface area of the swale must be 1% of the area that drains into the swale. The surface of the swale must be carefully constructed, to avoid compaction, which will inhibit dense vegetation growth and effective runoff infiltration. The installation of vegetated filter strips parallel to the top of the channel banks can help to treat sheet flows entering the swale.</li> <li>• Maintenance of the swale should include periodic mowing of the grass (never shorter than the design flow depth of the channel). Bare areas should be re-seeded, and debris and blockages regularly removed. Sediment depositions should be regularly removed from the swale, to prevent pollution of the runoff from contaminants contained therein.</li> </ul>	<p>Low</p>

Potential Impacts	Significance rating of impacts before mitigation	Proposed mitigation	Significance rating of impacts after mitigation
		<ul style="list-style-type: none"> <li>• Please note that the recommendations for the design of the swales are guidelines only and that the designs of the swales, sedimentation ponds and check dams must be done by a hydrological engineer.</li> <li>• Permeable paving should be used to reduce runoff and increase infiltration and ground water recharge.</li> <li>• As much as possible water should be retained on site to be reused again for irrigation and habitat creation.</li> <li>• Both storm water and excess effluent intended for irrigation must be purified according to DWS standards.</li> </ul>	
<p><b>5.2 Impacts</b>  <b>Drainage line and</b>  <b>water quality</b></p>	<p>High -  Moderate</p>	<ul style="list-style-type: none"> <li>• Utilize proper waste management practices.</li> <li>• Cover any wastes that are likely to wash away or contaminate storm water</li> <li>• Ensure handling, transport and disposal of hazardous substances are adequately controlled and managed.</li> <li>• Provide containment areas for potential pollutants at construction camps, refueling depot and concrete batching plants.</li> <li>• Fuel storage shall be within the construction camp, and within a bunded area with at least 110% of the volume of the amount of fuel stored, as per agreement and approval of the ECO. No storage of any fuel will be allowed on site, other than what is approved by the applicable provincial government departments.</li> <li>• Drip trays (min 10cm deep) are to be placed under all vehicles if they stand for more than 3 hours. The drip tray must be able to contain 110% of the total amount/ volume of oil in the vehicle. Spill kits must be available in all vehicles that transport hydrocarbons for dispensing to other vehicles on the site. The dispensing devices (pump heads) must be compatible with the vehicles to which they are dispensing. In addition, the dispensing devices must be fitted with the necessary valves/ apparatus that will ensure that the nozzles do not drip fuel after pumping has stopped.</li> <li>• Cement mixing shall be done only at specifically selected sites. After construction activities ended the cement shall be crushed and removed from the site. This mixing area shall then be ripped and rehabilitated.</li> <li>• Limit the construction footprint and support areas (e.g. temporary access servitudes) as far as possible;</li> <li>• No indiscriminate destruction of wetland vegetation should be allowed;</li> </ul>	<p>Low</p>

Potential Impacts	Significance rating of impacts before mitigation	Proposed mitigation	Significance rating of impacts after mitigation
		<ul style="list-style-type: none"> <li>• Make use of geotextiles within disturbed areas of steeper topography to avoid erosion through surface water runoff;</li> <li>• Stormwater management along informal roadways to reduce gulley erosion formation;</li> <li>• Construct within the low-flow (dry) period;</li> <li>• Correct site reinstatement and landscaping following any disturbances will abate channel and gulley formation;</li> <li>• Proper re-instatement of soils and landscaping to limit erosion gulley formation.</li> <li>• Soil layers within wetland zones are to be stored in their respective layers and replaced after entrenching has occurred in reverse order i.e. the original soil layering must be retained should entrenching within wetland habitat found to be necessary. Provision for this should be detailed within a rehabilitation plan and the site reinstatement should be audited by suitably qualified personnel.</li> <li>• No dumping of any excess building material or other wastes or litter should be allowed within any wetland and buffer areas;</li> <li>• Exotic vegetation recruitment was observed as an impacting feature within the wetlands. It is recommended that an exotic vegetation management strategy be developed as part of a rehabilitation plan to manage the present and future emergent exotic vegetation;</li> <li>• Subsistence hunting or harvesting of fauna or flora within the wetland zones should be prohibited;</li> </ul>	
<b>6.1 Noise/ vibration</b>	High	<ul style="list-style-type: none"> <li>• Noise levels shall be kept within acceptable limits, and construction crew must abide by National Noise Laws and local by-laws regarding noise.</li> <li>• If work is to be undertaken outside of normal work hours permission, must be obtained. Prior to commencing any such activity, the Contractor is also to advise the potentially affected neighbouring residents. Notification could include letter-drops.</li> <li>• No sound amplification equipment such as sirens, loud hailers or hooters are to be used on site except in emergencies and no amplified music is permitted on site.</li> <li>• Construction / management activities involving use of the service vehicle, machinery, hammering etc., must be limited to the hours between 7:00am and 5:30pm weekdays; 7:00am and 1:30pm on Saturdays; no noisy activities may take place on Sundays or Public Holidays.</li> <li>• Activities that may disrupt neighbours (e.g. delivery trucks, excessively noisy activities etc.) must be preceded by notice</li> </ul>	Low

Potential Impacts	Significance rating of impacts before mitigation	Proposed mitigation	Significance rating of impacts after mitigation
		<p>being given to the affected neighbours at least 24 hours in advance.</p> <ul style="list-style-type: none"> <li>Equipment that is fitted with noise reduction facilities (e.g. side flaps, silencers etc.) must be used as per operating instructions and maintained properly during site operations</li> </ul>	
<b>6.2 Visual Impact</b>	Low	<ul style="list-style-type: none"> <li>The site is in an extremely disturbed state with existing properties that are not well maintained.</li> <li>Structures that are to be erected should be aesthetically pleasing and blend into the area as far as possible to minimise the visual impact.</li> <li>Buildings are to reflect and residential scale and design with finishes matching the existing styles and finishes. Buildings must adhere to the local zoning code.</li> <li>Buildings must be maintained in good standing at all times</li> </ul>	Low
<b>7.1 Safety and Security</b>	Moderate	<ul style="list-style-type: none"> <li>A fence will be constructed around the site prior to commencement of construction</li> <li>The Applicant will be in contact with the local security firms.</li> <li>Signs should be erected on all entrance gates indicating that no temporary jobs are available, thereby limiting opportunistic labourers and crime.</li> <li>The site and crew are to be managed in strict accordance with the Occupational Health and Safety Act (Act No. 85 of 1993) and the National Building Regulations</li> <li>All structures that are vulnerable to high winds must be secured (including toilets).</li> <li>Potentially hazardous areas such as trenches are to be cordoned off and clearly marked at all times.</li> <li>The Contractor is to ensure traffic safety at all times and shall implement road safety precautions for this purpose when works are undertaken on or near public roads.</li> <li>Necessary Personal Protective Equipment (PPE) and safety gear appropriate to the task being undertaken is to be provided to all site personnel (e.g. hard hats, safety boots, masks etc.).</li> <li>All vehicles and equipment used on site must be operated by appropriately trained and / or licensed individuals in compliance with all safety measures as laid out in the Occupational Health and Safety Act (Act No. 85 of 1993) (OHSA).</li> <li>An environmental awareness training programme for all staff members shall be put in place by the Contractor. Before commencing with any work, all staff members shall be</li> </ul>	Low



Potential Impacts	Significance rating of impacts before mitigation	Proposed mitigation	Significance rating of impacts after mitigation
		<p>appropriately briefed about the EMP and relevant occupational health and safety issues.</p> <ul style="list-style-type: none"> <li>• All construction workers shall be issued with ID badges and clearly identifiable uniforms.</li> <li>• Access to fuel and other equipment stores is to be strictly controlled.</li> <li>• Emergency procedures must be produced and communicated to all the employees on site. This will ensure that accidents are responded to appropriately and the impacts thereof are minimised. This will also ensure that potential liabilities and damage to life and the environment are avoided.</li> <li>• Adequate emergency facilities must be provided for the treatment of any emergency on the site.</li> <li>• The nearest emergency service provider must be identified during all phases of the project as well as its capacity and the magnitude of accidents it will be able to handle. Emergency contact numbers are to be displayed conspicuously at prominent locations around the construction site and the construction crew camps at all times.</li> <li>• The Contractor must have a basic spill control kit available at each construction crew camp and around the construction site. The spill control kits must include absorptive material that can handle all forms of hydrocarbon as well as floating blankets / pillows that can be placed on water courses.</li> <li>• The Contractor shall make available safe drinking water fit for human consumption at the site offices and all other working areas.</li> <li>• Washing and toilet facilities shall be provided on site and in the Contractors camp.</li> <li>• Adequate numbers of chemical toilets must be maintained in the Contractors camp to service the staff using this area. At least 1 toilet must be available per 20 workers using the camp. Toilet paper must be provided.</li> <li>• The chemical toilets servicing the camp must be maintained in a good state, and any spills or overflows must be attended to immediately.</li> <li>• The chemical toilets must be emptied on a regular basis.</li> <li>• The Contractors site must be located on the high side of the site, so any leakages or spillages will be contained on site.</li> <li>• HIV AIDS awareness and education should be undertaken by all Contractor staff.</li> </ul>	
<b>7.2 Economic opportunities</b>	<b>Low</b>	<ul style="list-style-type: none"> <li>• Make use of local labour.</li> </ul>	<b>High positive</b>

Potential Impacts	Significance rating of impacts before mitigation	Proposed mitigation	Significance rating of impacts after mitigation
		<ul style="list-style-type: none"> <li>• Provide clear and realistic information regarding employment opportunities and other benefits for local communities in order to prevent unrealistic expectations.</li> <li>• Provide skills training for construction workers.</li> <li>• Provide job opportunities at one of the few areas that will provide work in the area.</li> <li>• Skills training and transfer.</li> </ul>	
<p><b>8.1 Destruction of cultural / heritage sites</b> No sites of cultural or heritage importance were found during the Heritage impact Assessment</p>	Low	<ul style="list-style-type: none"> <li>• Ensure that construction staff members are aware that heritage resources could be unearthed and the scientific importance of such finds.</li> <li>• Ensure that heritage objects are not to be moved or destroyed without the necessary permits from the South African Heritage Resources Agency (SAHRA) in place.</li> </ul>	Low
<p><b>9.1 Waste</b></p>	Low	<ul style="list-style-type: none"> <li>• Adequate number of waste disposal receptacles are to be positioned at strategic locations within the development.</li> <li>• Temporary waste storage points on site shall be determined. These storage points shall be accessible by waste removal trucks and these points should not be located in areas highly visible from the properties of the surrounding land-owners/tenants/in areas. These areas should also be already disturbed. The storage of solid waste on site, until such time that it may be disposed of, must be in the manner acceptable to the relevant Authority.</li> <li>• No waste materials shall at any stage be disposed of in public areas or adjacent properties, or where the wind direction will carry bad odors across the properties of adjacent tenants or landowners. The piling of any material that could rot and release unpleasant smells into the air will not be permitted. Burning of waste is not permitted. Spot fines of up to R100 may be administered if the employees are found to be polluting the area in any way.</li> <li>• Several waste bins must be provided and clearly marked or colour coded according to industry standards to allow for recycling of waste into <ul style="list-style-type: none"> <li>○ Paper</li> <li>○ Biodegradable</li> <li>○ Glass</li> <li>○ Plastics</li> <li>○ General</li> </ul> </li> <li>• No burning of waste.</li> <li>• Wayleaves required for all disposed waste.</li> </ul>	Low

Potential Impacts	Significance rating of impacts before mitigation	Proposed mitigation	Significance rating of impacts after mitigation
		<ul style="list-style-type: none"> <li>The waste bins shall be cleared by municipal services on a weekly basis.</li> <li>During municipal strikes special arrangements must be made to have the waste removed via private waste removal services.</li> </ul>	
<b>9.2 Existing infrastructure</b>	Medium	<ul style="list-style-type: none"> <li>Integrity of existing services to be ensured.</li> <li>Adherence to Service Report</li> <li>Adherence to Traffic Impact Study requirements.</li> <li>The service systems are to be designed according to the minimum requirements of and submitted to the City of Ekurhuleni Metropolitan Municipality for approval. No construction activities must commence on site prior to obtaining the necessary approval.</li> <li>Underground services should be designed in such a way so as to require minimum maintenance to avoid disturbance of the underground and superficial environment.</li> </ul>	Medium-low
<b>10.1 Functional design</b>	Medium	<ul style="list-style-type: none"> <li>Scale and design must fit with adjacent land uses</li> <li>Areas where services infrastructure has been installed must be rehabilitated with indigenous vegetation on completion.</li> <li>Installation of alternative measures, such as low energy and water consuming technology.</li> </ul>	<b>High positive</b>

**NO GO:**

**No-Go Alternative**

This option assumes that a conservative approach would ensure that the environment is not impacted upon any more than is currently the case. It is important to state that this assessment is informed by the current condition of the area. Should the Competent Authority decline the application, the 'No-Go' option will be followed, and the status quo of the site will remain.

List any specialist reports that were used to fill in the above tables. Such reports are to be attached in the appropriate Appendix.

Annexure G1: Geotechnical Report  
 Annexure G2: Ecological Report  
 Annexure G3: Wetland/Riparian Delineation and Functional Assessment  
 Annexure G4: Paleontological Report  
 Annexure G5: Heritage Impact Assessment

Describe any gaps in knowledge or assumptions made in the assessment of the environment and the impacts associated with the proposed development.

• **Assumptions**  
 In undertaking this BAR, it has been assumed that:

- All requirements from the local authority will be met by the proponent as a separate undertaking to the EIA process;
- The information provided by the proponent and the project planning team / specialists is accurate and discloses all information relevant to EIA, proposed project and possible impacts.
- Where supporting or baseline information was unavailable, a precautionary approach is adopted.

- **Gaps in Knowledge**

All specialist studies are conducted to certain levels of confidence, but in all instances known methodologies have been used and confidence levels are generally high. This means that in most cases the situation described in the pre-construction environment is accurate at high certainty levels, but there exists a low probability that some issues have not been identified during the studies. Furthermore, statistical analyses and mathematical models are merely tools which assist the researcher in assessing field observations and have innate assumptions which can reduce objectivity of the results obtained. This is not seen as a major flaw but should always be considered when assessing results.

Gaps in knowledge known to LEAP at this time, includes:

- Predicting the impact to the socio-economic and bio-physical environment for the life-cycle of the proposed project (i.e. 25-50 years) although it is expected to be positive since the social contribution will be high.

**3. IMPACTS THAT MAY RESULT FROM THE DECOMMISSIONING & CLOSURE PHASE – NOT APPLICABLE**

Briefly describe and compare the potential impacts (as appropriate), significance rating of impacts, proposed mitigation and significance rating of impacts after mitigation that are likely to occur as a result of the decommissioning and closure phase for the various alternatives of the proposed development. This must include an assessment of the significance of all impacts.

**The decommissioning or closure of the proposed project is not anticipated.**

**Proposal**

Potential impacts:	Significance rating of impacts (positive or negative):	Proposed mitigation:	Significance rating of impacts after mitigation:	Risk of the impact and mitigation not being implemented

**Alternative 1**

Potential impacts:	Significance rating of impacts (positive or negative):	Proposed mitigation:	Significance rating of impacts after mitigation:	Risk of the impact and mitigation not being implemented

**Alternative 2**

Potential impacts:	Significance rating of impacts (positive or negative):	Proposed mitigation:	Significance rating of impacts after mitigation:	Risk of the impact and mitigation not being implemented

List any specialist reports that were used to fill in the above tables. Such reports are to be attached in the appropriate Appendix.

Not Applicable

Where applicable indicate the detailed financial provisions for rehabilitation, closure and ongoing post decommissioning management for the negative environmental impacts.

Not Applicable

## 4. CUMULATIVE IMPACTS

Describe potential impacts that, on their own may not be significant, but is significant when added to the impact of other activities or existing impacts in the environment. Substantiate response:

Cumulative impacts are assessed with the combination effects of the Project with current and future development in the immediate area of the Project site. The cumulative impacts assessed depend on the status of other projects and the level of data available to characterise the magnitude of the impacts.

In terms of density, the general typology of development in the area consists of higher impact uses.

### **Cumulative Impacts**

- **Litter and Waste**

Activities associated with use of the site results in littering. Similarly, the building process generates wastes that could pollute the site and its surrounds. For this reason, it is important that a waste management plan must be developed. The litter will reduce as the construction phase ends. This will not result in a high cumulative impact.

A close out meeting is held with GDARD to ensure the Department is satisfied that the conditions of the ROD and the EMPR are met. This process is successful in ensuring that cumulative impact is minimized.

- **Vegetation and Fauna**

According to the GDARD C-Plan 3.3 the site is not situated within a Critical Biodiversity Area or an Ecological Support Area. The largest area within the boundaries of the study site consists of open disturbed grassland and fallow fields or secondary grassland with little to no remaining natural grassland vegetation. The rest of the study area is disturbed and has been transformed by past and present human activities. These areas include roads, formal and informal housing development and cleared areas. This is considered to be an impact of low significance as the largest portion of the development will occur on the low sensitive areas. The cumulative impact is thus low. No development will take place in the sensitivity area.

- **Stormwater Runoff**

The development of hard surfaces will give rise to greater volumes and velocity of runoff waters during high peak flows. This water will drain into the roads and storm water management system. Localised flooding may result on negative impacts on bed and banks of the stream course due to the cumulative effects. In order to minimize artificially generated surface storm water runoff, total sealing of paved areas such as parking lots, driveways, pavements and walkways should be avoided. Permeable material should rather be utilized for these purposes.

- **Social benefits**

The proposed development will promote job creation especially during the development phase of the township and will strengthen an existing residential area. The community will benefit (job creation and housing next to job opportunities) and a more sustainable economy will be created.

**5. ENVIRONMENTAL IMPACT STATEMENT**

Taking the assessment of potential impacts into account, please provide an environmental impact statement that sums up the impact that the proposal and its alternatives may have on the environment after the management and mitigation of impacts have been taken into account with specific reference to types of impact, duration of impacts, likelihood of potential impacts actually occurring and the significance of impacts.

**Proposal**

Proposal The following provides the rationale for the EAP’s reasoning that the project should be grant positive Environmental authorisation:

- The site falls outside of any sensitive or fragile habitats. No sensitive biological receptors were identified on the site and the site is largely disturbed.
- The proposed development will not have a detrimental impact on other residential development in the area.
- The Applicant has the capacity and resources to adequately implement the mitigation measures stipulated in the EMPr;
- The application site is within the urban edge and will restrict urban sprawl and thus adheres to the spatial objective to protect valuable agricultural land outside the urban edge.
- There are no sensitive social receptors (surrounding landowners) located in close proximity to the site.
- The primary regional corridors that influence the site is the R21 to the east, and the N1 to the west. Both of these regional corridors can be accessed from the site via Main Road (abutting the southern boundary of the site), and Olifantsfontein Road (R562) located to the north of the site.
- Evidently the proposed site is fed by several major (collector, distributor) roads which pass through the area. This plays in favour of the site from a retail perspective in that the site is exposed to and capable of intercepting both local and regional passing traffic.

**Alternative 1:**

Not Applicable

**Alternative 2**

Not Applicable

**No-go (compulsory)**

This option assumes that a conservative approach would ensure that the environment is not impacted upon any more than is currently the case. It is important to state that this assessment is informed by the current condition of the area. Should the GDARD decline the application, the ‘No-Go’ option will be followed, and the status quo of the site will remain.

**4. IMPACT SUMMARY OF THE PROPOSAL OR PREFERRED ALTERNATIVE**

Having assessed the significance of impacts of the proposal and alternative(s), please provide an overall summary and reasons for selecting the proposal or preferred alternative.

In accordance with GN No. 982, the Environmental Impact Phase is aimed at identifying and assessing potential impacts caused by the proposed development. The ability to mitigate any of the identified impacts are also



addressed and summarised into a working / dynamic Environmental Management Programme (EMP) for consideration by I&APs and ultimately by the GDARD.

**Table 4: Proposed Activity: Impact Summary**

	<b>Before Mitigation</b>	<b>After Mitigation</b>
<b>BIOPHYSICAL ENVIRONMENT</b>		
1.1 Dust/Air pollution - The generation of fugitive dust associated with construction activities & earthworks.	<b>Moderate</b>	<b>Low</b>
2.1 Visual Impacts: Topographical features contribute to the landscape character and sense of place of an area. Visual scarring due to cutting and embankments and areas devoid of vegetation are most obvious when located on elevated areas in the landscape.	<b>Moderate</b>	<b>Low</b>
2.2 Bulk earthworks: Deep cuttings, high embankments, disposal of soil and excavations cause local changes to topography	<b>Moderate</b>	<b>Moderate</b>
3.1 Soil erosion, loss of topsoil, deterioration of soil quality	<b>High</b>	<b>Low</b>
3.2 Soil pollution (due to hydrocarbon spillages)	<b>Moderate</b>	<b>Low</b>
4.1 Degradation, destruction of habitats/ ecosystem and impact on connectivity – classified as a Critical Biodiversity Area (CBA)	<b>High</b>	<b>Moderate</b>
4.2 Impacts on fauna and flora	<b>Moderate</b>	<b>Low</b>
5.1 Stormwater flow and drainage- Developments cause the modification of drainage patterns. Stormwater may be concentrated at certain points, increasing the velocity of flow in one area and reducing flow in another. This may contribute to flooding, soil erosion, sedimentation, scouring and channel modification downstream of the development.	<b>Moderate</b>	<b>Low</b>
5.2 Impact on water quality (due to hydrocarbon spillages)	<b>Moderate</b>	<b>Low</b>
<b>SOCIO-ECONOMIC ENVIRONMENT</b>		
6.1 Noise/ vibration	<b>Low</b>	<b>Low</b>
6.2 Visual impact on adjacent residents and motorists	<b>Low</b>	<b>Low</b>
7.1 Safety and Security	<b>Low</b>	<b>Low</b>
7.2 Employment opportunities	<b>Moderate (Positive)</b>	<b>High (Positive)</b>
8.1 Destruction of paleontological resources	<b>High</b>	<b>Moderate</b>
9.1 Waste	<b>Low</b>	<b>Low</b>
9.2 Existing infrastructure	<b>Low</b>	<b>Low</b>

10.1 Functional design	<b>Low (Positive)</b>	<b>High (Positive)</b>
<b>CUMULATIVE IMPACT</b>		
Transformation of natural habitat caused by the urban sprawl.	<b>low</b>	<b>low</b>

## 7. SPATIAL DEVELOPMENT TOOLS

Indicate the application of any spatial development tool protocols on the proposed development and the outcome thereof.

The proposed development will result in urban/ land use intensification inside of the EMM's urban's urban edge, which is in line with the GSDFs notion of a sustainable city. Also, the proposed development supports the notion of developing sustainable neighbourhoods and the provision of economic, social and community facilities in support of continued and sustainable residential densification.

### **EKURHULENI METROPOLITAN SPATIAL DEVELOPMENT FRAMEWORK, 2015(MSDF)**

The Metropolitan Spatial Development Framework (MSDF) represent the spatial interpretation of desired growth and development within the EMM. The MSDF spatially focuses economic and infrastructure development and gives spatial expression to the GDS and IDP.

Markedly In terms of MSDF, Clayville Extension 45 falls within what is classified as both a Priority Area 1 and a preferred urban growth/ Development area. In terms of the MSDF, priority areas are areas where capital expenditure and operational programmes should be focused on upgrading services and facilities to levels comparable with those of the rest of metro. In turn the urban growth Areas support the notions of a compact city and avoiding leap frog development in order to overcome the fragmented nature of the city and to develop a continuous urban structure in support of engineering, social and business services. This development is conducive to the intention of upgrading services and facilities to levels comparable with those of the rest of the metro and compaction of the city by marking higher and better use of well-located land within an existing township and Mega Housing Project.

### **EKURHULENI REGIONAL SPATIAL DEVELOPMENT FRAMEWORK- REGION B, 2015 (RSDF)**

Ekurhuleni spatial regional development framework for all the regions are firmly embedded in the MSDF which is the overarching spatial framework. The vision, mission, objectives and guiding principles of the MSDF therefore pertain to each RSDF, for the purposes of this section, the principles, mission, vision, etc. will therefore not be reviewed again. Instead the spatial content of the RSDF will be assessed to determine the compliance of the proposed development

The proposed area is densely populated, and it is known that urban populations particularly at high densities need community, social as well as economic facilities to retain healthy urban living. this application is thus supportive of supporting increasing residential densities to compact and integrate the metro's spatial form.

One of the main reasons for development is ultimately to protect the sensitive environmental component that is presently being neglected and destroyed. The proposed development takes the wetland and its buffer zones into consideration and proposes that those area not affected be utilized for urban development benefiting the Clayville community. The proposed development supports the SPLUMA of the Ekurhuleni Metropolitan Municipality.

Refer to **Annexure I1A** for the Township Approval.

## 8. RECOMMENDATION OF THE PRACTITIONER

Is the information contained in this report and the documentation attached hereto sufficient to make a decision in respect of the activity applied for (in the view of the Environmental Assessment Practitioner as bound by professional ethical standards and the code of conduct of EAPASA).

YES

NO

If "NO", indicate the aspects that require further assessment before a decision can be made (list the aspects that require further assessment):

Not Applicable

If "YES", please list any recommended conditions, including mitigation measures that should be considered for inclusion in any authorisation that may be granted by the competent authority in respect of the application:

It is recommended that the Proposed Activity is authorized.

The recommendations to include, if the authorisation of the Proposed Activity is granted, are amongst others:

### General:

- The monitoring of the construction site must be carried out by a professionally qualified Environmental Compliance Officer (ECO) with proven expertise in the field so as to ensure compliance to the Environmental Management Programme (EMPr).
- All mitigation measures listed in the BAR as well as the EMPr must be implemented and adhered to rehabilitated as soon as possible and revegetated with indigenous species.
- The species should be indigenous to the specific area and the composition of the vegetation should reflect the natural vegetation.
- The species used in rehabilitation of the proposed development should be indigenous to lessen the impact of exotic plant species on existing fauna and flora systems.
- Specific recommendations by the specialist include:

### Ecology:

- The indiscriminate use of heavy machinery by uninformed operators leading to the unnecessary destruction of habitat through unnecessary expansion of the impacting footprint area is perceived to be the leading cause of ecological impacts that can be easily avoided.
- Careful planning, basic education of operators and on-site management will all enable the impacts to be significantly reduced.
- Reduce impact by ecologically-sensitive construction methods and the following of a carefully planned Environmental Management Programme (EMPr).
- By keeping the footprint of the impacts reduced to a minimum by only allowing heavy machinery to operate on designated access roadways and by avoiding the unnecessary degradation of habitat within areas adjacent to the actual construction areas, the ecological impacts can be greatly reduced.
- The perceived ecological impacts have been rated as medium to low, with the majority of the impacts rated higher being related to the wetland unit and the preservation thereof.

- It should be noted that wetland habitat units are regarded as inherently ecologically sensitive ecosystems, regardless of present ecological state, and that they should be treated as such. This is because local impacts can often manifest downstream of the site, affecting many habitat specialist species and the water resource.
- The impacts can be significantly reduced through the implementation of mitigation measures that are also proposed within the table and that these impacts can be regarded as low after implementation of the mitigation measures.

**Heritage:**

Should archaeological sites or graves be exposed during construction work, it must immediately be reported to a heritage practitioner so that an investigation and evaluation of the finds can be made.

**9. THE NEEDS AND DESIRABILITY OF THE PROPOSED DEVELOPMENT** (as per notice 792 of 2012, or the updated version of this guideline)

• **Needs for the proposed development**

- There is an irreversible trend in South Africa and Internationally of people migrating towards urban areas. The search for better welfare and economic sustainability is spearheading migration from rural areas to urban areas. In 1990 the world urban population was 2.5 billion and it had reached 7 billion in 2011. During 2013, 64, 3% of the South African population resided in urban areas.
- The greatest shift in population between provinces appears to have been in Gauteng. There were 7.6-million people counted in the Gauteng region in the 1996 census. This had grown to 9.2- million by 2001, and to 12.3-million last year – an increase of 33.7% percent from 1996 to 2011.
- Ekurhuleni is distinguished by the fact that within its boundaries, population growth has been expanding at an annual average rate of 4.12 percent which is the highest growth rate recorded of all the six South African metropolitan municipalities (SACN, 2004). The population increased by 696 798 people between 2001 and 2011 (Ekurhuleni Annual Report 2012-2013, p9).
- The urban area within the proposed urban boundary for Region B is approximately 26 246 hectares in extent of which roughly 25% – 35% will be used for housing. As per Demacon’s Population and Household Estimations approximately 848 468 people will occupy the urban area by 2030. This relates to approximately 280 657 households and it was estimated that Region B will require, by 2030, 6 211.2 hectares of land to accommodate the growth of the region. Approximately 4668,1 hectares are necessary to accommodate the residential development.
- Ekurhuleni is also the country’s third largest metro in terms of households and number of residential properties, reflecting South Africa’s average ratio of 1.8 households to each registered property. During 2012, Ekurhuleni had the 4th highest number of sales transactions and the 5<sup>th</sup> highest average residential sales prices according to the deed’s registry. The average household income is the country’s 4th highest and the second most affordable of all SACN member cities.
- Though cities occupy a small percentage of the earth’s surface, their impact on the environment extends beyond their geographic boundaries. Cities that spread out into rural areas are more likely to leave a bigger ecological footprint than denser, more compact cities. Therefore, the provision of medium to high density housing not only impacts the social aspects of sustainable development, but also the economy and the environment. The Department of Human Settlements currently advocates the pursuit of a more compact form of housing, facilitation of higher densities, mixed use developments, as well as the integration of different land uses as an alternative to strict zoning. Developments which incorporate these principles are considered important in changing the nature of South African cities and contributing to the creation of sustainable human settlements.

• **Desirability of the proposed township**

- As stated earlier, the application is in line with the approved policies for development in the area and the application site is situated next to similar residential developments. The application site is within the urban edge and will restrict urban sprawl and thus adheres to the spatial objective to protect valuable agricultural land outside the urban edge.
- This development will promote the availability of residential and employment opportunities in close proximity to each other, especially if future development proposal is taken into account. In terms of the applicable Spatial Development Frameworks, a mixed land use area is proposed south of the application site that will predominately be developed for industrial / commercial uses in the future.
- Services are available in this area and the proposed development will optimise the existing resources including bulk infrastructure, roads, transportation and social facilities.
- The proposed development will also provide a variety and diversity in residential choices.
- A wide-ranging spectrum of amenities are required in order to create a functional and sustainable residential community for the resident. Such amenities include, but is not necessarily limited to, amongst others, economic and social facilities which contributes to local economic development, employment opportunities, educational and health care facilities.
- Consistence with the State's requirements for the development of inclusive Mega-Housing Projects that foster the creation of functional and sustainable residential community, the proposed development will further enhance and strengthen the range of land uses encompassing the Clayville Mega-Housing Project.
- Sever degradation of the original ecological state of the site has taken place, it is thus proposed that those areas that suffered damage to the south of the Kaalspruit and bordering onto the residential components of Clayville Extension 45 be used for urban development benefiting the Clayville community, whilst those areas to the north be rehabilitated, the current ecological state be improved and managed as a smaller and more appropriate area.
- The expansion and intensification of the provisional of social services and economic development are the next focus points in the delivery of a rounded, well-structured residential development area for the Clayville Community. Beneficially the provisioning of the social services precinct and retail site proposed by this development has the possibility to act as social and economic anchors for both the existing township and future township extensions of the larger Clayville.
- The income that will be generated by the Local Authority via rates and taxes and payment for services will have a multiplier effect on the economic growth within the municipal area.
- The proposed land use will not affect the environment negatively at all, as the area is already earmarked and is also being developed for residential purposes.

**10. THE PERIOD FOR WHICH THE ENVIRONMENTAL AUTHORISATION IS REQUIRED (CONSIDER WHEN THE ACTIVITY IS EXPECTED TO BE CONCLUDED)**

**10 years**

**11. ENVIRONMENTAL MANAGEMENT PROGRAMME (EMPR) (must include post construction monitoring requirements and when these will be concluded.)**

If the EAP answers "Yes" to Point 7 above, then an EMPr is to be attached to this report as an Appendix

EMPr attached

**YES**

## **SECTION F: APPENDIXES**

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The following appendixes must be attached as appropriate (this list is inclusive, but not exhaustive):

It is required that if more than one item is enclosed that a table of contents is included in the appendix

Annexure A1: Location Map

Annexure A2: Proposed Subdivision Plan

Annexure A3: Architectural Drawing

Annexure B: Photographs

Annexure C: Facility illustration(s) – Not Applicable

Annexure D: Route position information – Not Applicable

Annexure E: Public participation information

Annexure F: Water use license(s) authorisation, SAHRA information, service letters from municipalities, water supply information - Not Applicable

Annexure G: Specialist reports

Annexure G1A: Geotechnical Report (Phase 1)

Annexure G1B: Geotechnical Report (Phase 2)

Annexure G2A: Vegetation Assessment

Annexure G2B: Vertebrates Assessment

Annexure G3: Wetland/Riparian Delineation and Functional Assessment

Annexure G4: Paleontological Report

Annexure G5: Heritage Impact Assessment

Annexure H: EMPr

Annexure I1: Town Planning Memorandum

Annexure I2: Civil Service Report

Annexure I3: Electrical Service Report

Annexure I4: Traffic Impact Assessment

Annexure I5: EAP BY DECLARATION

Annexure I6: EAP CV

## **CHECKLIST**

To ensure that all information that the Department needs to be able to process this application, please check that:

- Where requested, supporting documentation has been attached;
- All relevant sections of the form have been complete