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 1/2022)

Kindly note that:

1. This **Basic Assessment Report** is the standard report required by GDARD in terms of the EIA Regulations, 2014.

2. This template is current as of April 2022. It is the responsibility of the EAP to ascertain whether subsequent versions of the template 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 must be submitted, for purposes of comments within a period of thirty (30) days, to a Competent Authority (uploaded to the EIA online system) empowered in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998), as amended to consider and decide on the application. The EIA online system can be accessed at https://eia.gauteng.gov.za**.
5.

6. **A copy (PDF) of the final report and attachments must be uploaded to the EIA online system. The EIA online system can be accessed at https://eia.gauteng.gov.za.**

7. **Draft and final reports submitted in terms of the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008) must be emailed to environmentsue@gauteng.gov.za.**

8. 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.

9. Selected boxes must be indicated by a cross and, when the form is completed electronically, must also be highlighted.

10. An incomplete report may lead to an application for environmental authorisation or Waste Management License being refused.

11. 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 authorization or Waste Management License being refused.

12. 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 or Waste Management License being refused.

13. The applicant must fill in all relevant sections of this form. Incomplete applications will not be processed. The applicant will be notified of the missing information in the acknowledgement letter that will be sent within 10 days of receipt of the application.

14. 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.

15. 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.

DEPARTMENTAL DETAILS

Gauteng Department of Agriculture and Rural Development
Attention: Administrative Unit of the Sustainable Utilisation of the Environment (SUE) Branch
P.O. Box 8769
Johannesburg
2000

Ground floor, Umnotho House, 56 Eloff Street, Johannesburg

Administrative Unit telephone number: (011) 240 3051/3052
Department central telephone number: (011) 240 2500

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DOCUMENT CONTROL						
Report Title	Proposed Mixed-Use Development with Associated Infrastructure on the Remainder of Portion 1 and Portion 31 of the Farm Bergvallei 37 IR, within the City of Johannesburg Metropolitan Municipality					
Document ID	Basic Assessment Report					
File Path	*Z:\Main data\PROJECTS\B\Bergvallei 37\LEAP Submissions\Draft Basic Assessment\2023.04.05 Bergvallei 37 - Draft Basic Assessment Report.doc*					
Client	**City of Joburg Property Company SOC Limited**		**Client Contact**		Mrs. Sizeka Tshabalala	
Revision	**Date**	**Revision details/Status**	**Prepared by**	**Author**	**Verifier**	**Approved by**
0	January 2024		Zimkhitha Mehlomakhulu		Dr. G Theron	Dr. G Theron
1						
2						
3						
Current Revision						
APPROVAL						
Signature						
Name	Dr Gwen Theron		**Name**			
Title	Environmental Practitioner 2019/1421		**Title**			

(For official use only)

NEAS Reference Number:	
File Reference Number:	**GAUT 002/22-23/E3401**
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

Is a closure plan applicable for this application and has it been included in this report? **NO**

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

Not Applicable

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? **YES**

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

If no, state reasons for not attaching the list.

Refer to the **Appendix 9** of Public Participation Report attached hereto under **Annexure D**

Have State Departments including the competent authority commented? **YES**

If no, why?

This document will be circulated to the relevant authorities, they will be given a 30-day review and commenting period in which they may provide comments on the proposed project. All comments received during the public review period will be submitted as part of the final submission of the BAR to GDARDE.

Contents

SECTION A: ACTIVITY INFORMATION

1. PROPOSAL OR DEVELOPMENT DESCRIPTION

Project title (must be the same name as per application form):

Project title: Proposed Mixed-Use Development with Associated Infrastructure on the Remainder of Portion 1 and Portion 31 of the Farm Bergvallei 37 IR, within the City of Johannesburg Metropolitan Municipality

The subject property is located on the south & north of Marlboro Drive (M60), West of the Intersection (124) with the Eastern Bypass (N3), Johannesburg and measures approximately 14.3 hectares. **Refer to Figure 1**

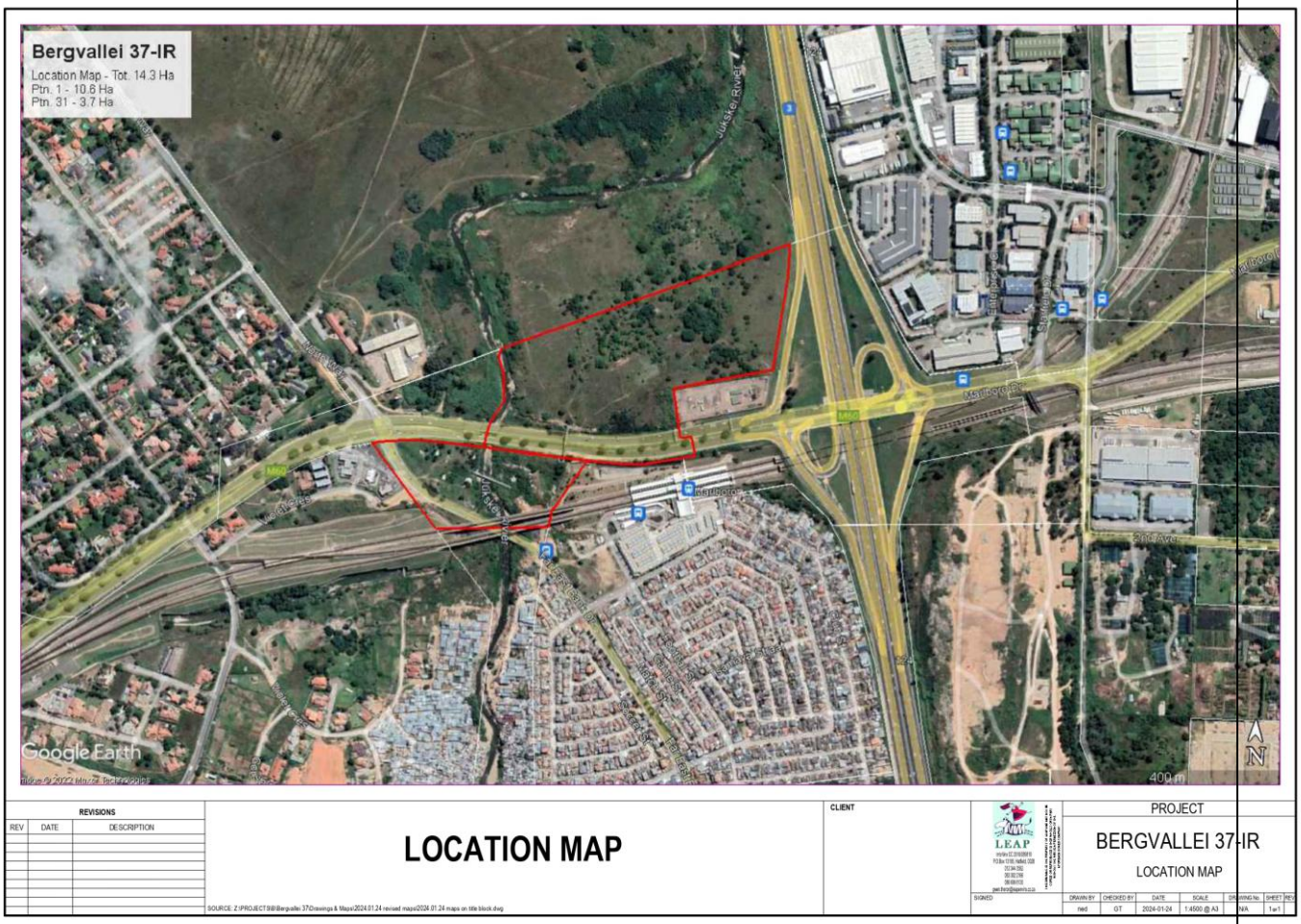


Figure 1: Google Location Map indicating the proposed development (Source: Google Earth)

Proposal development

It is the intention of City of Joburg Property Company SOC Limited (the Applicant) to develop a mixed-use development with associated infrastructure on the Remainder of Portion 1 and a Portion of the Remainder of Portion 31 of the Farm Bergvallei 37 IR, within the City of Johannesburg Metropolitan Municipality. **Refer to Table 1**

Table 1: Proposed Area schedule

Zoning	Land Use	Number of Erven	Area (Hectares)	Area Percentage
Residential 4	Social Rentals	2	1.26	8.71%
	Flisp Housing	2	1.52	10.50%
	Mixed Use	3	0.94	6.50%

	Breaking New Ground (RDP)	2	1.31	9.05%
Business 1	Business	1	0.38	2.63%
Government & Municipal	Government & Municipality	1	0.21	1.45%
Agricultural	Urban Agriculture	1	0.16	1.11%
SAR	Gautrain Rail Servitude	1	1.44	9.95%
Public Open Space	Public Open Space	6	3.4	23.50%
Right of way Servitude (Already Registered)	Right of way Servitude (Marlboro Drive)	1	1.35	9.33%
Street	Proposed Route	1	0.49	3.39%
	Street	*	2.01	13.89%
Total		**21**	**14.47**	**100.00%**

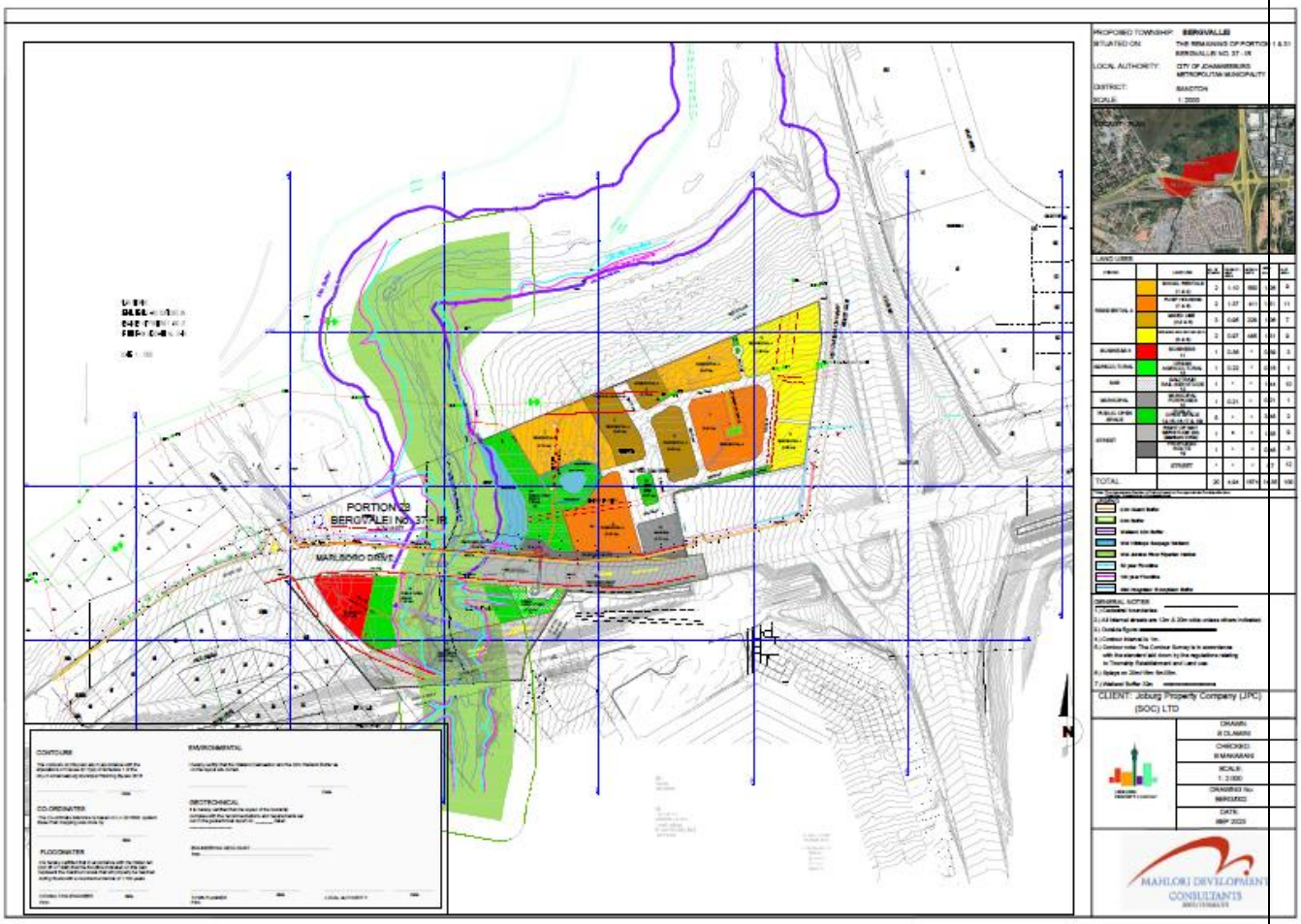


Figure 2: Proposed Layout Plan

Provision of Services

Access

It is proposed that access be provided via an Intersection 18, through the Frankenwald Development (**See Figure 3**).

There is a small piece of developable land on the south-eastern quadrant of Marlboro Drive/ North Way Drive/Far East that will be accessed from Bank Drive intersection.

Proposed Development Traffic

The *COTO* Manual was referenced to estimate the number of trips likely to be generated by the proposed development, together with the assessment scenarios and time periods.

The *COTO* Manual recommends a rate of 0,65 trips/1 du for the AM and PM for residential (BNG, FLISP and MU FLISP), a rate of 2,1 trips / 100m² GLA for the AM and PM for offices. The IN:OUT split being 25:75, for the residential and 85:15 for the offices for the AM and PM, respectively.

Trip generation adjustment factors for close proximity to PT node/ corridor, mixed use and very low / low car ownership were applied to the development in a logical approach as per the below:

- BNG: Very low car ownership – Public transport – Mixed use
- FLISP: Low car ownership – Public transport – Mixed use
- Mixed use FLISP: Low car ownership – Public transport – Mixed use
- Office: Low car ownership – Public transport – Mixed use
- Drive Thru: Low car ownership

Based on the recommended rates, the proposed development is expected to generate **568** trips, **577** trips during the AM and PM. A summary of the trip generation calculation for the proposed development is provided in Table 2 below:

Table 2: Trip generation calculations for the proposed development

						Totals		In / Out Split			
								AM Peak		PM Peak	
Development	**Size/Number of Units**	**Unit**	**AM Peak**	**PM Peak**	**Total Adjustment Factor**	**AM Peak**	**PM Peak**	**In**	**Out**	**In**	**Out**
BNG	1035	1 D/Unit	0.65	0.65	0.63875	243	243	61	182	170	73
FLISP	411	1 D/Unit	0.65	0.65	0.49425	135	135	34	101	95	41
MU FLISP	228	1 D/Unit	0.65	0.65	0.49425	75	75	19	56	52	22
Offices	3000	100 m² GLA	2.1	2.1	0.456	34	34	29	5	7	27
Shopping Centre		100 m² GLA	0.6	3.4	0.694	0	0	0	0	0	0
Fast Food	300	100 m² GLA	45	50	0.4	81	90	45	36	50	41
Total Trips Generated						568	**577**	**187**	**381**	**374**	**204**

Proposed Public Transport Infrastructure

Figure 3: Access Arrangement for the Proposed Development

Electricity

Available Capacity

The proposed development will be supplied with electricity from the Eskom supply network.

Estimated Electricity Demand

The total estimated maximum demand for the proposed development is 4037,6 kVA

The total estimated maximum demand for the Proposed Development with full use of electrical appliances is summarised in Table 3 below.

Table 3: Estimated Maximum Demand

Erf No.	Zoning	Land Use	Area (ha)	Number of Units	Floor Area (m^2)	AMDM	kVA
1	Residential 4	Social Rentals	0.79	360	15 800.00	2	720
2	Residential 4	Mixed Use	0.4	39	8000.00	2	78
3	Residential 4	Mixed Use	0.17	42	34000.00	2	84
4	Residential 4	Social Rentals	0.47	190	9 400.00	2	380
5	Residential 4	Breaking New Ground (RDP)	1.05	345	21000.00	2	
6	Residential 4	Breaking New Ground (RDP)	0.26	140	5200.00	2	126
7	Residential 4	Flisp	0.84	222	16 800.00	2	444
8	Residential 4	Mixed Use	0.49	147	9 800.00	2	294
9	Residential 4	Flisp	0.67	186	13 400.00	2	378
10	Municipal	Municipal	0.21	*	6 300.00	80	504
11	Business 3	Business	0.39	*	3 900.00	80	312
13	Urban Agriculture	Urban Agriculture	0.16	2	-	13.8	27.6
Total							**4037,6**

Proposed Reticulation Services

External Supply Network
The external network design will adhere to Eskom standards and requirements. A new Eskom secondary sub-station will be installed in the Frankenwald development for the MV distribution network.

A new bulk supply is proposed by installing a new Bulk Metering Unit (BMU) in the vicinity of the Proposed Development which can be energized by installing 120mm^2 11kV 3-core PILC copper cable from the new Frankenwald secondary sub-station to the new BMU. The Proposed Development could be supplied directly from the BMU via an MV consumer switch to be installed inside the boundary of the Proposed Development.

Bulk Metering
Bulk metering will be done by Eskom through a new BMU to be installed in a 3 x 7m servitude on the boundary of the Proposed Development.

Internal Reticulation
The following is proposed:

- Install new 315kVA and 500kVA miniature substations at optimum positions within the Proposed Development
- Install 95mm² 11kV 3-core copper PILC cables between the miniature substations
- Install wall-mounted distribution boards/meter kiosks at optimum positions
- Install 95mm² 4-core copper cable between the miniature substations and the distribution boards/meter kiosks

Bulk Services Contributions
The Bulk Services Contributions payable to the City of Johannesburg for civil engineering services will be determined with the compilation of the services agreement.

Sewer
Existing Services
The Proposed Development is situated within the Bruma Outfall Sewer (BR) basin which drains towards the Northern Wastewater Treatment Works (WWTW). The Northern WWTW currently has 5Mℓ/day spare capacity. The Frankenwald Development will add 12.8Mℓ/day treatment capacity at the Northern WWTW resulting in a shortfall of 7.8Mℓ/day. Expansion projects are currently underway for the Northern WWTW. The exact dates for the implementation and completion of these projects are unknown at this stage.

There is existing sewer that intersect the roosed Development, which include a 1800mm Ø Bruma Relief Outfall Sewer that intersects Erven 12, 14, 19 and 15 of the Proposed Development from south to north as well as a 1330mm Ø Northern Outfall Sewer which runs parallel and on the western bank of the Jukskei River, from south to north, west of the Proposed Development.

An existing 300mm Ø outfall sewer intersects the western portion of the portion of the Proposed Development north of Marlboro Drive (M60), from north to south, and connects to the existing 1800mm Ø Bruma Relief Outfall Sewer, south of Marlboro Drive (M60).

Proposed Sewage Network
The existing 300mm Ø outfall sewer intersecting the Proposed Development has more than 45% relative spare capacity. Taking the addition of the sewage flow of the Proposed Development the relative spare capacity of this outfall sewer reduces to 21%.

It is proposed that a 160mm Ø PVC-U Class 400 outfall sewer be installed inside the northern boundaries of Erven 5, 4, 3, 2 and 1 of the proposed Development up to the existing 300mm Ø outfall sewer, where it could connect.

Sewerage from Erf 1 of the Proposed Development can drain to the north western corner of Erf 1 where a new 160mm Ø PVC-U Class 400 outfall sewer can be installed on the inside of the northern boundary of Erf 15 of the Proposed Development up to the existing 1800mm Ø Bruma Relief Outfall Sewer, where it could connect.

Sewerage from Erf 11 of the Proposed Development can drain to the north eastern corner of Erf 11 where a new 160mm Ø PVC-U Class 400 manhole connection can be installed which could connect to the existing 160mm Ø uPVC Class 400 outfall sewer intersecting Erf 11 of the Proposed Development.

A 2,0m wide servitude will need to be registered in favour of Johannesburg Water (JW) along the southern boundary of Erf 9 of the Proposed Development for the proposed 160mm Ø PVC-U Class 400 outfall sewer.

A 4,0m wide servitude will need to be registered in favour of Johannesburg Water (JW) along the northern boundaries of Erven 5, 4, 3, 2 and 1 of the Proposed Development for the proposed 160mm Ø PVC-U Class 400 outfall sewers.

Confirmation that any bulk sewerage infrastructure upgrades are required for the Proposed Development will be obtained from Johannesburg Water and included in the Final BAR Submission.

Sewage Effluent

The estimated proposed sewerage flow for the Proposed Development is 523.96 kℓ/d. The estimated proposed sewerage flow for the Proposed Development is summarised in Table 4 below:

Table 4:Estimated Proposed Sewerage Flow

Erf No.	Zoning	Land Use	Proposed Development				
			Area (ha)	Number of Units	Floor Area(m^2)	Average Annual Daily Flow (AADF)	Sewerage Flow (kℓ/d)
1	Residential 4	Social Rentals	0.79	360	15 800.00	2.50 kℓ/500 m^2	79.00
2	Residential 4	Mixed Use	0.4	39	8 000.00	2.50 kℓ/500 m^2	40.00
3	Residential 4	Mixed Use	0.17	42	3 400.00	2.50 kℓ/500 m^2	17.00
4	Residential 4	Social Rentals	0.47	190	9 400.00	2.50 kℓ/500 m^2	47.00
5	Residential 4	Breaking New Ground (RDP)	1.05	345	21 000.00	2.50 kℓ/500 m^2	105.00
6	Residential 4	Breaking New Ground (RDP)	0.26	140	5 200.00	2.50 kℓ/500 m^2	26.0
7	Residential 4	Flisp	0.84	222	16 800.00	2.50 kℓ/500 m^2	84.00
8	Residential 4	Mixed Use	.49	147	9 800.00	2.50 kℓ/500 m^2	49.00
9	Residential 4	Flisp	0.67	189	13 400.00	2.50 kℓ/500 m^2	67.00
10	Municipal	Municipal	0.21		6 300.00	0.60 kℓ/Erf	0.60
11	Business 3	Business	0.39		3 900.00	1.20 kℓ/500 m^2	9.36
Total							**523.96**

Water Supply

Existing Services

The Remainder of Portion 1 of Bergvallei 37 – IR is situated within the Linbro Park Reservoirs Reservoir Zone, which is part of the water supply zone managed by the City of Johannesburg.

The eastern side of the Proposed Development currently has water pipelines ranging from 600mm – 1000mm Ø and they supply water to the Frankenwald, Buccleuch and Linbro Park townships to the north and east of the Proposed Development.

These water pipelines distribute water to the Frankenwald, Buccleuch and Linbro Park townships from the existing 12Mℓ Linbro Park Reservoir, south east of the Proposed Development.

The Remainder of Portion 31 of Bergvallei 37 – IR is situated within the Linbro Park Reservoirs (Alex) Sandton Bulk Direct PRV8/9 Reservoir Zone, which ais also part of the water supply zone managed by the City of Johannesburg.

An existing 160mm Ø water pipeline runs parallel and on the southern side of Laduma Avenue, south of the Proposed Development.

The Linbro Park reservoir currently has excess capacity, while the Alexandra reservoir lacks sufficient capacity and a portion of the Far East Bank relies on the Sandton Bulk system to compensate for the deficit from the Linbro Park reservoir. However, it is proposed that an additional reservoir for the Linbro Park/ Alexandra (LPA) water sub-districts be introduced in the future.

Confirmation that sufficient capacity is available will be obtained from Johannesburg Water and included in the Final BAR Submission.

New Water Reticulation

Proposed External Infrastructure

To accommodate the existing- and future land uses of the LPA water sub-districts the following bulk water infrastructure upgrades are planned for the Frankenwald Estate Development which is located directly north of the Proposed Development. These water infrastructure upgrades are required to be in place for the water supply of the Proposed Development:

- Installation of a new 600mm Ø feeder water pipeline from the existing 1000mm-600mm Ø water pipelines, east of the Proposed Development
- Construction of a new 30Mℓ Reservoir on Erf 54 Kelvin, north west of the Proposed Development.
- Installation of a new 315mm Ø bulk water pipeline at the northern boundary of the Frankenwald Estate Development, north west of the Proposed Development.
- Installation of a 800mm Ø - 400mm Ø gravity main to distribute water from the new 30Mℓ Reservoir

Water to the northern of the Proposed Development can be supplied from the proposed bulk water upgrades of the Frankenwald Estate Development. The following bulk water infrastructure will be required:

- A proposed 250mm Ø uPVC Class 16 water pipeline could be installed from the future 400mm Ø Frankenwald Estate gravity main, north of the Proposed Development. This pipeline could run south crossing the Jukskei River via a road bridge up to the northern boundary of the Proposed Development where it will connect to the internal water reticulation of the Proposed Development.

Water to the southern portion of the Proposed Development can be supplied from the existing water infrastructure of the Linbro Park Reservoirs (Alex) Sandton Bulk Direct PRV8/9 Reservoir Zone. The following bulk water infrastructure will be required:

- A proposed 160mm Ø uPVC Class 16 water pipeline can be installed from the existing 160mm water pipeline located on the southern side of Laduma Avenue, south east of the Proposed Development. This new pipeline could run parallel and on the northern side of Far East Bank Drive crossing the Jukskei River via an existing road bridge and continue up to the southern corner of Erf 11 of the Proposed Development where a bulk water meter and valve could be installed.

Wayleave approval will be obtained from Johannesburg Road Agency (JRA) for work to be done within municipal road reserves.

Proposed Internal Infrastructure

It is proposed that 110mm Ø – 250mm uPVC Class 16 water pipelines be installed for the Internal water reticulation.

Wayleave approval will be obtained from Johannesburg Road Agency (JRA) for work to be done within municipal road reserves.

Water Demand

The Average Annual Daily Demand (AADD) for the proposed development is 609,71 kℓ/d. The proposed water demand for the proposed development is summarised in Table 5 below:

Table 5 Proposed Water Demand

Erf No.	Zoning	Land Use	Proposed Development				
			Area	Number of	Floor Area	Average Annual	Total Water

			(ha)	Units	(m^2)	Daily Demand (AADD)	Demand (kℓ/d)
Linbro Park Reservoirs Reservoir Zone							
1	Residential 4	Social Rentals	0.79	360	15 800.00	2.90 kℓ/500m^2	91.64
2	Residential 4	Mixed Use	0.4	39	8 000.00	2.90 kℓ/500m^2	46.4
3	Residential 4	Mixed Use	0.17	42	3 400.00	2.90 kℓ/500m^2	19.72
4	Residential 4	Social Rentals	0.47	190	9 400.00	2.90 kℓ /500m^2	54.52
5	Residential 4	Breaking New Ground (RDP)	1.05	345	21 000.0	2.90 kℓ/500m^2	121.80
6	Residential 4	Breaking New Ground (RDP)	0.26	140	5 200.00	2.90 kℓ/500m^2	30.16
7	Residential 4	Flisp	0.84	222	16 800.00	2.90 kℓ/500m^2	97.44
8	Residential 4	Mixed Use	0.49	147	9 800.00	2.90 kℓ/500m^2	56.84
9	Residential 4	Flisp	0.67	189	13 400.00	2.90 kℓ/500m^2	77.72
10	Municipal	Municipal	0.21		6 300.0	0.60 kℓ/Erf	0.60
Sub-Total							**596.84**
Linbro Park Reservoirs (Alex) Sandton Bulk Direct PRV8/9 Reservoir Zone							
11	Business 3	Business	0.39		3 900.00	0.60 kℓ/Erf	12.87
Sub-Total							**12.87**
Total							**609.71**

Stormwater Management

Stormwater Drainage

The natural drainage pattern of the Remainder of Portion1 of Bergvallei 37 – IR is from south east to north west. The natural drainage pattern of the Remainder of Portion 31 is from the east and the west towards the Jukskei River intersecting this portion from south to north.

The pre-development stormwater run-off for the proposed development is summarised in Table 6 below

Table 6 Pre- development Stormwater Run-off

Catchment Area	Flood Return Period (Years)	Pre-Development Factor	Pre-Development Peak Flow (m^3//s)
Catchment Area 1	1:5	0.201	0.222
	1:25	0.275	0.449
	1:50	0.304	0.586
Catchment Area 2	1:5	0.201	0.075
	1:25	0.275	0.152
	1:50	0.304	0.199
Catchment Area 3	1:5	0.201	0.023
	1:25	0.275	0.046
	1:50	0.304	0.060

The post-development stormwater run-off for the proposed development is summarised in Table 7 below

Table 7 Post- development Stormwater Run-off

Catchment Area	Flood Return Period (Years)	Post-Development Factor	Post-Development Peak Flow (m^3//s)
Catchment Area 1	1:5	0.800	1.195
	1:25	0.800	1.772
	1:50	0.800	2.091
Catchment Area 2	1:5	0.800	0.366
	1:25	0.800	0.542
	1:50	0.800	0.640
Catchment Area 3	1:5	0.800	0.090
	1:25	0.800	0.134
	1:50	0.800	0.158

Existing Stormwater Infrastructure

There is existing municipal stormwater infrastructure located in Marlboro Drive and there is also an existing municipal stormwater infrastructure located in Far East Bank Drive, south east of the Proposed Development which consists of kerb inlets that drain into the Jukskei River and its tributaries.

The development will, however, not be able to connect to the existing stormwater infrastructure due to the general drainage pattern of the Proposed Development, in Marlboro Drive and Far East Bank Drive.

Proposed Stormwater Infrastructure

The stormwater run-off that is expected from the Proposed Development could drain via paved areas to kerb/grid inlets situated at low points. Stormwater pipes will be installed from the kerbs/grid inlets up to three earth attenuation ponds as follows:

- Attenuation Pond 1: the pond is proposed on Erf 1, which will be 1793m3 in volume, to collect the stormwater of catchment area 1.
- Attenuation Pond 2: a 550m3 earth attenuation pond is proposed in Erf 9 to collect the stormwater from catchment area 2.
- Attenuation Pond 3: a 135m3 attenuation pond is proposed in Erf 11 to collect the stormwater from catchment area 3.

Design Standards

The internal stormwater system will be designed for a 1:25-year flood return period and a run-off coefficient of 80%(C=0.8) will be allowed for the proposed development

A summary of the standards to be used in the design of the stormwater drainage system is presented in the table below.

Design Element	Specification
a) Minimum pipe size	450mm diameter (External)
b) Pipe Type	Interlocking joint pipes Pipe Class: 50D, 100D for road crossings
c) Minimum pipe gradient	0,67
d) Stormwater details	According to Johannesburg Roads Agency (JRA) Design Specifications for the Design of Street and Stormwater

Attenuation on Design

The technical data for the design of the attenuation pond is as follows:

- The attenuation ponds are capable of accommodating the Post 1:50 year development run-off
- The attenuation ponds will be designed to cater for an inflow equivalent to the Post 1:50 year run-off for Proposed Development
- The attenuation ponds will attenuate the post development 1:25 year run-off and the outflow will be the pre-development 1:5-year stormwater run-off. A weir will be provided to accommodate a storm where the run-off exceeds the post 1:25 year run-off. The weir and attenuation ponds will be able to accommodate a storm up to 1:50 year run-off.

- Outflow stormwater run-off from the attenuation ponds will discharge into 40mm Ø stormwater pipelines where it could discharge the pre-development 1:5-year stormwater run-off above the 32m Jukskei River Guard Buffer

List of annexures used in this section:
Annexure F: Town Planning Memorandum
Annexure G1: Bulk Engineering Services Report
Annexure G2: Comprehensive Stormwater Management Plan
Annexure H: Traffic Assessment Report
Annexure I: Department of Forestry, Fisheries and Environment Screening Tool

Select the appropriate box

The application is for an upgrade of an existing development		The application is for a new development	X	Other, specify	

Indicate the number of the relevant Government Notice:	**Activity No (s) (relevant notice): e.g., Listing notices 1, 2 or 3**	**Describe each listed activity as per the wording in the listing notices:**	**Application to the site**
December 2014 **as amended by** GN R 327, 7 April 2017	Listing Notice 1 Activity 9	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.	The development will require the upgrading of bulk infrastructure on and off the site. The engineering report investigated and report on the services required.
December 2014 **as amended by** GN R 327, 7 April 2017	Listing Notice 1 Activity 10	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;	The development will require the upgrading of bulk infrastructure on and off the site. The engineering report investigated and report on the services required .
December 2014 **as amended by** GN R 327, 7 April 2017	Listing Notice 1 Activity 19	The infilling or depositing of any material of more than 5 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 10 cubic metres from- (i) a watercourse;	Development of infrastructure exceeding 10 cubic metres within a watercourse. Although the majority of the development falls outside the wetlands and buffers a road and bridge must be

			constructed between Bergvallei and Frankenwald.
December 2014 **as amended by** GN R 327, 7 April 2017	Listing Notice 1 Activity 24	The development of a road – (i) for which an environmental authorisation was obtained for the route determination in terms of activity 5 in Government Notice 387 of 2006 or activity 18 in Government Notice 545 of 2010; or (ii) with a reserve wider than 13,5 meters, or where no reserve exists where the road is wider than 8 meters;	The proposed development will include the development of a road. Marlborough drive is partly a SANRAL and Partl a GUATRANS road.
GN. R 983, 8 December 2014 **as amended by** GN R 327, 7 April 2017	Listing Notice 1 Activity 27	The clearance of an area of 1 hectare or more, but less than 20 hectares of indigenous vegetation.	The total area of the site is approximately 14.3 hectares in extent.
GN. R 985, 8 December 2014 **as amended by** GN R 324, 7 April 2017	Listing Notice 3 Activity 12	The clearance of an area of 300 square metres or more of indigenous vegetation except where such clearance of indigenous vegetation. **c. Gauteng** ii. Within Critical Biodiversity Areas or Ecological Support Areas identified in the Gauteng Conservation Plan or bioregional plans.	Sections of the land are indicated as both critical biodiversity and ecological support areas. These areas have been investigated as part of the Terrestrial Biodiversity Assessment.
GN. R 985, 8 December 2014 **as amended by** GN R 324, 7 April 2017	Listing Notice 3 Activity 14	The development of— (ii) infrastructure or structures with a physical footprint of 10 square metres or more; where such development occurs— (c) if no development setback has been adopted, within 32 metres of a watercourse measured from the edge of a watercourse; **c. Gauteng** iv. Sites identified as Critical Biodiversity Areas (CBAs) or Ecological Support Areas (ESAs) in the Gauteng Conservation Plan or in bioregional plans.	The development is planned to accommodate a 32m buffer from any wetland and stream area. Although the majority of the development falls outside the wetlands and buffers, a road and bridge must be constructed between Bergvallei and Frankenwald

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

YES	NO

If yes, describe the legislation and the Competent Authority administering such legislation

Water Use License	
Legislation	**Competent Authority**
National Water Act, 1998 (Act No 36 of 1998)	Department of Water and Sanitation

If yes, have you applied for the authorisation(s)?	YES	**NO**
If yes, have you received approval(s)? (Attach in appropriate appendix)	YES	**NO**

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:**
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
Constitution of the Republic of South Africa (Act No 108 of 1990)	Government of South Africa	18 December 1996
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.	Gauteng Department of Agriculture and Rural Development (GDARD)	7 April 2017
National Water Act (Act No 36 of 1998)	Department of Water and Sanitation (DWS)	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	
• Companion Guideline on the Environmental Impact Assessment Regulations, 2010	Gauteng DARD	Various dates

• Environmental Management Framework Guidelines, 10 October 2012. • Public Participation Guideline, 10 October, 10 October 2012. • Fee Regulations Guidance Document, April 2014 • Guideline on need and desirability in terms of the Environmental Impact Assessment Regulations, 2010 • EIA Listed Activities and Timelines (January 2015) • Section 24G and Similar Listings (January 2015)		
• All relevant Provincial regulations, Municipal by-laws and ordinances This includes: • Gauteng Provincial Environmental Management Framework GPEMF 2015 • SPLUMA Bylaws of COJ • The Gauteng Draft Red Data Policy • The Gauteng Draft Ridges Policy • Protection of Agricultural Land in Gauteng Revised Policy (June 2006) • City of Johannesburg Municipality Spatial Development Framework (SDF) • Gauteng Transport Infrastructure Act	Provincial and Local - Gauteng Department of Agriculture and Rural Development (GDARD) and the City of Johannesburg Metropolitan Municipality. Application made to GDARD.	Various dates

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

Legislation, policy of guideline	**Description of compliance**
Constitution of the Republic of South Africa (Act No 108 of 1990)	• Obligation to ensure that the proposed development will not result in pollution and ecological degradation; and • Obligation to ensure that the proposed development is ecologically sustainable, while demonstrating economic and social development. The proposed project can be considered as a sustainable development that will prevent pollution and ecological degradation whilst promoting justifiable economic and social development.
National Environmental Management Act, 1998 (Act No. 107 of 1998 as amended).	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 considers the environmental and socio-economic conditions in compliance with the NEMA principles.
National Water Act (Act No 36 of 1998)	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. 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.
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.	GDARD is the provincial mandated authority to implement the Regulations for Environmental Impact Assessment in Gauteng. This application is made in terms of the regulations and is submitted to GDARD for consideration.
National Heritage Resources Act No 25 of 1999 (Act No 25 of 1999 as amended)	The site is it has a Low Archaeological and Cultural Heritage Sensitivity.
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 proposed site is situated within Zone 2: Sensitive areas within the urban development zone must be conserved and where linear development (roads etc.) cannot avoid these areas, a proper assessment and implementation of alternatives must be undertaken.
• Companion Guideline on the Environmental Impact Assessment Regulations, 2010 • Environmental Management Framework Guidelines, 10 October 2012.	Guidelines have informed this Application for Environmental Authorisation procedures and project / BAR.

• Public Participation Guideline, 10 October, 10 October 2012. • Fee Regulations Guidance Document, April 2014 • Guideline on need and desirability in terms of the Environmental Impact Assessment Regulations, 2010 • EIA Listed Activities and Timelines (January 2015) • Section 24G and Similar Listings (January 2015	
• All relevant Provincial regulations, Municipal by-laws and ordinances This includes: • Gauteng Provincial Environmental Management Framework GPEMF 2015 • SPLUMA Bylaws of COJ • The Gauteng Draft Red Data Policy • The Gauteng Draft Ridges Policy • Protection of Agricultural Land in Gauteng Revised Policy (June 2006) • City of Johannesburg Municipality Spatial Development Framework (SDF) • Gauteng Transport Infrastructure Act	Guidelines have informed this Application for Environmental Authorisation procedures and project / BAR.

3. 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.

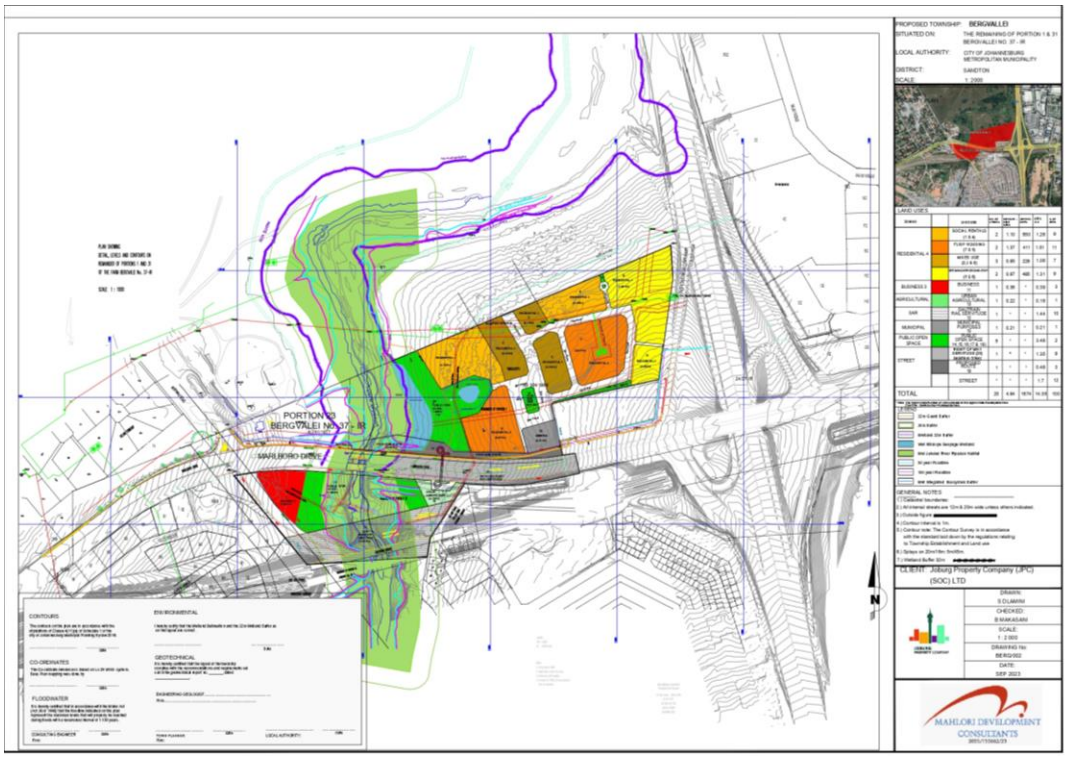
The no-go option must in all cases be included in the assessment phase as the baseline against which the impacts of the other alternatives are assessed. **Do not** include the no go option into the alternative table below.

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

Proposed Activity: Proposed Mixed-Use Development with Associated Infrastructure on the

Remainder of Portion 1 and Portion 31 of the Farm Bergvallei 37 IR, within the City of Johannesburg Metropolitan Municipality



Provide a description of the alternatives considered.

No.	**Alternative type**, either alternative: site on property, properties, activity, design, technology, energy, operational or other (provide details of "other")	**Description**
1	**PROPOSED ACTIVITY: Mixed-Use Development with Associated Infrastructure**	Proposed Mixed-Use Development with Associated Infrastructure on the Remainder of Portion 1 and Portion 31 of the Farm Bergvallei 37 IR, within the City of Johannesburg Metropolitan Municipality The proposed development located on the south & north of Marlboro Drive (M60), West of the Intersection (124) with the Eastern Bypass (N3), Johannesburg and measures approximately 14.3 hectares. The site is currently vacant land and on a broader scale is bordered by Midrand – Pretoria to the north, the O.R Tambo on the South East and the Johannesburg CBD on the South West. The proposed development will increase the available housing within the area and diversify the area

		with vibrant business development.
2	**Alternative 1 Light Industrial development**	The introduction of a high industrial development, which will include warehouses, storage facilities, shopping center, etc. only, although suited to the general functioning and land uses of the surrounding urban environment, high industrial uses are considered unsuitable due to the following reasons: • Over-saturation of a single-use activity. • Increase of heavy vehicles on the surrounding road network, causing further damage to existing roads in the area. • Lack of diversity and vibrancy associated with a business development and related uses
3	**Alternative 3 No Go**	This implies that the site be left as is and that no development or alteration be done. If this alternative is pursued the sites existing habitat will be retained. This option has the following drawbacks: • The potential to provide housing will be lost • A very viable opportunity to create jobs and income for the local market during the construction and operational phase will be neglected. • The area will fall further in disrepair. Given the fact that the site will eventually degenerate if left unmanaged, it is reasonable to state that the no-go option is less favorable than some of the other options presented.

No.	**Alternative type**, - **Location**	**Description**
1	**Proposal - Infill development location (preferred)**	This is the most preferred location type due to the balance achievable between social, environmental, and economic requirements: • The land belongs to the Applicant. • Situated within the urban realm adjacent to existing and proposed urban infrastructure, service, and amenities. • Socially inclusive due to its location in numerous communities and along public transport routes.
2	Alternative 1 – Inner City Location	An inner-city location would be environmentally and socially feasible. High density residential is preferred in the inner city. The proposed development offers three housing typologies (i.e., Flisp, Breaking New Ground, and Social Housing Rentals) which will create an urban environment characterised by diverse usage & income levels. A transit-oriented density is also proposed (i.e., convenience stores and office units) which will offer residents convenient access to a range of land uses located near each other.

No.	**Alternative type**,	**Description**

	Technology	
1	**Proposal Technology**	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.
2	Alternative 1	The appropriate Green Building bylaws will be implemented. Measures will be put in place to make the development as ecologically responsible as possible such as the installation of: • Energy efficient light bulbs • Solar heating units, • Low flow water taps • Use of local labour • Use of local materials

No-Go Alternative

This implies that the site be left as is and that no development or alteration be done. If this alternative is pursued the site's existing habitat will be retained. This option has the following drawbacks:

- The potential to provide housing will be lost
- During the construction and operational phases, a very viable opportunity to create jobs and income for the local market will be lost.
- The area will deteriorate further.
- The site may be occupied by illegal squatters or vagrants.

Given that the site will eventually degenerate if left unmanaged, it is reasonable to conclude that the no-go option is less favorable than some of the other options presented.

Not applicable as alternatives are provided.

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:

	Size of the activity:
Proposed activity ***(Total environmental (landscaping, parking, etc.) and the building footprint)***	Development footprint Approximately 14.3 ha
Alternatives:	
Alternative 1 (if any)	Not Applicable
Alternative 2 (if any)	Not Applicable

Ha/ m^2

or, for linear activities:

Length of the

	activity:
Proposed activity	Not Applicable
Alternatives:	
Alternative 1 (if any)	Not Applicable
Alternative 2 (if any)	Not Applicable

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)	Not Applicable
Alternative 2 (if any)	Not Applicable

Ha/m^2

5. SITE ACCESS

Proposal

Does ready access to the site exist, or is access directly from an existing road?	**YES**	NO
If NO, what is the distance over which a new access road will be built		**N/A**

Describe the type of access road planned:

Access will be provided via Intersection 18, through the Frankenwald Development (**Refer to Figure 3)**

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

Describe the type of access road planned:

Access will be provided through the Frankenwald Development, via intersection 18.

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).

No Go Alternative

Does ready access to the site exist, or is access directly from an existing road?	YES	NO
If NO, what is the distance over which a new access road will be built		Not Applicable

Describe the type of access road planned:

Not Applicable as the site will be left as is.

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

Refer to Annexure A

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 B

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 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

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	**Not Applicable**	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 alterative 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	**Not Applicable**	time s	(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)

E. **PROPERTY DESCRIPTION**

Property description: (Including Physical Address and Farm name, portion etc.)	Proposed Mixed-Use Development with Associated Infrastructure on the Remainder of Portion 1 and Portion 31 of the Farm Bergvallei 37 IR, within the City of Johannesburg Metropolitan Municipality The proposed development located on the south & north of Marlboro Drive (M60), West of the Intersection (124) with the Eastern Bypass (N3), Johannesburg and measures approximately 14.3 hectares. The site is currently vacant land and on a broader scale is bordered by Midrand – Pretoria to the north, the O.R Tambo on the South East and the Johannesburg CBD on the South West. The proposed development will increase the availability of housing within the area and diversify the area with vibrant business development

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 l:**
	26°4'52.93"S	28°6'39.50"E
	26°4'59.46"S	28°6'28.59"E

In the case of linear activities:

Alternative:	**Latitude (S):**	**Longitul(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 21-digit Surveyor General code of each cadastral land parcel

T	0	I	R	0	0	0	0	0	0	0	0	0	0	3	7	0	0	0	0	1
1	**2**			**3**				**4**								**5**				
T	0	I	R	0	0	0	0	0	0	0	0	0	0	3	7	0	0	0	3	1
1	**2**			**3**				**4**								**5**				

3. GRADIENT OF THE SITE

Indicate the general gradient of the site.

Flat	**1:50 – 1:20**	1:20 – 1:15	1:15 – 1:10	1:10 – 1:7,5	1:7,5 – 1:5	Steeper than 1:5

4. LOCATION IN LANDSCAPE

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

Ridgeline	Plateau	Side slope of hill/ridge	Valley	Plain	**Undulating plain/low hills**	River front

E) *5. GROUNDWATER, SOIL AND GEOLOGICAL STABILITY OF THE)* Is the site located on any of the following?

Shallow water table (less than 1.5m deep)	YES	**NO**
Dolomite, sinkhole or doline areas	YES	**NO**
Seasonally wet soils (often close to water bodies)	YES	**NO**
Unstable rocky slopes or steep slopes with loose soil	YES	**NO**
Dispersive soils (soils that dissolve in water)	YES	**NO**
Soils with high clay content (clay fraction more than 40%)	YES	**NO**
Any other unstable soil or geological feature	YES	**NO**
An area sensitive to erosion	YES	**NO**

(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 **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):**
o	o

c) are any caves 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):**
o	o

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):**

0	0

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**

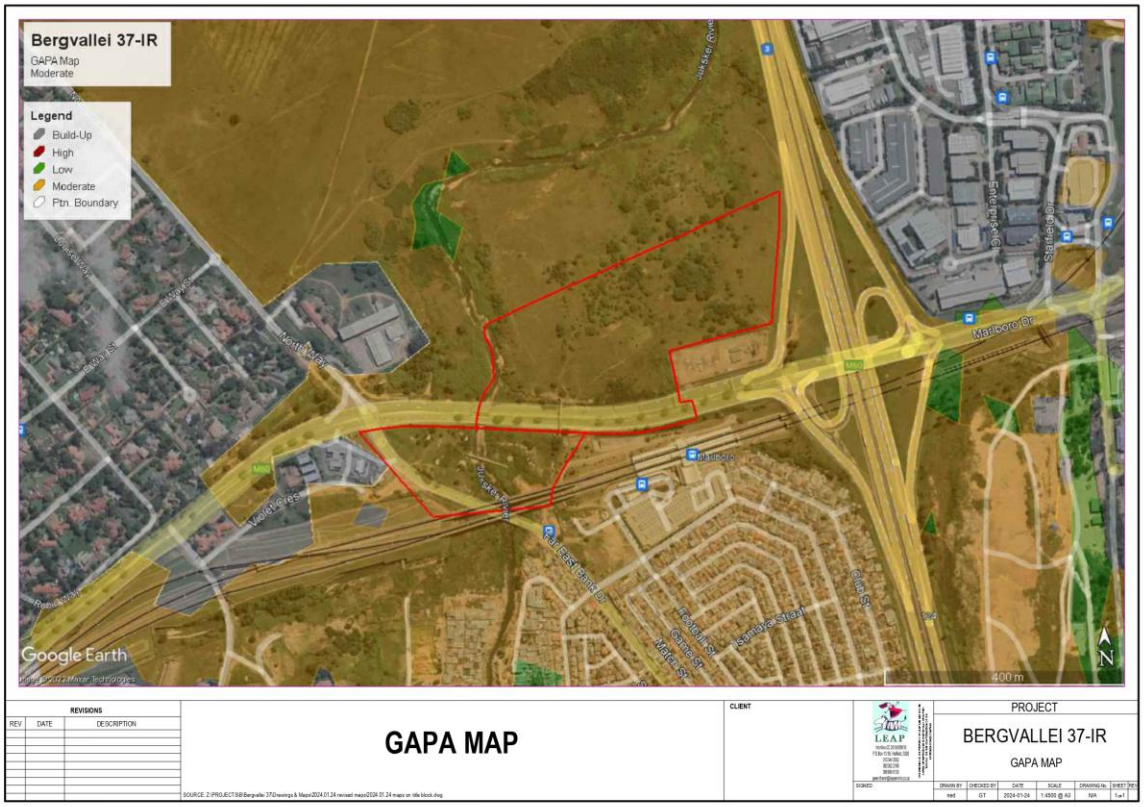


Figure 4: Gauteng Agricultural Potential Atlas (Source: GDARD)

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 groundcovers present on the site and include the estimated percentage found on site–

Natural veld - good condition % =	**Natural veld with scattered aliens % =70**	**Natural veld with heavy alien infestation % =20**	Veld dominated by alien species. % =	Landscaped (vegetation) % =

Sport field % =	Cultivated land. % =	Paved surface (Hard landscaping) % =	Building or other structure % =	**Bare soil % =10**

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.

An Environmental Screening tool was used to assess site sensitivities, refer to Table 8.

Table 8: Sensitivities according to the Environmental Screening Tool

Theme	Very High Sensitivity	High Sensitivity	Medium Sensitivity	Low Sensitivity
Agriculture Theme			x	
Animal Species Theme		x		
Aquatic Biodiversity Theme	X			
Archaeological and Cultural Heritage Theme				x
Civil Aviation Theme		x		
Defence Theme			x	
Plant Species Theme			x	
Terrestrial Biodiversity Theme	X			

According to Gauteng Provincial Environmental Management Framework (GPEMF), the project site falls within **Zone 2 - High control zone** (within the urban development zone – **Zone 1**). This zone is sensitive to development activities.

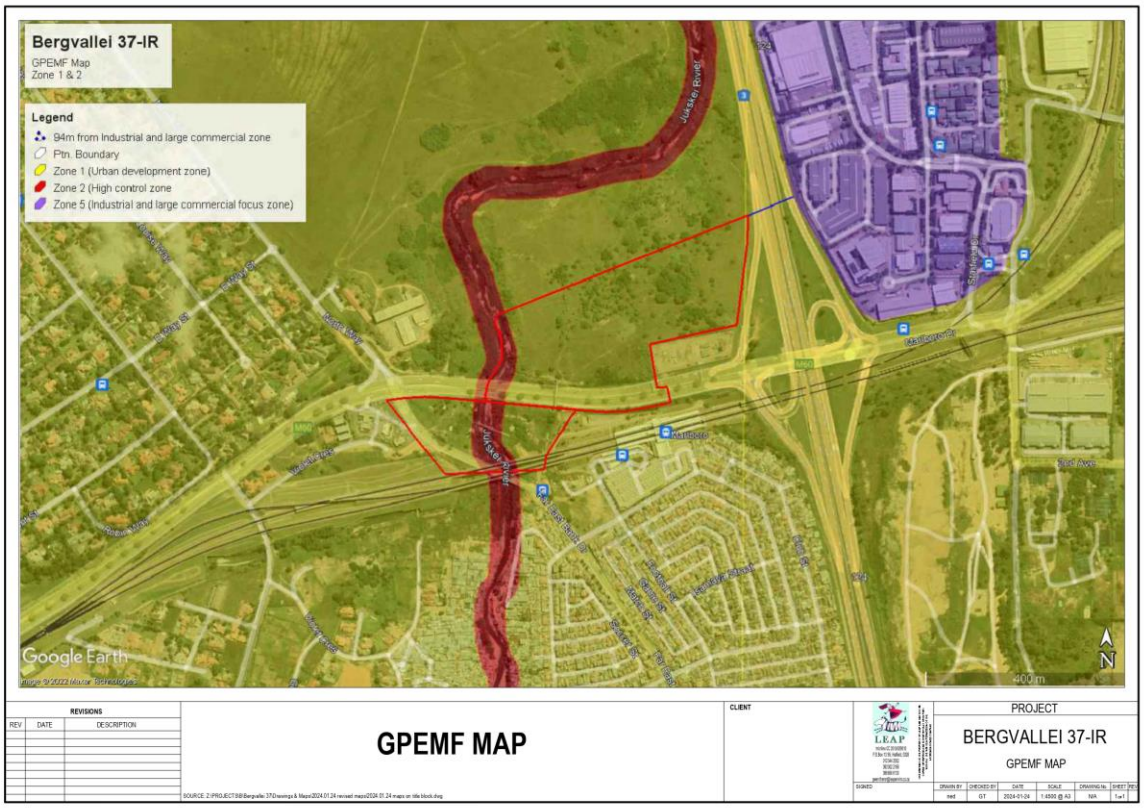


Figure 5: GPEMF Map

There are no existing land uses as the subject property is vacant and is degraded from past and current anthropogenic activities, dumping of rubble & litter, removal of woody species; regular burning etc.

The proposed development site is underlain by granitic and mafic rocks of the Johannesburg Dome Granite of the Achaean Basement Complex.

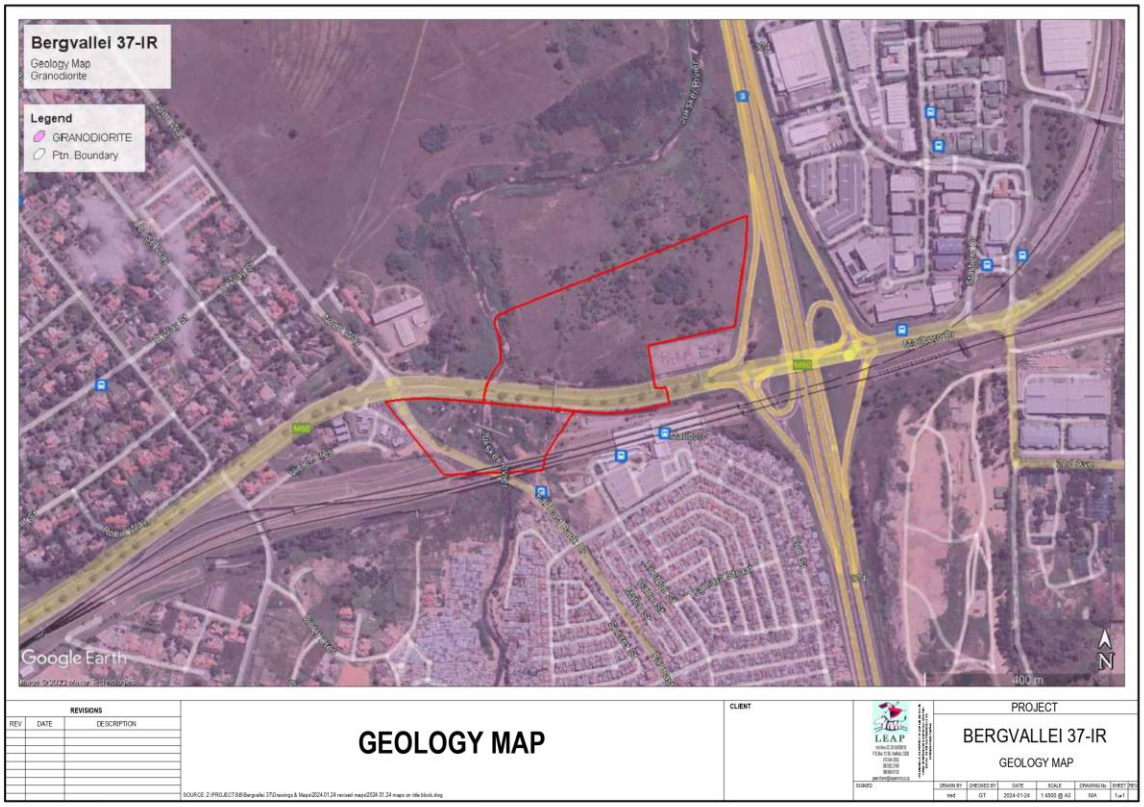


Figure 6: Geology Map

According to Mucina & Rutherford (2006), the study is associated with one vegetation type, namely the Egoli Granite Grassland (Gm 10). Egoli Granite Grasslands in the Gauteng Province are highly threatened and are listed as Endangered. Only a small fraction (3%) of this vital habitat has been formerly conserved within Gauteng. The vegetation of this endangered ecosystem is characterized by the dominance of the grass *Hyparrhenia hirta* but has a high species diversity with some rocky outcrops in-between.

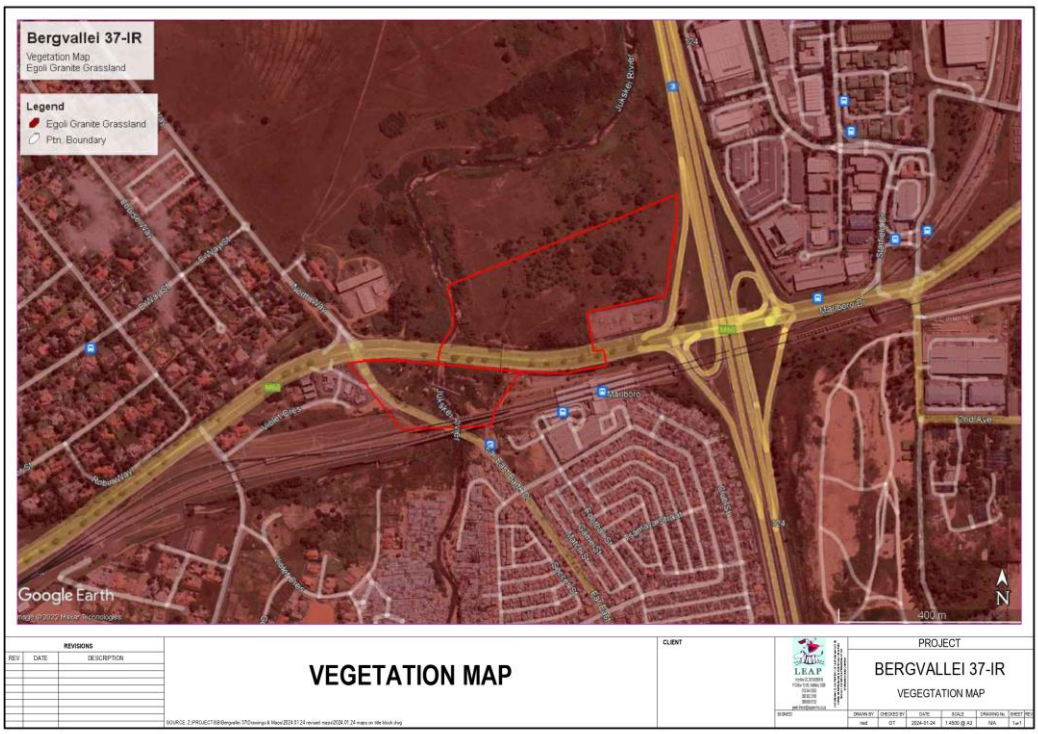


Figure 7: Vegetation Map

Freshwater Ecosystem

Based on current outputs of the NFEPA project (Nel et al., 2011), there are no FEPA wetlands or wetland clusters located within the study area or situated within several kilometres from the study area. The COJ wetland data set shows significant number of wetland in and around the site. The Julskei river flows through the site.

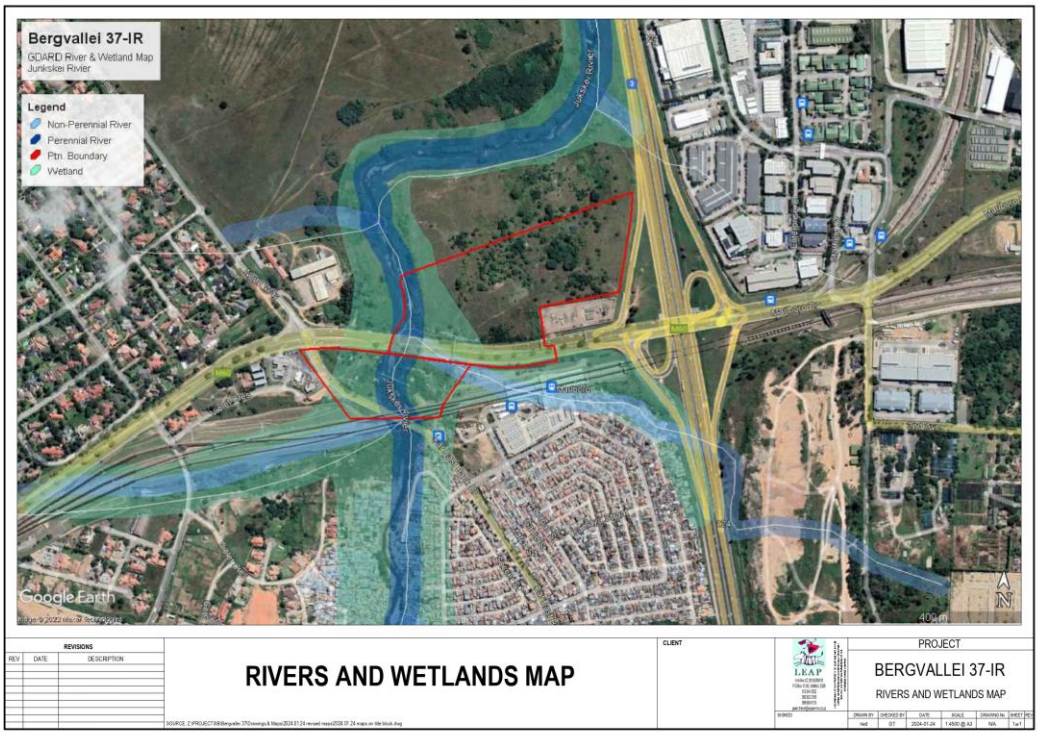


Figure 8: Rivers and Wetlands Map – Source COJ

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:

The GDARD C Plan shows that the land is included in an Ecological Support Area and an Important Area.

Was a specialist consulted to assist with completing this section	**YES**	NO

If yes complete specialist details

Name of the specialist:	Specialist Declarations form part of this report and attached as **Annexure M.**		
Qualification(s) of the specialist:			
Postal address:			
Postal code:			
Telephone:		Cell:	082 4641021
E-mail:		Fax:	-

Are any further specialist studies recommended by the specialist?	YES	**NO**
If YES, specify: N/A		
If YES, is such a report(s) attached?	YES	NO

If YES list the specialist reports attached below

Not Applicable

Signature of specialist: _____ Date:

Geotechnical Site Investigation

The study was undertaken by the **Ntamu Engineers** in October 2022. The summary of the report is presented below, Refer to **Annexure C1** for the complete report.

Topography and Surface Drainage

The proposed development site is characterised by an undulating landscape with moderate slopes with an

average east west dipping gradient of 7%. The estimated altitudes above sea level of the site are Maximum: 1507m, Minimum: 1499m and an Average of 1486m.

Method of Investigation

Thirteen test pits were excavated and subsequently profiled by a registered engineering geologist, according to a method suggested by Jennings et.al. (1973). Disturbed representative soil was recovered from the test pits and were taken to SGS laboratory in Pretoria for further testing and identification. The test pits were excavated using a Tractor-Loader-Backhoe (TLB) at depths ranging between 0.50 and 1.80 meters below ground level (mbgl).

Figure 9: Location of excavated test pits

Geology

The proposed development site is underlain by granitic and mafic rocks of the Johannesburg Dome Granite of the Achaean Basement Complex. The site is underlain by transported soils confined to the upper portions of the site. Underneath the transport soils is the ferruginous material underlain by slightly to moderately weathered granite. Highly weathered granite outcrops were recorded, emerging from the central portion to the north of the site.

Excavatibility

Excavations for the Remainder of Portion 1 are expected to use soft excavation techniques to remove the thin layer of colluvium, intermediate to hard excavation techniques to remove the uncontrolled fill on the eastern side of the site and to remove residual granite and outcropping granite hard bedrock.

Excavations for the Remainder of Portion 31 of Bergvallei 37 are expected to use soft to intermediate excavation techniques to remove the thick layer of uncontrolled fill that covers the entire platform.

It is recommended that all the required earthworks be carried out in accordance with the latest guidelines provided by Sans 1200.

Groundwater

No water seepage was encountered on the development site except for trial pit 7 on the Remainder of Portion 1 of Bergvallei 37 exhibited various forms of pedogenic material such as ferrugious soil as well as signs of seepage.

Collapsible Soil Profile

The natural in-situ soils encountered on the Remainder of Portion 1 of Bergvallei 37 comprise loose to medium dense silty sand and sands with no visual open-textured structures such as voids and pinholes, which indicate collapse potential.

The natural in-situ soils encountered on Remainder of Portion 31 of Bergvallei 37 comprise loose clayey sandy gravel with no visual open-textured structures such as voids and pinholes, which indicate collapse potential.

These soils ae extremely dispersive and specific methods appropriate to manage these granite soils MUST implemented during construction to avoid excessive erosion.

Expansive Soils

The natural in-situ soils underlying on the Remainder of Portion 1 and on Remainder of Portion 31 of Bergvallei 37 site comprise silty sand and sands. The laboratory results of all the samples analysed exhibit low potential expansiveness.

Geotechnical Classification

According to the NHBRC site class designation, the Remainder of Portion 1 of Bergvallei 37 is classified Site Class **2/R/S1/C2** and the Remainder of Portion 37 of Bergvallei 37 is classified as:Site Class **2/S1/C2**.

Founding of the Structure

The recommended foundation system for the proposed development must be considered for single-story, rigid, residential masonry structures are summarised in the table below.

Erf Number	Site Class	Construction Type	Foundation design and building procedures
		Normal Foundation	• Normal foundation: • Foundations to SABS 0400 Part H • Foundation bearing pressure not to exceed 50 kPa. • Good site drainage • Estimated total settlement is less than five (<5)
		Compaction of in situ soils below individual footings	• Compaction of in situ soils below individual footings: • Remove in situ material below foundations to

Portion 1: RE/1/37	**C/R/S1/C2**		a depth and width of 1,5 times the foundation width or to a competent horizon and replace with material compacted to 93% Mod AASHTO density at -1% to +2% of optimum moisture content. • Normal construction with lightly reinforced strip footings. • Light reinforcement in masonry. • Site drainage and plumbing/service precautions to be taken
		Modified Normal	• Reinforced strip footlongs • Articulation joints at some Internal and all external doors • Light reinforcement in masonry • Site drainage and service plumbing precautions • Foundation pressure not to exceed 50 kPa • Estimated settlement is between 5 – 15.
Portion 2: RE/31/37	**C/S1/C2**	**Modified Normal**	• Reinforced strip footlongs • Articulation joints at some Internal and all external doors • Light reinforcement in masonry • Site drainage and service plumbing precautions • Foundation pressure not to exceed 50 kPa • Estimated settlement is between 5 – 15.
		Compaction of in situ soils below individual footings	• Compaction of in situ soils below individual footings: • Remove in situ material below foundations to a depth and width of 1,5 times the foundation width or to a competent horizon and replace with material compacted to 93% Mod AASHTO density at -1% to +2% of optimum moisture content. • Normal construction with lightly reinforced strip footings. • Light reinforcement in masonry. • Site drainage and plumbing/service precautions to be taken

Conclusion

According to the 1: 250 000 scale 2628 East Rand Geological Map Series The proposed location is underlain by granitic and mafic rocks. of the Johannesburg Dome Granite of the Achaean Basement Complex. The area is not underlain by dolomite; therefore, it is classified as non-dolomitic area.

There was no Groundwater seepage was encountered during site investigation. However, various forms of ferruginisation as well as signs of seepage were observed in most of the trial pits.

The Remainder of Portion 1 and Remainder of Portion 31 of Bergvallei 37 have been broadly classified based on field observations/investigation and laboratory soil testing of soil samples, the sites are classified as **Class 2/R/S1/C2** and **Class 2/S2/C2**, respectively.

Thus, the proposed development (Portion 1: RE/1/37 and Portion 2: RE/31/37) is Suitable for Township Development with precautions.

Terrestrial Biodiversity Assessment

The study was undertaken by the **Enviroguard Ecological Services CC** in August 2022. The summary of the report is presented below, Refer to **Annexure C2** for the complete report.

Vegetation Type

According to Mucina & Rutherford (2006), the study area is associated with one vegetation type, namely the Egoli Granite Grassland (Gm 10). Egoli Granite Grasslands in the Gauteng Province are highly threatened and are listed as Endangered. Only a small fraction (3%) of this vital habitat has been formerly conserved within Gauteng. The vegetation of this endangered ecosystem is characterized by the dominance of the grass *Hyparrhenia hirta* but has a high species diversity with some rocky outcrops in-between.

Species common for this vegetation type include *Aristida canescens, Digitaria monodactyla, Themeda triandra, Setaria sphacelata, Eragrostis curvula, Eragrostis chloromelas, Heteropogon contortus, Melinis repens, Monocymbium ceresiiforme, Becium obovatum, Helichrysum rugulosum, Nidorella hottentotica, Berkheya insignis, Crabbea hirsuta, Cyanotis speciosa* and *Kohautia amatymbica.*

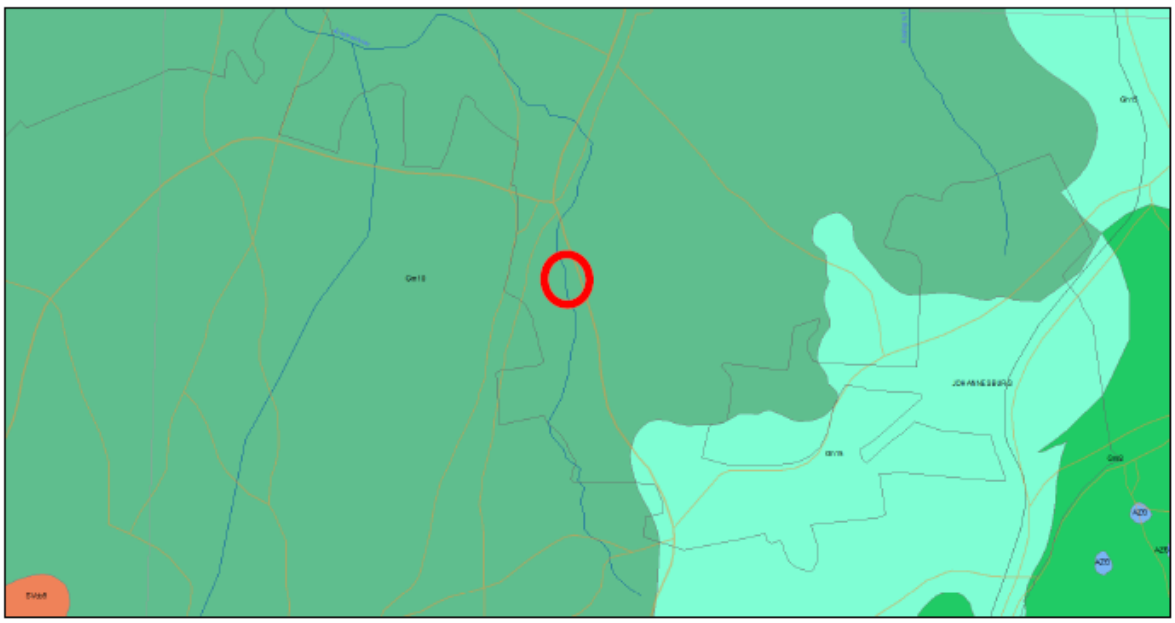


Figure 10: Vegetation Type Map

Vegetation type for the proposed development
Habitats and Floral Composition

Four broad vegetation units were identified namely 1) Eragrostis curvula Grassland 2) Alien woodland 3) Degraded area and 4) Riverine area.

1) ***Eragrostis curvula* grassland**

The *Eragrostis curvula* grassland vegetation unit was observed in the northern, north-western, and eastern parts of the study area and is characterized by the dominance of the grasses *Eragrostis curvula, Eragrostis chloromelas, Hyparrhenia hirta* and the forbs *Helichrysum nudifolium, Vernonia oligocephala* and *Physalis viscosa.* Other species present include the dwarf shrub *Seriphium plumosum,* the grasses *Cynodon dactylon, Aristida congesta* subsp. *congesta, Heteropogon contortus,* and the forbs *Pseudognaphalium luteo-album* and *Pollichia campestris.*

2) **Alien woodland**

The Alien woodland vegetation unit occurs in the central part of the study area on a rocky hill and is characterized by the dominance of various declared alien invader woody species of which *Melia azedarach* is the most dominant. Prominent species include the alien trees *Tipuana tipu, Solanum mauritianum, Acacia dealbata,* and *Acacia mearnsii*. Other species include the woody *Vachellia karroo, Searsia lancea,* the grasses *Pennisetum clandestinum, Eragrostis gummiflua,* and the forbs *Plantago lanceolata, Bidens pilosa, Tagetes minuta,* and *Schkuhria pinnata.*

3) **Degraded area**

The Degraded area vegetation unit located in the south-western parts of the study area south of Marlboro Road on open land with the Jukskei river flowing through the central part of this vegetation unit.

4) **Riverine area**

The Riverine area vegetation unit along the embankment of the Jukskei River comprises mainly open grassland and include the grasses *Imperata cylindrica*, *Paspalum urvillei*, and the forb *Typha capensis* with dense stands of the alien invasive reed *Arundo donax* present. Single individuals of woody species are present along the embankment and include the trees *Morus alba*, *Eucalyptus camaldulensis* and *Salix babylonica*.

Figure 11: Vegetation units for the proposed development

No red data species were found to be present in any of the vegetation units and no suitable habitat exists due to the transformed condition thereof. There were no protected plant species observed on the study site.

Site Ecological Importance

According to the **Site Ecological Importance** analysis vegetation units 1, 2, & 3 have a VERY LOW biodiversity importance, while vegetation unit 4 (although degraded) has a MEDIUM biodiversity importance mostly because of it being a water system.

Fauna

A preliminary faunal habitat assessment of the status, spatial requirements and habitat preferences of all priority faunal species (mammals, birds, reptiles and amphibians) likely to occur within or surrounding the Bergvallei site was undertaken.

Amphibians

No frog species were recorded since the survey was undertaken during the daylight hours during winter months. Fieldwork was augmented with species lists compiled from personal records; data from the South African Frog Atlas Project (SAFAP) and published data. The list provided in table below is regarded as likely to be fairly comprehensive.

Common Name	Scientific Name	Breeding Habitat
*Guttural Toad	*Sclerophrys gutturalis*	Seasonal and permanent pans
*Red Toad	*Schismaderma carens*	Deeper (>1m) *Typha capensis-Phragmites australis* permanent pan

*Common Platanna	*Xenopus laevis*	Seasonal and permanent pans
Boettger's or Common Caco	*Cacosternum boettgeri*	Seasonal pans and inundated grassland
Bubbling Kassina	*Kassina senegalensis*	Seasonal pans and inundated grassland
Tremelo Sand Frog	*Tomopterna cryptotis*	Seasonal pans and inundated grassland
Natal Sand Frog	*Tomopterna natalensis*	Seasonal pans and inundated grassland
Giant Bullfrog	*Pyxicephalus adspersus*	Seasonal pans and inundated grassland
Delalande's River Frog	*Amietia delalandii*	Seasonal and permanent pans
Cape River Frog	*Amietia fuscigula*	Permanent pan
Striped Grass Frog	*Strongylopus fasciatus*	Seasonal pans and inundated grassland
Snoring Puddle Frog	*Phrynobatrachus natalensis*	Seasonal pans and inundated grassland

Reptiles

No snake species were observed during the single site visitation and low population numbers are expected due to the high levels of anthropogenic activities on and surrounding the site. The dumping of building rubble has created suitable habitat for certain reptile species such as Herald Snake (*Crotaphopeltis hotamboeia*), Variable Skink (*Trachylepis varia*), Brown House Snake (*Lamprophis fuliginosus*), and Spotted Skaapsteker (*Psammophylax rhombeatus*). Snake species likely to occur on the Bergvallei site include Rinkhals (*Hemachatus haemachatus*), Red-lipped Snake (*Crotaphopeltis hotamboeia*), Brown House Snake (*Boaedon capensis*), Brown Water Snake (*Lycodonomorphus rufulus*) and Rhombic Night Adder (*Causus rhombeatus*).

Three species were observed on site namely, Speckled Rock Skink (*Trachylepis punctatissima),* Cape Skink (*Trachylepis capensis*) and Variable Skink (*Trachylepis varia*). Gecko species recorded included Common Dwarf Gecko (*Lygodactylus capensis*).

Avifauna/Birds

Twenty-four (24) bird species were observed on site. However, the species recorded during the field survey are common, widespread and typical of fairly uniform grassland as well as riverine habitat. The dominant bird species were granivores such as Cape Turtle Dove, Laughing Dove, Speckled Pigeon and Southern Red Bishops. The *Typha capense* beds within the Jukskei River offer suitable habitat for Lesser Swamp Warbler, Little Rush-Warbler, Greater Reed Warbler.

Wetland Assessment

The study was undertaken by **WaterMakers** in August 2022. The summary of the report is presented herewith, Refer to **Annexure C3** for the complete report.

Vegetation Type

The study site is located within the Egoli Granite Grassland Biome of South Africa. High summer rainfall is characteristic of the Grassland Biome combined with dry winters with night frost and marked diurnal temperature variations.

The Egoli Granite Grassland occurs in the Gauteng Province in the Johannesburg dome and extends toward Centurion in the North, Muldersdrift to the east and Tembisa to the west. The grassland is usually dominated by *Hyparrhenia hirta* with some woody species on rocky-out crops or rock sheets. Only about 3% of this unit is conserved in statutory reserves and private conservation and more than two thirds has already undergone transformations mostly by urbanisation, cultivation or by building of roads. This classifies the unit as Endangered (Mucina & Rutherford, 2006).

The study area is located within the Southern Temperate Highveld freshwater ecoregion, which is delimited by the South African interior plateau sub-region of the Highveld aquatic ecoregion, of which the main habitat type, in terms of watercourses, is regarded as Savannah-Dry Forest Rivers.

Freshwater Ecosystem

Based on current outputs of the NFEPA project (Nel et al., 2011), there are no FEPA wetlands or wetland clusters located within the study area or situated within several kilometres from the study area (**See Figure 12**).

Wetland and/ Riparian Vegetation

The study area falls within the Mesic Highveld Group 3 wetland vegetation group which is considered as being Critically Endangered According to Macfarlane et al. (2014)

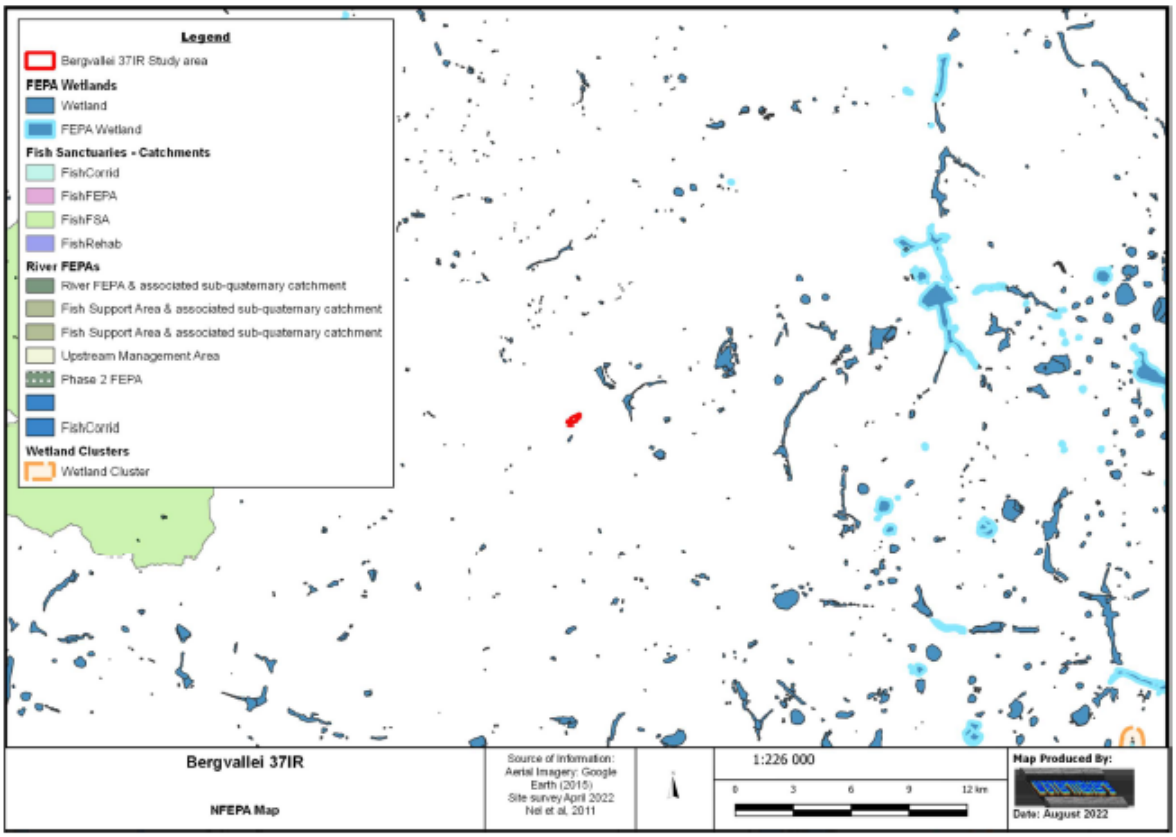


Figure 12 National Freshwater Ecosystem Priority Areas associated with the Proposed Development

Delineated Wetland and/ Riparian Areas

One riparian watercourse was delineated within the study area and within 500m from the study area, named

Jukskei River Riparian and the Jukskei River Riparian within the study site is regarded as a C Section channel because it has base flow.

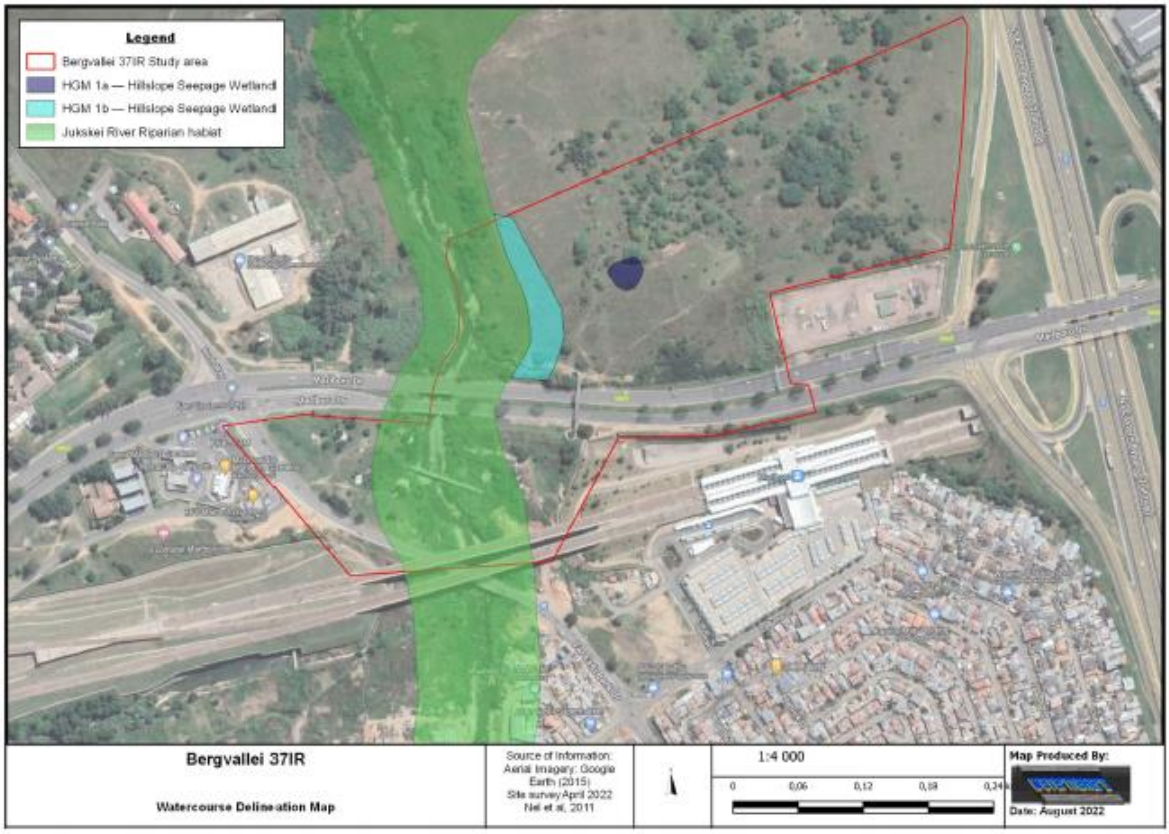


Figure 13: Watercourse Delineation map for the study area and vicinity

Present Ecological State

Historic imagery and vegetation conditions observed in the study area indicated that the different riparian sub-zones (marginal and non-marginal zones) were often not recognisable in some instances within the study area, hampering an effective and defensible VEGRAI assessment. Findings of the VEGRAI vegetation assessment conducted on riparian units identified within the study area revealed that riparian habitat associated with the study area were regarded as being in a seriously modified state (i.e., Ecological Category E).

Table 9: VEGRAI score for the riparian vegetation.

Riparian Unit	VEGRAI Score	Ecological Category
Jukskei River Riparian	65.2	E

Jukskei River Riparian is regarded as being seriously modified due to the historic and current anthropogenic impacts including significant impacts within the direct catchment including soil profile and topographic manipulation, severe successional vegetation changes as well as severe morphological impacts.

Riparian Ecological Importance and Sensitivity

Jukskei River Riparian has a moderate a moderate Hydrological and Functional Importance due to the potential array of ecosystem services provided and associated importance of a primary drainage. Jukskei River Riparian's Ecological Importance and Sensitivity are significantly reduced as a result of the high level

of pollution, invasive and exotic vegetation associated with the riparian habitat and channel bank erosion within the vicinity of the study area. Direct human benefits were regarded as low within Jukskei River Riparian.

Table 10: Ecological Importance and Sensitivity scores for wetland complexes

Watercourse	Parameter	Rating (0-4)	Confidence (1-5)
Jukskei River Riparian	**Ecological Importance and Sensitivity**	**Very Low** (0.9)	2.0
	Hydrological / Functional Importance	**Moderate** (2.8)	2.5
	Direct Human Benefits	**Very Low** (0.8)	2.5

Buffer Recommendations

Determination of the preliminary buffer requirements for the riparian features associated with the proposed development (typical mixed-use development) followed the approach of Macfarlane & Bredin (2016), whereby the preliminary required buffers were developed based on various factors, including assumed building densities, slope, annual precipitation, rainfall intensity, channel width, catchment to wetland ratio, etc.

Accordingly, preliminary buffer requirements for the identified wetlands were determined to be variable depending on the specific adjacent slope condition, historic impacts, associated gradient as well as management regime applied:

- Jukskei River Riparian habitat: 30m from edge of delineated riparian habitat
- HGM 1a: 32m GDARD buffer
- HGM 1b: Variable buffer 15m from the edge of the delineated wetland areas on the southern and northern boundaries and 20m on the eastern and western boundaries.

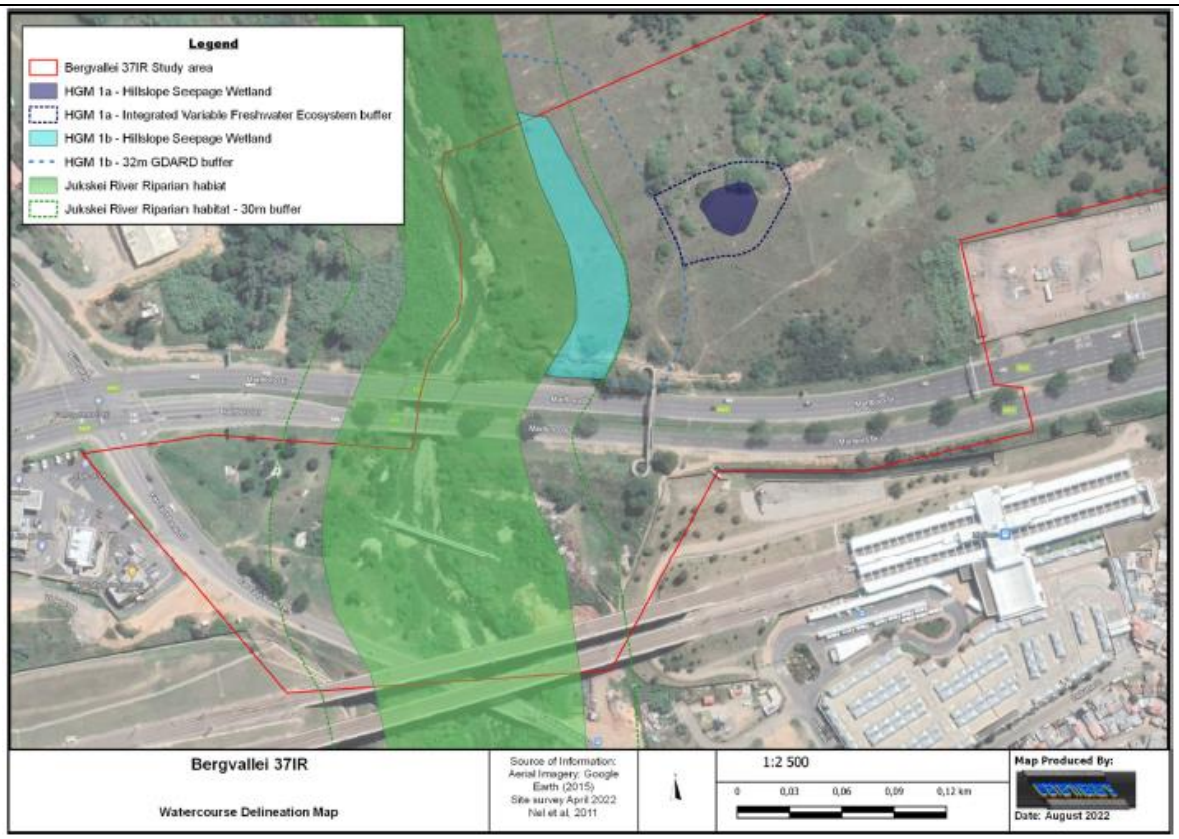


Figure 14: Freshwater Ecosystem and GDARD Buffers for watercourses within the vicinity of the Study area.

Floodline Assessment

The study was undertaken by **CivilConsult Consulting Engineers (Pty) Ltd**. The summary of the report is presented herewith, Refer to **Annexure C5** for the complete report.

The proposed development is affected by floodwater due to the Jukskei River those transverses it**. Refer to Figure 15**

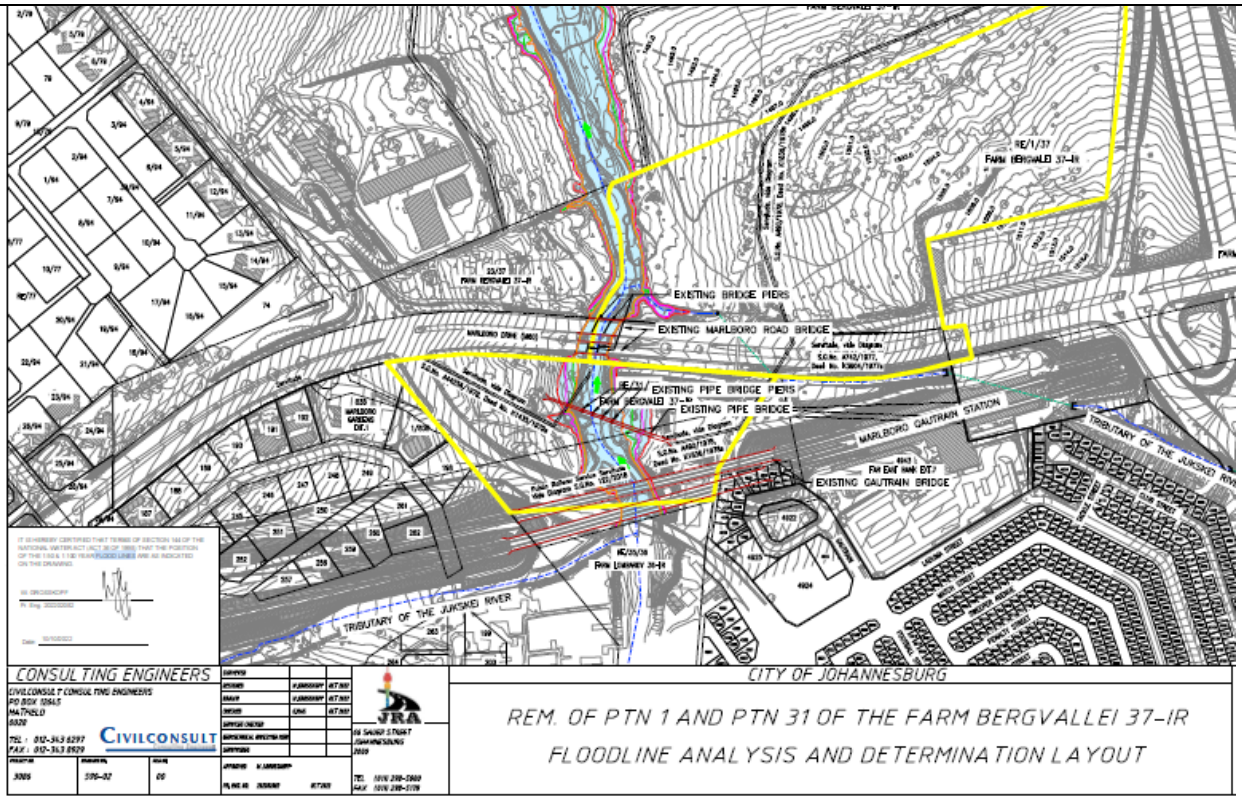


Figure 15: 1:10, 1:20, 1:50 and 1:100-year RI Flood Lines

Catchment Area

The catchment Area Size and Quaternary Drainage Region as indicated by the Department of Water and Sanitation (DWS) is shown in the table below.

Catchment Area No.	Catchment Area Size (km²)	Quaternary Drainage Region as indicated by the Department of Water and Sanitation (DWS)
1	105.24	A21C

Catchment Area 1

Hydrological Data and Flood Peaks for Catchment Area 1

Criteria used to determine the peak flood is shown in Table 11 and 12

Table 11: Hydrological Data

Item No.	Determination Element	Criteria
1	Method	Unit Hydrograph
2	Quaternary Drainage Regions (DWS)	A21C
3	Catchment Are	± 105.24 (km²)
4	Length of the longest watercourse	± 21.77 (km²)
5	Mean Annual Rainfall	± 750m
6	Flood Return Period	1:10, 1:20, 1:50 and 1:100-year
8	Height Difference at 1% and 85% of the length of the watercourse	187.132m
9	Rainfall Region	Inland

Table 12: Calculated Flood Peaks

Method	Return Interval (RI			
	1:10-year	1:20-year	1:50-year	1:100-year
	Peak Flood Runoff (m^3/s)			
Unit Hydrograph Method	**149.77**	**203.21**	**293.80**	**389.03**
Standard Design Flood Method	132.91	192.95	282.55	357.82
Empirical Method	144.15	166.14	232.11	293.19

Air Quality Baseline Assessment

The study was undertaken by **JBenviroservices (Pty) Ltd** in September 2022. The summary of the report is presented herewith, Refer to **Annexure C6** for the complete report.

The study site is located within a residential area. The Alexandra-NAQI ambient station was used to determine the ambient air pollutant concentrations (as per what was available**)** and the average ambient wind field conditions. Available pollutant concentrations for the area are PM_{10}, $PM_{2.5}$, and SO_2. The average concentrations of the aforementioned were within the NAAQS limits.

The average wind directions for the area originates from the east-south-east and west-north-west directions. The wind seeds for the area are relatively weak which will result in pollutants being localized to their sources as distant dispersion only occurs with stronger winds (**See Figure 16)**.

The proposed development area is highly likely to be impacted by air inversions due to the area being located within a lower elevation than the surrounding areas. These air inversions will mostly occur during winter and colder days, resulting in worsened air quality or higher levels of air pollution near ground level. The inversion, during winter and / or cold days, creates what can be described as a dome or a bubble, which consists of a layer of warm air, at the top of the dome, which prevents denser cold air, inside of the dome, from dispersing upward into the atmosphere.

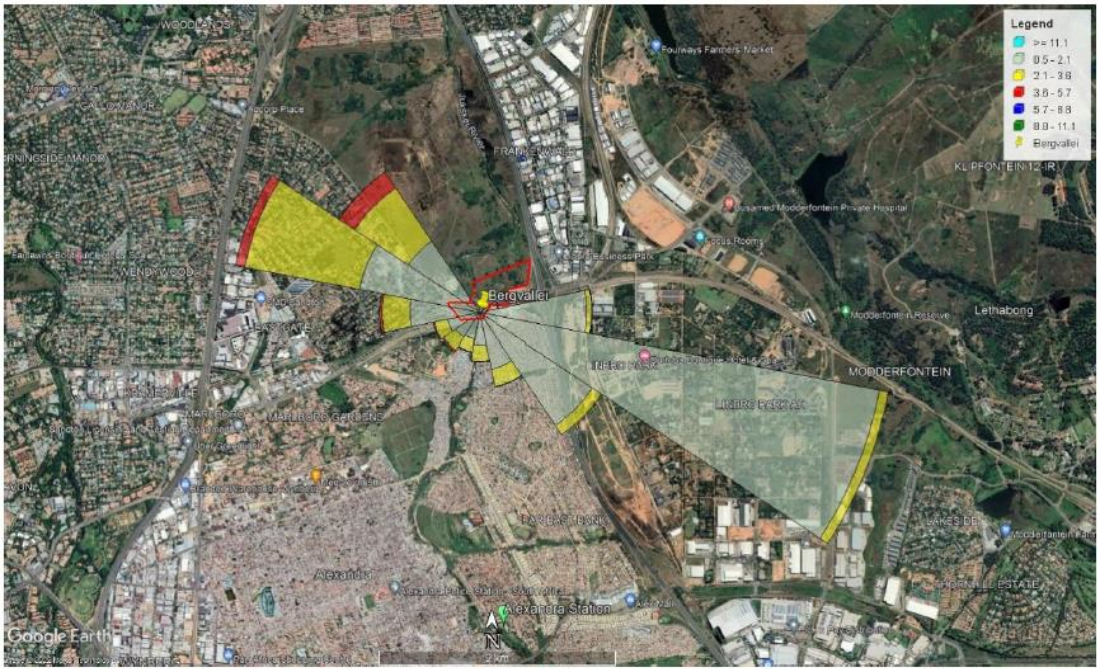


Figure 16:Wind rose depicting average wind speeds and directions (blowing from) for the Alexandra area.

The inversion subsequently traps pollutants originating from various sources such as household warming in the form of fires, vehicle exhaust emissions and other industry-related pollutants and confines the said pollutants in the ambient air near the surface / ground level. This will typically happen during early morning hours up until late morning / early afternoon, when the ambient colder, denser air has been warmed up enough to allow for dispersion into the atmosphere.

Ambient Concentrations SAAQIS
The following section deals with the monitoring results obtained for each location, as well as the ambient pollutant concentrations for the local area.

Table 13 : Ambient pollutant concentration obtained from the ambient air quality monitoring station located in Alexandra.

Type	SO_2	$PM_{2.5}$	PM_{10}
Average Recorded	12.45	31.39	60.09
Maximum Recorded	344.74	350.84	505.35
Minimum Recorded	0.45	1.73	3.34

Conclusion
The pollutant concentrations, sourced from the Alexandra-NAQI monitoring station, have indicated that the average concentrations of SO2, PM10 and PM2.5 were within the allowable ambient limits set out in the NAAQS. However, as the monitoring station only records SO2 and PMs, it is recommended that, should additional data on other pollutants be required, ambient testing for TVOCs, NOX and O3 be conducted in order to further inform the ambient air quality baseline.

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[AN]	17. Hospitality facility	18. Church	19. Education facilities	20. Sport facilities
21. Golf course/polo fields	22. Airport[N]	23. Train station or shunting yard[N]	**24. Railway line[N]**	**25. Major road (4 lanes or more)[N]**
26. Sewage treatment plant[A]	27. Landfill or waste treatment site[A]	28. Historical building	29. Graveyard	30. Archeological site
31. Open cast mine	32. Underground mine	33.Spoil heap or slimes dam[A]	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.

NORTH

	9	**1**	**½**	**1**	**15**
	9	**1**	**1**	**1**	**15**
WEST	**9/25**	**1/2/25**		**1**	**15/25**
	1	**1/2**	**9**	**9**	**1/25**
	9	**2/9**	**9**	**9**	**9**

EAST

SOUTH

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

Annexure C: Specialist Studies

Annexure C2: Terrestrial Biodiversity Assessment
Annexure C3: Wetland Assessment
Annexure C5: Floodline Assessment
Annexure C4: Phase 1 Heritage Resource Impact Assessment
Annexure C6: Air Quality Baseline Assessment Report

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.

The subject property is situated in Ward 109 under region E of the City of Johannesburg.

Demographic Analysis

The City of Johannesburg Local Municipality has a total population of 4,4 million of which 76,4% are black African, 12,3% are white people, 5,6% are coloured people, and 4,9% are Indian/Asian. Of those 20 years and older 3,4%have completed primary school, 32,4% have some secondary education, 34,9% have completed matric, 19,2% have some form of higher education, and 2.9% of those aged 20 years and older have no form of schooling.

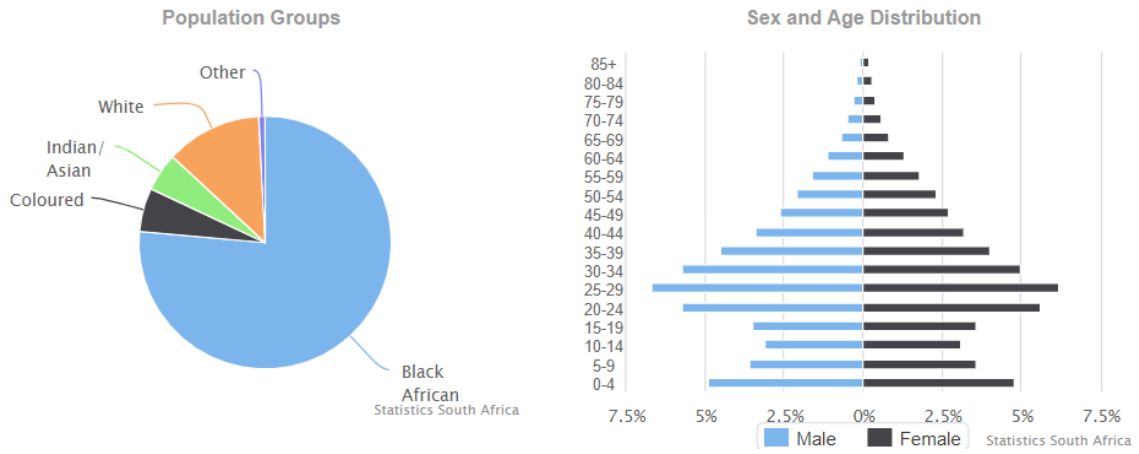


Figure 17: Population Groups and the Sex and Age Distribution (Source: Stats SA Community Survey 2016)

Household Profile

There are 2 261 490 economically active (employed or unemployed but looking for work) people in the City of Johannesburg; of these 25,0% are unemployed. Of the 1 228 666 economically active youth (15–35 years) in the area, 31,5% are unemployed.

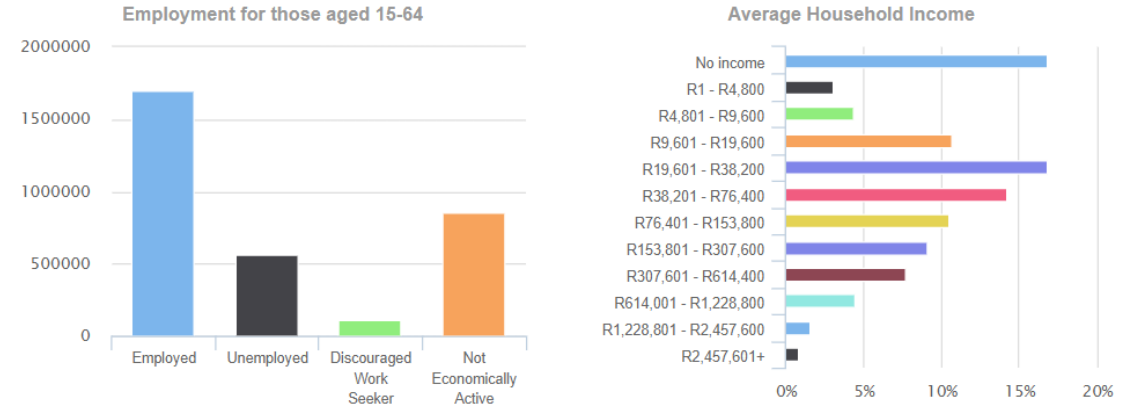


Figure 18: Employment for those aged 1564 and the Average Household Income (Source: Stats SA Community Survey 2016)

Living Conditions

There is 1 434 856 households in the municipality with an average household size of 2,8 persons per household. 64,7% of households have access to piped water, 26,9% have water in their yard and only 1,4% of households do not have access piped water.

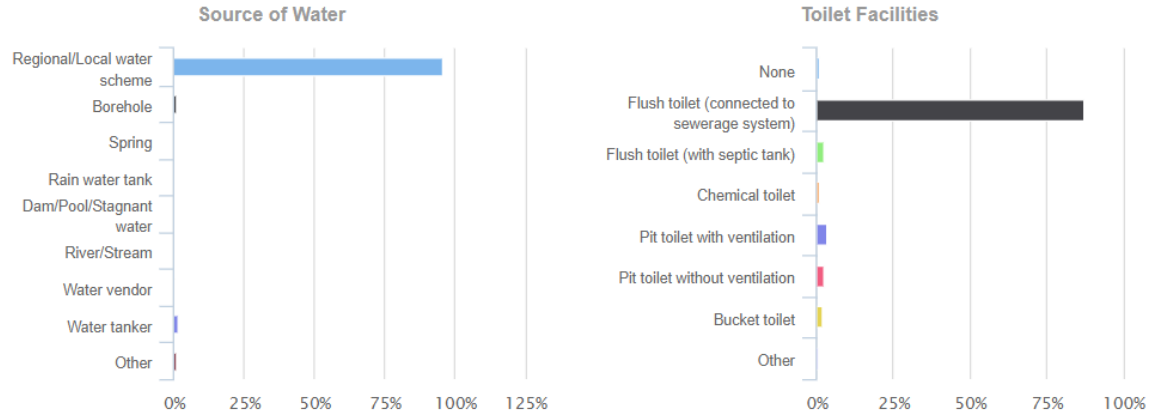


Figure 19: Statistics on Source of water and Toilet Facilities for an average household (Source: Stats SA Community Survey 2016)

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 m2 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 resources

authority;

(d) the re-veklop of a site exceeding 10 000 m² 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**
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:

A Phase 1 Cultural Heritage Impact Assessment was conducted by a Heritage Consultant in August 2022. The summary of the report is presented below, Refer to **Annexure C4** for the complete report.

Cultural Landscape

The cultural landscape qualities of the region essentially consist of two components. The first is a rural area in which the human occupation is made up of a pre-colonial (Stone Age and Iron Age) occupation and a much later colonial (farmer) component, which, over time also gave rise to an urban component.

Stone Age

No sites, features or objects of cultural significance dating to the Stone Age were identified in the project area.

Iron Age

No sites, features or objects of cultural significance dating to the Iron Age were identified in the project area.

Historic period

No sites, features or objects of cultural significance dating to the historic period were identified in the project area.

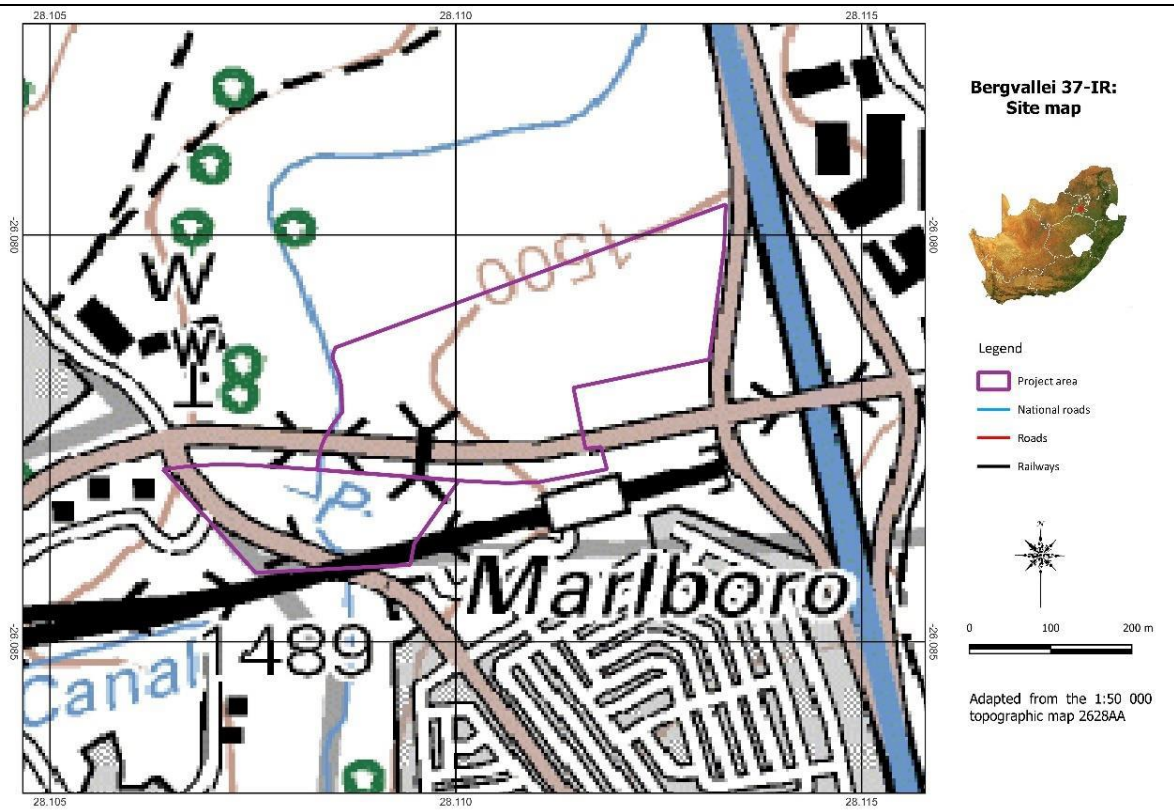


Figure 20: Location of known heritage sites and features in relation to the project area.

Conclusions

- During the survey no sites, features or objects of cultural significance were identified.
- For the current study, as no sites, features or objects of cultural significance were identified, impact of the proposed develop is determined to be very low and no mitigation measures are proposed.
- For this proposed project, the assessment has determined that no sites, features or objects of cultural heritage significance occur in the project area, therefore no permits are required from SAHRA or the PHRA.
- If heritage features are identified during construction, as stated in the management recommendation, these finds would have to be assessed by a specialist, after which a decision will be made regarding the application for relevant permits.

From a heritage point of view, it is recommended that the Proposed Project be allowed to continue on acceptance of the mitigation measures presented above and the conditions proposed below.

Will any building or structure older than 60 years be affected in any way?	YES	**NO**
Is it necessary to apply for a permit in terms of the National Heritage Resources Act, 1999 (Act 25 of 1999)?	YES	**NO**

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

Not Applicable

SECTION C: PUBLIC PARTICIPATION (SECTION 41)

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

2. 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**

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

This is the Draft Basic Assessment Report will be submitted for review and comments to the City of Johannesburg Metropolitan Municipality. Any comments received from the Local Authority will be included into the Final Basic Assessment Report.

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

This is the Draft Basic Assessment Report will be submitted for review and comments to the City of Johannesburg Metropolitan Municipality. Any comments received from the Local Authority will be included into the Final Basic Assessment Report.

3. 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):

Please refer to the **Comments and Response Register (Appendix 6)** of the Public Participation Report attached hereto under **Annexure D** for issues raised by the I&APs.

Summary of aspects received from I&APs are:

- Eskom will raise no objection to this application provided it's rights and services are acknowledged and respected at all times, and the requirements as laid down by the Occupational Health and Safety Act No 85/1993, are complied with.
- Concerns on the listed activities for the proposed development.

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

Please refer to the Comments and Response Register **(Appendix 6)** of the Public Participation Report attached hereto under **Annexure D** for issues raised by the I&APs.

Additional Information

- Newspaper notices were placed in the local newspaper.
- On-site notices were placed on-site at the same time and at the main entrance of the site, and along the sides of the property.
- Adjacent landowners were informed of the proposed activity by faxing, e-mailing and/or mailing a BID
- (Background Information Document) to them explaining the proposed activity and the location of the site. They were also encouraged to respond to the BID in order to compile an I&AP list with all relevant issues and concerns.
- The Ward Councillor was informed of the proposed road development by e-mail.

I&APs were invited to arrange for individual meetings to discuss details should they wish to.

4. 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.

5. APPENDICES FOR PUBLIC PARTICIPATION

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

Annexure D 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
4) Each alterative needs to be clearly indicated in the box below
5) Attach the above documents in a chronological order

Section D has been duplicated for alternatives	**0**	times	(Complete only when appropriate)

Section D Alternative No.	**0**	(Complete only when appropriate for above)

1. WASTE, EFFLUENT, AND EMISSION MANAGEMENT

Solid waste management

Will the activity produce solid construction waste during the construction/initiation phase?	**YES**	NO
If yes, what estimated quantity will be produced per month?		**N/A**

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
If yes, what estimated quantity will be produced per month?		0.75m3 per unit per week

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

Litter and waste generated during the operational 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).
Recyclable waste will be managed according to the municipal requirements.

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)?

Construction waste will be disposed of by waste contractors at a licensed facility; it is the contractor's responsibility to locate facilities capable of facilitating the waste/product. A landfill or recycling facility could be included. The licensed municipal service provider - will be responsible for waste removal and disposal during the operational phase.

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

- Recyclable waste will be managed according to the municipal requirements .
- As per the NEM: WA, waste is to be sorted and recycled at source.

The Environmental Management Programme will incorporate measures of optimal reuse or recycling without compromising the integrity of the site with possible pollution. As construction material is regarded as a waste material, it will not be recycled on site as it will require appropriate licensing.

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)?	YES	**NO**

Will the activity produce any effluent that will be treated and/or disposed of on-site?	Yes	**NO**
If yes, what estimated quantity will be produced per month?		**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	**NO**

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 wastewater, if any:

No wastewater 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?	**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 domestic effluent to be generated by this activity(ies)?	YES	**NO**

Will the activity produce any effluent that will be treated and/or disposed of on-site?	YES	**NO**

If yes describe how it will be treated and disposed off.

Not Applicable

Emissions into the atmosphere

Will the activity release emissions into the atmosphere?	YES	**NO**
If yes, is it controlled by any legislation of any sphere of government?	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.

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

Emissions during construction will mostly be in the form of dust and smoke. Odour from the refuse yards is to be combated by the provision of a compaction unit and is to be walled. The EMPr attached in **Annexure E** 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.

municipal	Directly from water board	groundwater	river, stream, dam or lake	other	the activity will not use water

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 Water Use Licence for construction of the Bridge crossing of the Jukskei River.

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

Municipal

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, wills, ceilings and roofs.

Notices of awareness regarding the effective use of energy will be posted within the proposed sports-facilities to make the people aware of the importance of using electricity effectively. Rfer to EMPr in **Appendix E: EMPr**.

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

Alternative energy sources were investigated as part of the design of the proposed development, however, due to the nature of the project no alternative energy source was deemed feasible in terms of the practicality and economic implications of the proposed development. However, energy efficient technology will be promoted for this proposed development to lower the footprint on the current energy grid for the area.

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 AND AFFECTED PARTIES

Summarise the issues raised by interested and affected parties.

Issued raised by Interested and Affected Parties have been included into the Public Participation Report.

Please refer to the comments and Response Register **(Appendix 6)** of the Public Participation

Report attached hereto under **Annexure D** for issues raised by the I&APs.

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):

Refer to Comments and Response Report on **Appendix 6** attached hereto under **Annexure D**.

2. IMPACTS THAT MAY RESULT FROM THE CONSTRUCTION AND OPERATIONAL PHASE

Briefly describe the methodology utilised 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'

2.4 Aspects raised by I&APs

Issued raised by Interested and Affected Parties are investigated and as far as it is applicable to the project are assessed:

- Eskom will raise no objection to this application provided it's rights and services are acknowledged and respected at all times, and the requirements as laid down by the Occupational Health and Safety Act No 85/1993, are complied with.
- Concerns on the listed activities for the proposed development.

Table 12: 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:

Probability	**Duration**
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	
Scale	**Magnitude**
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 **high** 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 **moderate** 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 **low** 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 13 and Table 14:

2.1 Significance scores of expected impacts

Preferred Alternative – Preferred Alternative – Proposed Mixed-Use Development with Associated Infrastructure on the Remainder of Portion 1 and Portion 31 of the Farm Bergvallei 37 IR, within the City of Johannesburg Metropolitan Municipality

Table 13: Assessment of Potential Impact of the Preferred Alternative

Potential Impact	Scale	Duration	Probability	Magnitude	Significance Points	Impact Significance	Confidence
Construction phase							
ISSUE: AIR QUALITY							
1.1 Dust/Air pollution - The generation of fugitive dust associated with construction activities & earthworks.	**Site only (1)**	**Long term (4)**	**Highly probable (4)**	**Moderate (6)**	**54**	**Moderate environmental significance**	**High**
2. ISSUE TOPOGRAPHY							
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 within an area that has already been developed**	**60**	**Moderate environmental significance**	**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 environmental significance**	**High**

Potential Impact	Scale	Duration	Probability	Magnitude	Significance Points	Impact Significance	Confidence
3. ISSUE GEOLOGY AND SOILS							
3.1 Soil erosion, loss of topsoil, deterioration of soil quality	**Site only (1)**	**Medium term (4)**	**Highly Probable (4)**	**Moderate (6)**	**54**	**Moderate environmental significance**	**High**
3.2 Soil pollution	**Site only (1)**	**Immediate (3)**	**Medium probability (3)**	**Moderate (6)**	**42**	**Moderate environmental significance**	**High**
4. **ISSUE FAUNA AND FLORA**							
4.1 Degradation, destruction of habitats/ ecosystem	**Site only (1)**	**Long term (4)**	**Medium Probable (3)**	**Moderate (6)**	**48**	**Moderate environmental significance**	**High**
4.2 Impacts on fauna and flora	**Site only (1)**	**Long term (4)**	**Medium Probable (3)**	**Moderate (6)**	**48**	**Moderate environmental significance**	**High**
5. **ISSUE HYDROLOGY**							
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.	**Local (2)**	**Long term (4)**	**Medium Probability (3)**	**Moderate (6)**	**54**	**Moderate environmental significance**	**High**

Potential Impact	Scale	Duration	Probability	Magnitude	Significance Points	Impact Significance	Confidence
5.2 Impact on wetlands and water quality	**Local (2)**	**Short term (2)**	**Medium probability (3)**	**Moderate (6)**	**42**	**Moderate environmental Significance**	**Medium**
SOCIO-ECONOMIC AND CULTURAL HISTORICAL ENVIRONMENT							
6. ISSUE AESTHETICS, LANDSCAPE CHARACTER AND SENSE OF PLACE							
6.1 Noise/ vibration	**Site only (1)**	**Immediate (1)**	**Highly probable (4)**	**Moderate (6)**	**36**	**Moderate environmental significance**	**High**
6.2 Visual impact	**Site only (1)**	**Medium term (3)**	**Medium probability (3)**	**Moderate (6)**	**42**	**Moderate environmental significance**	**High**
7. ISSUE SOCIAL WELL-BEING AND QUALITY OF THE ENVIRONMENT							
7.1 Safety and Security	**Local (2)**	**Short term (2)**	**Low probability (2)**	**Moderate (6)**	**36**	**Moderate environmental significance**	**High**
7.2 Job opportunities	**Region (3)**	**Long term (4)**	**Highly Probable (4)**	**Moderate (6)**	**66**	**Moderate Environmental significance**	**Medium**
8. ISSUE HISTORICAL ENVIRONMENT							
8.1 Destruction of cultural / heritage sites	**Site only (1)**	**Immediate (1)**	**Low Probability (2)**	**Minor (2)**	**8**	**Low Environmental Significance**	**Medium**
9. ISSUE INFRASTRUCTURE AND SERVICES/WASTE							
9.1 Waste	**Site only**	**Short time**	**Medium**	**Minor (2)**	**14**	**Low**	**High**

Potential Impact	Scale	Duration	Probability	Magnitude	Significance Points	Impact Significance	Confidence
	(1)	(2)	probability (3)			environmental significance	
9.2 Pressure on existing infrastructure and services	Local (2)	Long term (4)	Low probability (2)	Moderate (6)	48	Moderate environmental significance	Medium
10. ISSUE DESIGN AND LAYOUT							
10.1 Functional design of Residential development	Local (2)	Long term (4)	Low Probability (2)	Minor (2)	16	Low environmental significance	Medium

Alternative 1: Light Industrial Development

Table 14: Assessment of Potential Impact of Alternative 1

Potential Impact	Scale	Duration	Probability	Magnitude	Significance Points	Impact Significance	Confidence
Construction phase							
ISSUE: AIR QUALITY							
1.1 Dust/Air pollution - The generation of fugitive dust associated with construction activities & earthworks.	Site only (1)	Long term (4)	Highly probable (4)	Moderate (6)	54	Moderate environmental significance	High
2. ISSUE TOPOGRAPHY							
2.1 Visual Impacts Topographical features contribute to the landscape character and	Local (2)	Long term (4)	Highly probable (4)	Moderate (6) - Situated within an area that has	60	Moderate environmental significance	High

Potential Impact	Scale	Duration	Probability	Magnitude	Significance Points	Impact Significance	Confidence
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				**already been developed**			
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 environmental significance**	**High**
3. ISSUE GEOLOGY AND SOILS							
3.1 Soil erosion, loss of topsoil, deterioration of soil quality	**Site only (1)**	**Medium term (4)**	**Highly Probable (3)**	**Moderate (6)**	**48**	**Moderate environmental significance**	**High**
3.2 Soil pollution	**Site only (1)**	**Immediate (3)**	**Medium probability (2)**	**Moderate (6)**	**36**	**Moderate environmental significance**	**High**
4. ISSUE FAUNA AND FLORA							
4.1 Degradation, destruction of habitats/ ecosystem	**Site only (1)**	**Long term (4)**	**Medium Probable (2)**	**Moderate (8)**	**56**	**Moderate environmental significance**	**High**
4.2 Impacts on fauna and flora	**Site only (1)**	**Long term (4)**	**Medium Probable (2)**	**Moderate (8)**	**56**	**Moderate environmental significance**	**High**

Potential Impact	Scale	Duration	Probability	Magnitude	Significance Points	Impact Significance	Confidence
5. ISSUE HYDROLOGY							
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.	**Local (2)**	**Long term (4)**	**Medium Probability (3)**	**Moderate (6)**	**54**	**Moderate environmental significance**	**High**
5.2 Impact on wetlands and water quality	**Site only (1)**	**Immediate (1)**	**Low probability (2)**	**Minor (2)**	**8**	**Low environmental Significance**	**Medium**
SOCIO-ECONOMIC AND CULTURAL HISTORICAL ENVIRONMENT							
6. ISSUE AESTHETICS, LANDSCAPE CHARACTER AND SENSE OF PLACE							
6.1 Noise/ vibration	**Site only (1)**	**Immediate (1)**	**Highly probable (4)**	**Moderate (6)**	**36**	**Moderate environmental significance**	**High**
6.2 Visual impact	**Site only (1)**	**Medium term (3)**	**Medium probability (3)**	**Moderate (6)**	**42**	**Moderate environmental significance**	**High**
7. ISSUE SOCIAL WELL-BEING AND QUALITY OF THE ENVIRONMENT							

Potential Impact	Scale	Duration	Probability	Magnitude	Significance Points	Impact Significance	Confidence
7.1 Safety and Security	**Local (2)**	**Short term (2)**	**Low probability (2)**	**Moderate (6)**	**36**	**Moderate environmental significance**	**High**
7.2 Job opportunities	**Region (3)**	**Long term (4)**	**Highly Probable (4)**	**Moderate (6)**	**66**	**Moderate Environmental significance**	**Medium**
8. ISSUE HISTORICAL ENVIRONMENT							
8.1 Destruction of cultural / heritage sites	**Site only (1)**	**Immediate (1)**	**Low Probability (2)**	**Minor (2)**	**8**	**Low Environmental Significance**	**Medium**
9. ISSUE INFRASTRUCTURE AND SERVICES/WASTE							
9.1 Waste	**Site only (1)**	**Short time (3)**	**Medium probability (3)**	**Minor (2)**	**14**	**Low environmental significance**	**High**
9.1 Pressure on existing infrastructure and services	**Local (2)**	**Long term (4)**	**Low probability (2)**	**Moderate (6)**	**48**	**Moderate environmental significance**	**Medium**
10. ISSUE DESIGN AND LAYOUT							
10.1 Functional design of Industrial development	**Local (2)**	**Long term (4)**	**Low Probability (2)**	**Minor (2)**	**16**	**Low environmental significance**	**Medium**

Table 15: Assessment of potential impacts and proposed mitigation measures

Potential Impacts	Significance rating of impacts before mitigation	Proposed mitigation.	Significance rating of impacts after mitigation
1.1 Dust /Air pollution The generation of dust associated with construction activities.	Moderate	• 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 neighbouring properties. • Dust generation should be kept to a minimum. • Dust must be suppressed on access roads and construction areas during dry periods by the regular application of water. • Speed limits must be implemented in all areas, including public roads and private property to limit the levels of dust pollution. • The clearing of vegetation from the site should be selective and done just before construction so as to minimise erosion and dust. • 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 m²), applying mulching or brush packing, or creating windbreaks using brush or bales. • Excavating, handling or transporting erodable materials in high wind or when dust plumes are visible shall be avoided. • 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. • No burning of refuse or vegetation is permitted.	Low
2.1 Visual Impacts - Topographical changes	Moderate	• The site area is to be physically screened off with a shade cloth fence at least 1.8m in height. • The site must be managed appropriately, and all rubbish and rubble removed to a recognized waste facility. • Excess soil and bedrock should be disposed of at an appropriate facility.	Low

Potential Impacts	Significance rating of impacts before mitigation	Proposed mitigation.	Significance rating of impacts after mitigation
		• A certificate of disposal must be obtained for any waste that is disposed of. • Waste must not remain on site for more than 2 weeks. • Refuse bins must be provided by the Contractor for rubbish to be used by staff. • Excess concrete must be disposed of correctly and at an appropriate facility. • No waste may be placed in any excavations on site. • The construction camp must be located as far from other properties as possible. • Light pollutions should be minimised. • The construction footprint must be minimised. • Construction / management activities must be limited to the daylight hours between 7:00am and 5:30pm weekdays; 7:00am and 1:30pm on Saturdays. • 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. • Should overtime/night work be authorized, the Contractor shall be responsible to ensure that lighting does not cause undue disturbance to neighbouring residents. • In this situation, low flux and frequency lighting shall be utilised.	
2.2 Bulk earthworks	Moderate	• Avoid development on excessively steep slopes. • Avoid cutting steep embankments. • Provide the necessary erosion protection measures.	Low
3.1 Soil erosion, loss of topsoil, deterioration of soil quality	Moderate	• Appropriate erosion and stormwater management structures must be installed around the construction site. • All construction vehicles, plant, machinery and equipment must be properly maintained to prevent leaks. • 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.	Low

Potential Impacts	Significance rating of impacts before mitigation	Proposed mitigation.	Significance rating of impacts after mitigation
		• Drip trays are to be utilised during daily greasing and re-fuelling of machinery and to catch incidental spills and pollutants. • 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. • 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. • Fuels and chemicals must be stored in adequate storage facilities that are secure, enclosed and bunded. • All excavations and foundations must be inspected regularly. • Once earthworks are complete, disturbed areas are to be stabilised with mulch, straw or other approved method.	
3.2 Soil Pollution	Moderate	• Ensure correct position of construction caps, equipment yards, refueling depots, concrete batching plant etc. to avoid areas susceptible to soil and water pollution. • Ensure appropriate handling of hazardous substances • Remediate polluted soil. • 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. • Equipment used in the development process must be adequately maintained so that during operations it does not spill oil, diesel, fuel, or hydraulic fluid. • In the event of spills from vehicles, the area should be cleaned immediately using a bioremediation product, such as *Petro-Clean ™* 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	Low

Potential Impacts	Significance rating of impacts before mitigation	Proposed mitigation.	Significance rating of impacts after mitigation
		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.	
4.1 Degradation, destruction or elimination of habitats/ecosystems	High – Moderate	• No littering by construction workers is permitted. Any litter will be collected and removed off-site to a registered waste site. • 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. • No burning of stockpiled vegetation is permitted. • All alien plants that occur in South Africa. None of these species may be introduced and they must all be controlled. • The alien plants on site will be removed during construction. • 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). • Alien vegetation re-growth must be controlled throughout the entire site during the construction period. • 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. • Monitor all sites disturbed by construction activities for colonisation by exotics or invasive plants and control these as they emerge. • Use indigenous plant species in all gardens	Moderate
4.2 Impacts on fauna and flora	Moderate - low	• The contractor must ensure that no fauna species are disturbed, trapped, hunted or killed during the construction phase. • Disturbance to birds, animals and reptiles and their habitats should be prevented at all times. • The illegal hunting or capture of wildlife will not be	Low

Potential Impacts	Significance rating of impacts before mitigation	Proposed mitigation.	Significance rating of impacts after mitigation
		tolerated. Such matters will be handed over to the relevant authorities for prosecution. • These species should then be relocated to a natural habitat. • 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 Flourescent Bulbs (CFL‟s) should be prescribed as they do not attract as many invertebrates (insects) at night and will not disturb the existing wildlife. Sodium lamps require a third less energy than conventional light bulbs. • 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 Bushbabies, geckoes, chameleons, bullfrogs and tortoises. Palisade fencing with adequate gaps is recommended for the conserved public open spaces. • All invader or exotic plant species must be removed from the site and disposed of at a landfill site. • All Declared Weeds and invaders must be removed from the site. • Where herbicides are used to clear vegetation, specimen-specific chemicals should be applied to individual plants only. General spraying should be prohibited. • 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. • 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 *Conservation of Agricultural Resources Act* 43 of 1983 and the associated penalties and prohibitions.	

Potential Impacts	Significance rating of impacts before mitigation	Proposed mitigation.	Significance rating of impacts after mitigation
		• The least environmentally damaging insecticides, to manage invertebrate pests, must be applied. Pyrethroids and 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.	
5.1 Stormwater flow, drainage and Increased runoff due to hardened surfaces	Moderate	• 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. • Drainage channels must be constructed along access roads every 50m to divert runoff during construction period. • 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. • 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 • 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.	Low

Potential Impacts	Significance rating of impacts before mitigation	Proposed mitigation.	Significance rating of impacts after mitigation
		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. • 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. • 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. • Permeable paving should be used to reduce runoff and increase infiltration and ground water recharge. • As much as possible water should be retained on site to be reused again for irrigation and habitat creation. • Both storm water and excess effluent intended for irrigation must be purified according to DWS standards.	
5.2 Impacts Drainage line and water quality	High - Moderate	• Utilize proper waste management practices. • Cover any wastes that are likely to wash away or contaminate storm water. • Ensure handling, transport and disposal of hazardous substances are adequately controlled and managed. • Provide containment areas for potential pollutants at construction camps, refueling depot and concrete batching plants. • 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.	Low

Potential Impacts	Significance rating of impacts before mitigation	Proposed mitigation.	Significance rating of impacts after mitigation
		• 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. • 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. • Limit the construction footprint and support areas (e.g. temporary access servitudes) as far as possible; • No indiscriminate destruction of riparian vegetation should be allowed; • Make use of geotextiles within disturbed areas of steeper topography to avoid erosion through surface water runoff; • Stormwater management along informal roadways to reduce gulley erosion formation; • Construct within the low-flow (dry) period; • Correct site reinstatement and landscaping following any disturbances will abate channel and gulley formation; • Proper re-instatement of soils and landscaping to limit erosion gulley formation. • No dumping of any excess building material or other wastes or litter should be allowed within any wetland and buffer areas; • Subsistence hunting or harvesting of fauna or flora within the riparian zones should be prohibited.	
6.1 Noise/ vibration	High	• Noise levels shall be kept within acceptable limits, and construction crew must abide by National Noise Laws and local by-laws regarding noise.	Low

Potential Impacts	Significance rating of impacts before mitigation	Proposed mitigation.	Significance rating of impacts after mitigation
		• 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. • 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. • 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. • Activities that may disrupt neighbours (e.g. delivery trucks, excessively noisy activities etc) must be preceded by notice being given to the affected neighbours at least 24 hours in advance. • 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	
6.2 Visual Impact	Low	• Structures that are to be erected should be aesthetically pleasing and blend into the area as far as possible to minimise the visual impact to the surrounding residential areas. • Buildings must be maintained in good standing at all times. • Add graphic	Low
7.1 Safety and Security	Moderate	• Prior to commencement of construction, a fence will be constructed around the site. • Signs should be erected on all entrance gates indicating that no temporary jobs are available, thereby limiting opportunistic labourers and crime. • 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	Low

Potential Impacts	Significance rating of impacts before mitigation	Proposed mitigation.	Significance rating of impacts after mitigation
		Regulations • All structures that are vulnerable to high winds must be secured (including toilets). • Potentially hazardous areas such as trenches are to be cordoned off and clearly marked at all times. • 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. • 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.). • 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). • 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 appropriately briefed about the EMP and relevant occupational health and safety issues. • All construction workers shall be issued with ID badges and clearly identifiable uniforms. • Access to fuel and other equipment stores is to be strictly controlled. • 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. • Adequate emergency facilities must be provided for the treatment of any emergency on the site. • 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	

Potential Impacts	Significance rating of impacts before mitigation	Proposed mitigation.	Significance rating of impacts after mitigation
		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. • 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. • The Contractor shall make available safe drinking water fit for human consumption at the site offices and all other working areas. • Washing and toilet facilities shall be provided on site and in the Contractors camp. • 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 and cleaning detergents must be provided. • The chemical toilets servicing the camp must be maintained in a good state, and any spills or overflows must be attended to immediately. • The chemical toilets must be emptied on a regular basis. • The Contractors site must be located on the high side of the site so any leakages or spillages will be contained on site. • HIV AIDS awareness and education should be undertaken by all Contractor staff.	
7.2 Economic opportunities	Low	• Make use of local labour. • Provide clear and realistic information regarding employment opportunities and other benefits for local communities in order to prevent unrealistic expectations. • Provide skills training for construction workers. • Provide job opportunities at one of the few areas that will provide work in the area.	**High positive**

Potential Impacts	Significance rating of impacts before mitigation	Proposed mitigation.	Significance rating of impacts after mitigation
		• Skills training and transfer.	
8.1 Destruction of cultural / heritage sites No sites of cultural or heritage importance were found during the Heritage impact Assessment.	Low	• Ensure that construction staff members are aware that heritage resources could be unearthed and the scientific importance of such finds. • If heritage objects are uncovered, ensure that such objects are not to be moved or destroyed without the necessary permits from the South African Heritage Resources Agency (SAHRA) in place.	Low
9.1 Waste	Low	• Pollution of the adjacent Juskei River must be avoided at all cost. • A bulk waste trap MUSTb e installed upstream between Alexander and the development to captue he waste at source and avod further downstream pollution. • The COJ MUST make financial provision for the installation of the trap and for its maintenance. • Adequate number of waste disposal receptacles are to be positioned at strategic locations within the development. • 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. • No waste materials shall at any stage be disposed of in public areas or adjacent properties, or where the wind direction will carry bad odours 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. Spot fines of up to R100 may be administered if the employees are found to be polluting the area in any way.	Low

Potential Impacts	Significance rating of impacts before mitigation	Proposed mitigation.	Significance rating of impacts after mitigation

		• Several waste bins must be provided and clearly marked or colour coded according to industry standards to allow for recycling of waste into
		  ○ Paper
		  ○ Biodegradable
		  ○ Glass
		  ○ Plastics
		  ○ General
		• No burning of waste is permitted.
		• Wayleaves required for all disposed waste.
		• The waste bins shall be cleared by municipal services on a weekly basis.
		During municipal strikes special arrangements must be made to have the waste removed via private waste removal services.	

9.2 Existing infrastructure	Medium	• Integrity of existing services around the Garsfontein area to be ensured. • Service Report will be Adherence to. • The service systems are to be designed according to the minimum requirements of and submitted to the City of Tshwane Metropolitan Municipality for approval. • No construction activities will commence on site prior to obtaining the necessary approvals. • Underground services should be designed in such a way so as to require minimum maintenance to avoid disturbance of the underground and superficial environment.	Medium-low
10.1 Functional Design	Medium	• Scale and design must fit with adjacent land uses • Areas where services infrastructure has been installed must be rehabilitated with indigenous vegetation on completion.	**High positive**

NO GO:

No-Go Alternative

This option assumes that a conservative approach will ensure that the environment is not harmed any more than it is now. It is critical to note that this assessment is based on the current state of the area. If the

Competent Authority rejects the application, the 'No-Go' option will be used, and the site will remain in its current state.

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

Annexure C: Specialist Studies
Annexure C2: Terrestrial Biodiversity Assessment Report
Annexure C3 : Wetland Assessment Report
Annexure C4: Phase 1 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 instance's 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 DECOMISSIONING AND 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.

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**
Not Applicable				

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**
Not Applicable				

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**
Not Applicable				

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:

Cumulative Impacts

- **Litter and Waste**

The current waste problem on site MUST be addressed an a viable solution provided on the COJ land prior to ANY further development. The waste from Alex spills into the Jukskei and pollute every part of the river downstream.

Activities associated with use of the site during construction may result in littering. Similarly, the construction process generates wastes that could pollute the site and its surrounds. As a result, 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 cumulative impact.

- **Vegetation and Fauna**

The proposed development will transform the site and will lead to the partial loss of habitat for any potential plant of animal species. The riparian habitat is retained which along the movement of species from the golf course to the Moreletakloof Nature reserve.

- **Surface Water Pollution**

Spillages of oil and fuel from construction vehicles has the potential to contaminate surrounding surface water resources.

- **Ground Water Pollution**

The construction phase could result in increased infiltration of contaminants into the ground water and soil. The clearing of the site could result in exposed soil surfaces which may be prone to erosion, creation of dust and sedimentation of water bodies. Spillages of oil, lubricants and fuel from construction vehicles has the potential to contaminate the soil and groundwater. Cement mixing, and the storage of fuel must be conducted in a workshop area in order to prevent soil and groundwater contamination.

- **Increased Stormwater Runoff**

The development of hard surfaces will give rise to greater volumes and velocity of runoff waters during high peak flows or heavy rain. 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 nearby water resources as a result of cumulative effects. Mitigation and dissipating methods will be installed at outlet structures.

- **Social benefits**

The proposed development will meet the rapid growing population within the City of Johannesburg as well as the high rate of unemployment and create job opportunities within the area.

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 current waste problem on site MUST be addressed an a viable solution provided on the COJ land prior to ANY further development.
- The proposed development will not have a detrimental impact on other development in the area.
- The Applicant has the capacity and resources to adequately implement the mitigation measures stipulated in the EMPr;
- The development match the character of the surrounding land uses.

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.

6. IMPACT SUMMARY OF THE PROPOSAL OR PREFERRED ALTERNATIVE

For proposal:

See below

For alternative:

See below

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, as amended, 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

	Before Mitigation	After Mitigation
BIOPHYSICAL ENVIRONMENT		
1.1 Dust/Air pollution - The generation of fugitive dust associated with construction activities & earthworks.	**Moderate**	**Low**
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.	**Moderate**	**Low**
2.2 Bulk earthworks: Deep cuttings, high embankments, disposal of soil and excavations cause local changes to topography	**Moderate**	**Moderate**
3.1 Soil erosion, loss of topsoil, deterioration of soil quality	**High**	**Low**
3.2 Soil pollution (due to hydrocarbon spillages)	**Moderate**	**Low**
4.1 Degradation, destruction of habitats/ ecosystem and impact on connectivity – classified as an Ecological Support Areas	**High**	**Moderate**
4.2 Impacts on fauna and flora	**Moderate**	**Low**
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.	**Moderate**	**Low**
5.2 Impact on water quality (due to hydrocarbon spillages)	**Moderate**	**Low**
SOCIO-ECONOMIC ENVIRONMENT		
6.1 Noise/ vibration	**Low**	**Low**
6.2 Visual impact on adjacent residents and motorists	**Low**	**Low**
7.1 Safety and Security	**Low**	**Low**
7.2 Employment opportunities	**Moderate (Positive)**	**High (Positive)**
8.1 Destruction of paleontological resources	**Low**	**Low**
9.1 Waste	**HIGH**	**Moderate**

9.2 Existing infrastructure	**Low**	**Low**
10.1 Functional design	**Low (Positive)**	**High (Positive)**
CUMULATIVE IMPACT		
Transformation of natural habitat caused by the urban sprawl.	**Low**	**Low**

7. SPATIAL DEVELOPMENT TOOLS

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

The following spatial development tools were applied and/or considered:

This application complies with the development principles as stated in Section 7 of Act No. 16 of 2013 (SPLUMA), as follows:

These principles apply throughout the Republic of South Africa. Not all the general principles are usually applicable to a particular case and the applicant contends that the following apply to the application at hand:

Spatial sustainability
It is believed that this application will further the objective of promoting land development in locations that create sustainable human settlements and limit urban sprawl. The proposed development will optimise the use of existing resources (bulk infrastructure).

Efficiency
The principle of efficiency is being promoted. This proposed development will promote land development that makes optimum use of existing resources and promote the principle of the sharing of costly infrastructure through the principle of intensifying land uses.

Spatial Resilience
This application seeks to adhere to the principles of flexibility and resilience by promoting land use densification, which directly increase urban resilience.

Good administration
As the proposed application is prepared in terms of the provisions of the City of Johannesburg Land Use Management By-Law, 2016 read with the Spatial Planning and Land Use Management Act, 2013 the principle of good administration will be adhered to.

The development proposal will therefore be commensurate with the general principles for land development laid down by SPLUMA, as applicable to the present situation.

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

General:

- The current waste problem on site MUST be addressed an a viable solution provided on the COJ land prior to ANY further development.
- 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.

Specific recommendations by the specialist include:

- Designs should consider soil properties, slopes and runoff energy.
- No activities should take place in the riparian areas and associated buffer zone.

Ecology:

- No development within vegetation unit 4 and associated buffer zone is recommended.
- The implementation of an on-going alien vegetation removal programme as well as the rehabilitation and revegetation degraded areas is recommended.

Heritage:

If heritage features are identified during construction, as stated in the management recommendation, these finds would have to be assessed by a specialist, after which a decision will be made regarding the application for relevant permits.

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

The proposed mixed-use development and associated promotes the use and development of land that further enhances the use of existing infrastructure and resources.

The development is located within the City of Johannesburg, and economic development promotion and facilitation are important goals. The development is an economic development by the public sector, which will generate substantial opportunities for the Municipality to generate revenue for residents to have jobs being created both in the construction and operational phases as well as increase in the City's tax base.

This proposed mixed-use development is proposed as a counter to increased urban sprawl on the periphery of the city's established areas and with a view to accommodating demand in close proximity to places of employment, transportation routes and business nodes, as well as infrastructure availability densification is an economic imperative.

10. THE PERIOD FOR WHICH THE ENVIRONMENTAL AUTHORISATION IS REQUIRED
(CONSIDER WHEN THE ACITIVTY 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 EMP is to be attached to this report as an Appendix.

EMPr attached **YES**

SECTION F: APPENDIXES

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: Sensitivity Map
Annexure A3: Layout Plan
Annexure B: Photographs
Annexure C: Specialist Studies
Annexure C1: Geotechnical Site Investigation
Annexure C2: Terrestrial Biodiversity Assessment Report
Annexure C3: Wetland Delineation and Assessment Report
Annexure C4: Phase 1 Heritage Resource Impact Assessment
Annexure C5: Floodline Assessment Report
Annexure C6: Air Quality Baseline Assessment Report
Annexure D: Public Participation information
Annexure E: EMPr
Annexure F: Town Planning Memorandum
Annexure G1: Bulk Engineering Services Report
Annexure G2: Comprehensive Stormwater Management Plan
Annexure H: Traffic Assessment Report
Annexure I: Department of Forestry, Fisheries and Environment Screening Tool
Annexure J: EAP CV
Annexure K: EAP Declaration
Annexure L: Specialist Declaration
Annexure M: Maps A3

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.