Gauteng Department of Agriculture and Rural Development (GDARD)

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, 2010 (Version 1)

List of all organs of state and State Departments where the draft report has been submitted, their full contact details and contact person

Kindly note that:

1. This **Basic Assessment Report** is the standard report required by GDARD in terms of the EIA Regulations, 2010.

2. This application form is current as of 2 August 2010. It is the responsibility of the EAP to ascertain whether subsequent versions of the form have been published or produced by the competent authority.

3. **A draft Basic Assessment Report must be submitted to all State Departments administering a law relating to a matter likely to be affected by the activity to be undertaken. The draft reports must be submitted to the relevant State Departments and on the same day, two CD's of draft reports must also be submitted to the Competent Authority (GDARD) with a signed proof of such submission of draft report to the relevant State Departments.**

4. 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.

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

6. An incomplete report shall be rejected.

7. 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 rejection of the application as provided for in the regulations.

8. Five (5) copies (3 hard copies and 2 CDs-PDF) of the final report and attachments must be handed in at offices of the relevant competent authority, as detailed below.

9. No faxed or e-mailed reports will be accepted. Only hand delivered or posted applications will be accepted.

10. 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.

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

Administrative Unit of the Sustainable Utilisation of the Environment (SUE) Branch
18th floor Glen Cairn Building
73 Market Street, Johannesburg

Admin Unit telephone number: (011) 355 1345
Department central telephone number: (011) 355 1900

(For official use only)

File Reference Number:	GAUT: 002/14-15/0258					
Application Number:						
Date Received:						

* Submission to State Departments (Number 3 above)

Has a draft report for this application been submitted to 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 State Departments referred to above been attached to this report? NO

if no, state reasons for not attaching the list.

The Draft report will be distributed to:
City of Johannesburg Metropolitan Municipality
The Department of Water and Sanitation is not required to give feedback
The South African Heritage Resources agency will also receive the Heritage report.

SECTION A: ACTIVITY INFORMATION

1. ACTIVITY DESCRIPTION

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

The Whiskin residential development on Holding 102, 103, 104, 105 and 106 Crowthorne Agricultural Holdings

Figure 1: Location map

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:**
e.g. 983, 04 December 2014	1(a)	Construction of a 600 mW generator
983, 04 December 2014	9	The development of infrastructure exceeding 1000 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; excluding where- (a) such infrastructure is for bulk transportation of water or storm water or storm water drainage inside a road reserve; or (b) where such development will occur within an urban area.
983, 04 December 2014	10	The development and related operation of infrastructure exceeding 1000 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; excluding where- (a) such infrastructure is for bulk transportation of sewage, effluent, process water, waste water, return water, industrial discharge or slimes inside a road reserve; or (b) where such development will occur within an urban area.
983, 04 December 2014	27	The clearance of an area of 1 hectares or more, but less than 20 hectares of indigenous vegetation, except where such clearance of indigenous vegetation is required for- (i) the undertaking of a linear activity; or (ii) maintenance purposes undertaken in accordance with a maintenance management plan.

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

Building Plans will be submitted to the City of Johannesburg Metropolitan Municipality for review and approval. Buildings, structures and services will adhere to the minimal standards of the Municipality.

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 No. 107 of 1998 as amended.	National & Provincial	27 November 1998
National Heritage Resources, 1999 (Act 25 of 1999)	National and Provincial – south African Heritage Resources Authority	1999
The National Water Act, 1998 (Act 36 of 1998)	National and Provincial – Department of Water and Sanitation – No application envisioned.	1998
The Conservation of Agricultural Resources Act, 1983 (Act 43 of 1983)	National and Provincial – GDARD & Department of Agriculture, Forestry and Fisheries – No application envisioned	1983
Constitution of the Republic of South Africa Act (No 108 of 1996)	National, Provincial and Local Government No application envisioned	1996
Environment Conservation Act (No 73 of 1989)	Department of Environmental Affairs; Department of Water	1989

	Affairs; Provincial Department of Environmental Affairs	
NEMA - Biodiversity Act (2004)	Dept of Environmental Affairs No application envisioned	2004
Occupational Health and Safety Act (No 85 of 1993)	Department of Labour No application envisioned	1993
National Road Traffic Act (No 29 of 1989)	Department of Transport Application made to GAUTRANS by the Traffic Engineers	1989
All relevant Provincial regulations, Municipal by-laws and ordinances This includes: • Gauteng Planning and Development Act (Act No 3 of 2003) (GPDA) • The Gauteng Draft Red Data Policy • The Gauteng Draft Ridges Policy • Protection of Agricultural Land in Gauteng Revised Policy (June 2006) • City of Johannesburg Metropolitan Municipality Spatial Development Framework (SDF) • City of Johannesburg Metropolitan Municipality's Open Space Framework	Provincial and Local - Gauteng Department of Agriculture and Rural Development (GDARD) and the City of Johannesburg Metropolitan Municipality (CoJ) Application made to GDARD and CoJ	

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.
Provide a description of the alternatives considered

No.	**Alternative type**, either alternative: site on property, properties, activity, design, technology, operational or other(provide details of "other")	**Description**
1	Proposal – High-density residential scheme and uses ancillary and subservient thereto.	It is proposed to develop a high-density residential scheme and uses ancillary and subservient thereto. The prosed layout calls for one erf (proposed Erf 1) that will be development for high density residential uses and a three erven (proposed Erven 2 to 4) that will be used for private open space. The size of the site is approximately 12,8272 ha The following land use development controls are proposed: • Proposed Erf 1 o Zoning: "Residential 3" o Density: A maximum of 1050 units shall be developed o Height: The height of all buildings shall be restricted to 4 storeys o Coverage: The coverage shall not exceed 50% • Proposed Erven 2, 3 and 4 o Zoning: "Private Open Space", and uses ancillary and subservient thereto, including a gatehouse and clubhouse A building line of 15m and 10m shall apply along Whisken and Ethel Avenues respectively, provided that parking shall be permitted within the building line and that the building line may be relaxed with the written approval of the local authority.
2	Alternative 1 – Construction of mix use development of offices and a commercial centre	Construction of mix use development of offices and a commercial centre Although suited to the general functioning and land uses of the surrounding urban environment is considered unsuitable due to several commercial and office developments already existing and being planned for the area.
3	Alternative 2 – No go option	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 additional 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 negated; • The area will fall further in disrepair and the protection and appropriate management of the ecological significant areas will be negated; or • Illegal squatters or vagrants may inhabit the site. Given the fact that the site will eventually degenerate if left unmanaged, and the fact that it is most likely unsuitable to be utilised for grazing or agricultural purposes due to its location, it is reasonable to state that the no-go option is less favourable than some of the other options presented. Furthermore, should this property not be developed it would be left as an isolated and disconnected land due to all the surrounding areas.

The development will consist of the following components:

- **Road access and Parking**

Access shall be taken from Whisken Avenue at a distance fo 290m from the road reserve boundary of the proposed Pits Avenue /Whiskin Avenue marginal access intersection, which is in excess of the 100m throat length required by GDRT. A combined entrance comprising two inbound and two exit lanes are proposed at the security boom control. An additional separate lane is proposed for refuse and delivery vehicles. The site access will be permanently manned by security guards 24 hours per day. (This entrance will accommodate emergency vehicles, which require a 4m wide lane.) The stacking distance from the security booms for the development will be a minimum of 48m which will allow sufficient stacking for 8 passenger vehicles.

The proposed entrance for the proposed Whiskin development will thus have no effect on existing developments.
The marginal access at the Pitts Avenue/Whiskin Avenue intersection is proposed to be located approximately 560m south of the Pitts Avenue/ Macgregor Road and 307m north of the Pitts Avenue, Kyalami Boulevard and Kenilworth Road intersection

The minimum separation requirements of 285m as stipulated in the National Guidelines for Road Access Management in South Africa is duly met and a public transport layby facility can be accommodated on the proposed K71(P66-1) route should this be required.

It is envisaged that U-turns can be accommodated at the Pitts Avenue/Macgregor Road and Pitts Avenue (P66-1/K71), Kyalami Boulevard and Kenilworth Street intersections. At the Pitts Avenue/Macgregor Road intersection, a 4.2m wide painted island currently exists on the southern approach. Based on the P66-1 road upgrade detail design drawings, a 17m wide median island will be provided on this same approach. This will allow vehicles travelling northwards to manoeuvre around the median island safely and make a U-turn without impeding the through traffic. At the Pitts Avenue (P66-1/K71), Kyalami Boulevard and Kenilworth Street intersection, protected right turn traffic signal phases are currently operational during the weekday AM and PM peak hour periods for vehicles travelling northbound and southbound. Vehicles travelling southwards will be able to make a U-turn safely during this protected phase without impeding the conflicting northbound through traffic during the weekday AM and PM peak hour periods.

Currently, Arthur Avenue and Allandale Road are the only two east-west link roads in this area from Pitts Avenue. The proposed marginal access at the Pitts Avenue/Whiskin Avenue intersection is envisaged to become a public road under the jurisdiction of the JRA and will link Pitts Avenue to Neptune Avenue. It is envisaged that Whiskin Avenue will provide an alternative access to the region and serve the wider community.

The proposed marginal access road for the proposed Crowthorne Extension 20 development will thus have no effect on existing and future accesses on the Pitts Avenue corridor.

- Parking shall be provided for the use of tenants in the ratio of 1 bay per single bedroom unit and 0,5 bays for every additional bedroom for every dwelling unit. Parking for visitors shall be provided in the ratio of 1 bay for every 4 units.

Traffic

The proposed Whiskin development is expected to generate 825 trips to the road network with a 206/619 (in : out) and 578/248 (in : out) directional split during the weekday AM and PM peak hour periods respectively.

The trip distribution is defined as the expected origin, route, and destination pattern of the new trips through the road network surrounding the proposed development. The traffic distribution pattern is derived from the traffic flow data and is based on predicted origins and destinations of the new trips. It is assumed that with the proposed new marginal access at the Pitts Avenue/Whiskin Avenue intersection, 65% of the anticipated new trips enter and exit the proposed site along Whiskin Avenue from the Neptune Road direction and 35% enter and exit the proposed site from the proposed new marginal access at Pitts Avenue during the weekday AM peak hour period. Similarly, it is assumed that 55% of the anticipated new trips enter the proposed site along Whiskin Avenue from the Neptune Road direction and 45% enter the proposed site from the proposed new marginal access at the Pitts Avenue/Whiskin Avenue intersection during the weekday PM peak hour period.

Furthermore, it is envisaged that a proportion of the existing traffic using the Main Road/Arthur Avenue and Pitts Avenue (R55)/Macgregor Road (Main Road) intersections will also be redistributed with the proposed construction of the marginal access at the Pitts Avenue/Whiskin Avenue intersection. It has been assumed that 50% of existing left turning vehicles on the southern approach and 50% of through vehicles on the western approach of the Main Road/Arthur intersection will be

redistributed to the proposed Pitts Avenue/Macgregor Road and the proposed Pitts Avenue/Whiskin Avenue marginal access intersections during the weekday AM and PM peak hour periods.

Similarly, it has also been assumed that approximately 50% of the existing left turning vehicles on the western approach of the Pitts Avenue/Macgregor Road intersection will be diverted to the proposed Pitts Avenue/Whiskin Avenue marginal access intersection during the weekday AM and PM peak hour periods.

Due to the challenges associated with the construction of a section of the proposed K56 Provincial Route in the vicinity of the proposed site, a new left-in-left-out marginal access on Pitts Avenue or future K71(P66-1) route is proposed. The capacity and adequacy of the proposed marginal access has been analysed in detail to ensure that there is adequate capacity to cater for the proposed development and existing traffic in the wider area.

External infrastructure improvements have been identified for the Main Road, Arthur Avenue and Pitts Avenue intersection. The infrastructure improvement involves the optimising of traffic signal timings and phasing and converting the through lane to a shared left, through and right turning lane on the western approach. It should be noted that with the abovementioned improvements the level of service is anticipated to improve from LOS C to LOS B, the overall average delays is anticipated to improve from 28 seconds to 20 seconds (28.5% improvement) and the v/c ratio will decrease from 0.97 to 0.83 (approximately 14% improvement) during the weekday AM peak hour period for the 2020 horizon. Similarly, the level of service is anticipated to remain the same at LOS C, the overall average delays is anticipated to improve from 33 seconds to 27 seconds (approximately 18.2% improvement)
and the v/c ratio will decrease from 1.47 to 1.15 (approximately 22% improvement) during the weekday PM peak hour period for the 2020 horizon.

It should be noted that WSP SA Civil and Structural Engineers are currently investigating the possibility of a grade separated geometric configuration at the Pitts Avenue and Macgregor Road intersection. This configuration is anticipated to provide improved traffic operations at this intersection. Hence, no further site specific upgrading or improvement has been identified for the 2015 and 2020 traffic conditions.

Whiskin Avenue is not a public transport route. Pitts Avenue (R55), Arthur Avenue and Walton Road are major taxi routes with numerous informal and formal drop-off and pickup points along its length. These routes are currently within the maximum pedestrian threshold walking distance of 800 - 1000m from the proposed site. This development will have minimal effect on current public transport routes or operations. The developer proposes to construct new taxi laybys at the Neptune Avenue, Whiskin Avenue and Walton Road intersection to accommodate the potential taxi trips anticipated to be generated by the proposed Crowthorne Extension 20 development. For safety reasons, the developer also intends to provide pedestrian walkways on Whiskin Avenue along the street frontage of the site

It can be concluded that the proposed new left-in-left-out marginal access at the Pitts Avenue/Whiskin Avenue intersection will satisfy the criteria indicated in the **Gauteng Provincial Government, Technical Requirements for Partial and Marginal Accesses on Gauteng Provincial Roads** document dated November 2014.

In summary, the traffic analysis undertaken would support the implementation of the proposed new left-in-left-out marginal access at the Pitts Avenue/Whiskin Avenue intersection subject to the mitigating measures indicated in this report being implemented.

- **Storm water**

There is limited formalized stormwater management in the area. The stormwater currently flows as surface sheet flow over the area as per the current fall towards the north.

Currently the stormwater runoff is discharged as sheet flow over the grasslands of the site, internally and onto the road reserves of both Pitts Avenue-R55 (Gautrans Road K71.02/P66-1) and Ethel Avenue.

An embankment and “V”-shaped earth channel has been shaped along the western boundary between the site and Pitts Avenue-R55 (Gautrans Road K71.02/P66-1). Runoff is diverted along this towards two stone pitched lined channels which divert the stormwater into a concrete lined “V”-shaped road edge channel running along Pitts Avenue and falling in a northerly direction. Runoff is captured in two catchpits along this road length and it ultimately discharges in the riverine area about 550m to the north of the site.

There is no formal stormwater drainage infrastructure along Ethel Avenue.

The boundary on the high side of the site is formed by Whisken Avenue, which runs along a watershed. For this reason, there is no notable upstream ingress of stormwater onto the site.

Internally the stormwater will be managed using a combination of shaped roads to act as drainage channels and piped stormwater reticulation. Due to the site configuration and the fact that Erf 101 juts into the site, the site is divided into two distinct catchments, the eastern catchment and the western catchment. These two catchments are separated along the western boundary of Erf 106 along the line of the previously “proclaimed road”.

It is proposed that three new attenuation tanks be constructed on the site to reduce the flood flows to acceptable levels and not to exceed pre-development discharge rates. One attenuation tank will be situated at the low point of the eastern catchment. Due to space constraints it was decided to construct two attenuation tanks within the western catchment. One of these being placed at the low point to the northern extent of the catchment to deal with stormwater from the lower half of the catchment and the other positioned midway up the slope, to catch and manage stormwater from the upper half of this western catchment. In this manner, the western catchment is separated into two sub-catchments, effectively.

The run-off generated by the paved areas and roofs will run onto the internal roads and parking areas and captured by kerb and grid inlets and conveyed to attenuation tanks by a stormwater pipe network. It will be designed to accommodate the

runoff generated by storm events with a recurrence interval of up to 5 years. or storm events with a recurrence of more than 5 years up to 1:25 years, the excess discharge not able to be accommodated by the piped system will be channelled in the roadways towards the attenuation facilities provided.

In the event of an unusually large storm the attenuation tanks, outlet structures, roads and parking will be sufficiently rigid to be able to withstand a 50 year recurrence storm. The internal roads fall towards the attenuation facilities and these will include inlets in their roofs to allow for ingress of major storm runoff. Weepholes will be provided in the boundary walls at the lower parts of the site.

In terms of the JRA stormwater management plan it was determined that attenuation for peak storm discharges is required on this site due to the development. The stormwater runoff from the site post development for the 1:5 and 1:25 year recurrence period will not exceed the pre-development 1:5 year and 1:25 year recurrence period storms, respectively. Furthermore the attenuation facilities are of an adequate size and sufficiently robust to accommodate a 1:50 year storm flow.

Consequently, downstream stormwater infrastructure needs not be upgraded as there will not be an increase in stormwater runoff from the development. These stormwater management and attenuation requirements will be further advanced and ratified in the stormwater management study and report process.

- **Water supply**

According to GIS data from Johannesburg Water, there is a 90mm Ø municipal water main and a 400mm Ø trunk main running along Whisken Avenue. The 90mm Ø line is currently supplying the neighbouring stands (agricultural holdings) in the greater Crowthrone A/H area. This line is supplied from a 110mm Ø main at a connection point some 570m to the east, at the junction of Whiskin Avenue and Walton Road and is fitted with a PRV at this point.
The 400mm Ø trunk main is situated on the opposite side of Whisken Avenue from the site (southern road reserve). A series of 110mm and 160mm Ø pipes are connected to it and supply water to the Kyalami Estates extensions to the south of Whisken Avenue. One of the 160mm Ø pipes is fitted with a PRV and is situated adjacent to the boundary between Erven 524 and 525, Kyalami Estates Extension 14 – about 145 meters to the east of the south eastern corner of the site.

It appears that the 160mm Ø supply pipe between Erven 23 and 24 Kyalami Estates and then 110mm Ø supply pipe between Erven 1205 and 1153 Kyalami Estates have not been fitted with PRV's. These latter two supply connections feeding Kyalami Estates are situated opposite the southern boundary of the site.

For this residential development the JW standard is 800 litres per unit of Res 3 building area per day and together with an allowance for the guardhouse and clubhouse, this results in an average daily demand is 9.74 L/s. Applying a peak factor of 4 the calculated peak demand is 39.0 L/s.

The fire installation will be complaint in terms of Johannesburg Water regulations and will include a combined 160 mm Ø council connection with a fire hydrant, a non-return valve and booster facility at the main entrance gate (within the Whisken Road reserve) and will include fire hydrants at a maximum of 180m spacing internally all with a minimum hydrant flow rate of 25 L/s at a minimum pressure of 15m (1.5 bar) and a design fire duration of 4 hours.

A total of twelve (12) fire hydrants are required to adequately protect the proposed development. All are situated on the internal 110 mm Ø pipes. Fire hose reels will be required for the 4 storey walk up units.

The existing 90mm Ø water supply network feeding the Crowthorne A/H area is insufficient to cater for these requirements. It is proposed to connect onto the existing 160mm Ø water main that branches off from the 400mm Ø trunk main adjacent to the boundary between Erven 23 and 24 Kyalami Estates, at a point outside the boundary of these erven with Whisken Avenue. A new 150m long 160mm Ø Class 16 water supply main from the municipal connection point to the site internal water supply network will be sufficient.

This new supply pipe will be of uPVC and will be fitted with either fully restrained or Victaulic couplings. A new PRV will be installed by immediately opposite the site connection, on Whisken Avenue and will reduce the pressure to about 3.6 bar static pressure.

Internally a combination of 110mm Ø and 75mm Ø pipes forming a network is sufficient. Since there is 11m fall across the site there should be about 4.7 bar static pressure at the lowest point of the site, in the north east corner, which is within acceptable limits. The site connection will be at the highest point of the site. Each new 4 storey residential block will then be provided with a 50mm connection. The entire site will have one bulk water meter. The civil engineers do not foresee any water pressure and supply flow problems related to this site.

If required, the developer will at his own cost install a privately owned PRV valve after the JHB Water meter to protect the internal reticulation from excessive pressures.

No flow rate and peak pressure problems are foreseen due to the significant infrastructure that it is intended connecting to as well the suitable site topography.

Adequate flow and pressure thus exists for this development.

- **Sewer Services**

There is currently no formal sewer reticulation servicing the erven making up the site, which are situated immediately to the north of the local watershed, the highpoint of which is situated roughly along Whisken Avenue in the vicinity of the site. The areas to the south of the watershed (Kyalami Estates and various Extensions) are serviced in terms of sewer. However due to the topography at the site, sewerage from this site is unable to be routed towards this reticulation. As a result, the erven making up the site are presently making use of septic tank type systems.

It is a condition of Johannesburg Water that before the proposed Kyalami Retail Centre project and the development of

Crowthorne Ext 18 may proceed, a new outfall sewer, to cater for the significant increase in waste water that would be generated by these developments, must be constructed.

Presently it is planned that the proposed outfall sewer ranging from 250mm Ø to 560mm Ø is to run from the north west corner of Erf 10 Kyalami A/H in a roughly westerly direction to connect into the existing 1200mm Ø Bruma Outfall Sewer. The total length of this proposed outfall sewer link is to be approximately 4940m.

In order to facilitate the sewer drainage from the site, it is the intention to extend this outfall sewer by about another 700m from the north west corner of the proposed retail development, along its northern boundary (with Kyalami Main Road –M71), beneath Pitts Avenue-R55 (Gautrans Road K71.02/P66-1) by means of directional drilling, terminating at the north western corner of the site. This outfall sewer extension pipe will be a 200mm Ø uPVC pipe.

Detail design drawings for this new outfall sewer have been prepared by ADA Consulting Engineers and are currently being assessed by JHB Water.

The Johannesburg Water Guidelines and Standards were used to determine sewer discharge rates and design parameters. Based on this, for this Res 3 development the total average daily discharge from the entire site is anticipated to be approximately 8.52L/s. With a general peak factor of 2.3 multiplied by the average daily discharge determines a peak discharge from the site as 19.65 L/s (2.3 x 8.52L/s).

In line with the JW Guidelines and Standards, the minimum design flow velocity for full-flow conditions of 0.7m/s and maximum velocity of 3.0m/s will be complied with.

It is proposed that sewerage generated on site will be reticulated in a network consisting of new 160mm Ø sewer pipework, which was determined to be adequate for the design flows and site parameters. This sewer pipework will cross the boundary at the north western corner of the site and connect into a new municipal sewer manhole forming part of the new outfall sewer system previously discussed.

The manhole will be constructed as part of the project.

The internal sewer network will be constructed using a 160 mm Ø uPVC pipe with a minimum fall of 1:80 and a minimum cover of 1000 mm in all areas. The minimum velocity of 0.7m/s and a maximum velocity of 3.0m/s will not be exceeded, as per JW Guidelines and Standards requirements. Individual sewerage connections to residential units, the clubhouse and the guard house will be using 110mm Ø pipes.

From the site connection point, a new 200mm Ø sewer pipe will be constructed as part of the project and will link with the new 250mm Ø section of the proposed outfall sewer, discussed previously. This link will be constructed of uPVC pipe with a minimum fall of 1:200 and a minimum cover of 1400 mm beneath roads and paved areas and 1000mm below other areas, as per the JW Guidelines and Standards. This link sewer will include a road crossing under Pitts Avenue, which will be done using directional drilling. It is acknowledged that Gautrans wayleaves will be required for this road crossing.

The pipe is sized to act as a communal conduit, able to accommodate future flows from prospective developments within the greater applicable catchment area.

For both internal and external sewer reticulation, to comply with good engineering principles and Johannesburg Water standards for sewer maintenance manholes will be constructed at all changes of horizontal direction, changes in gradient and at junctions as well as at a maximum spacing of 80 m on straight lengths.

- **Electricity**

As per the letters from Eskom attached hereto under **Annexure I3**, the proposed development falls within the Eskom supply area. Eskom has no objection to the issuing of a section 101 certificate by the City of Johannesburg for the proposed development.

Eskom can make an electrical supply available.

There is an Eskom 11kV network near the above proposed development. The present Eskom network would need to be extended / strengthened to make the supply available. Electricity will be brought form the Leeukop substation and will be linked to the Crowthorne substation line to form a closed connection between the two substations.

- **General**

The development falls within the City of Johannesburg Metropolitan Municipality and the promotion and facilitation of economic development is an important objective. Authorisation will facilitate the aforementioned

The proposed development of the proposed site will contribute to the re-engineering of the existing urban form, the establishment of a more compact city and also contribute to the optimization of the use of existing infrastructure such as bulk sewer lines, bulk roads and water.

The occupants will benefit from the use of alternative energy sources adopted in the proposed development, reducing operation cost.

The development is clearly an economic development by the private sector, which will generate substantial opportunities for the Municipality to generate revenue for residents to have access to a wide range of amenities and for jobs to be created both in the construction and operational phases and increase the City's tax base.

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

The property falls within Administrative Region A and specifically in Sub-area 9 of Region A. The bulk of area is earmarked for rural residential development, though recognition is given in the RSDF for the expansion of the urban boundary onto the site, given its locality in relation to the P66-1, Main Road and Allandale Road.

The SDF and RSDF allows for densities beyond that which is proposed in these documents, provided that it can be demonstrated that the site has unique characteristics that warrant such a deviation.

In terms of the RSDF, residential densification in Region A is promoted at nodes, along critical mobility routes, in relation to low-income housing initiatives and on consideration of site specifics of a given application. The application site satisfies three of these requirements, being located along a critical mobility route, is in close proximity to the Waterfall Node and the site specifics also support an increase in density.

The RSDF further states that densification must go hand in hand with the provision of housing solutions for low to middle income earners, the latter being the target market of the proposed development, and that residential development must contribute to the development of a compact city.

Finally, the RSDF states that the nodes (regional significance) where significant residential densification will be supported are Midrand Metropolitan Node, Fourways Regional Node, Waterfall City and Sunninghill Regional Node. The site being located within close proximity to the Waterfall City Node fulfils this requirement

The site forms part of zones 6A (District Mixed Use Node Core) and 6B (District Mixed Use Node Periphery of the Kyalami Development Framework (Annexure F). In terms of the Kyalami Development Framework, high density residential developments are supported, with no upper density limit specified

The mobility function of the Road Network will be protected and enhanced where possible. There will be no access onto the P66-1 and the holdings in the township will be with a single access point.

The proposed development will have no impact on any adjoining or surrounding property as it is large enough to allow for the proposed density, height, landscaping and parking, without it impacting on any adjoining property.

It is therefore evident that owing to its size, shape and location, the site is unique and is ideally suited for the proposed increase in densities.

The proposed development is consistent with the Joburg 2040 Growth and Development Strategy (GDS). More specifically it promotes the core principles of the GDS in that the proposed development will:

- Support the principle of building sustainable human settlements as the proposed density promote the reduction of urban sprawl and traffic congestion. This is as the site is well located in relation to major transport routes (Main Road, the P66-1 and Allandale Road) as well as being well located in relation to major emerging employment nodes (Waterfall Estate).
- Support the principle of building and growing an inclusive economy.
- Support the principle of overcoming a dysfunctional urban system, one characterised by low densities, sprawl and continuing housing deficits. The higher densities on the site will meet the need for a different housing typology in the area.
- Support the principle of ensuring resource security and environmental sustainability. The higher densities on a site so well located in relation to three major roads (P66-1, Main Road and Allandale Road) will make the future scale-up of mass public transit more viable and reduce overall transportation costs.

In order to function effectively, residential areas should ideally accommodate a variety of residents who are at different stages of their respective life cycles, have different housing needs and who have different income levels. In the immediately surrounding area of the site, there is little by way of such variety, and the introduction of the proposed development will meet a need for different housing typologies for different residents.

Though there are no high density developments in the immediate vicinity, higher densities in the broader Kyalami area has proven to be hugely popular, especially developments that are well located in relation to major transport routes such as the recently developed Kyalami Extension 20.

Higher densities on the site will also have the advantage of helping meet the infrastructure needs of the broader area and will alleviate the pressure on the City to incur the costs of upgrading the infrastructure on its own. As part of meeting its obligations, the developer will provide bulk water, sewer and electricity infrastructure to the site, as well as upgrade several roads and intersections in the area. These improvements will not only benefit the site, but will also meet the needs of existing developments.

Refer to **Annexure I1** hereto for the Townplanning motivating memorandum
Refer to **Annexure I2** hereto for the services outline scheme report and Joburg Water acceptance of services report
Refer to **Annexure I3** attached hereto for letter received from Eskom in respect of power supply with regards to the proposed development
Refer to **Annexure I 4** attached hereto for the Traffic Assessment

No.	**Alternative type**, - Location alternatives	**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 • Aligns to the prerequisites of the City of Johannesburg Metropolitan Municipality SDF • Situated within the urban realm adjacent to existing and proposed urban infrastructure, service and amenities • Socially inclusive due to its location to numerous communities and along public transport routes
2	Alternative 1 – Inner City Location	An inner-city location would be environmentally and socially feasible, however economically unviable, provided that the same area extent of land be found available for development as inner-city resources are very scarce.
3	Alternative 2 – Suburban location	Not socially, environmentally or economically feasible due to the following: • Not situated adjacent to primary movement corridors • Not accessible to a range of socio-economic population groups • Isolated nature of development and therefore not inclusive • Contrasting densities and heights with regard to the mixed-use nodal development • Availability of land at an affordable cost minimal

No.	**Alternative type**, either alternative: site on property, properties, activity, design, technology, operational or other(provide details of "other")	**Description**
1	Proposal Technology	Standard construction equipment will be used during the construction phase. Measures will put in place to make the development as energy efficient as possible such as the installation of Energy efficient light bulbs
2	Alternative 1	Standard construction equipment will be used during the construction phase. Measures will put in place to make the development as energy efficient as possible such as the installation of Energy efficient light bulbs
3	Alternative 2	No technology alternatives required

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

NOTE: The numbering in the above table must be consistently applied throughout the application report and process

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	12,8272 Ha including private open space
Alternatives:	
Alternative 1 (if any)	12,8272 Ha
Alternative 2 (if any)	12,8272 Ha
	Ha/ m^2

or, for linear activities: **Not applicable**

	Length of the activity:
Proposed activity	
Alternatives:	
Alternative 1 (if any)	
Alternative 2 (if any)	
	k/km

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

	Size of the site/servitude:
Proposed activity	12,8272 Ha
Alternatives:	
Alternative 1 (if any)	12,8272 Ha
Alternative 2 (if any)	12,8272 Ha
	Ha/m^2

5. SITE ACCESS

Proposal

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

Describe the type of access road planned:

Access shall be taken from Whisken Avenue at a distance of 290m from the road reserve boundary of the proposed Pits Avenue /Whiskin Avenue marginal access intersection, which is in excess of the 100m throat length required by GDRT. A combined entrance comprising two inbound and two exit lanes are proposed at the security boom control. An additional separate lane is proposed for refuse and delivery vehicles.

The marginal access at the Pitts Avenue/Whiskin Avenue intersection is proposed to be located approximately 560m south of the Pitts Avenue/ Macgregor Road and 307m north of the Pitts Avenue, Kyalami Boulevard and Kenilworth Road intersection

Refer to Figure 2a and 2b below indicating the two alternives for site access

Include the position of the access road on the site plan.

Alternative 1

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

Describe the type of access road planned:

Access shall be taken from Whisken Avenue and shall be to the satisfaction of the local authority, provided that a line of no access shall apply along Pitt Road.

Include the position of the access road on the site plan.

Alternative 2

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

Describe the type of access road planned:

No access will be required and existing access will be used

Include the position of the access road on the site plan.

Figure 2a: Alternaitve 1 Proposed Site access

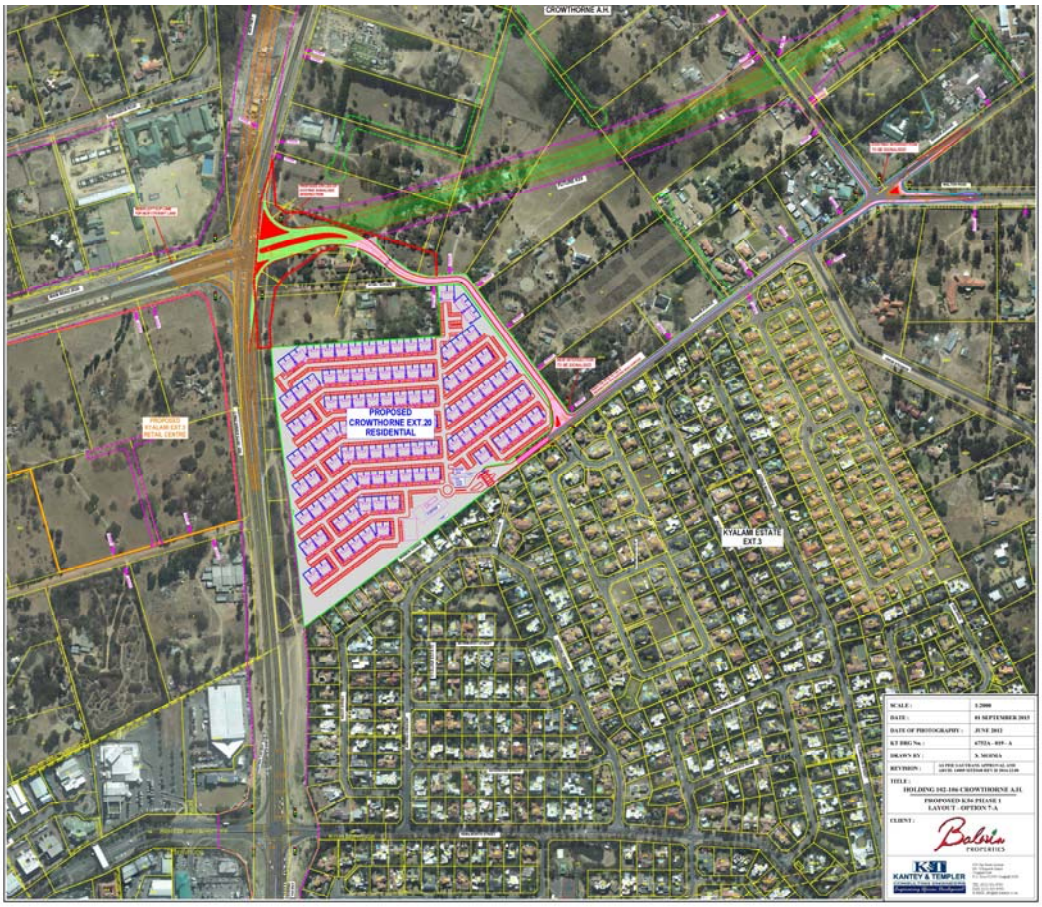

Figure 2b: Alternative 2: Proposed site access

Section A 6-8 has been duplicated **0** Number of times

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

(only complete when applicable)

6. SITE OR ROUTE PLAN

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

- the scale of the plan, which must be at least a scale of 1:2000 (scale can not be larger than 1:2000 i.e. scale can not be 1:2500 but could where applicable be 1:1500)
- the property boundaries and numbers of all the properties within 50m of the site;
- the current land use as well as the land use zoning of each of the properties adjoining the site or sites;
- the exact position of each element of the application 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, street lights, sewage pipelines, septic tanks, storm water infrastructure and telecommunication infrastructure;
- walls and fencing including details of the height and construction material;
- servitudes indicating the purpose of the servitude;
- sensitive environmental elements on and within 100m of the site or sites 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);
- for gentle slopes the 1m contour intervals must be indicated on the plan and whenever the slope of the site exceeds 1:10, the 500mm contours must be indicated on the plan; and
- the positions from where photographs of the site were taken.
- Where a watercourse is located on the site at least one cross section of the water course must be included (to allow the 32m position from the bank to be clearly indicated)

7. SITE PHOTOGRAPHS

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 Annexure**.** It should be supplemented with additional photographs of relevant features on the site, where applicable.

8. FACILITY ILLUSTRATION

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 Annexure.

SECTION B: DESCRIPTION OF RECEIVING ENVIRONMENT

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

Further:

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 | **0** | 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 | **0** | times
(complete only when appropriate)

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

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

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

Section B - Section of Route | | (complete only when appropriate for above)

Section B – Location/route Alternative No. | | (complete only when appropriate for above)

1. PROPERTY DESCRIPTION

Property description: Holding 102, 103, 104, 105 and 106 Crowthorne Agricultural Holdings to be developed as Crowthorne X20

(Farm name, portion etc.)

2. ACTIVITY POSITION

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

Alternative:	**Latitude (S):**	**Longitude (E):**
	25º59'2,50"S	28º4'42,07"E

In the case of linear activities: Not applicable

Alternative:	**Latitude (S):**	**Longitude (E):**
• Starting point of the activity	º	º
• Middle point of the activity	º	º
• End point of the activity	º	º

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

Addendum of route alternatives attached **N/A**

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

5. GROUNDWATER, SOIL AND GEOLOGICAL STABILITY OF THE SITE

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

Shallow water table (less than 1.5m deep)	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 **UNKNOWN**

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 **UNKNOWN**

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

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 3)? YES **NO**

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

7. GROUNDCOVER

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

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

Natural veld - good	Natural veld with	Natural veld with	**Veld dominated**	Landscaped

condition % =	scattered aliens % =	heavy alien infestation % =	**by alien species % = Approx. 50%**	(vegetation) % =
Sport field % =	Cultivated land % =	Paved surface (hard landscaping) % =	**Building or other structure % = Approx. 50%**	Bare soil % =

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

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:

Except for the one orange listed geophyte *Hypoxis hemerocalidea* (African potato), no red data habitat is present on the property and no such species were recorded. It is recommended that *Hypoxis hemerocallidea* is removed from the property (under the supervision of a qualified botanist/ecologist/natural conservator) and replanted in suitable natural habitat.

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:

Are there any special or sensitive habitats or other natural features present on the site?	YES	**NO**

If YES, specify and explain:

Although the study area is located within the threatened Egoli Granite Grassland vegetation type (Mucina & Rutherford 2006), the study area is completely transformed due to human activities. No sensitive habitat or plant and animal species are present. The area has a very low biodiversity and comprises mostly pioneer and weedy plant species. The large number of declared alien invasive species is present on the study site is alarming. Not only do these species affect the study area negatively, but also serves as a central point from where there seeds are dispersed into surrounding natural areas.

From a plant and animal ecological point of view the area has no conservation or biodiversity value.

The orange listed geophyte individuals *Hypoxis hemerocallidea* must be removed by a qualified botanist/ecologist/nature conservationist before any development commences. These species should then be replanted in suitable natural habitat.

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

If yes complete specialist details

Name of the specialist:	Enviroguard Ecological Services CC		
Qualification(s) of the specialist:	• Prof LR Brown: Reg. No. 400075/98 (Botanical Science and Ecological Science). • Mr C Cook: Reg. No. 400084/08 (Aquatic Science)		
Postal address:	PO Box 703, Heidelberg, 1438		
Postal code:	1438		
Telephone:		Cell:	082 4641021
E-mail:	envguard@telkomsa.net	Fax:	

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

If YES list the specialist reports attached below

Signature of specialist: _____ Date:

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

8. LAND USE CHARACTER OF SURROUNDING AREA

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

1. Vacant land	2. River, stream, wetland	3. Nature conservation area	4. Public open space	5. Koppie or ridge
6. Dam or reservoir	7. Agriculture	**8. Low density residential**	**9. Medium to high density residential**	10. Informal residential
11. Old age home	**12. Retail**	13. Offices	**14. Commercial & warehousing**	**15. Light industrial**
16. Heavy industrial[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 X250m

NORTH

8 / 34	**8 / 34**	**8 / 34**	**8 / 34**	**8 / 34**
8 / 34	**8 / 34**	**8 / 34**	**8 / 34**	**8 / 34**
12 – kyalami ridge x3 mall to be constructed soon	**12 - kyalami ridge x3 mall to be constructed soon**		**8 / 34**	**8 / 34**
8 /34	**8 /34**	**9**	**9**	**9**
14 / 15	**14 / 15**	**9**	**9**	**9**

WEST EAST

SOUTH

= Site

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 G1: Geotechnical Assessment
Annexure G2: Ecological Assessment
Annexure G3: Heritage Assessment

1. Geotechnical Assessment

Eight test pits (TP9 to TP16) were excavated across the site. The test pits were excavated using a tractor-loader-backhoe (backactor). The test pits were excavated to refusal or to the excavation limit of the machine. All test pits were profiled in situ by an engineering geologist and where necessary disturbed soil samples were taken for laboratory testing.

Available geological maps indicate that the area of investigation is underlain by granite of the Johannesburg Granite Dome. This was confirmed during the present investigation. Residual soils have developed from the weathering of the granite bedrock. A thin layer of transported hillwash occurs as the upper soil layer across the site. The general soil profile is described below.

The upper 0,2m to 0,6m of in situ soil across the site comprises loose intact silty sand of transported hillwash origin. The hillwash is underlain by loose / loose to medium dense intact silty sand with abundant quartz gravel. This gravel layer represents the transported pebble marker. The pebble marker extends to depths varying between 0,4m and 1,0m (average depth 0,65m).

The pebble marker is underlain by medium dense varying to dense cemented and ferruginised silty sand reworked residual granite. The reworked residual granite extends to depths varying between 1,0m and 2,4m (average depth 1,65m) in test pits TP9 to TP12 and TP14 to TP16. Refusal of the backactor was obtained upon very dense residual granite at depths varying between 1,1m and 1,2m in test pits TP3, TP6 and TP13.

Test pits TP1, TP2, TP4, TP5, TP7 and TP8 were terminated at depths of the order of 1,5m within the reworked residual granite during the previous geotechnical investigation. The reworked residual granite is underlain by medium dense to dense jointed silty sand residual granite. The residual granite extends to depths in excess of 3,5m, the excavation limit of the machine.

A perched water table was noted in test pits TP9 to TP11 and TP14 at depths varying between 3,1m and 3,5m. Standing water was noted at these depths after 24 hours. No perched water table or zones of seepage were noted in any of the remaining test pits across the site.

The hillwash and pebble marker are considered to be potentially highly compressible / collapsible. These soil layers are thus unsuitable for use as founding layers even for proposed lightly loaded structures.

Based on the soil profile as described above the site can be classified as Zone S according to the classification system given by the NHBRC and SAICE Code of Practice (1995).

Conventional strip / spread foundations could be placed upon the medium dense or better reworked / residual granite. This founding layer occurs at depths varying between 0,45m and 1,4m (average depth 0,8m). An allowable bearing pressure of 200kPa could be used for the above founding layer. Under these load conditions total settlements of the order of 5mm to 10mm are envisaged. Differential settlements should be taken as 50% of the total settlements.

An allowable bearing pressure of 300kPa could be utilized for the dense or better reworked residual granite and / or medium dense or better residual granite. These founding layers occurs at depths varying between 0,9m and 1,4m (average depth 1,1m). Under the above load conditions total settlements are envisaged to be of the order of 5mm to 10mm. Differential settlements should be taken as 50% of the total settlements. Conventional strip / spread foundations could be employed as suitable foundation types.

In addition to the above comments it is noted that the in situ soils across the site are inert, that is, non-expansive. This was confirmed by the laboratory test results obtained from the van Rooy report. It is further noted that the in situ soils across the site have a near neutral pH and poor electrical conductivity (approx. 10mS/m) which is indicative of non-corrosive to mildly corrosive in situ soils.

2. Ecological Assessment

The study area falls within the Grassland Biome and classified as belonging to the endangered Egoli Granite Grassland vegetation type (GM10) (Mucina & Rutherford 2006).

The study area is however, totally transformed with no vegetation reminiscent of the original grassland vegetation remaining. The total area is transformed due to the levelling of the land as well as the development of buildings some years ago. The area has no ecosystem functioning or value.

A survey of the proposed development areas was carried out by driving around the entire area by car and closer inspection of the actual site carried out on foot during daylight as well as an evening survey on the 9th of February 2015. Due to the close proximity of the site to the R55 as well as historic agricultural activities and present high-density residential developments within Kyalami Estate; the majority of natural vegetation (Egoli Granite Grassland Gm10) has already been transformed or become severely degraded due to large scale illegal dumping activities and invasion of anthropogenic grasses (kikuyu) as weedy plant and alien tree species (*Acacia mearnsii, Melia azedarach, Jacaranda mimosifolia* and *Morus alba*). The majority of the site consists of completely transformed vegetation due to existing residential developments and abandoned buildings.

2.1 Vegetation

The study area comprises three vegetation units namely the 1) Developed area; 2) Degraded grassland; and 3) Alien woodland. Refer to Figure 3 below.

Figure 3: Location of three vegetation units identified during the ecological assessment. The entire site has a low (no) conservation value and no sensitive areas occur on site

2.1.1 Developed area

This area comprises a guest house with a well maintained garden, various outbuildings and other residential houses with gardens or remnants of gardens surrounding them. The area has been landscaped many years ago and planted with mostly ornamental trees with some indigenous trees also present, and lawn grass. It is maintained in some way by regular mowing of the lawn areas. Building and other material are present in some locations especially in the areas that have been abandoned.

The grass areas are dominated by the grass *Cynodon dactylon* though the alien invasive grass *Pennisetum clandestinum* (kikuyu) is present in some areas. The woody component consists of a mixture of garden ornamentals, declared alien invader trees, and some indigenous trees that were planted many years ago as part of the landscaping activities. Alien invasive species include *Jacaranda mimosifolia, Cotoneaster pannosus, Acacia mearnsii* and *Lantana*

camara. Indigenous species include *Acacia karroo, Diospyros lycioides, Gymnosporia buxifolia,* while garden hybrids include *Ceratonia saliqua, Quercus* spp*., Acer buergerianum* and various conifer species.

Vegetation unit 1 (Developed areas) is transformed due to these areas having been landscaped and a mixture of ornamental, alien invasive, and indigenous species planted. Various buildings have been erected on these premises many years ago resulting in the area becoming transformed with vegetation not representative of the natural vegetation and environment. This unit therefore has from a plant ecological and ecosystem functioning point of view a **low (no) conservation value**.

2.1.2 Degraded grassland

This unit is located in the central to east section of the study area. It consists of an old grassland that was most probably previously planted for pasture purposes and left fallow. There are a few rocks present while the soil is loamy.

The vegetation is dominated by the grass *Eragrostis curvula* with the weed *Gomphocarpus fruticosus* and the highly invasive category 1 declared invaders *Campuloclinium macrocephalum* and *Solanum mauritianum* prominent throughout these areas. Some woody species occur in dense clumps scattered throughout this unit but mostly on its northern boundary. These include *Searsia pyroides*, *Searsia lancea* and the exotic invader species *Acacia mearnsii*, *Lantana camara* and *Robinia pseudoacacia*.

The orange listed geophyte *Hypoxis hemerocallidea* is present and occurs as small groups and single individuals within this unit. Small maize patches are also present in some areas of this unit.

A small section in the north-eastern corner of the study site (labelled 2b on figure 1) is totally dominated by the grass *Eragrostis curvula* with few alien invasive species present. The grasses *Hyparrhenia hirta*, *Cynodon dactylon*, *Digitaria eriantha* and the forbs *Verbena tennuisecta* and *Peudognaphalium luteo-album* are prominent in this section.

Vegetation unit 2 (Degraded grassland) was most probably previously ploughed and planted with pasture grasses. This area has now been left fallow for many years resulting in the grass layer becoming moribund. These moribund areas became open spaces for pioneer weedy and alien species that are present throughout the study site. As a result these alien and pioneer species have established throughout the grassland and are slowly displacing all the natural species. The vegetation is dominated by secondary successional, pioneer and alien invasive species. The area is not representative of natural grassland and is regarded as being transformed. The high number of declared alien invasive species threatens the natural environment and its ecosystem functioning. From a plant ecological and ecosystem functioning point of view this area has a **low (no) conservation value**.

2.1.3 Alien woodland

This woodland is located on an old abandoned and demolished residential portion in the southern section of the study site. The soil is dark loamy with few rocks present.

The vegetation is dominated by the declared invader trees *Melia azedarach* that are mostly more than 10m tall. These trees cover more than 80% of the study site resulting in a highly degraded herbaceous layer underneath the canopies. A large number of declared alien invader species are prominent underneath the canopies of these trees and include *Araujia sericifera, Cereus jamacaru, Mirabilis jalapa, Datura stramonium, Solanum mauritianum* and *Lantana camara*. Forbs present include *Bidens pilosa, Conyza bonariensis* and *Sida alba.*

A remnant area of a previously well-kept grass lawn (*Pennisetum clandestinum* – kikuyu) is also found within this unit. This area is totally dominated by the exotic invasive kikuyu grass that is more than half a metre tall. Various pioneer weeds such as *Tagetes minuta* and *Bidens pilosa* are also present within this unit.

Rubble and litter are dumped in this area (while doing the survey a small truck dumped building rubble on the site). Humans use the area as a toilet with broken bottles and other litter strewn in various places. As a result the area is classified as an alien forest. The vegetation is completely transformed with no natural vegetation left. This area poses a huge threat to the environment due to the many alien invasive species and has from an ecological and ecosystem functioning point of view a **low (no) conservation value**.

2.1.4 Red data species

Except for the one orange listed geophyte *Hypoxis hemerocalidea* (African potato), no red data habitat is present on the property and no such species were recorded. It is recommended that *Hypoxis hemerocallidea* is removed from the property (under the supervision of a qualified botanist/ecologist/natural conservator) and replanted in suitable natural habitat.

2.2 Faunal Assessment

2.2.1 Amphibians

As the survey was undertaken for a single day/evening during the summer months (February), only a few species of frogs were recorded. Ideally, a herpetological survey should be undertaken throughout the duration of the wet season (September-January). It is only during this period accurate frog lists can be compiled. During this survey; fieldwork was augmented with species lists compiled from personal records; data from the South African Frog Atlas Project (SAFAP) and published data, and the list provided in Table below is therefore regarded as likely to be fairly comprehensive.

Frog species recorded by the consultant in the Kyalami /Blue Hills/Chartwell and Beauliea areas during the period 1991 to 2015 include *Amietophrynus gutturalis, Schismaderma carens, Xenopus laevis, Cacosternum boettgeri, Kassina senegalensis, Tomopterna cryptotis, Tomopterna natalensis, Pyxicephalus adspersus, Amietia quecketti*, *Phrynobatrachus natalensis, etc.*

The Giant Bullfrog (*Pyxicephalus adspersus*) is a protected frog species whose conservation status has been revised and was included as a Red Data Species under the category „Lower Risk near threatened" (Minter *et al.* 2004). Giant Bullfrogs historically occurred throughout the Kyalami-Blue Hills-Crowthorne Agricultural Holdings area.

Limited foraging potential occurs on the site due to the transformation of the entire site into an existing residential erven and garden as well as degraded grassland (old horse paddocks and Teff pastures). Marginally suitable foraging habitat occurs within the open grasslands to the north of the site. Due to frequent burning of the remaining patches of grasslands, the natural species composition and prey availability become transformed. Several large termite mounds occur on these sites and the annual emergence of several thousand winged alates provide an important food source to several animal species, especially herpetofauna.

No breeding habitat occurs on the site or in the immediate surrounding area. The seasonally inundated margins around the artificial dams in the Beaulieu (Witpoort) Bird Sanctuary approximately 980 m to the north-west of the site may still offer suitable breeding habitat. Historic breeding activities were recorded in 1991-1994 mainly due to the draining of the artificial permanently inundated dam. Extremely limited migratory habitat remains as the site has extensive barriers/walls as well as situated adjacent to R55 and M71 road and several secondary roads. These roads often offer the only migrational route for Giant Bullfrogs towards suitable breeding habitats; resulting in mass road fatalities. The R55 with its high vehicular traffic can be considered a migration barrier for the majority of frog species. Several high security walls and wire (razor) fences limit the migration of several species around the entire Kyalami Estate area.

It is therefore considered the study site contains limited suitable foraging and migratory habitat of low conservation importance, and no suitable breeding habitat for Bullfrogs. Destruction of the habitat provided by the study area will have an impact of low significance on the conservation status of these species within a local (Kyalami Estate) scale and a low significance within Gauteng.

2.2.2 Reptiles

Comprehensive reptile species lists are impossible to determine with extensive fieldwork over a number of months or even years. As a result of human presence in the area (pathways, houses) coupled with habitat destruction and disturbances (frequent fires at incorrect time of year), alterations to the original reptilian fauna are expected to have already occurred. No scattered rupicolous or rocky outcrops and indigenous Egoli Granite Grassland vegetation remains on the transformed site. Destruction of rocky outcrops and removal of rock will result in the destruction of vital habitat for remaining rupicolous (living on or amongst rocks) reptile species including snakes, skinks and geckos. No termite mounds were observed within the degraded grasslands and landscaped areas within the site. Two reptile species were recorded namely a Striped or Speckled Rock Skink (*Trachylepis punctatissima*) and a Cape Dwarf Gecko (*Lygodactylus capensis*). Both these species are urban exploiters and were observed within the residential garden. Low reptile diversity is expected from the transformed site due to extensive habitat transformation and high levels of anthropogenic activities on and surrounding the site.

Reptile species recorded for the 2528 DA QDGC according to ReptiMAP (SARCA) include Southern Tree Agama, Brown House Snake, Common Flap-neck Chameleon, Transvaal Gecko, Speckled Rock Skink, etc.

Actual species list for the site will contain considerable less species due to extensive habitat transformantion and degradation.

Continual destruction of suitable habitats has resulted in the disappearance of numerous reptile species on the Highveld. No snake species were recorded during the brief field survey. Indiscriminate killing of snake species is likely to have resulted in the disappearance of the larger and the more sluggish snake species within the study area. No evidence of illegal reptile collecting was observed throughout the site although it may have occurred in the past. No threatened reptile species were recorded during this survey, but the Coppery Grass Lizard (*Chaemaesaura aenea*), which is categorised as Near-Threatened in the latest Red Data List (SARCA 2014) has been recorded from the grid square (2528 DA) within which the study area is situated. No suitable habitat occurs within the proposed site due to the transformation (established gardens and lawns) and degradation of the majority of grasslands (overgrazing, frequent fires, alien vegetation invasion and grass harvesting activities).

2.2.3 Avifauna

Due to time constraints no comprehensive bird lists could be compiled. During brief site visitations (total of 8 hrs), 26 bird species were recorded. Two hundred and forty five (245) bird species have been recorded during the SABAP2 within the 2555-2800 pentad in which the study site is situated. The majority of species recorded during field surveys are common, widespread and typical highveld species. Numbers of bird species in the Kyalami area have declined mainly due to increased levels of human disturbances (quad and off-road bikes); extensive habitat transformation due to increased urban sprawl and agricultural activities; as well as severe habitat degradation of the wetlands as well as rivers (especially the Modderfontein spruit, Klein Jukskei and Jukskei).

At a local (Kyalami AH) scale the transformed grasslands on the site provide limited habitat for birds in general. Destruction of the habitat provided by the study area will have an impact of negligible significance on the conservation status of threatened species within a local (Kyalami) scale and no significance within Gauteng.

2.2.4 Mammals

No small mammal trapping was conducted. Fieldwork was augmented with previous surveys in similar habitats as well as published data. The area was initially traversed on foot to ascertain the presence of available refuges which comprised of soil, rubble and waste stockpiles. The only mammal species observed were a few scattered African Molerat burrows in the sandier sections of the site as well as a House Rat. Mammal diversity is expected to be low and mainly urban exploiters such as the introduced House Rat and House Mouse.

No sensitive or endangered mammals were recorded within the study area. The majority of larger mammal species are likely to have been eradicated or have moved away from the area, as a result of hunting and poaching as well as

habitat alteration and degradation. Common or Bush Duiker, Black-backed Jackal have however been recorded from surrounding grasslands situated in the Kyalami and Blue Hills area. Smaller mammal species are extremely vulnerable to snares and poaching activities as well as feral cats and dogs. According to the "South African Red Data Book of Terrestrial Mammals" (Smithers 1986) and Skinner and Smithers (1990), the study area falls within the distribution ranges of 12 species which are placed into one of known threatened species (Endangered, Vulnerable and Rare). The study site may provide suitable habitat for at least 1 of the 12 above-mentioned threatened species, namely the South African Hedgehog (*Atelerix frontalis),* though the presence of dogs on the property could result in them being killed.

South African Hedgehogs have been recorded in the Fourways, Chartwell and Dainfern areas. The recent transformation and destruction of large open grassland areas for high density residential developments within Broadacres, Dainfern, Fourways and Chartwell areas and increased human presence has resulted in the decline of Hedgehogs in the area. Destruction of the transformed habitat provided by the study area will have a negligible impact on the remaining (albeit limited) mammals found on the site. The development of the site will have a **low significance** on the conservation status of the remaining animal species within a local (Kyalami) scale and no significance within Gauteng

3. Heritage Assessment

The study area falls within that zone usually located on the front edge of (city) urban-sprawl where the land previously used for agricultural use (only) have become subdivided into small holdings. What used to be a large single agricultural unit or farm now consists of tens of small properties. These units do not have their economic base in traditional agriculture but are sustained by a variety of land uses and economic activities with strong urban associations. This phenomenon happened in the past forty years.

Therefore most of the built fabric, date from this period. The result was that any historic farmsteads older than 60 years that may have existed have either disappeared or have been 'upgraded'.

However, during the last couple of years large scale urban development took place which would have had a big impact on any sites, features or object of cultural significance that might have occurred here in the past.

At present the open areas in the study area is densely overgrown and is used by unscrupulous people who dump building rubble and other rubbish on it.

Most of the properties show an eclectic mix of styles and material used in their construction. Coupled to this is in some cases haphazard extension of the associated structures, indicating a chronological development of expansion as more room was required due to expanding families or with the development of small business opportunities on some of the sites.

Although some of the properties are still occupied, others are abandoned and neglect and vandalism is taking its toll. Others are systematically being stripped of fixtures and in some cases even the bricks are being torn down for recycling

From the 1939 topocadastral map it was determined that very little development existed in the region of the study area. The implication is that no structures older than 60 years exist on the properties

The Heritage Impact assessment summarised that as no site, features or objects of cultural significance are known to exist in the study area, there would be no impact as a result of the proposed development.

Therefore, from a heritage point of view we recommend that the proposed development can continue. It was recommended that if archaeological sites or graves are exposed during construction work, it should immediately be reported to a heritage consultant so that an investigation and evaluation of the finds can be made.

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 proposed development promotes the use and development of land that optimizes the use of existing resources.
- The development falls within the City of Johannesburg Metropolitan Municipality and the promotion and facilitation of economic development is an important objective. Authorisation will facilitate the aforementioned - development of a residential development.
- The development is an economic development by the private sector, which will generate substantial opportunities for the Municipality to generate revenue for residents to have access to a wide range of amenities and for jobs to be created both in the construction and operational phases and increase the City's tax base.
- The proposed development of the proposed site will contribute to the re-engineering of the existing urban form, the establishment of a more compact city and also contribute to the optimization of the use of existing infrastructure such as bulk sewer lines, bulk roads and water.
- The development is situated within an urban area and will counter 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
- The proposed development will cater for a variety of residents with different income levels in the surrounding area, therefore contributing to the integration of previously disadvantaged persons into the area.

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 alterantives, 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-zoning 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:

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

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

The Heritage Impact assessment summarised that as no site, features or objects of cultural significance are known to exist in the study area, there would be no impact as a result of the proposed development.

Therefore, from a heritage point of view we recommend that the proposed development can continue. It was recommended that if archaeological sites or graves are exposed during construction work, it should immediately be reported to a heritage consultant so that an investigation and evaluation of the finds can be made.

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 Annexure

SECTION C: PUBLIC PARTICIPATION

1. ADVERTISEMENT

The Environmental Assessment Practitioner must follow any relevant guidelines adopted by the competent authority in respect of public participation and must at least –

1(a) Fix a site notice at a conspicuous place, on the boundary of a property where it is intended to undertake the activity which states that an application will be submitted to the competent authority in terms of these regulations and which provides information on the proposed nature and location of the activity, where further information on the proposed activity can be obtained and the manner in which representations on the application may be made;

1(b) inform landowners and occupiers of adjacent land of the applicant's intention to submit an application to the competent authority;

1(c) inform landowners and occupiers of land within 100 metres of the boundary of the property where it is proposed to undertake the activity and whom may be directly affected by the proposed activity of the applicant's intention to submit an application to the competent authority;

1(d) inform the ward councillor and any organisation that represents the community in the area of the applicant's intention to submit an application to the competent authority;

1(e) inform the municipality which has jurisdiction over the area in which the proposed activity will be undertaken of the applicant's intention to submit an application to the competent authority; and

1(f) inform any organ of state that may have jurisdiction over any aspect of the activity of the applicant's intention to submit an application to the competent authority; and

1(g) place an advertisement in one local newspaper and any *Gazette* that is published specifically for the purpose of providing notice to the public of applications made in terms of these regulations.

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 (GDARD).

Has any comment 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):

The Department reviewed this application and has no objection to the proposed development. The following is recommended by the Environmental Infrastructure & Services Department of the CoJ.

- The indigenous trees are conserved and development planned around them as far as possible.
- The CoJ open Space Framework requires a provision of 2,4ha of Socio-economic open space per 1000 population. This open space must be useable for recreation.
- The design of storm water management systems should be based on Sustainable Urban Drainage Systems (SUDS) and Water Sensitive Urban Design approaches (WSUDS) which enhance natural drainage through permeable surfacing and which integrate landscaping with stormwater in line with best practice storm water management. A stormwater management plan is subject for approval by JRA prior to the Site Development Plan stage.

  Management of stormwater will also need to be designed in such a manner as to prevent negative impacts such as erosion and sedimentation, and to ensure environmental protection of downstream areas. Such plan would be required to meet the following criteria/standards:

  Peak discharge – no increase in discharge for any event of any duration up to the 25 year RI event

  Volume of runoff – no increase up to the annual 10 year rainfall

  Runoff frequency – no surface runoff for the 1yr RI event of any duration

  Water Quality – no deterioration

  The storm water management system should meet the following objectives:
  - Reproduce as nearly as possible the hydrological conditions at point of discharge that existed prior to development
  - Provide for removal of most urban pollutants
  - Have a neutral to positive impact on the natural and human environment
  - Low maintenance structures and measures. In terms of the CoJ Catchment Management Policy, no structures are permitted within the 1:100 year flood line r riparian zone.
- All landscaping in common areas and streetscaping should use indigenous plants only, with preference given t locally indigenous species where possible.
- A copy of the Record of Decision showing approval by GDARD must be forwarded to this Department.

This Department should be informed of the date that construction on site would commence for the purpose of compliance monitoring.

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

Comment from the municipality on the Draft BA is included in the Public participation report of the Final Basic Assessment.

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.

Additional Information
a. A meeting will be held on the 24th of February 2015 to inform the public about the proposed development.
b. Newspaper notices were placed in "The Beeld" on Wednesday 23 January 2015.
c. On-site notices were placed on site on at the same time and at the main entrance of the site, and along the sides of the property (information meeting).
d. 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.
e. The Ward Councillor was informed of the proposed development by telephonic conversation and e-mail.
f. The first Draft BAR was put out for 30 day comment on the 20th of February and commetns were worked into the amended Draft.
g. The Amended Draft was put out for30 day comment on the 30th July, 2015.

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):

- Impact of the Development on traffic
- Description of proposed development, including building plans, size of plots number of storeys, access
- Impact of proposed development on security
- Bulk contribution to infrastructure, storm water, access, upgrade of roads density of development
- Effect of proposed development on infrastructure
- Privacy of Kyalami Estates Residents
- Connection to bulk services sewer line – bulk sewer line is unwanted in area

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

4. GENERAL PUBLIC PARTICIPATION REQUIREMENTS

The Environmental Assessment Practitioner must ensure that the public participation 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 inadequate.

The practitioner must record all comments and respond to each comment of the public / interested and affected party before the application 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

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

Appendix 1 – Proof of site notice

Appendix 2 – Written notices issued to those persons detailed in 1(b) to 1(f) above

Appendix 3 – Proof of newspaper advertisements

Appendix 4 –Communications to and from persons detailed in Point 2 and 3 above

Appendix 5 – Minutes of any public and/or stakeholder meetings

Appendix 6 - Comments and Responses Report

Appendix 7 –Comments from I&APs on Basic Assessment (BA) Report

Appendix 8 –Comments from I&APs on amendments to the BA Report

Appendix 9 – Copy of the register of I&APs

Appendix 10 – Comments from I&APs on the application

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 (complete only when appropriate) **0** times

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?	Approx. 50m^3	

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

Dumper Trucks via contractor requirements

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

Waste will be removed by a Certified Waste Management Company and be disposed of at a registered landfill site.

Will the activity produce solid waste during its operational phase?	**YES**	NO
If yes, what estimated quantity will be produced per month?	Approx. 100m^3	

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

Solid waste during the operational phase will primarily be household waste. It will be picked-up by the local municipality and discarded at a registered landfill site.

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)?

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.

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?	m^3	
If yes, has the municipality confirmed that sufficient capacity exist 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?	m^3	

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

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:			
Contact person:			
Postal address:			
Postal code:			
Telephone:		Cell:	
E-mail:		Fax:	

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

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?	Approx. 350m^3	
If yes, has the municipality confirmed that sufficient capacity exist 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.

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:

Not applicable

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: liters

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

If yes, have you applied for the water use permit(s)?	YES	NO
If yes, have you received approval(s)? (attached in appropriate annexure)	YES	NO

3. POWER SUPPLY

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

Eskom

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

4. ENERGY EFFICIENCY

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

Energy efficient light bulbs
Gas for cooking and for heating in the winter

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

Solar geysers

Additional information:

- **Solid waste management**

The proposed activity will produce solid construction waste during the construction phase. The EMP attached in **Annexure H** of the Basic Assessment Report indicates various ways in which these waste items will be minimized and discarded. However, the following points highlight a few of these key points:
The types of solid waste that will be produced are mostly construction rubble and would be optimally used as filling material.

- All domestic waste will be disposed at a registered landfill site.
- Re-use and recycling would be encouraged by providing facilities for recycling on site.

- **Liquid effluent (other than domestic sewage)**

No liquid effluent other than domestic sewage will be produced by the proposed activity.

- **Liquid effluent (domestic sewage)**

The proposed activity will produce liquid effluent in the form of a small quantity of domestic sewage during the construction and operational phase.

- **Emissions into the atmosphere**

The proposed activity will release emissions, mostly in the form of dust, into the atmosphere during the construction phase. The EMP attached in **Annexure H** of the Basic Assessment Report indicates various ways in which these emissions will be minimized and controlled.

SECTION E: IMPACT ASSESSMENT

The assessment of impacts must adhere to the minimum requirements in the EIA Regulations, 2006, 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.

1. ISSUES RAISED BY INTERESTED AND AFFECTED PARTIES

Summarise the issues raised by interested and affected parties.

- Impact of the Development on traffic
- Description of proposed development, including building plans, size of plots number of storeys, access
- Impact of proposed development on security
- Bulk contribution to infrastructure, storm water, access, upgrade of roads density of development
- Effect of proposed development on infrastructure
- Privacy of Kyalami Estates Residents

Summary of response from the practitioner to the issues raised by the interested and affected parties
(A full response must be provided in the Comments and Response Report that must be attached to this report):

Refer to the comments and response report attached to appendix 6 of the public participation report, which is attached hereto under Annexure E.

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

Briefly describe the methodology utilised in the rating of significance of impacts

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

2.1.1 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.

2.1.2 Site Inspection
The environmental consultant and specialists conduct a site visit and identify potential sensitive environments such as streams, wetlands, and ridges. These areas are then red-flagged to be investigated further and excluded from development.

2.1.3 Public Participation
Conducting public participation will produce an issues list. Such a list needs to be screened for relevant impacts, which then need to be addressed, by specialist studies or further investigation.

2.1.4 GDARD Review / Terms of Reference
GDARD reviews the application and the different sub-directorates within the department give comments to the relevant environmental officer. The issues identified are forwarded to the environmental consultant and these issues are addressed or translated as impacts.

2.2 The following criteria for **Impact Significance** were used in calculating the significance rating of the possible impacts as described in the table below (identical to the table in the Basic Assessment Report).
Thompson (1990) in short defines impact significance as an expression of the cost or value of an impact to society. In booklet no. 5 Impact Significance of the Integrated Environmental Management information
Series, published by DEAT (2002), the rating of impacts of magnitude & significance is set forth as follows:

2.2.1 High
Of the highest order possible within the bounds of impacts that could occur. In the case of adverse impacts, there is no possible mitigation that could offset the impact, or mitigation is difficult, expensive, time consuming or some combination of these. Social, cultural and economic activities of communities are to such an extent that these come to a halt. In the case of beneficial impacts, the impact is of a substantial order within the bounds of impacts that could occur.

2.2.2 Medium
Impact is real, but not substantial in relation to other impacts that might take effect within the bounds of those that could occur. In the case of adverse impacts, mitigation is both feasible and fairly easily possible. Social, cultural and economic activities of communities are changed, but can be continued (albeit in a different form). Modification of the project design or alternative action may be required. In the case of beneficial impacts, other means of achieving this benefit are about equal in time, cost and effort.

2.2.3 Low
Impact is of a low order and therefore likely to have little effect. In the case of adverse impacts, mitigation is either easily achieved or little will be required, or both. Social, cultural and economic activities of communities can continue

unchanged. In the case of beneficial impacts, alternative means of achieving this benefit are likely to be easier, cheaper, more effective and less time-consuming.

2.2.4 No impact
Zero impact.

SEE ANNEXURE I5 FOR THE IMPACT ASSESSMENT METHODOLOGY, IMPACT ASSESSMENT TABLE AND MITIGATION MEASURES.

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.

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

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.

Table 7.1 : Impact assessment – Construction and operational phase

Alternative 1 – Preferred Alternative - High-density residential scheme and uses ancillary and subservient thereto.

Potential Impact	Scale A	Magnitude B	Duration C	Consequence A+B+C	Probability	Impact Significance	Confidence
Construction phase							
1. ISSUE: AIR QUALITY							
1.1 Dust/Air pollution - The generation of fugitive dust associated with construction activities & earthworks.	**Local (2)**	**Low (1)**	**Short term (1)**	**Low (4)**	**Definite**	**Low & definite = Low**	**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)**	**Medium (2)**	**Long term 4)**	**Medium (8))**	**Definite**	**Medium & definite = moderate**	**high**
2.2 Bulk earthworks: Deep cuttings, high embankments, disposal of soil and excavations cause local changes to topography	**Local (2)**	**Medium (2)**	**Long term (3)**	**Medium (7))**	**Definite**	**Medium & definite = Moderate**	**high**
3. ISSUE GEOLOGY AND SOILS							
3.1 Soil erosion, loss of topsoil, deterioration of soil quality	**Local (2)**	**Medium (2)**	**Long term (3)**	**Medium (7)**	**Definite**	**Medium & definite = Moderate**	high
3.2 Soil pollution	**Site only (1)**	**Medium (2)**	**Medium term (2)**	**Low (5)**	**Improbable**	**Low & Improbable = Low**	high
3.3 Perched water table was noted in some of the test pits at depths varying between 3,1m and 3,5m, should be taken into account in terms of design	**Site only (1)**	**Low (1)**	**Long term (3)**	**Low (5)**	**Improbable**	**Low & improbable = Low**	
4. ISSUE FAUNA AND FLORA							
4.1 Degradation, destruction of habitats/ ecosystem	**Site only (1)**	**Low (1)**	**Long term (3)**	**Low (5)**	**Definite**	**Medium & definite = medium**	**high**
4.2 Impacts on fauna and flora	**Site only (1)**	**Medium (2)**	**Long term (3)**	**Medium (6)**	**Definite**	**Medium - definite = Medium**	**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)**	**Low (1)**	**Long term (3)**	**Medium (6)**	**Definite**	**Medium & Definite = Medium**	**high**
5.2 Impact on water quality	**Local (2)**	**Low (1)**	**Short term (2)**	**Low (5)**	**Probable**	**High & definite = Low**	**high**
SOCIO-ECONOMIC AND CULTURAL HISTORICAL ENVIRONMENT							
6. ISSUE AESTHETICS, LANDSCAPE CHARACTER AND SENSE OF PLACE							
6.1 Noise/ vibration	**Local (1)**	**Medium (2)**	**Short term (1)**	**Low (4)**	**Definite**	**Low & definite =**	**high**

Potential Impact	Scale A	Magnitude B	Duration C	Consequence A+B+C	Probability	Impact Significance	Confidence
						Low	
6.2 Visual impact	**Local (1)**	**Medium (2)**	**Short term (1)**	**Low (4)**	**Definite**	**Low & definite = Low**	**high**
7. ISSUE SOCIAL WELL-BEING AND QUALITY OF THE ENVIRONMENT							
7.1 Safety and Security	**Local (1)**	**Medium (2)**	**Medium term (2)**	**Low (5)**	**Probable**	**Low & probable = Low**	high
7.2 Job opportunities	**Region (2)**	**High (3)**	**Long term (3)**	**High (8)**	**Probable**	**High & probable = High**	Medium
7.3 Increase in traffic	**Region (2)**	**High (3)**	**Long term (3)**	**High (9)**	**Definite**	**High & Definite High**	
8. ISSUE HISTORICAL ENVIRONMENT							
8.1 Destruction of cultural / heritage sites	**None**	**None**	**None**	**Not significant (0)**	**Improbable**	**Not significant & improbable = insignificant**	**medium**
9. ISSUE INFRASTRUCTURE AND SERVICES/WASTE							
9.1 Waste	**Local (1)**	**Low (1)**	**Short term (2)**	**Low (4)**	**Probable**	**Low & probable = Low**	**high**
9.1 Pressure on existing infrastructure and services	**Region (3)**	**High (3)**	**Long term (3)**	**High (9)**	**Probable**	**High & probable = High**	**Medium**
10. ISSUE DESIGN AND LAYOUT							
10.1 Functional design of Residential development	**Local (2)**	**Medium (2)**	**Long term (3)**	**Medium (7)**	**Probable**	**Medium &probable = Medium**	**Medium**

Alternative 2 – mixed use office park and commercial centre

The impacts for Alternative 2 is similar to that of Alternative 1 with the following exceptions:

Potential Impact	Scale A	Magnitude B	Duration C	Consequence A+B+C	Probability	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.	**Region (2)**	**High (3)**	**Long term (3)**	**Very High (8)**	**Probable**	**Very High & probable = Very High**	**Medium**
5.2 Impact on water quality	**Regional (2)**	**Low (1)**	**Long term (3)**	**Medium (6)**	**Definite**	**Medium & definite = Medium**	**Medium**

Alternative 3 – Not applicable – No Go option

2.2 Proposed mitigation measures

Preferred alternative: - It is proposed to develop a high-density residential scheme and uses ancillary and subservient thereto.

Although the study area is located within the threatened Egoli Granite Grassland vegetation type (Mucina & Rutherford 2006), the study area is completely transformed due to human activities. No sensitive habitat or plant and animal species are present. The area has a very low biodiversity and comprises mostly pioneer and weedy plant species. The large number of declared alien invasive species is present on the study site is alarming. Not only do these species affect the study area negatively, but also serves as a central point from where there seeds are dispersed into surrounding natural areas.

From a plant and animal ecological point of view the area has no conservation or biodiversity value.

The orange listed geophyte individuals Hypoxis hemerocallidea must be removed by a qualified botanist/ecologist/nature conservationist before any development commences. These species should then be replanted in suitable natural habitat.

Table 7.2a : Mitigation measures per listed activity

Proposed mitigation per listed activity	
Activity 9 and 10 i.t.o GN 983 **Mitigaton measures in terms of impacts related to the installation of Services.** **Storm water** There is limited formalized stormwater management in the area. The stormwater currently flows as surface sheet flow over the area as per the current fall towards the north. Currently the stormwater runoff is discharged as sheet flow over the grasslands of the site, internally and onto the road reserves of both Pitts Avenue-R55 (Gautrans Road K71.02/P66-1) and Ethel Avenue. An embankment and "V"-shaped earth channel has been shaped along the western boundary between the site and Pitts Avenue-R55 (Gautrans Road K71.02/P66-1). Runoff is diverted along this towards two stone pitched lined channels which divert the stormwater into a concrete lined "V"-shaped road edge channel running along Pitts Avenue and falling in a northerly direction. Runoff is captured in two catchpits along this road length and it ultimately discharges in the riverine area about 550m to the north of the site. There is no formal stormwater drainage infrastructure along Ethel Avenue. The boundary on the high side of the site is formed by Whisken Avenue, which runs along a watershed. For this reason, there is no notable upstream ingress of stormwater onto the site. Internally the stormwater will be managed using a combination of shaped roads to act as drainage	Activity 27 i.t.o GN 983 **Activities related to the clearance of indigenous vegetation** The size of the site is approximately 12,8272 ha The following land use development controls are proposed: • Proposed Erf 1 o Zoning: "Residential 3" o Density: A maximum of 1050 units shall be developed o Height: The height of all buildings shall be restricted to 4 storeys o Coverage: The coverage shall not exceed 50% • Proposed Erven 2, 3 and 4 o Zoning: "Private Open Space", and uses ancillary and subservient thereto, including a gatehouse and clubhouse A building line of 15m and 10m shall apply along Whisken and Ethel Avenues respectively, provided that parking shall be permitted within the building line and that the building line may be relaxed with the written approval of the local authority.

Proposed mitigation per listed activity	
channels and piped stormwater reticulation. Due to the site configuration and the fact that Erf 101 juts into the site, the site is divided into two distinct catchments, the eastern catchment and the western catchment. These two catchments are separated along the western boundary of Erf 106 along the line of the previously "proclaimed road". It is proposed that three new attenuation tanks be constructed on the site to reduce the flood flows to acceptable levels and not to exceed pre-development discharge rates. One attenuation tank will be situated at the low point of the eastern catchment. Due to space constraints it was decided to construct two attenuation tanks within the western catchment. One of these being placed at the low point to the northern extent of the catchment to deal with stormwater from the lower half of the catchment and the other positioned midway up the slope, to catch and manage stormwater from the upper half of this western catchment. In this manner, the western catchment is separated into two sub-catchments, effectively. The run-off generated by the paved areas and roofs will run onto the internal roads and parking areas and captured by kerb and grid inlets and conveyed to attenuation tanks by a stormwater pipe network. It will be designed to accommodate the runoff generated by storm events with a recurrence interval of up to 5 years. or storm events with a recurrence of more than 5 years up to 1:25 years, the excess discharge not able to be accommodated by the piped system will be channelled in the roadways towards the attenuation facilities provided. In the event of an unusually large storm the attenuation tanks, outlet structures, roads and parking will be sufficiently rigid to be able to withstand a 50 year recurrence storm. The internal roads fall towards the attenuation facilities and these will include inlets in their roofs to allow for ingress of major storm runoff. Weepholes will be provided in the boundary walls at the lower parts of the site. In terms of the JRA stormwater management plan it was determined that attenuation for peak storm discharges is required on this site due to the development. The stormwater runoff from the site post development for the 1:5 and 1:25 year recurrence period will not exceed the pre-development 1:5 year and 1:25 year recurrence period storms, respectively. Furthermore the attenuation facilities are of an adequate size and sufficiently robust to accommodate a 1:50 year storm flow. Consequently, downstream stormwater infrastructure needs not be upgraded as there will not be an increase in stormwater runoff from the development. These stormwater management and attenuation requirements will be further advanced and ratified in the stormwater management study and report process. Refer to Figure 4 below • **Water supply** According to GIS data from Johannesburg Water, there is a 90mm Ø municipal water main and a 400mm Ø trunk main running along Whisken Avenue. The 90mm Ø line is currently supplying the neighbouring stands (agricultural holdings) in the greater Crowthrone A/H area. This line is supplied from a 110mm Ø main at a connection point some 570m to the east, at the junction of Whiskin	

Proposed mitigation per listed activity	
Avenue and Walton Road and is fitted with a PRV at this point. The 400mm Ø trunk main is situated on the opposite side of Whisken Avenue from the site (southern road reserve). A series of 110mm and 160mm Ø pipes are connected to it and supply water to the Kyalami Estates extensions to the south of Whisken Avenue. One of the 160mm Ø pipes is fitted with a PRV and is situated adjacent to the boundary between Erven 524 and 525, Kyalami Estates Extension 14 – about 145 meters to the east of the south eastern corner of the site. It appears that the 160mm Ø supply pipe between Erven 23 and 24 Kyalami Estates and then 110mm Ø supply pipe between Erven 1205 and 1153 Kyalami Estates have not been fitted with PRV's. These latter two supply connections feeding Kyalami Estates are situated opposite the southern boundary of the site. The existing 90mm Ø water supply network feeding the Crowthorne A/H area is insufficient to cater for these requirements. It is proposed to connect onto the existing 160mm Ø water main that branches off from the 400mm Ø trunk main adjacent to the boundary between Erven 23 and 24 Kyalami Estates, at a point outside the boundary of these erven with Whisken Avenue. A new 150m long 160mm Ø Class 16 water supply main from the municipal connection point to the site internal water supply network will be sufficient. This new supply pipe will be of uPVC and will be fitted with either fully restrained or Victaulic couplings. A new PRV will be installed by immediately opposite the site connection, on Whisken Avenue and will reduce the pressure to about 3.6 bar static pressure. Internally a combination of 110mm Ø and 75mm Ø pipes forming a network is sufficient. Since there is 11m fall across the site there should be about 4.7 bar static pressure at the lowest point of the site, in the north east corner, which is within acceptable limits. The site connection will be at the highest point of the site. Each new 4 storey residential block will then be provided with a 50mm connection. The entire site will have one bulk water meter. The civil engineers do not foresee any water pressure and supply flow problems related to this site. See Figure 4 below. • **Sewerage Services** There is currently no formal sewer reticulation servicing the erven making up the site, which are situated immediately to the north of the local watershed, the highpoint of which is situated roughly along Whisken Avenue in the vicinity of the site. The areas to the south of the watershed (Kyalami Estates and various Extensions) are serviced in terms of sewer. However due to the topography at the site, sewerage from this site is unable to be routed towards this reticulation. As a result, the erven making up the site are presently making use of septic tank type systems. It is a condition of Johannesburg Water that before the proposed Kyalami Retail Centre project and the development of Crowthorne Ext 18 may proceed, a new outfall sewer, to cater for the significant increase in waste water that would be generated by these developments, must be constructed.	

Proposed mitigation per listed activity	
Presently it is planned that the proposed outfall sewer ranging from 250mm Ø to 560mm Ø is to run from the north west corner of Erf 10 Kyalami A/H in a roughly westerly direction to connect into the existing 1200mm Ø Bruma Outfall Sewer. The total length of this proposed outfall sewer link is to be approximately 4940m. In order to facilitate the sewer drainage from the site, it is the intention to extend this outfall sewer by about another 700m from the north west corner of the proposed retail development, along its northern boundary (with Kyalami Main Road –M71), beneath Pitts Avenue-R55 (Gautrans Road K71.02/P66-1) by means of directional drilling, terminating at the north western corner of the site. This outfall sewer extension pipe will be a 200mm Ø uPVC pipe. Detail design drawings for this new outfall sewer have been prepared by ADA Consulting Engineers and are currently being assessed by JHB Water. From the site connection point, a new 200mm Ø sewer pipe will be constructed as part of the project and will link with the new 250mm Ø section of the proposed outfall sewer, discussed previously. This link will be constructed of uPVC pipe with a minimum fall of 1:200 and a minimum cover of 1400 mm beneath roads and paved areas and 1000mm below other areas, as per the JW Guidelines and Standards. This link sewer will include a road crossing under Pitts Avenue, which will be done using directional drilling. It is acknowledged that Gautrans wayleaves will be required for this road crossing. The pipe is sized to act as a communal conduit, able to accommodate future flows from prospective developments within the greater applicable catchment area. For both internal and external sewer reticulation, to comply with good engineering principles and Johannesburg Water standards for sewer maintenance manholes will be constructed at all changes of horizontal direction, changes in gradient and at junctions as well as at a maximum spacing of 80 m on straight lengths.	

Table 7.2b : Mitigation measures per identified impact

1.1 Dust /Air pollution The generation of dust associated with construction activities & earthworks	**Very-low**	• The building area is to be physically screened off with a shade cloth fence at least 1.8m in height, to prevent dust from being blown onto the road or neighbouring properties. • 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 or a biodegradable soil stabilisation agent. • Speed limits must be implemented in all areas, including public roads and private property to limit the levels of dust pollution. • It is recommended that the clearing of vegetation from the site should be selective and done just before construction so as to minimise erosion and dust. • Should construction in areas that have been stripped not be commencing within a short period of time the exposed areas shall	Low

		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.	
2.1 Visual Impacts - Topographical changes	Medium	• 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. • 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.	Low
2.2Bulk earthworks	Medium	• 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	Medium	• 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. • 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.	Low

3.2 Soil Pollution	**Low**	• 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.	Low
4.1 Degradation, destruction or elimination of habitats/ecosystems	Medium-low	• Site clearing is to be limited to only the area necessary for carrying out the specified works and the destruction of vegetation should be minimised. • No littering by construction workers is permitted. Any litter will be collected and removed off-site to a registered waste site. • Cleared indigenous vegetation can be stockpiled for possible reuse in later rehabilitation or landscaping, or as a brush pack for erosion prevention. • 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.	Low
4.2 Impacts on fauna and flora	Medium	• 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 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 private open spaces. • Before any vegetation is removed, a suitably qualified person (i.e. on ECO request of a vegetation specialist) shall inspect the study area for any plant/ grass/ tree species that could be transplanted to other similar/ suitable areas. This includes all Red Data or Protected, or rare plants that may be found during the flora site assessment or during construction operations. • Any medicinal/ protected/ Red Data flora including the orange list species *Hypoxis hemerocallidea* that will have to be removed shall be removed by a suitably qualified specialist and relocated. The applicable responsible person at the provincial department must be notified in the event of such plants being identified, who will then advise the ECO regarding what steps need to be taken and who will be responsible for the relocation and transplantation processes. • 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. • Only indigenous floral species (preferably using endemic o local species from the area), which are water wise and require minimal horticultural practices may be used during landscaping and rehabilitation. • All alien invasive plant and tree species should be removed from the site to prevent further invasion	Low

		• Remaining indigenous trees (naturally occurring in the area) should be retained wherever possible	
5.1 Stormwater flow, drainage and increased runoff due to hardened surfaces	Medium	• Stormwater management plan to be approved by Council's Open Space Division/ and/or engineers. • 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.	Medium
5.2 Impacts on water quality in respect of ground water **There are NO wetlands on site, however water runoff from construction site could runoff into the surrounding area impacting watercourses within the drainage area.**	Low	• Utilize proper waste management practices. • 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. • 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.	Low
6.1 Noise/ vibration	Low	• Noise levels shall be kept within acceptable limits, and construction crew must abide by National Noise Laws and local by-laws regarding noise. • 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	Low
6.2 Visual Impact	Low	• The site is in an extremely disturbed state , with existing properties that are not well maintained. • Structures that are to be erected should be aesthetically pleasing and blend into the area as far as possible to minimise the visual impact. • Buildings are to reflect and residential scale and design with finishes matching the existing styles and finishes. Buildings must adhere to the local zoning code and not be more than 2 storeys. • Buildings must be maintained in good standing at all times	Low
7.1 Safety and Security	Low	• 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 Regulations	Low

		• 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 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 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.	Positive High
8.1 Destruction of cultural / heritage sites No sites of cultural or heritage importance	Low	• Ensure that construction staff members are aware that heritage resources could be unearthed and the scientific importance of such finds. • Ensure that heritage objects are not to be moved or destroyed without the necessary permits from the South African Heritage Resources Agency (SAHRA) in place.	Low

were found during the Heritage impact Assessment			
9.1 Waste	Low	• Adequate number of waste disposal receptacles are to be positioned at strategic locations within the development. • No burning of waste. • Wayleaves required for all disposed waste.	Low
9.2 Existing infrastructure	High	• Integrity of existing services to be ensured. • Adherence to Service Report • Adherence to Traffic Impact Study requirements. • The service systems are to be designed according to the minimum requirements of, and submitted to the City of Johannesburg Metropolitan Municipality for approval. No construction activities must commence on site prior to obtaining the necessary approval. • 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
10.1 Functional design	Medium	• Scale and design must fit with adjacent land uses	Low

Alternative 2 – Office park and commercial centre
The impacts of Alternative 2 are similar to that of Alternative 1 with the following exceptions:

Table 7.3a: Mitigation measures listed activities

Potential Impacts	**Significance rating of impacts before mitigation**	**Proposed mitigation per listed activity**		**Significance rating of impacts after mitigation**
		Activity 9 and 10 i.t.o GN 983 As per table 7.2 above **Mitigation measures in terms of impacts related to the installation of Services.**	Activity 27 i.t.o GN 983 As per table 7.2 above **Activities related to the clearance of indigenous vegetation**	

Table 7.3b: Mitigation measures listed activities

Stormwater flow and drainage- Developments cause the modification of drainage patterns.	**Medium**	• Stormwater management plan to be approved by Council's Open Space Division/ and/or engineers.	Low

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.			
Additional noise and nuisance during **operational phase** of a commercial centre and business park – in the form of restaurants etc.	**Medium**	• Operational hours should be limited to 7h30 to 21h00, Mondays to Fridays and Saturday from 7h30 to 23h00 on weekends and public holidays. Necessary architectural changes will be made to the buildings and facilities to remain inside the required noise levels.	Medium-low
Impact on water quality in terms of ground water and drainage areas surrounding site.	**Medium**	• Locate construction cam, refueling depots, sanitation facilities and concrete batching plant 150m away from drainage area. • Utilize proper waste management practices. • 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. • 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.	Low

Alternative 3 – No – Go option

No environmental management plan will be implemented therefore no additional mitigation measures will be implemented.

Potential impacts:	**Significance rating of impacts:**	**Proposed mitigation:**	**Significance rating of impacts after mitigation:**
Flora disturbances	Low	The site will be left as is. No additional mitigation measures will	No mitigation measures will be

		be implemented.	implemented
Fauna disturbances	Low	The site will be left as is. No additional mitigation measures will be implemented.	No mitigation measures will be implemented
Increased run-off due to hard surfaces	Medium-low	The site will be left as is. No additional mitigation measures will be implemented.	No mitigation measures will be implemented
Erosion	Medium-low	The site will be left as is. No additional mitigation measures will be implemented.	No mitigation measures will be implemented
Pollution	Medium-low	The site will be left as is. No additional mitigation measures will be implemented.	No mitigation measures will be implemented

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

Annexure G1: Geotechnical Assessment
Annexure G2: Ecological Assessment
Annexure G3: Heritage Assessment
Annexure I1: Town planning Motivating Memorandum
Annexure I2: Services Outline Scheme Report
Annexure I3: Letters from Eskom
Annexure I4: Trafic Assessment

3. IMPACTS THAT MAY RESULT FROM THE DECOMISSIONING AND CLOSURE PHASE

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

The proposed development of offices and related infrastructure will probably operate in one form or another for a very long time – it is thus not realistic to evaluate the decommissioning phase at this stage. It is not foreseen that the proposed development would reach a decommissioning and closure phase due to the type of development. Section 3 is therefore not applicable to the proposed development.

Direct impacts:
The direct impacts associated with the decommissioning of the site are likely to be similar to the construction phase.

- Dust pollution
- Noise pollution
- Visual impact
- Fires and explosions may occur.
- Deep excavations.

Indirect impacts:
The indirect impacts associated with the decommissioning of the site are likely to be similar to the construction phase.

- Construction traffic
- Security
- Spread of alien vegetation

Socio Economic

- The decommissioning of the site will result in a loss of revenue for the local economy and the loss of jobs at the site. In the short term the decommissioning phase will create jobs.

Cumulative impacts:
The cumulative impacts associated with the decommissioning of the site are likely to be similar to the construction phase.

- Surface water pollution
- Increased run off of water
- Ground water pollution
- Socio Economic losses

Faunal Displacement

- The displacement of fauna as a result of an increase in ambient noises, vibrations is likely to remain even with mitigation. However if the site is returned to a state as close to the natural vegetation type of the area there is a possibility that fauna may migrate back over time.

Mitigation
The site will only be decommissioned if it is no longer needed.

- Decommissioning should take place during the dry winter months.
- Dismantling of equipment must be conducted by an accredited contractor.
- Deep excavations must be cordoned off prior to being back filled.
- Certificates must be obtained for all actions performed.
- Once the site has been filled it must be rehabilitated

Proposal

Potential impacts:	Significance rating of impacts:	Proposed mitigation:
Waste	High	Waste to be taken and spoiled at licensed landfill site
Visual	High	Rehabilitation plan
Dust	High	Dust suppression methods to be utilised
Noise	Medium	Working hours Adherence to EMP
Sense of place	Medium	Rehabilitation plan to be adhered to
Job losses	Medium	No mitigation

Alternative 1 – Impacts will be similar to the impacts discussed for the preferred alternative

Potential impacts:	Significance rating of impacts:	Proposed mitigation:	Significance rating of impacts after mitigation:

Alternative 2 – No additional activities to occur on site

Potential impacts:	Significance rating of impacts:	Proposed mitigation:	Significance rating of impacts after mitigation:
			Low

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

Annexure G1: Geotechnical Assessment
Annexure G2: Ecological Assessment
Annexure G3: Heritage Assessment
Annexure I1: Townplanning Motivating Memorandum
Annexure I2: Services Outline Scheme Report
Annexure I3: Letters from Eskom
Annexure I4: Traffic assessment

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:

Proposal – High density residential scheme and uses ancillary and subservient thereto(Cumulative impacts)

Due to the existing disturbed areas and the full regard for the environment, as well as the small scale of the proposed development, the cumulative impacts of **the proposal** would be minimal.

The proposed development will occur within the existing developed and degraded areas and no additional cumulative impacts are expected.

The ecological statement regarded the development area as having a low conservation value and ecosystem functioning.

No Sensitive fauna and flora communities were found on site.

The orange listed species *Hypoxis hemerocallidea* that will have to be removed shall be removed by a suitably qualified specialist and relocated. The applicable responsible person at the provincial department must be notified in the event of such plants being identified, who will then advise the ECO regarding what steps need to be taken and who will be responsible for the relocation and transplantation processes.

With the implementation of the Environmental Management plan, suitable mitigation measures will be implemented.
Potential cumulative impacts include:
Surface Water Pollution

- Spillages of oil, lubricants and fuel from construction vehicles, plant and machinery has the potential to contaminate surface water bodies.

Increased run off of Water

- Stormwater run off has the potential to erode the topsoil and result in sedimentation of water bodies if not controlled.

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, plant and machinery has the potential to contaminate the soil and groundwater.
- Cement mixing and the storage of fuel must be conducted so as to prevent contamination of the soil and groundwater.

Alternative 1- Construction of mix use development of offices and a commercial centre - (Cumulative impacts)
Due to the existing disturbed areas and the full regard for the environment, as well as the small scale of the proposed development, the cumulative impacts of **Alternative 1** would be minimal.

However due to the commercial aspect of the proposed development, the development could have a negative impact on surrounding neighbours in terms of noise caused by activities on the site such as shopping and restaurant facilities during after normal working hours.

Sensitive fauna and flora communities would be protected by implementing mitigation measures stated in the EMP

Potential cumulative impacts include:
Surface Water Pollution

- Spillages of oil, lubricants and fuel from construction vehicles, plant and machinery has the potential to contaminate surface water bodies.

Increased run off of Water

- Stormwater runoff has the potential to erode the topsoil and result in sedimentation of water bodies if not controlled.

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, plant and machinery has the potential to contaminate the soil and groundwater.
- Cement mixing and the storage of fuel must be conducted so as to prevent contamination of the soil and groundwater.

Alternative 2- (Cumulative impacts)
No additional activities will occur on the site. However the site is severely disturbed. No additional mitigation measures will be implemented and the site could eventually degenerate and could be subject to illegal dumping, illegal occupation of the site, which could lead to veld fires, increased crime etc.

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 - High density residential scheme and uses ancillary and subservient thereto

All measures will be implemented to develop those areas with the least ecological value. The proposed development could also positively impact on the safety and security of the area, the expansion of services capacity (water and sanitation), as well as the upgrade of existing infrastructure.

It is therefore suggested that the proposal be approved. The proposed development of the high density residential development including related infrastructure will provide additional work opportunities, and increase the City of Johannesburg's Tax base.

The duration of the of the impacts will only be during the construction phase and due to the disturbed nature of the proposed site the impacts from the proposed the development will be low. Impacts can be successfully mitigated

Furthermore the ecological assessment determined that there are no ecologically sensitive areas on site in terms of fauna and flora.

It is therefore suggested that the Preferred Alternative be approved.

Alternative 1 - Construction of mix use development of offices and a commercial centre

All measures will be implemented to develop those areas with the least ecological value. The proposed development could also positively impact on the safety and security of the area, the expansion of services capacity (water and sanitation), as well as the upgrade of existing infrastructure.

The proposed development of the office development and related infrastructure will provide additional work opportunities, and increase the City of Johannesburg's Tax base.

However due to the commercial aspect of the proposed development, the development could have a negative impact on surrounding neighbours in terms of noise caused by activities on the site such as shopping and restaurant facilities during after normal working hours.

Alternative 2 - No-go (compulsory)

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 additional housing in the area will be lost;

- A very viable opportunity for creating jobs and income for the local market will be negated;
- The area will fall further in disrepair and the protection and appropriate management of the ecological significant areas will be negated; or
- Illegal squatters or vagrants could inhabit the site.

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.

The approval will ensure that an EMP be implemented and that the sensitive areas on the site will be managed and that any floral and faunal species which are currently being hunted illegally be moved to natural habitat and be protected

6. IMPACT SUMMARY OF THE PROPOSAL OR PREFERRED ALTERNATIVE

For proposal:

Mitigation is achieved by a strict Environmental Management Plan controls any unnecessary environmental abuse.

Minimal negative environmental impacts are expected and mitigation is achieved by a strict Environmental Management Plan controls any unnecessary environmental abuse.

The positive impacts of the proposed development include job creation during the construction and operation phase, skills development for the community, improved tax base for the City of Johannesburg, provision of needed housing in the area.

For alternative:

Minimal negative environmental impacts are expected and mitigation is achieved by a strict Environmental Management Plan controls any unnecessary environmental abuse.

The positive impacts of the proposed development include job creation during the construction and operation phase, skills development for the community, improved tax base for the City of Johannesburg, provision of housing in the area.

However due to the commercial aspect of the proposed development, the development could have a negative impact on surrounding neighbours in terms of noise caused by activities on the site such as shopping and restaurant facilities during after normal working hours.

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.

The proposed development area of the site is already disturbed and the area is therefore regarded as having a low conservation value and ecosystem functioning. Therefore the development will not lead to additional impacts on the environment.
The residential development together with related infrastructure will optimally utilize the land to promote an accessible development, using an urban design framework which responds to the City's requirements.
The positioning of the services will be strategically planned according to the proposed layout to prevent further impacts on the environment.
Effective storm water management can be implemented.
Impact on the ecological environment will be mitigated due to the implementation of the EMP during construction.
There are no ecologically sensitive areas on site.
The community will benefit due to the improvement of bulk infrastructure as well as various job opportunities.

7. RECOMMENDATION OF 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).	**YES**	NO

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

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:

Traffic calming measures must be installed to prevent racing on the roads and to protect the horses and riders.
SPECIALIST RECOMMENDATION All specialist report recommendations must be adhered to.

MUNICIPALITY

All requirements from the Joburg Municipality be adhered to.

The following is recommended by the Environmental Infrastructure & Services Department of the CoJ.

- The indigenous trees are conserved and development planned around them as far as possible.
- The CoJ Open Space Framework requires a provision of 2,4ha of Socio-economic open space per 1000 population. This open space must be useable for recreation.
- The design of storm water management systems should be based on Sustainable Urban Drainage Systems (SUDS) and Water Sensitive Urban Design approaches (WSUDS) which enhance natural drainage through permeable surfacing and which integrate landscaping with stormwater in line with best practice storm water management. A stormwater management plan is subject for approval by JRA prior to the Site Development Plan stage.

  Management of stormwater will also need to be designed in such a manner as to prevent negative impacts such as erosion and sedimentation, and to ensure environmental protection of downstream areas. Such plan would be required to meet the following criteria/standards:

  Peak discharge – no increase in discharge for any event of any duration up to the 25 year RI event

  Volume of runoff – no increase up to the annual 10 year rainfall

  Runoff frequency – no surface runoff for the 1yr RI event of any duration

  Water Quality – no deterioration

  The storm water management system should meet the following objectives:
  - Reproduce as nearly as possible the hydrological conditions at point of discharge that existed prior to development
  - Provide for removal of most urban pollutants
  - Have a neutral to positive impact on the natural and human environment
  - Low maintenance structures and measures. In terms of the CoJ Catchment Management Policy, no structures are permitted within the 1:100 year flood line r riparian zone.
- All landscaping in common areas and streetscaping should use indigenous plants only, with preference given t locally indigenous species where possible.

EMP

- Regulations in the EMP should be adhered to, to protect receiving landscape.
- An Environmental Control Officer (ECO) should be appointed to audit the EMP on a bi-weekly basis during construction phase

Invasive species:

- All invasive species should be removed, as stipulated by CARA, and an on-going monitoring programme is required.
- Removal of these species should take place in an environmentally friendly way and should limit the disturbance from the removal of the species to as small an area as possible.

Rehabilitation:

- The areas disturbed by the development, but not covered by the development, should be rehabilitated as soon as possible and revegetated with indigenous species.
- The species should be indigenous to the specific area and the composition of the vegetation should reflect the natural vegetation
- The species used in rehabilitation of the proposed development should be indigenous to lessen the impact of exotic plant species on existing fauna and flora systems in the region

Storm water control:

- The stormwater management plan for this development should include the management of surface runoff during both the construction and operational phases.
- The stormwater management plan is to be approved by the Environmental Division of City of Johannesburg Metropolitan Municipality before construction may commence.
- Permeable Paving could be used to reduce runoff and increase infiltration and ground water recharge
- As much water as possible should be retained on site to be reused again for irrigation and habitat creation.

8. ENVIRONMENTAL MANAGEMENT PROGRAMME (EMPr)

If the EAP answers yes to Point 7 above then an EMP is to be attached to this report as an Annexure

EMPr attached	Yes

SECTION F: ANNEXURES

The following annexures must be attached as appropriate:

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

Annexure A: Site plan(s)

Annexure B: Photographs

Annexure C: Facility illustration(s)

Annexure D: Route position information

Annexure E: Public participation information

Annexure F: Water use license(s) authorisation, SAHRA information, service letters from municipalities, water supply information

Annexure G: Specialist reports
- Annexure G1: Geotechnical Report
- Annexure G2: Ecological Assessment
- Annexure G3: Heritage Assessment

Annexure H: EMPr

Annexure I: Other information
- Annexure I1: Townplanning Motivating Memorandum
- Annexure I2: Services Outline Scheme Report
- Annexure I3: Letters from Eskom
- Annexure I4: Traffic Assessment
- Annexure I5 Impact Assessment Statement
- Annexure I6: Comparison of alternatives
- Annexure I7: Undertaking by Environmental Assessment Practitioner
- Annexure I8: EAP CV

CHECKLIST

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

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